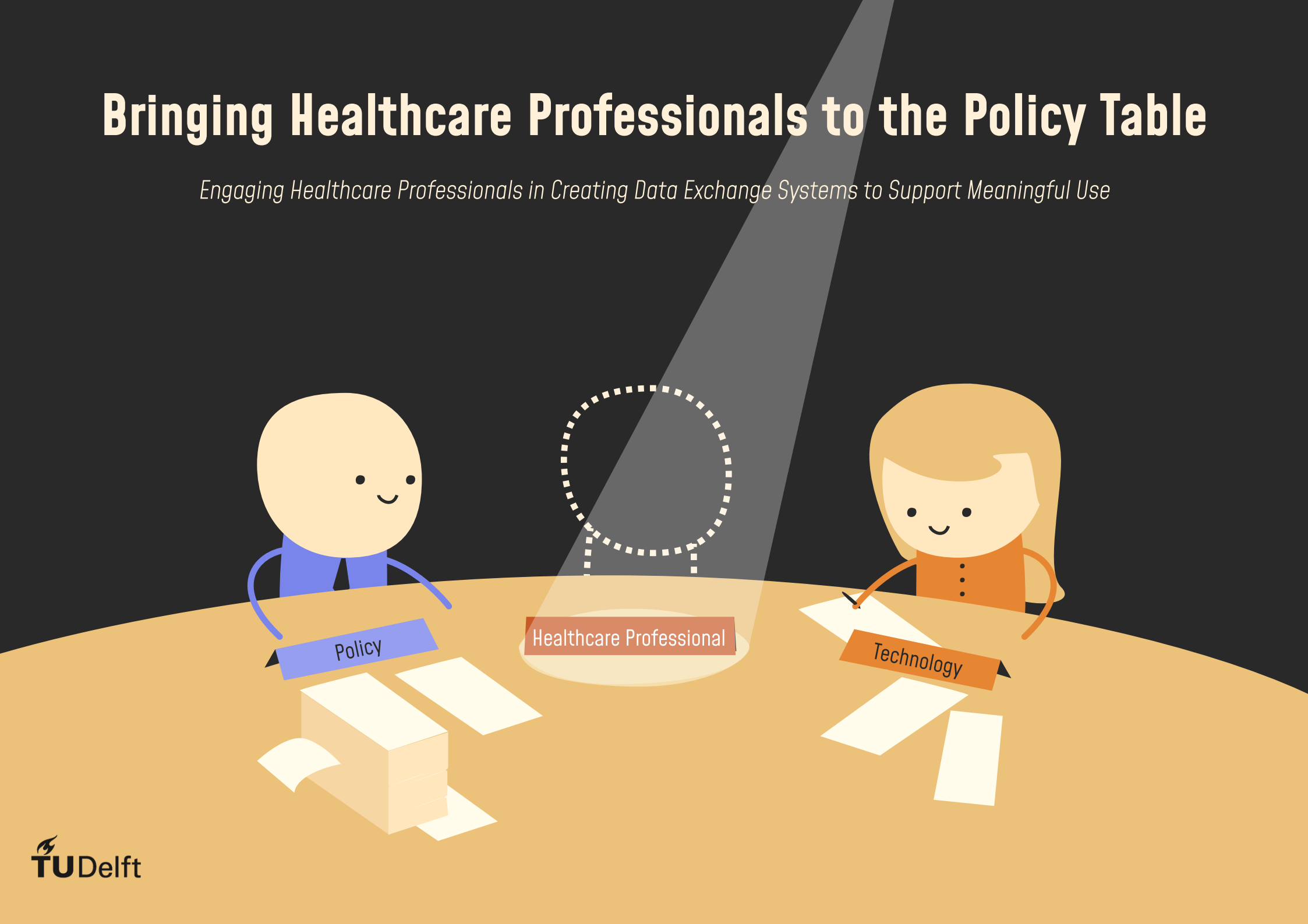
Bringing Healthcare Professionals to the Policy Table

Engaging Healthcare Professionals in Creating Data Exchange Systems to Support Meaningful Use



TU Delft

"The real problem is not that people err; it is that they err because the system design asks them to do tasks they are ill-suited for."

Junginger (2021)

Master thesis

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Preface

You are about to read the master thesis of Peter van Oost, a student Design for Interaction. Before taking you with me on a journey though the complex world of healthcare policy, I would like to thank the people that have made this all possible. First of all I want to thank my chair and mentor, Armagan Albayrak and Froukje Sleeswijk Visser. Their enthousiasm and experience have helped me through many difficult decisions and times of struggle. I also want to thank Petra Kok and Barbara Grootswagers, who have both made the most efforts to make sure I had all of the organizational support they could offer. I am grateful for all of the professionals and experts who have dedicated their time towards my interviews, evaluations, co-creations and answering my never-ending questions. Lastly, I want to thank my friends, parents and girlfriend who have supported and encouraged me with all of their energy and input.

Abstract

The Dutch healthcare system is under pressure. Standardizing digital data exchange is one of the strategies to improve quality and reduce costs. The BgZ will be the first standardized exchange implemented.

The Ministry of Health, Welfare, and Sport (VWS), healthcare institutions, Nictiz, and other stakeholders are collaborating to facilitate this standardization. However, they are struggling to deliver a truly usable system. Why is this?

My leverage analysis indicates that balancing power is the most crucial way to guide the system. Balancing power is inherent in almost all relationships, as different interests vie for influence on decisions and priorities.

The most critical relationship where power needs to be balanced is that between the healthcare professional and their software supplier. System actors with power apply it to prioritize technical and societal developments. Healthcare professionals need to be empowered to push the system to create software solutions that provide meaningful use in healthcare context.

Key Deliverables

- A new research process of request articulation which is able to accurately represent and support the perspectives of healthcare professionals (figure 0.1a)
- An interaction design that allows regular healthcare professionals to express their knowledge in a structured and accessible way (figure 0.1b)
- A strategy to achieving the future vision by articulating 4 phases, and insights on specific actions and capacities to build to get there.

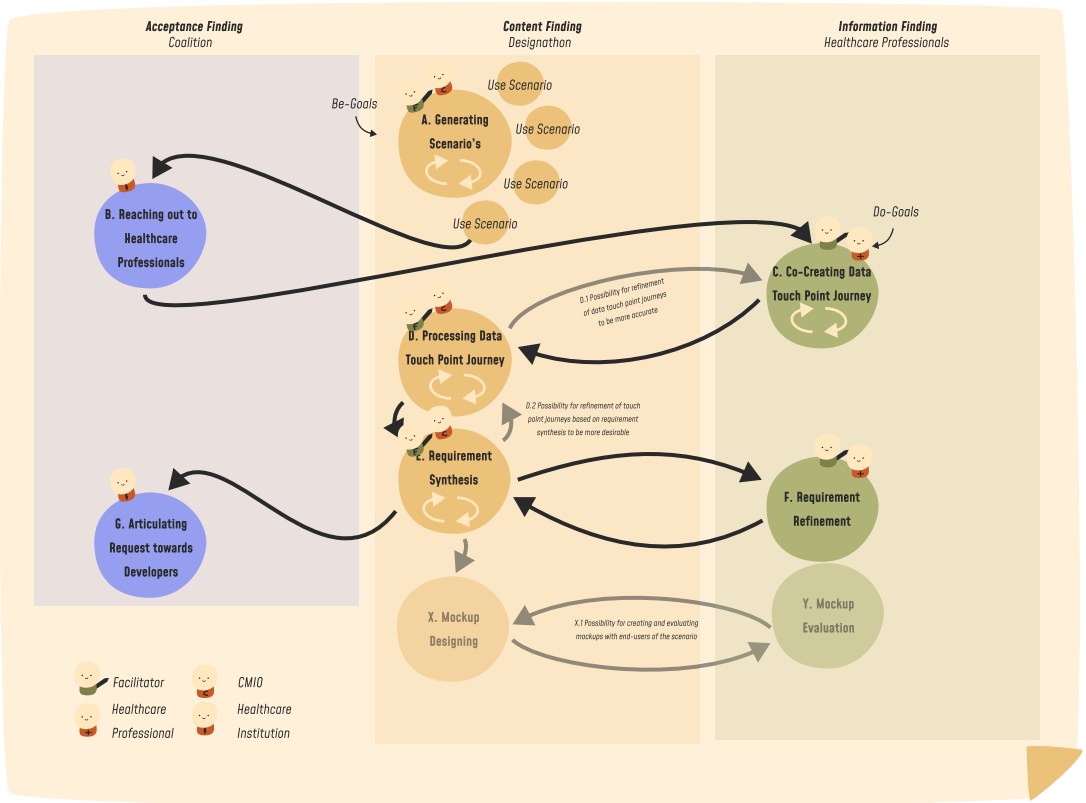

Figure 0.1a *Research Group Process Design*

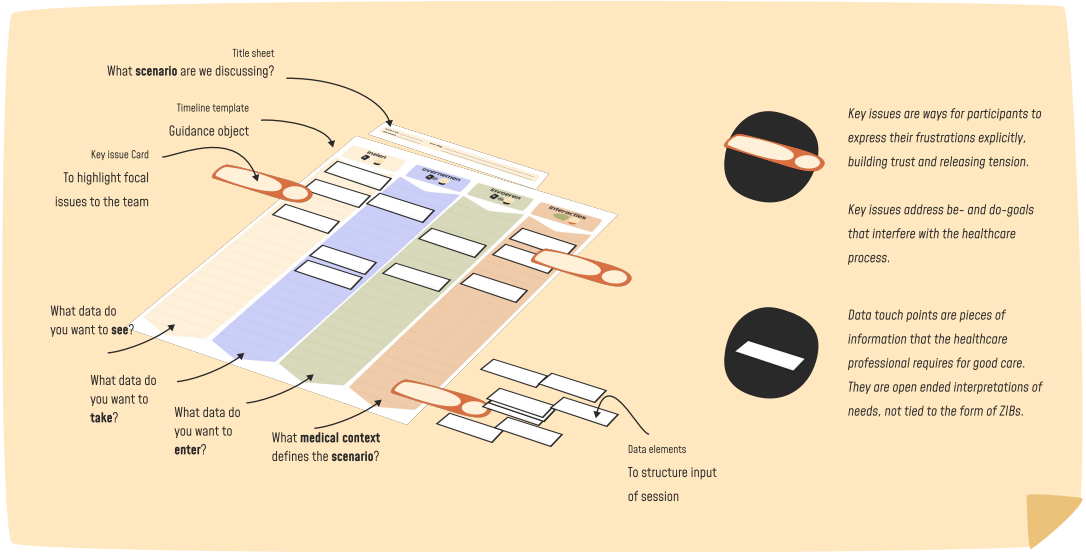

Figure 0.1b *Interaction Design for Data touch point gathering*

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1.4 List of Concepts and Abbreviations

Abbreviation	Concept
VWS	ministerie van Volksgezondheid Welzijn & Sport
PGO	Persoonlijke GezondheidsOmgeving
BgZ	Basisgegevensset zorg
ZIN	Zorg Instituut Nederland
LZ	Langdurige Zorg
CZ	Curatieve Zorg
AMvB	Algemene Maatregel van Bestuur
Wegiz	Wet elektronische gegevensuitwisseling in de zorg
Begiz	Besluit elektronische gegevensuitwisseling in de zorg
WJZ	directie Wetgeving en Juridische Zaken
DICIO	Directie Informatie beleid/ CIO
CMIO	Chief Medical Information Officer
IAK	Integraal AfwegingsKader voor beleid en regelgeving
CNIO	Chief Nursing Information Officer
KCBR	Kenniscentrum voor beleid en regelgeving
EDHS	european health data space
VRHT	Versturen van recept door huisarts aan terhandsteller
ZIB	ZorgInformatie Bouwstenen
NVZ	Nederlandse Vereniging Ziekenhuizen
FMS	Federatie Medisch Specialisten
ZN	Zorgverzekeraraars Nederland
NEN	NEderlandse Norm
Nictiz	De Nederlandse kennisorganisatie voor digitale informatievoorziening in de zorg.
HDE	Healthcare Data Exchange

Semantic Clarification

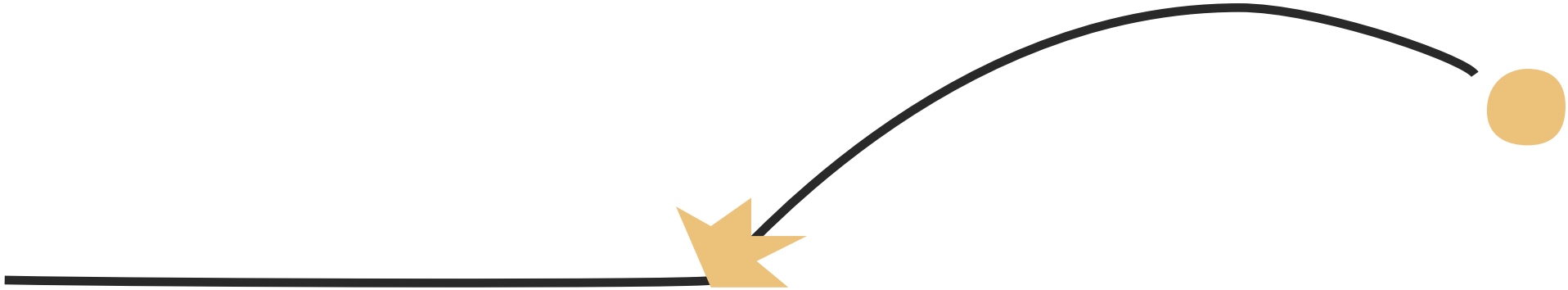
To prevent confusion, I want to quickly address some seemingly overlapping vocabulary.

System

- Social systems, describing relations of individuals, organizations and processes
- Technical systems, describing relations of technical components and software
- EPD/ HDE system, describing software systems specifically that handle digital patient data exchange
- Healthcare system, describing the collective of healthcare processes and institutions

Process

- Healthcare Process, describing the actions within a specific healthcare setting, like transfers or operations
- (Policy) Process, a set of activities done by actors to achieve a goal within the policy system



1

Introduction

Objectives and Kick-off

What is the motivation for conducting this research, and what is the initial project brief?

1.1 Objectives of the Report

This report aims to serve as a comprehensive overview of my findings and recommendations on implementation of BgZ (Basisgegevensset Zorg) policy.

Primary Objectives

- To show an in depth systemic analysis of behaviour, processes and flows through uncovering challenges and themes.
- To propose a future that pivots radically towards embedding the power of healthcare professionals in the policy and design systems.
- Develop actionable recommendations by creating a comprehensive strategy to realize the future vision for healthcare data exchange policy.

1.2 Reading Guide

This report is intended for both academic readers and system members. I want to make the distinction between four reading goals of this report

- context: for readers that need to more fully understand the context in which the project takes place
- methodology: for readers which are interested in the methods used for research and design activities
- deep knowledge: for readers interested in deep knowledge about findings of the research
- actionable insights: for readers interested in actionable insights and guides for implementation

Figure 1.2a shows the recommended reading paths.

Figure 1.2a *Recommended reading paths*

1.3 Ethics and Quotation of Sources

In conducting this research, it is crucial to acknowledge the ethical considerations involved, especially given the (politically) sensitive nature of many of the topics discussed. Ensuring the confidentiality and anonymity of sources is a primary concern to protect the individuals who have contributed their insights and experiences.

To maintain the integrity of this research while safeguarding the privacy of participants, all sources will be referred to in a non-traceable manner. For instance, if a source is cited as (VWS), it indicates that the information was provided by an employee of the Ministry of Health, Welfare and Sport (VWS). This approach ensures that the context and origin of the information are clear without compromising the confidentiality of the individual contributors. Sporadically, quotes will not have a reference at all, when I think the statement could be too sensitive.

This method not only protects the identities of those involved but also encourages candid and honest communication. Participants can share their experiences and perspectives without fear of repercussion, allowing for a more accurate and comprehensive understanding of the issues at hand.

While the ethical necessity of anonymizing sources is clear, this approach does come with certain drawbacks. One significant disadvantage is that the quotes can lose some articulation because the specific position and role of the speaker are not known to the reader. The precise context in which a statement was made, such as the speaker's role within the organization or their level of influence, can add valuable nuance and depth to the understanding of the issues discussed.

Without this context, some quotes might appear less authoritative or their relevance might be harder to gauge. This can affect the reader's ability to fully appreciate the insights shared and the weight they should carry. Despite this limitation, the priority remains to protect the participants' confidentiality while striving to present a comprehensive and truthful account of the findings.

1.4 Limitations

While the report aims to provide comprehensive insights, it acknowledges that the perspectives presented are based on a cross-section of the system and may not encompass all viewpoints. The data collection primarily relied on interviews and contextual research within a specific subset of stakeholders in the healthcare system. This approach, although insightful, may not capture the full spectrum of experiences and perspectives across different regions, specialties, and organizational levels. As a result, the findings and recommendations may not be universally applicable and could benefit from further validation through broader, more diverse stakeholder engagement.

The analysis and design were conducted by a single design student aiming to capture the system's richness. This means the report reflects my perspective on observations and analysis. While this offers a relatively unfiltered outsider's perspective, it also means the report is influenced by my personal interpretation of the data. Despite efforts to preserve nuance, diversity, and richness, the report remains a product of an individual viewpoint. Therefore, continuous updates and iterative assessments will be necessary to ensure that the strategies and solutions proposed remain effective and aligned with the evolving landscape of healthcare digitalization.

1.5 Kick-off

To develop a design intervention that ensures alignment, communication, and empathy between policymakers, related institutions, and the healthcare field on the project Basisgegevensset Zorg (BgZ), several steps were taken to initiate this research.

Problem Statement

The core problem addressed in this report is the misalignment and communication barriers between VWS, related institutions, and the healthcare field. This issue can be attributed to several factors:

1. Distinct Experiences and Knowledge: VWS and healthcare workers possess very different experiences and knowledge bases. Bridging the gap between these worlds requires effective communication strategies that consider these differences.
2. Organizational Structure: The current structure inhibits direct communication between policymakers and end-users, creating a 'whispering circle' where information exchange is often slowed and distorted.
3. Complex Healthcare Landscape: The diverse needs and resources of each sector and institution make policy creation and evaluation challenging, even with streamlined communication. Power struggles among trade associations and institutions further complicate progress.

These factors collectively seem to result in difficulties for stakeholders in understanding and empathizing with each other, leading to friction and dissatisfaction with presented policies. These insights lead to the design statement in figure 1.5a. The original project brief can be found in appendix A.

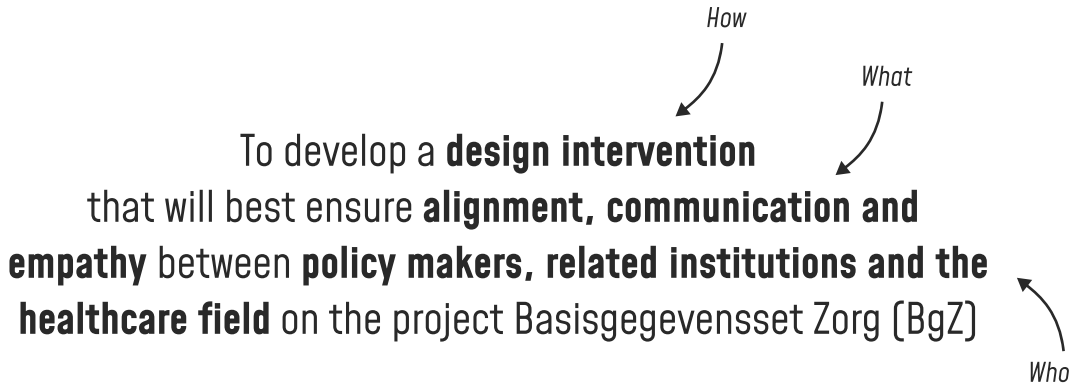


Figure 1.5a *Kick off design statement*

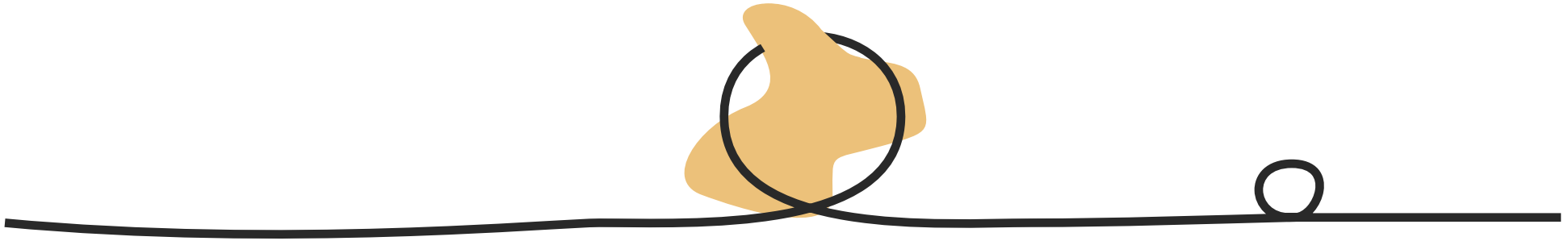
Symptoms Identified

The main symptoms that have been identified, and are the driving factor behind this research are

- Lack of commitment: Healthcare institutions are not committing to policy choices for implementation

- Unhappy healthcare professionals: Healthcare professionals are unhappy with the new software that implements the BgZ exchange.

- Delays in policy making: Policy timelines and implementation deadlines are under pressure.



2

Theoretical Background

Solving Policy Challenges Through Systemic Design

Why is systemic design a useful approach to tackle complex problems like the implementation of BgZ policy?

Introduction

What

The challenges that face the BgZ policy system are complex and difficult to address even for experienced members of the system. Systemic Design is a great approach to solving these challenges by addressing the root causes rather than the symptomatic problems.

Why

The nature of regulating and designing for healthcare data exchange is inherently complex, involving multiple stakeholders, workflows and processes. A systemic design approach is crucial to comprehensively address these complexities, identify root causes of usability issues, and develop sustainable solutions. By employing systemic design, we can map out relationships, uncover leverage points, and understand the broader ecosystem, ensuring that interventions are targeted and effective.

How

The chapter is structured to describe each methodological step in detail, explaining the rationale behind the chosen methods, the process of data collection, and the techniques used for analysis.

Contents

Conclusion

In conclusion, systemic design offers a powerful and comprehensive approach to addressing the complexities inherent in healthcare data exchange policies such as the BgZ. By leveraging the principles of holistic perspective, iterative processes, stakeholder engagement, and focus on underlying patterns and structures, systemic design provides a solid framework for developing sustainable and adaptive solutions. This approach is particularly beneficial in the context of healthcare, where multiple stakeholders, intricate workflows, and stringent regulatory requirements create a challenging environment for policy implementation. By addressing the root causes of problems rather than merely treating symptoms, systemic design ensures that interventions are not only well-targeted but also lead to lasting improvements.

Furthermore, recognizing and integrating diverse perspectives within the systemic design process is crucial for fostering collaboration and achieving comprehensive solutions. By balancing the visionary, managerial, and entrepreneurial perspectives, policies can be both innovative and practical, aligning long-term goals with immediate needs. This multifaceted approach enhances the relevance and acceptance of policies, ultimately leading to more efficient and effective healthcare data exchange systems. As demonstrated in this project, systemic design, when applied thoughtfully and inclusively, has the potential to transform complex policy challenges into opportunities for meaningful and sustainable change.

2.1 Why Systemic Design Is Crucial for BgZ Policy Challenges

Incorporating systemic design thinking into policy settings is crucial for addressing complex, multifaceted problems like those encountered in healthcare data exchange. This approach is particularly effective in scenarios requiring significant consultation and engagement with stakeholders and community members, as indicated by Blomkamp (2021). The BgZ policy, aimed at improving healthcare data exchange, exemplifies a situation where systemic design thinking can be particularly beneficial.

Systemic design thinking integrates principles of systems theory with design practices, emphasizing a holistic understanding, iterative processes, and stakeholder collaboration. This chapter explores the principles of systemic design thinking, its relevance to policy-making, and its practical application in creating sustainable and adaptive policies. Figure 2.1b shows the systemic design process in a nutshell.

Principles of Systemic Design Thinking

Systemic design thinking is based on several key principles (figure 2.1a):

1. Holistic perspective: Understanding the entire system, including the relationships and interactions among its parts. This perspective helps identify leverage points where interventions can create significant positive changes.
2. Iterative process: Involves continuous cycles of prototyping, testing, and refining to adapt to changing conditions and emerging insights. This non-linear approach is essential for dealing with complex systems.
3. Stakeholder engagement: Involving diverse stakeholders throughout the design process ensures that multiple perspectives are considered, fostering buy-in and enhancing the relevance and acceptance of the resulting policies.
4. Focus on patterns and structures: Rather than addressing isolated problems, systemic design seeks to understand and influence the underlying patterns and structures that drive system behavior.

Relevance to Policy-Making

Traditional policy-making often follows a linear, top-down approach, which can be inadequate for addressing complex, dynamic issues. Systemic design thinking offers several advantages in policy settings (figure 2.1a):

1. Adaptability: Policies designed with systemic thinking are more adaptable to changing circumstances and can evolve over time. This adaptability is crucial in rapidly changing fields like healthcare and technology.
2. Comprehensive solutions: By considering the whole system, systemic design ensures that policies address root causes rather than just symptoms. This leads to more comprehensive and sustainable solutions.
3. Enhanced collaboration: Systemic design fosters collaboration among stakeholders, breaking down silos and encouraging joint problem-solving. This collaboration is particularly important in policy settings, where different sectors and organizations must work together to achieve common goals.

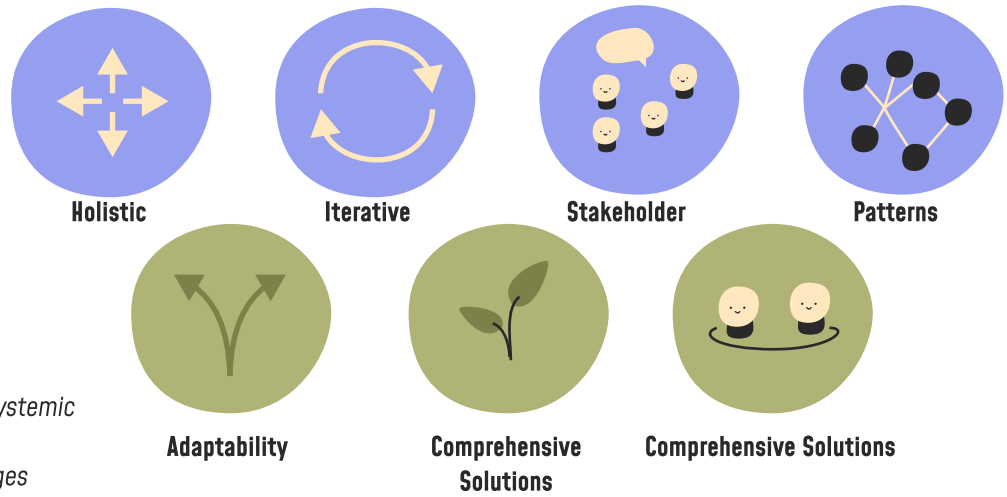


Figure 2.1a *Key properties of systemic design and why it's useful for addressing BgZ policy challenges*

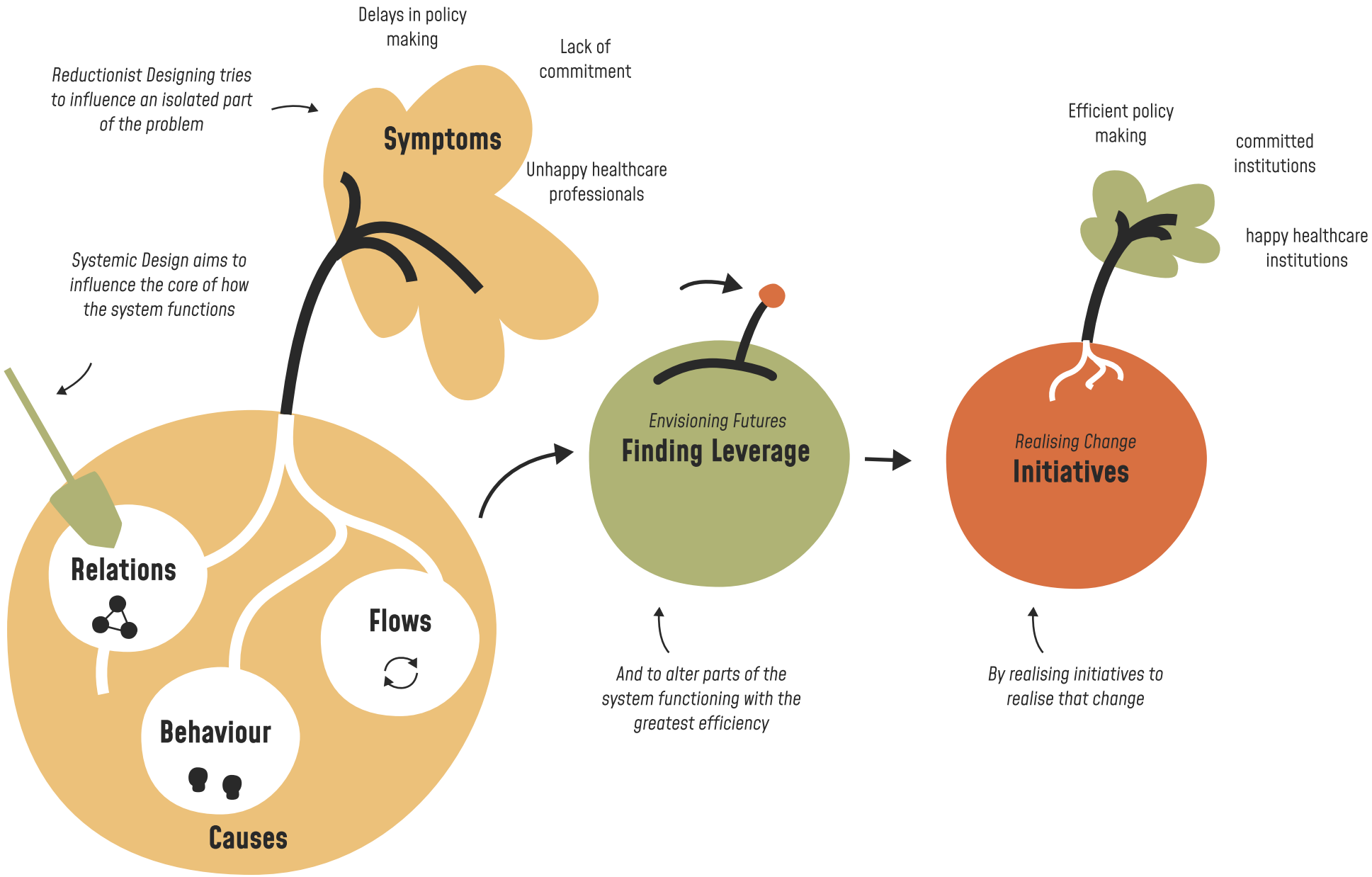


Figure 2.1b *Systemic design in a nutshell*

2.2 How Systemic Design Is Different Than Other Design Disciplines

Systemic design stands out from other design disciplines by its holistic approach, addressing complex challenges such as healthcare data exchange by considering the entire ecosystem, including stakeholder relationships, workflows, and regulatory requirements. It focuses on root causes rather than symptoms, ensuring sustainable interventions. In the context of BgZ policy, systemic design aims to map out interactions and leverage points to enable effective changes.

This approach is framed within the four design domains by Jones and Van Ael (2022): Identity & Artefacts, Products, Services & Platforms, Organizations & Processes, and Systems & Policies. Each domain represents increasing complexity, requiring unique approaches.

Systemic design emphasizes holistic interventions targeting entire systems, considering patterns and structures rather than isolated elements (figure 2.2a). It fosters collaborative stakeholder relationships and relies on emerging, flexible evidence bases. Evaluating systemic actions is challenging, requiring innovative methods. Balancing systemic and reductionist mindsets, positioned along a spectrum, leads to sustainable, impactful changes in complex domains like policy design for healthcare data exchange. A more in depth explainer can be found in appendix X.

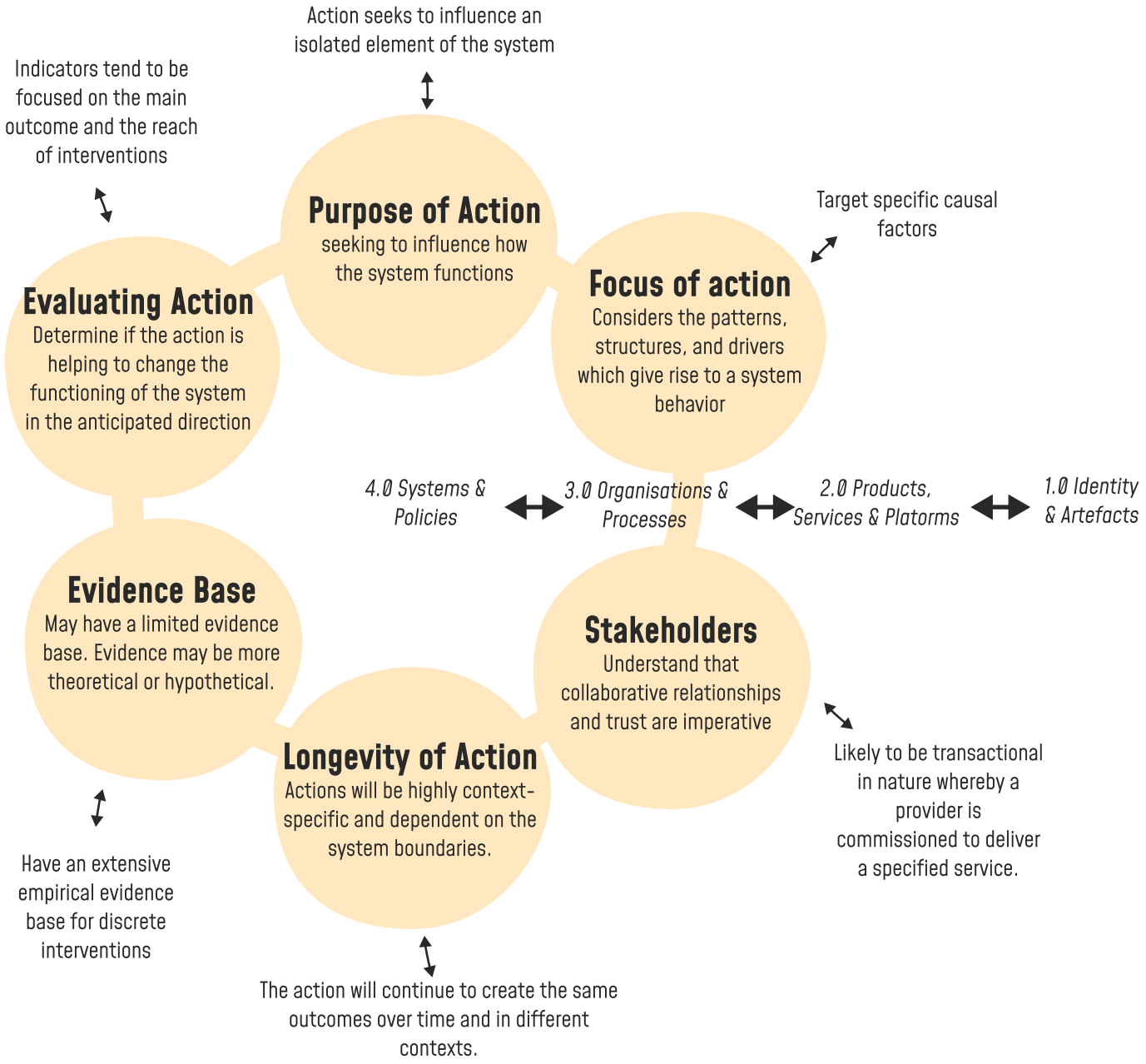


Figure 2.2a *Reductionist vs Sustems mindset (Nobles et al, 2022)*

2.3 Recognising Perspectives

Recognizing and leveraging multiple perspectives is crucial in systemic design, especially when addressing complex challenges like healthcare data exchange. The dynamics between perspectives—visionary, manager, and entrepreneur—can be both challenging and constructive.

Personal Experience

Individuals within these groups contribute their personal experiences and professional expertise. Junginger (2021) emphasizes the significance of understanding the human element within systems: "*The real problem is not that people err; it is that they err because the system design asks them to do tasks they are ill-suited for.*"

Perspectives in Systemic Design

Systemic design categorizes perspectives into three archetypical roles: the Visionary, the Manager, and the Entrepreneur.

- Visionaries advocate for rapid and radical change, focusing on long-term goals and transformative ideas.
- Managers seek stability and efficiency, ensuring new systems are reliable and compliant.
- Entrepreneurs implement new ideas and improvements, balancing visionary ambitions with practical strategies.
-

Dynamics Between Perspectives

Often, these roles are seen in opposition. Managers might view visionaries as unrealistic and entrepreneurs as risky. Visionaries might see managers as obstacles to progress and entrepreneurs as compromising too much. Entrepreneurs might see visionaries as out of touch and managers as overly conservative. However, by reframing these interactions positively, each perspective can be leveraged for mutual benefit.

Managers provide stability and insight into current systems, entrepreneurs drive practical innovation, and visionaries keep the focus on long-term goals and transformative potential. This constructive reframing fosters collaboration and aligns efforts toward shared objectives.

Framing of Perspectives

The interaction between these perspectives can be both challenging and constructive. Each role perceives the others in unique ways, which can either hinder or enhance collaboration.

- Negative framing: Often, these perspectives are seen in opposition. Managers might view visionaries as unrealistic and entrepreneurs as risky. Visionaries might see managers as obstacles to progress, and entrepreneurs as compromising too much. Entrepreneurs might see visionaries as out of touch and managers as overly conservative.

Applying Perspectives to BgZ Policy

In the context of BgZ policy, understanding these perspectives is essential. The policy aims to enhance healthcare data exchange, a complex challenge requiring input from diverse stakeholders. Recognizing and integrating the viewpoints of visionaries, managers, and entrepreneurs allows the policy to balance innovation with practicality and long-term vision with immediate needs. Understanding and shifting between these perspectives can enhance daily work and contribute to more effective systemic design.

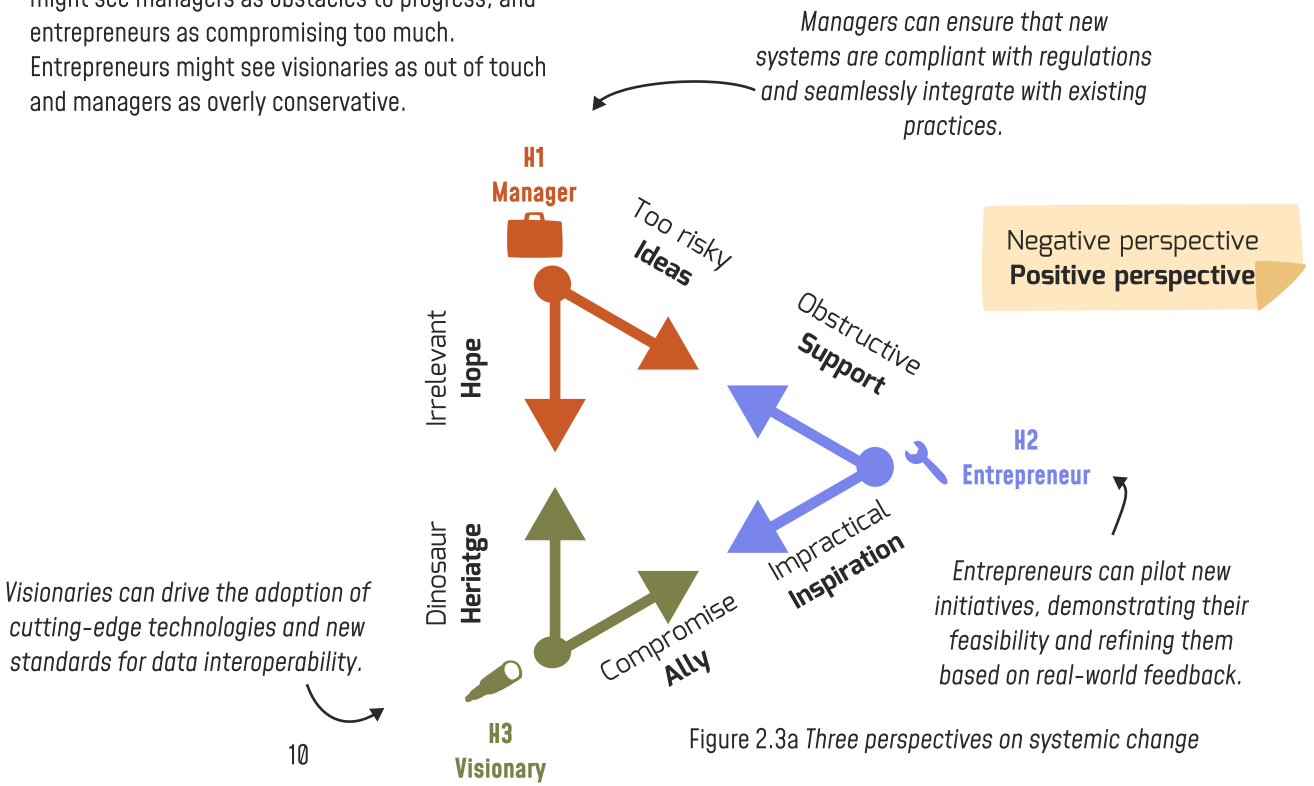


Figure 2.3a *Three perspectives on systemic change*

2.4 Methodology

To give an overview of all the sources and methodologies I have used in this report, see figure 2.4a. Note that the specific roles within organizations are kept vague on purpose, to protect the identity of interviewees and participants of my research.

Systemic Design thrives with plenty of stakeholder engagement and interaction with researchers. This is why not only information gathering is important, but also participative and evaluative practice of insights along the way. Figure 2.4b shows these participative activities, along with methodologies used.

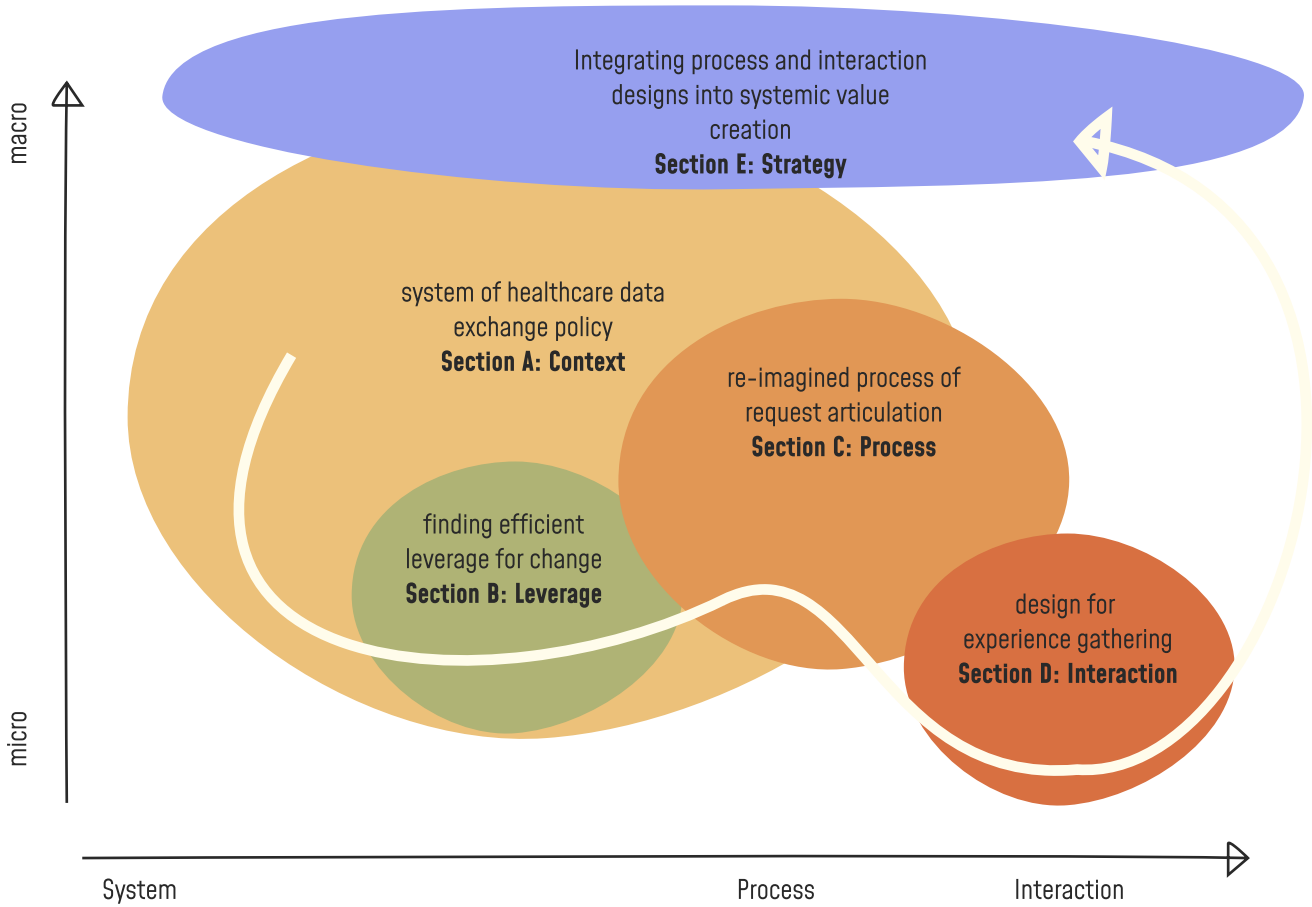


Figure 2.4a *Journey through system levels*

system of healthcare data exchange policy
Section A: Context

Research
10 Interviews
- 4 at VWS
- 4 with system architects
- 2 in healthcare

12 Observations
- 9 at VWS
- 2 with system architects
- 1 with healthcare

Methods
Contextual Interview
Statement Clustering
Literature Review
Stakeholder Discovery
Actor Map
Iceberg Model

finding efficient leverage for change
Section B: Leverage

Research
6 Evaluations
- 4 with VWS
- 1 with system architects
- 1 with healthcare

1 Co-creation session
- 2 participants from VWS
- 1 participant from system architects

Methods
Influence Map
System Archetypes
Story Loops
Soft Systems Modeling
Leverage Analysis
Three Horizons
Outcome Map
Intervention Strategy

re-imagined process of request articulation
Section C: Process

Research
5 observations
- 3 Designathon day sessions
- 1 Designathon evening session
- 1 VWS meeting

5 Interviews
- 2 with system architects
- 1 with software representative
- 1 with facilitator
- 1 with VWS

Methods
Frequency Analysis
Observations
Contextual Interview

design for
experience gathering
Section D: Interaction

Research
- 3 interaction tests with students
- 4 tests & interviews at hospital

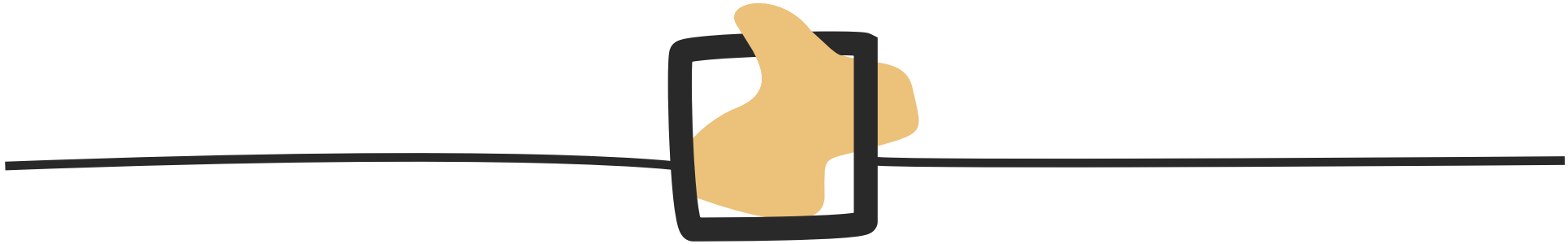
Methods
Prototyping
Interaction Design

Integrating process and interaction designs into systemic value creation
Section E: Strategy

Research
5 strategy evaluations
- VWS
- Nictiz
- Software supplier
- Healthcare CMIO
- Healthcare Usability Expert

Methods
Three Horizons
Change Readiness Check
Collaboration Model

Figure 2.4b *Methodologies used per section*



3

Framing the System

Introducing the BgZ, Wegiz, and IZA: Context and Objectives

What actors, processes and goals can be identified that capture the essence and boundaries of the system?

Introduction

What

This chapter examines the system of patient data exchange, focusing on the Basisgegevensset Zorg (BgZ) project and the Wet Elektronische Gegevensuitwisseling in de Zorg (Wegiz). It covers the history and evolution of patient records, the benefits and risks of Electronic Patient Dossiers (EPDs), and the key stakeholders and their roles.

Why

Understanding the boundaries of a system is crucial step in addressing the challenges and implementing effective solutions in the Basisgegevensset Zorg (BgZ) project. Systems have no obvious process, time or conceptual boundaries, so any research must define the boundaries of the system.

How

Framing the system involves identifying its boundaries, key stakeholders, and the relationships between them. This chapter provides a comprehensive overview of the BgZ as a product, the broader healthcare vision outlined in the Integraal Zorgakkoord (IZA), and the legislative framework established by the Wet Elektronische Gegevensuitwisseling in de Zorg (Wegiz). An analysis of the aspects of the general problem 'how to facilitate and regulate healthcare data exchange is done to better understand the contents of the societal problem at hand.

Contents

Conclusion

The examination of the healthcare data exchange system, particularly the Basisgegevensset Zorg (BgZ) project and the Wet Elektronische Gegevensuitwisseling in de Zorg (Wegiz), reveals significant complexities and challenges in the digital transformation of healthcare data management. The transition from paper-based systems to Electronic Patient Dossiers (EPDs) has improved data availability and administrative efficiency but introduced interoperability challenges, hindering seamless data exchange across different healthcare institutions and compromising patient care.

Efficient digital patient data exchange is crucial for enhancing healthcare quality. It enables informed decision-making, improves patient safety, promotes integrated care, and reduces healthcare costs. However, successful implementation requires addressing key challenges, including technical interoperability, data security, data quality, legal frameworks, and stakeholder engagement.

The success of the BgZ implementation depends on the effective collaboration of various stakeholders, including advocates, system architects, policy makers, and healthcare professionals. The Wegiz framework provides a legislative backbone, but its framework nature necessitates additional standards and certifications to ensure compliance and data integrity. Overcoming resistance from healthcare institutions and ensuring commitment to common standards and protocols is essential for achieving the goals of BgZ and improving healthcare data exchange.

3.1 How Healthcare Data Exchange Developed to It's Current Digital State

The transition from paper-based systems to electronic formats marks a significant milestone in healthcare data management. Traditionally, patient information was stored in paper folders, posing challenges such as limited accessibility, susceptibility to loss or damage, and inefficiency in sharing information.

Transition to Electronic Patient Dossiers (EPDs)

Electronic Patient Dossiers (EPDs) aimed to address these limitations by digitizing patient records, promising improved data availability, reduced administrative burdens, and enhanced patient care. EPDs facilitate quicker access to patient histories, streamline documentation, and support more efficient care coordination among healthcare providers.

Interoperability Challenges

The shift to EPDs introduced challenges, particularly regarding interoperability—the ability of different systems and organizations to exchange and utilize information seamlessly. Often, data within EPDs cannot be effortlessly transferred between various institutions or departments, leading to inefficiencies and compromised patient care.

Impact of EPD Design on Data Collection

The design of EPDs significantly influences the type and quality of data collected. Poorly designed systems can lead to decreased clinical efficiency, lower quality and safety of patient care, reduced healthcare professional job satisfaction, and diminished integration across healthcare organizations. Thus, the design and implementation of EPDs are crucial in the successful digital transformation of healthcare data management.

3.2 Why Digital Patient Data Exchange Is Crucial for Good Healthcare Quality

Improving Healthcare Efficiency

Digital patient data exchange significantly reduces the administrative burden by minimizing repetitive data entry and manual transfers of patient information. This efficiency saves time for healthcare providers, allowing them to concentrate more on patient care rather than paperwork (Jacquemard, 2021).

Promoting Integrated Care

Integrated care models rely on the seamless sharing of patient information to coordinate care across different settings. This approach ensures continuity of care, especially for patients with chronic conditions or complex medical needs (Van Schoten, 2022).

Cost Improvements

Effective data exchange can lead to significant cost savings in healthcare by reducing duplicate tests and procedures, improving diagnostic accuracy, and preventing medical errors. Moreover, access to comprehensive patient data enables healthcare providers to deliver higher quality care, leading to better patient outcomes and increased patient satisfaction (OECM, 2022).

Secondary Uses of Healthcare Data

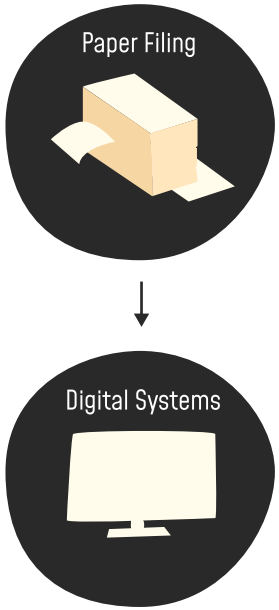
Properly managed and shared healthcare data is invaluable for research, public health monitoring, and policy-making. Large datasets can be analyzed to identify trends, improve healthcare services, and inform public health interventions, driving innovations in healthcare and contributing to improved health outcomes on a population level (OECM, 2022).

Enhancing Quality of Care

When healthcare providers have timely access to comprehensive patient information, they can make more informed decisions, reduce the risk of medical errors, and deliver more personalized care. This seamless flow of information ensures that patients receive the right treatment at the right time, improving health outcomes.

Ensuring Patient Safety

Good data exchange plays a significant role in safeguarding patient safety. Properly exchanged data ensures that all healthcare providers involved in a patient's care are aware of their medical history, current medications, allergies, and other critical information. This reduces the likelihood of adverse drug interactions, duplicative testing, and other safety risks (World Health Organization, 2021).



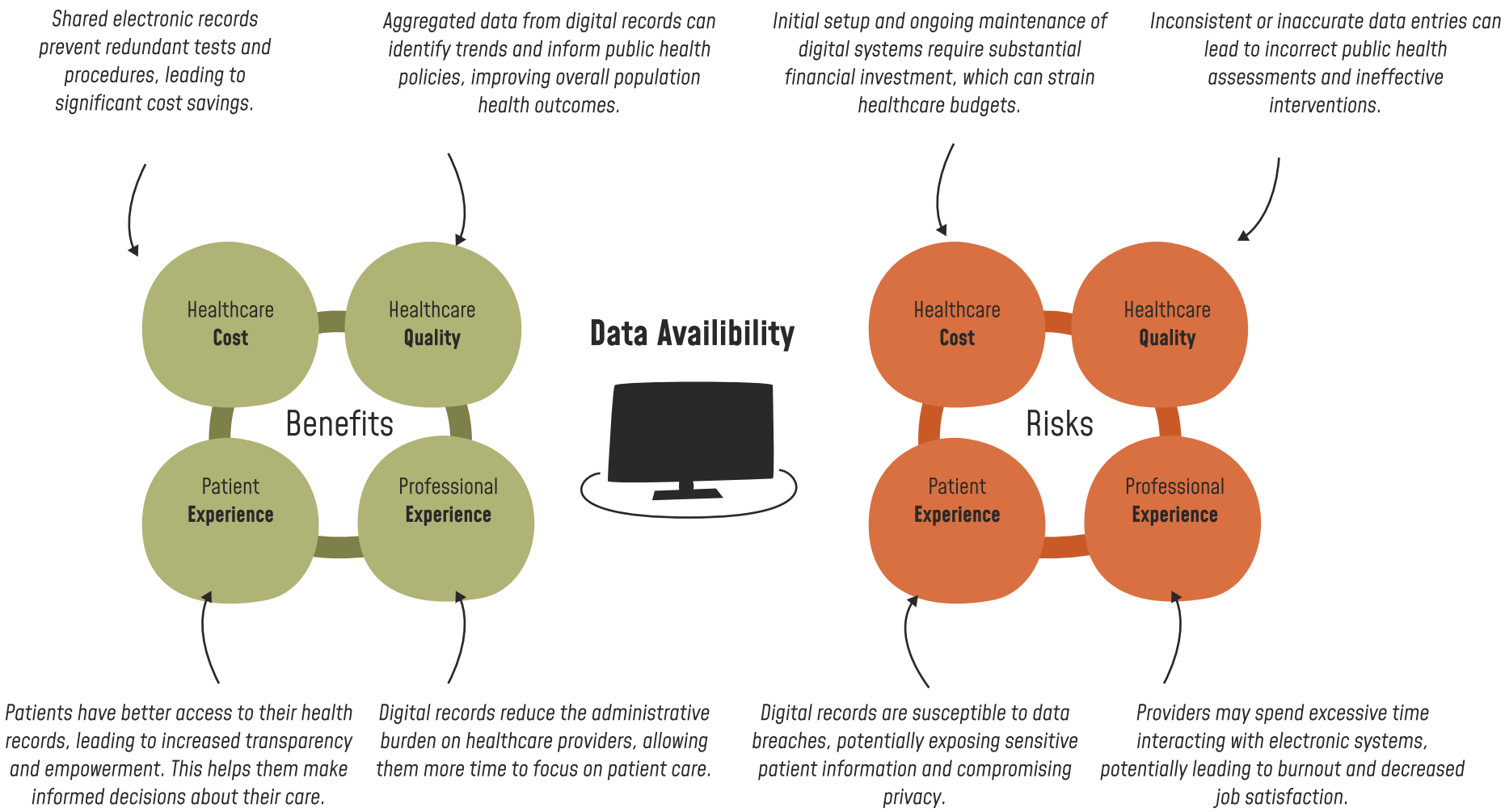


Figure 3.2a *Possible effects of data availability when well implemented (left) versus when poorly implemented (right)*

3.3 What Kinds of Patient Data Needs to Be Prioritized?

There are many defined kinds of patient data that need to be exchanged for quality healthcare. These exchanges can differ between kinds of institutions, like hospitals, nursing care or psychiatric care. Exchanges can also differ per medical specialization.

VWS has decided to prioritize the implementation of these data exchanges. How this implementation works will be explained in the next sub-chapter, but for now it's important to know that five healthcare data exchanges have been selected, and efforts for implementation are focused on that by VWS. These data exchanges are listed in figure 3.3a. The first prioritization is the BgZ (figure 3.3b). Data exchange has 8 discrete steps, some technical and some for health, which can be found in appendix J.

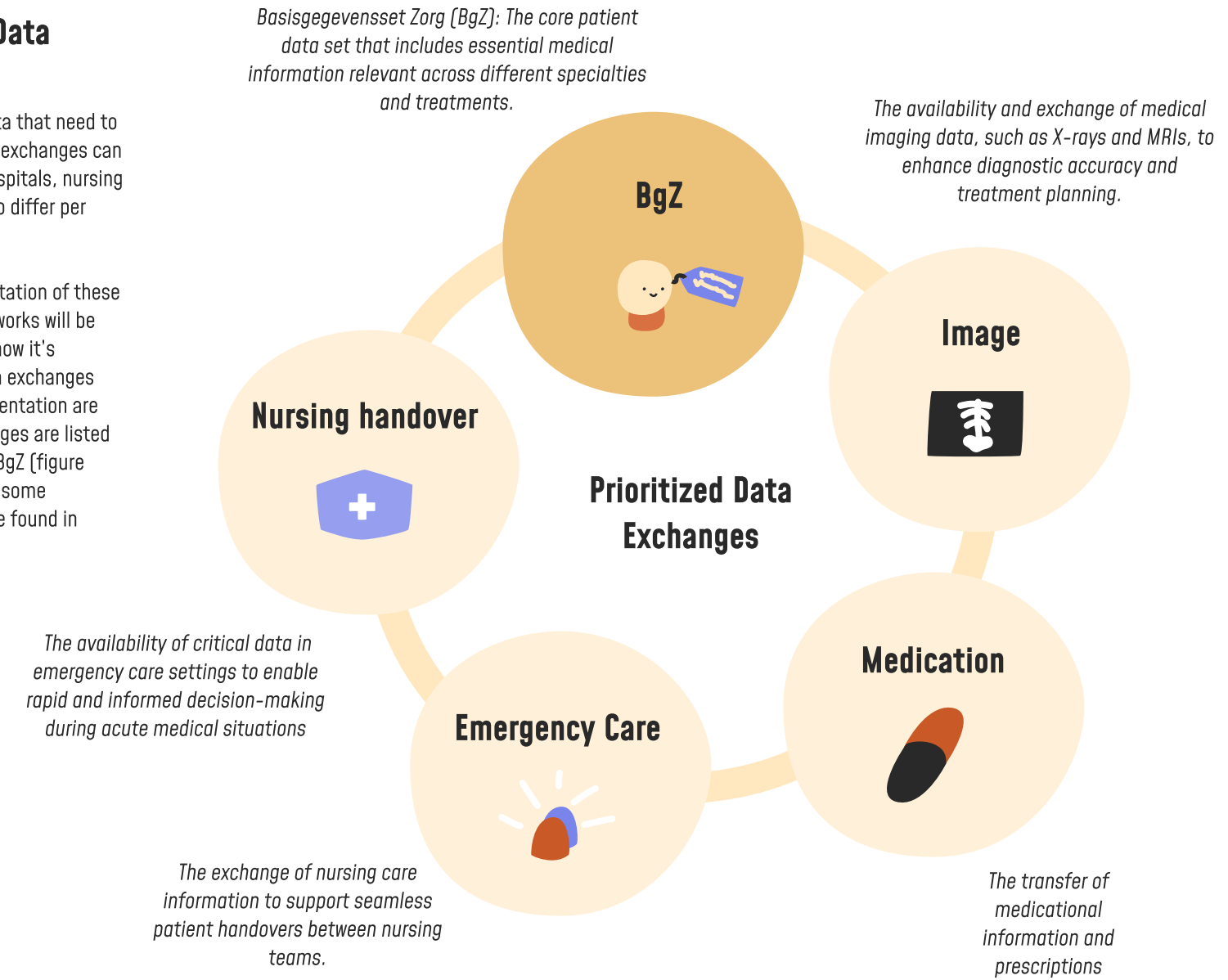
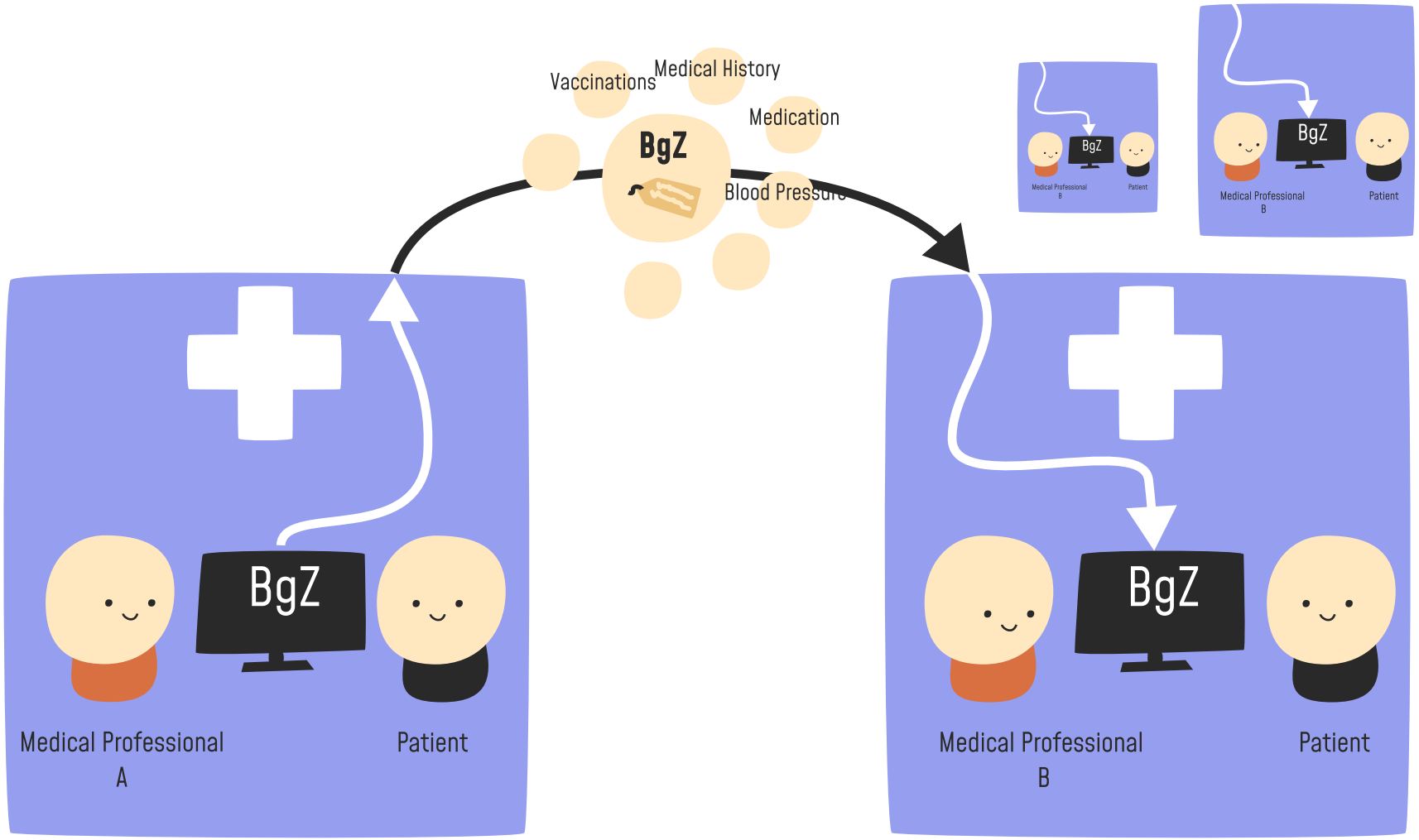


Figure 3.3a *Five prioritized data exchanges*

The Basisgegevensset Zorg (BgZ) is **the minimal set of patient data** that is relevant across specialties, medical conditions, and professional groups, and is important for continuity of care.



3.4 What Do You Need to Facilitate Implementation of BgZ Exchange?

Digital healthcare data exchange presents several challenges that need to be addressed to ensure efficient, secure, and accurate data flow across healthcare systems. This section explores key challenges, including language, data security, data quality, legal issues, and integration.

The Wet Elektronische Gegevensuitwisseling in de Zorg (Wegiz) is a critical legislative framework aimed at standardizing and streamlining electronic healthcare data exchange in the Netherlands. Its successful implementation hinges on four key building blocks: defining the data to exchange, establishing how to exchange it, certifying the processes, and legislating the overall framework. A history overview of the Wegiz can be found in appendix D. An overview of key processes and relations can be found in appendix E and N.

What Data to Exchange
The first building block focuses on identifying the types of data that need to be exchanged. This involves defining a core set of patient data, known as the Basisgegevensset Zorg (BgZ). The BgZ includes essential patient information such as demographics, medical history, allergies, and current treatments, ensuring all healthcare providers have access to the same critical data for continuity of care.

The Federation of Medical Specialists (FMS) plays a crucial role in developing quality standards for the BgZ, ensuring the data collected is relevant and comprehensive. Additionally, Zorginformatiebouwstenen (ZIBs), or healthcare information building blocks, are used to structure and standardize the data elements within the BgZ.

How to Exchange Data
The second building block deals with the technical mechanisms for data exchange. This involves developing secure, efficient, and interoperable systems that can transmit data between different healthcare providers and institutions. Nictiz, the Dutch national center of expertise for digital information exchange in healthcare, creates and maintains these technical standards.

These standards include protocols such as Health Level Seven International (HL7) and Fast Healthcare Interoperability Resources (FHIR), which enable seamless data exchange across various healthcare IT systems. By adhering to these protocols, healthcare providers ensure data integrity and confidentiality during transmission.

How to Certify Exchange
Certification ensures that the systems and processes used for data exchange meet established standards. The Dutch Institute for Standardization (NEN) is responsible for developing and maintaining the necessary norms and certifications that healthcare providers and IT vendors must follow. Certification processes validate that the systems adhere to the required technical standards, ensuring reliability and security in data exchanges.

Standards include common data elements, coding systems like SNOMED CT for clinical terms, and ICD-10 for diagnoses. This certification guarantees that all involved parties use compatible technologies and protocols, reducing errors and enhancing patient care.

Motivating the Exchange
The final building block involves incentivizing the adoption of the exchange. The main method for that is creating a legal framework to support and enforce the standardized exchange of healthcare data. The Ministry of Health, Welfare, and Sport (VWS) oversees this aspect, ensuring that the legislative environment supports the goals of Wegiz. This includes enacting laws and regulations that mandate the use of standardized data exchange protocols and protect patient privacy and data security.

The legislative framework addresses data ownership, consent, and access controls, ensuring patient rights are protected and healthcare providers exchange data responsibly. This clear legal structure helps all stakeholders understand their obligations and work together towards the goals of Wegiz.

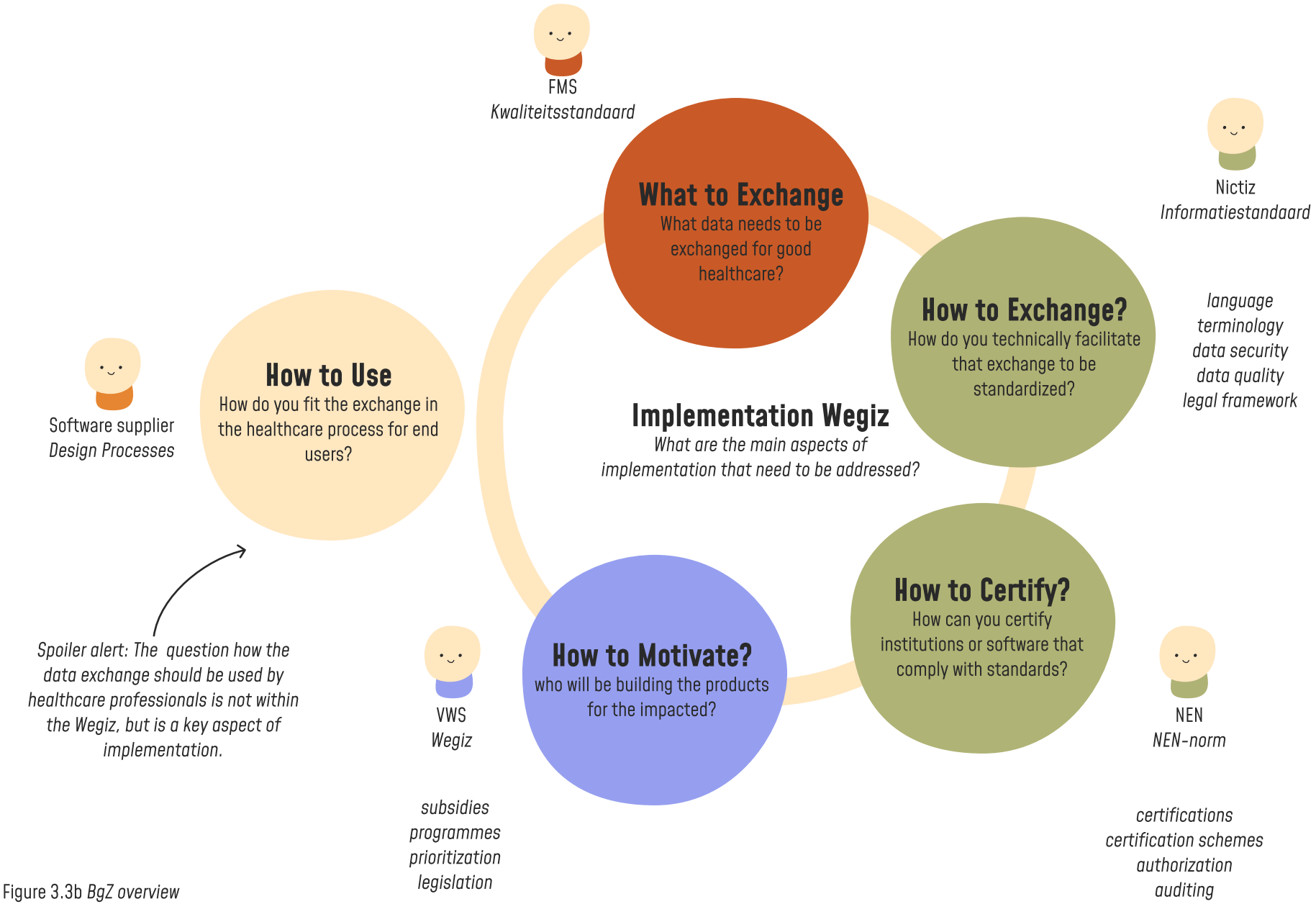


Figure 3.3b *BgZ overview*

3.5 Why Is National Implementation So Difficult?

So we know the main questions for implementation of the BgZ. But why is implementing this data exchange so difficult?

Centralised Strategy

Answering these questions requires a centralised strategy and leadership. Coordination of technical and political aspects of implementation requires taking into account various priorities, technical issues and more. The Wegiz is the main tool for VWS to achieve that. However, the Wegiz is a framework law, meaning VWS has only control over *that* exchange should be digital, but it can't enforce *how* without other institutions. *"Fragmentation characterises not only Dutch health system provision but also its regulation and governance. A high number of institutional actors and organisations have a stake in governance and regulation, data creation and processing, and data interoperability and exchange."(OECD, 2022)*

Addressing Commitment

Even with a unified plan, healthcare institutions may resist adhering to common agreements due to resource constraints and the effort required to change existing systems. Centralized control can mitigate these issues by providing incentives, support, and oversight to ensure compliance. The Dutch Ministry of Health, Welfare, and Sport (VWS) plays a pivotal role in coordinating these efforts, offering financial and technical support to institutions during the transition phase.

Facilitating Integration

Integrating new digital systems into existing workflows is complex and requires coordinated efforts to minimize disruptions. Centralized control can provide a map for integration, offering best practices and standardized procedures to follow. This ensures that all institutions are on the same page, facilitating smoother transitions and better interoperability.
Centralized control can also help in managing the technical aspects of integration, such as compatibility issues between different systems and software versions. By providing a centralized support system, institutions can receive the technical assistance they need to overcome these challenges efficiently.

Framework-Law

The Wegiz is a so-called framework law (gegevensuitwisselingindezorg.nl, 2024). This means that it is not stated which data a healthcare professional must exchange, only that data exchange must take place electronically from a certain date. Data exchange must take place according to norms and certifications, from a later date. It does not state if data is allowed to be exchanged. This is stated in a different law which the Wegiz does not affect. Below, you can see an infographic designed by VWS to summarize the Wegiz.

3.6 What Actors Are Involved in Implementation of BgZ

The implementation of the Basisgegevensset Zorg (BgZ) within the Wet Elektronische Gegevensuitwisseling in de Zorg (Wegiz) framework involves a complex network of stakeholders. These actors play distinct roles in the healthcare data exchange ecosystem. Understanding these roles and their interactions is crucial for the successful deployment and operation of BgZ.

Impacted
These are the stakeholders directly affected by healthcare policies and data exchange processes. They include healthcare institutions, medical professionals, and patients. Their roles involve:

- Healthcare Institutions: Implement and manage IT systems to facilitate data exchange.
- Medical Professionals: Use these systems daily to access and update patient information, providing feedback for improvements.
- Patients: The ultimate beneficiaries of efficient healthcare data exchange, gaining better continuity of care and improved health outcomes.

Implementers
Implementers are responsible for creating the technical infrastructure that enables data exchange. They work closely with healthcare institutions to deploy these systems. Key implementers include:

- Software Suppliers: Develop and provide the IT solutions necessary for healthcare data exchange.
- UX/UI: Design systems user experience and interface.

Advocates
Advocates are federations and unions that represent various segments of the healthcare system but are not directly impacted by the daily operations of healthcare data exchange. They possess a high degree of institutional knowledge and influence policy decisions. Key advocates include:

- Federation of Medical Specialists (FMS): Represents medical specialists and is pivotal in developing quality standards for healthcare data.
- Dutch Federation of University Medical Centers (NFU): Represents university medical centers and advocates for advanced medical research and education.
- National Association of Hospitals (NVZ): Represents general hospitals and focuses on ensuring that hospital interests are considered in policy-making.
- Information Council for Healthcare (IZ): Advises on digital healthcare policies and the integration of IT systems in healthcare.

System Architects
System architects develop the standards and frameworks that define how BgZ functions. They ensure that data exchange is consistent, secure, and efficient. Important system architects include:

- Nictiz: The national center of expertise for digital information exchange in healthcare, Nictiz develops the technical standards for data exchange, such as HL7 and FHIR protocols.
- Dutch Institute for Standardization (NEN): Develops norms and certifications to ensure that healthcare IT systems comply with established standards.

Policy Makers
Policy makers shape the legal and regulatory framework for healthcare data exchange. They are responsible for implementing and overseeing Wegiz and other related policies. Key policy makers include:

- Ministry of Health, Welfare, and Sport (VWS): Oversees the implementation of Wegiz and ensures that healthcare data exchange policies align with national health objectives.
- Directorate for Information Policy (DICIO): Focuses on creating and maintaining policies related to information management in healthcare.
- Directorate for Curative Care (CZ): Works on policies that directly impact patient care and treatment.

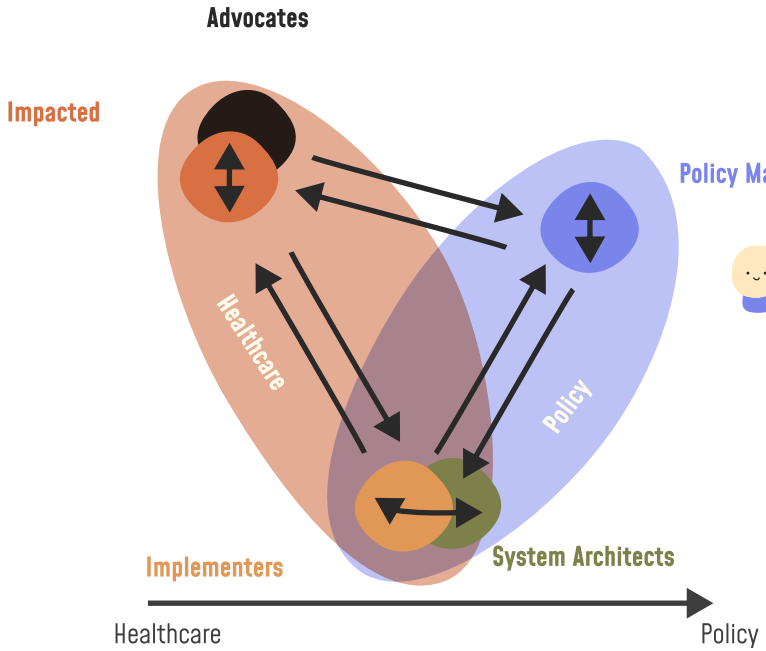
Other stakeholders
It's important to realize that these stakeholders are a representation of stakeholders that have been shown to be relevant in my project and research, but there are many organizations that have impact on the system which I have chosen to keep out because they don't affect this part of the system in my scope.

FMS: Federation of Medical Specialists
NVZ: Nationale Vereniging van Ziekenhuizen
NFU: Nederlandse Federatie van Universitaire Medische Centra
IZ: Informatieberaad Zorg

Healthcare institutions: Decide on management & ICT

- **Healthcare Professionals:** Implement the BgZ in their systems and processes
- **ICT Departments:** buy and develop software solutions

Patients: The ultimate beneficiaries of improved data exchange.



Ministry of Health, Welfare and Sport (VWS): Coordinates and legislates the process around the Wegiz and BgZ.

- **DICIO:** Directie Informatiebeleid
- **CZ:** Directie Curatieve Zorg

Software Suppliers: In the market to provide clients with integrated solutions

- **Developers:** Create the technical solutions to facilitate data exchange.
- **UX/UI:** Design systems user experience and interface.

Nictiz: Develops the standards and frameworks for healthcare data exchange.

NEN: Develops norms and certifications so providers and developers can be authorised

Figure 3.6a *Stakeholder groups*

3.7 System Frame Summary

To conclude on the definition of the system frame figure 3.7a shows a summary.
Policy processes done by system actors, focused on **Policy Makers**, to **facilitate implementation** of **BgZ** to benefit **Healthcare Data Exchange.**

- I focus on policy processes because I want to systemically address problems.
- I focus on policy makers within this system because they are the current 'pullers of the cart' and are the hub that ties almost all stakeholders together
- I want to focus on facilitating implementation of HDE. That means that I don't want to design an interface or user experience for HDE, but look at ways the system can be organized to *produce* HDE systems which are ready to be implemented
- I focus on the BgZ and not other instances of HDE because the client of this case is working on implementation of the BgZ. However, findings which resonate with other data exchanges are always helpful to create a more broad relevance towards implementation
- I focus on healthcare data exchange, not healthcare technology in general, and not even EPD systems in general.

One important note is that this report was written and researched with BgZ exchange in mind because it's the first exchange that has been prioritized, and it's a necessary choice to keep the scope relatively small. The findings in this report however can assumed to generally apply to most other healthcare exchange processes, and are therefore valuable for future different exchange implementations.

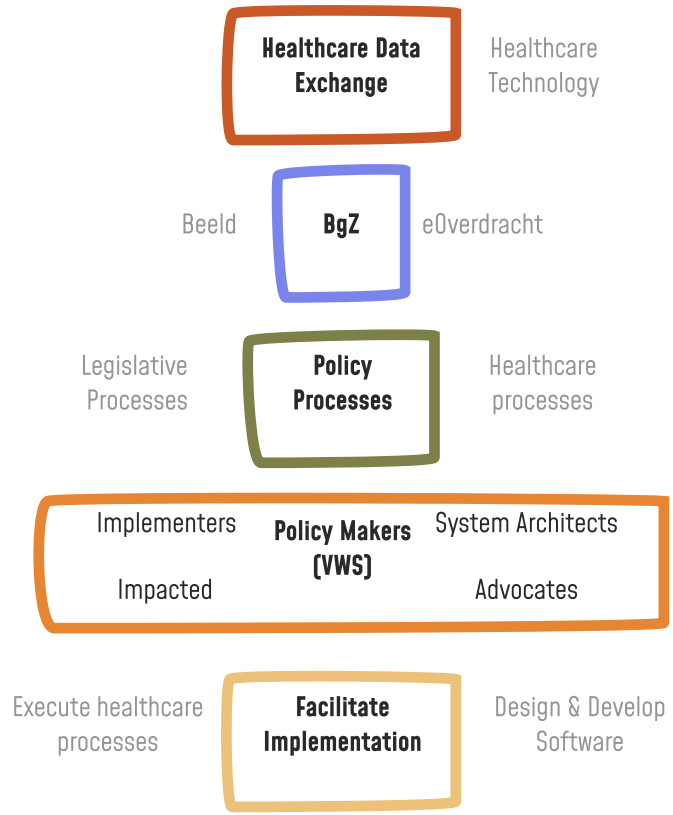


Figure 3.7a *System Frame Summary*

4

Listening to the System

Identifying Themes to Structure Insights

What themes can be found that represent challenges in behavior and processes as observed and experienced by system members?

Introduction

What
This chapter focuses on uncovering the fundamental patterns of behaviour within the healthcare policy system. By examining these patterns, we aim to reveal the key themes that characterize the system's operations and challenges.

Why
Understanding the complete set of patterns and phenomena is crucial for grasping the major themes that shape the system's dynamics. Identifying these themes allows us to comprehend the relationships, flows, and processes that define how the system functions. This foundational knowledge is essential for developing strategies to change the system's outcomes effectively. By recognizing the underlying challenges, we can better target interventions to address root causes rather than just symptoms.

How
The identification of these themes is achieved through a combination of observations, interviews, and literature research. Engaging with members of the system provides firsthand insights into the real-world dynamics at play. These insights are then enriched with existing literature and documentation on the BgZ provided by VWS. By clustering individual statements into sub-themes and aggregating these into larger themes, we can construct a comprehensive overview of the challenges within the system. This structured approach ensures that our analysis is grounded in both empirical data and theoretical understanding, providing a solid basis for subsequent interventions.

Contents

Conclusion

The comprehensive analysis of the healthcare policy environment through interviews and observations revealed eight overarching themes that encapsulate the systemic challenges faced by stakeholders. These themes include the confusion and dissatisfaction caused by frequent interventions and steering, the inefficiencies stemming from poorly structured meetings and communication, and the difficulties in aligning diverse institutions and policies. Hierarchical structures and fragmented communication channels exacerbate these issues, leading to misunderstandings, delays, and inefficient coordination.

Additionally, the lack of consistent reflectivity hinders organizational learning and adaptability, while insufficient iterative processes result in unexpected challenges and high costs. The fragmented nature of required knowledge complicates decision-making for stakeholders, and wavering commitment from the healthcare field affects the implementation and collaboration on policy initiatives.

Addressing these challenges requires clear communication, purposeful meeting planning, integration of processes, and fostering a culture of reflection and continuous improvement. By understanding and addressing these themes, policymakers can better facilitate the implementation of effective healthcare data exchange systems, ensuring that interventions are sustainable and beneficial for all stakeholders involved. This foundational understanding is crucial for the subsequent phases of research, which will dive deeper into the sub-themes and their interrelations.

4.1 Interviewing and Observing With Key Actors

To start the journey of exploration I have conducted ten interviews and observations.

Goal of Interviews

The primary goal of conducting semi-structured interviews is to capture a wide range of perspectives from various actors within the system (see sticky for more information). These interviews aim to:

- Understand the healthcare context that the BgZ tries to regulate.
- Explore the processes, behaviours, and stakeholders involved.
- Identify the needs, dreams, and pain points of participants.

Goal of Observations

Apart from interviews, a set of observation were also made. twelve internal and external interactions were observed. ten of those were meetings, often hybrid or online, but sometimes completely offline. Appendix M shows some initial insights that lead to a piece of the scoping.

The goal of the observations is

- Learn about the healthcare context the BgZ aims to regulate.
- Observe processes, behaviours, and stakeholder interactions.
- Document the materials and environments in which stakeholders operate.

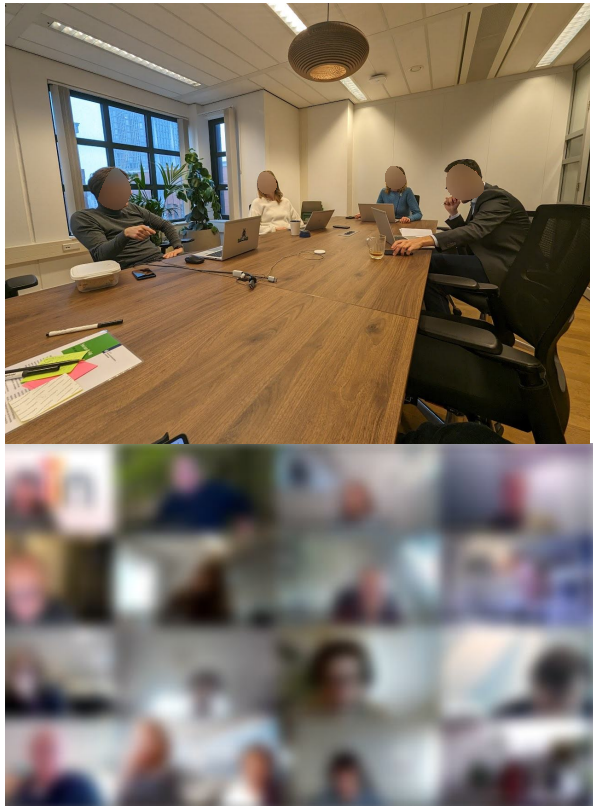


Figure 4.1a *(top) Observed meeting at VWS. Note that one of the participants was present online. (bottom) Observed meeting online. There were 20 participants in a Teams meeting discussing the future of our healthcare system.*

Semi-structured Interview

- 10 interviewees
- 1-2 hours per interview
- 4 at VWS, 4 at system architects, 1 at healthcare & 1 at advocates

Semi-structured interviews are a great way to open your gaze and gain a diverse set of information. As opposed to open-ended interviews you prepare some guiding questions and 'boxes to tick', but you leave a lot of room for unexpected topics, to which you can divert if it seems valuable. The other end of the spectrum has the designer doing structured interviews, or even a session. Here a list of per-determined questions is given to ensure consistent and complete information sets. For this stage, semi-structured interviews are great, because they allow the designer to navigate a more complex and uncertain environment, without having to narrowing the scope beforehand and potentially missing crucial diversions.

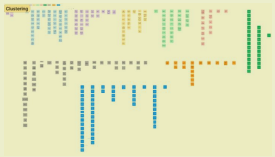
Observations

- 9 at VWS
- 2 with system architects
- 1 with healthcare

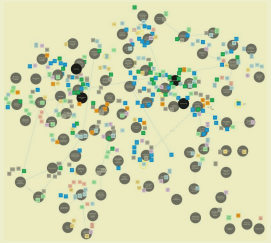
4.2 Clustering Insights Into Themes and Challenges

The previous information gathering results in the formation of eight overarching themes which portray challenges in the system. These themes are comprised of smaller clusters, which are comprised of individual statements and observations. This means that every theme and sub-theme can be traced back to the original source. Appendix O shows this process in more detail.

Insights Clustered Into Sub-Themes Into Themes



Interview Statements



Clustering into sub-themes

Clustering into overarching themes

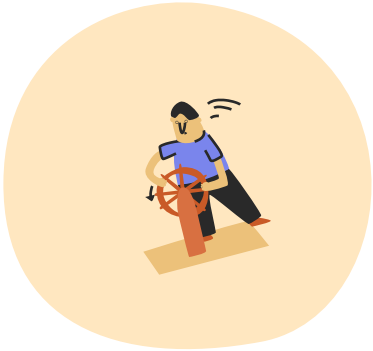
Eight Themes

Figure 4.2a shows the eight overarching themes which were identified. Because it will become the most important factor in the future vision, I will only highlight one of the themes. Appendix P shows all overarching themes in depth with their sub-themes and accompanying quotes.

The overarching themes identified in the healthcare policy environment highlight significant challenges related to interventions, meeting setups, institutional alignment, and organizational structures. Frequent and confusing interventions lead to delays and dissatisfaction among stakeholders, exacerbated by unrealistic expectations set by extensive documentation and large-scale testing without iterative steps. Poorly structured meetings and insufficient thought about participants' roles contribute to inefficiencies and miscommunication. Fragmented communication channels and unclear roles further complicate coordination, resulting in disconnected actions and redundancy. Hierarchical structures and divided institutions create barriers to effective communication and alignment, leading to misunderstandings, delays, and inefficiencies.

Moreover, the lack of consistent reflectivity hampers organizational learning and adaptability, with insufficient iterative processes leading to unforeseen challenges, elevated costs, and poor integration of information. The fragmented and complex nature of required knowledge adds to the difficulty for stakeholders to make informed decisions. Additionally, there is a wavering commitment from the healthcare field to implement and collaborate on policy initiatives, influenced by the perceived value of policies, regulatory compliance demands, and availability of support and resources.

These issues underscore the need for clear communication, purposeful meeting planning, integration of processes, and fostering a culture of reflection and continuous improvement within the healthcare policy framework.



A. Interventions and Steering Cause Confusion, Delays, and Discontent in the Process

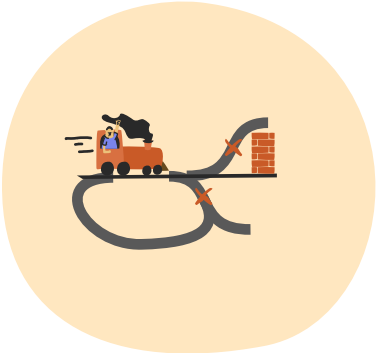
B. Setup of Meetings and Communication Lacks Sufficient Thought and Vision of Who Should Attend and Why

C. Drifting Islands of Institutions in Healthcare, Partners, and Policy Have Trouble Gaining Alignment

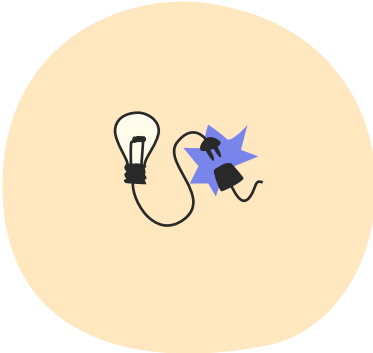
D. Hierarchy and Divided Institutions Are Causing Difficult Communication and Struggle with Alignment

E. Inconsistent Reflectivity is Affecting Organizational Learning and Changing Approaches

F. Required Knowledge is Separated, Difficult, and Complex to Grasp for All Stakeholders

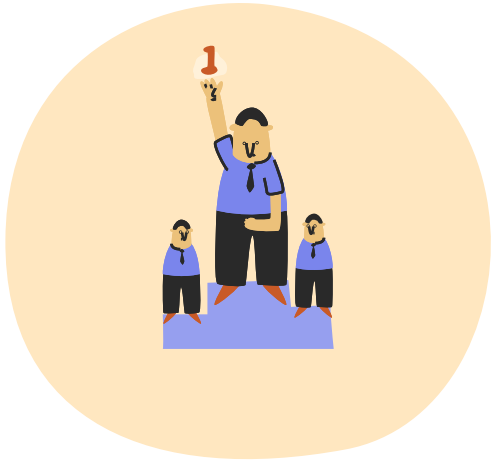


G. Low Levels of Iterative Work Lead to Surprises, High Costs, and Mediocre Integration of Information from Sources



H. Intention to Implement and Collaborate on Policy from the Healthcare Field is Wavering

Figure 4.2a *Eight overarching themes. Full explainers can be found in appendix P*



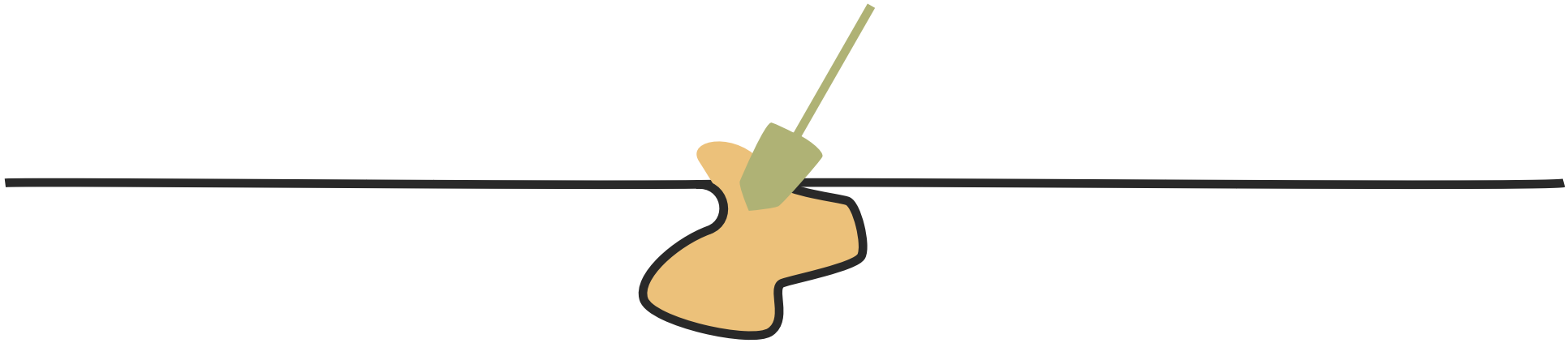
D. Hierarchy and Divided Institutions Are Causing Difficult Communication and Struggle With Alignment

The theme highlights how hierarchical structures and divided institutions create barriers to effective communication and alignment within the healthcare system. The complexities and bureaucracies inherent in hierarchical setups often lead to misunderstandings, delays, and inefficiencies. This theme explores how these organizational structures impact the overall coordination and cooperation among different entities.

Themes

- Obvious Power Relations: The presence of clear hierarchies often dictates interactions and decisions, sometimes hindering effective communication and collaboration.
- Difficulty in Navigating the Political Landscape: The complex political environment within and between institutions complicates decision-making and alignment.
- Need for Clear Responsibilities: Clear delineation of roles and responsibilities is often lacking, leading to confusion and inefficiencies.
- Struggles with Alignment: Different priorities and methods within hierarchical structures lead to difficulties in aligning efforts and achieving common goals.
- Lack of Control and Oversight: Inconsistent oversight and control mechanisms result in fragmented actions and uncoordinated efforts.
- Escalation as a Conflict Resolution Method: The reliance on hierarchical escalation to resolve conflicts often delays solutions and exacerbates tensions.
- Challenges in Coordination: The divided nature of institutions creates challenges in coordinating actions and aligning strategies.
- *Balancing Power Relations: Managing power dynamics within and between organizations.*

"It is very hierarchical here."
"It is difficult to navigate the political minefield."
"The upper people have to make the decisions."
"How do you make and argue policy choices?"
"There are multiple governance structures, with several lines."
"There is no line for constructive cooperation."
"We often find ourselves behind unexpected things."
"Conflicts are escalated, and it takes time to resolve."
"The decision-making process is cumbersome."
"In principle, we are not dependent on the standards, but we do want them."
"Hierarchical thinking can be a barrier to innovation."
"Responsibility is divided and unclear, leading to delays."



5

Understanding the System

Soft System Modelling to Find Leverage Points

How are defining themes related causally, and which can be identified to provide the most effective leverage for change?

Introduction

What
This chapter dives deeper into the intricate relationships between the overarching themes and sub-themes identified in the previous chapter. By meticulously examining these connections, we aim to uncover the underlying dynamics that shape the healthcare policy system.

Why
Understanding these relationships and causal connections is crucial for identifying leverage points within the system. These leverage points represent specific properties, behaviours, or processes that, when strategically influenced, can lead to significant and positive changes across the entire system. By pinpointing these areas, we can develop targeted initiatives that maximize impact and drive systemic improvements.

How
To achieve this, we employ a combination of influence mapping, soft systems modeling, and leverage analysis. Influence mapping helps visualize the connections and dependencies between various elements within the system. Soft systems modeling provides a framework for understanding complex patterns and feedback loops. Leverage analysis identifies the most impactful points within the system where interventions can yield the greatest benefits. Through these methodologies, we aim to construct a comprehensive understanding of the system's dynamics, enabling the formulation of effective strategies for sustainable change.

Contents

Conclusion

In conclusion, this chapter highlights the significance of identifying and understanding the causal relationships and leverage points within the healthcare policy system. By differentiating between symptoms and root causes, we can address the fundamental issues that hinder effective healthcare data exchange. The key leverage points identified—such as the ability to reflect and act on reflections, effective meeting goals, thoughtful meeting design and setup, balancing power relations, taking small and careful steps, and knowing where to find the right people—offer strategic opportunities for impactful interventions.

These leverage points provide a pathway to drive systemic change with minimal effort, ensuring that interventions are not only targeted but also sustainable. The focus on understanding these causal relationships reinforces the necessity of systemic design in managing complex challenges. This approach promotes continuous reflection, stakeholder engagement, and incremental progress, essential for achieving meaningful and lasting improvements.

By concentrating on these leverage points, we can facilitate more effective policy implementation, improve coordination among stakeholders, and enhance the overall quality of healthcare data exchange. These insights will serve as a foundation for the strategic recommendations and actions proposed in the subsequent chapters, aiming to create a more efficient and integrated healthcare system.

5.1 Relating Themes to Separate Cause From Symptoms

Understanding causal relations is a big part of systemic design. It allows the designer to construct feedback loops and helps understanding where challenges fit in the symptomatic-fundamental scale. These causal relations are first explored on the level of the eight overarching themes as discussed in the previous chapter.

Figure 5.1a shows the causal relations between the themes. We can see that *hierarchical relations* are considered the most fundamental factor of these eight. The *intention to implement* is on the most symptomatic side. How this method works can be found in appendix R.

Example of Relating Themes

To exemplify these causal relations we can look at one example of a relationship between hierarchy and implementation. Interviews have revealed that intimate knowledge of the problems the policy system is trying to deal with is crucial, and that this knowledge is scarce within VWS itself. However, due to the selective authority on subjects which VWS accepts, and in which circumstances, it becomes difficult for outsiders to express that knowledge. Then when VWS makes decisions based on flawed and missing knowledge, they keep going because a decision was made. That deciion then leads to a sub-par implementation plan and therefore low implementation readiness by healhcare institutions.

Finding Causal Relations

It is important to note how causal relations are constructed and identified. Some relations can directly inferred from interview statements. For example: "Het gaat niet snel genoeg, dus er zit druk om grote stapjes te zetten." tells us that the perception of slowness is causing pressure to take large steps. Some relations have to be deducted logically. This relies more on assumptions of the designer based on the discovered context. Other relations are drawn from literature. This relates to the evidence base attribute of systemic design by Nobles (2021). Systemic design often has a more hypothetical or theoretical evidence base.

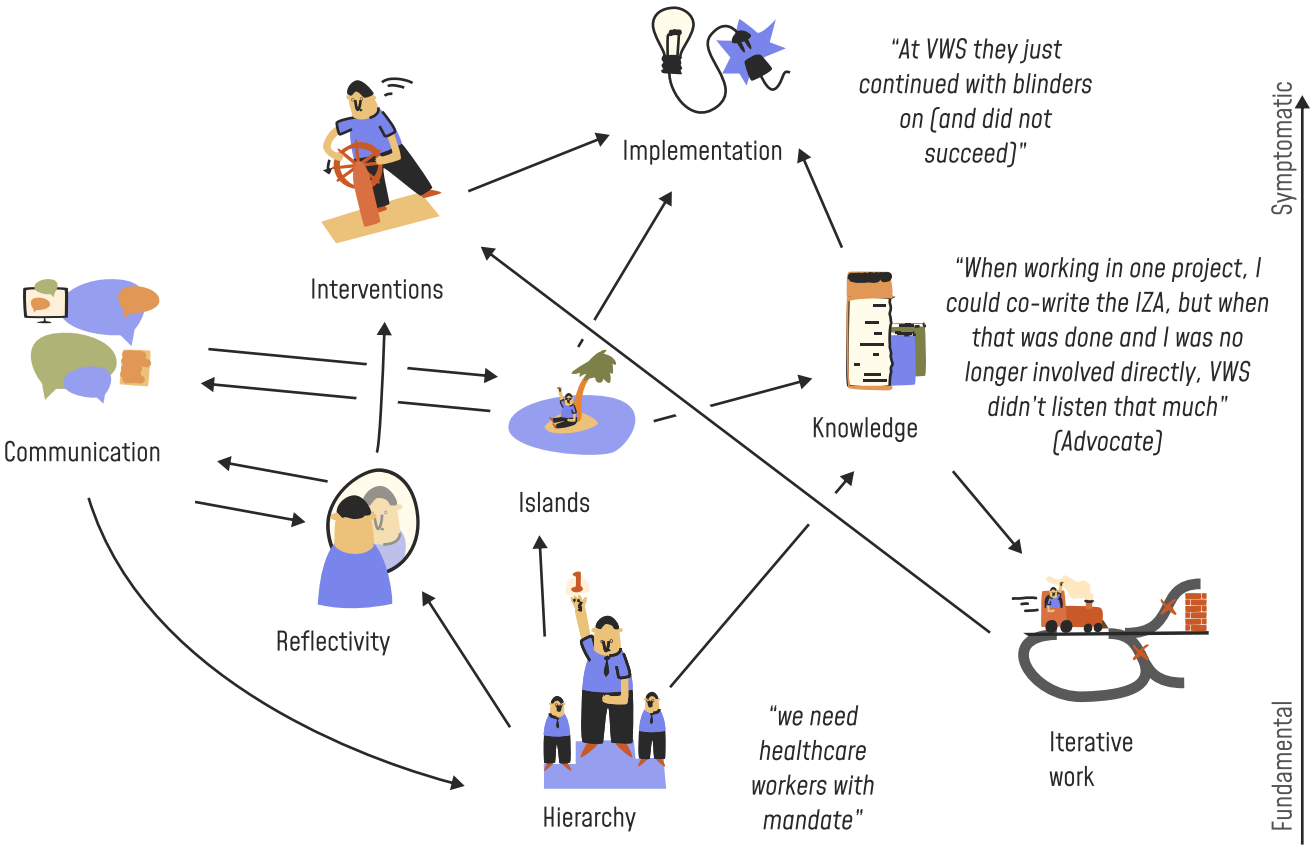


Figure 5.1b *Causal relations between themes discovered in chapter 4.*
Higher themes are identified as more symptomatic, while lower themes are identified as more fundamental

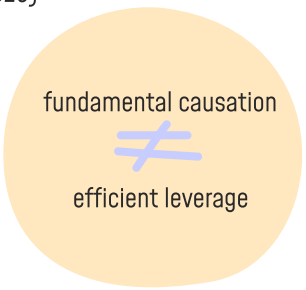
5.2 Soft Systems Modelling to Discover Complex Patterns and Feedback Loops

The largest scale culmination of all previous techniques is a soft system modeling approach. Theory (Nobles, 2022; Murphy & Jones, 2020) explains how complex systems are often made up of several feedback loops, describing core processes. These loops can be either reinforcing (nudging results in spiralling out of control) or balancing (nudging results in going back to a stable state). Influencing such loops can have a big impact on the overall system. Where in figure 5.1 the core loops were described, this type of modelling aims for a much larger level of detail.

Fundamental Factors Are Not Always Leverage

The reason why we are so interested to describe feedback loops and system modelling is because fundamental causes are not always causes with the most leverage. Leverage means that changing a factor will be able to make large changes within the functioning of system with minimal effort.

"*The value for decision making is that graph modelling reveals the strengths and weaknesses in an analysis based on comparable reference models, enabling policy or advising teams to make well-supported claims for investment within change programs." (Murphy & Jonres, 2020)*



Social Network Analysis

One of the most thorough ways to find leverage is through social network analysis. This is a method that is relatively novel in relation to design. A social network is created by connecting elements through relations. Phenomena can be interpreted as elements, and causal relations between them as connections. This means that we can create a social network by connecting the themes we found in the previous chapter. Appendix O and R provide more insights in how this social network analysis is created. The sticky provides some initial insights in the method.

Leverage & Bottlenecks

Using kumu.io, same digital tool as in the research by Murphy and Jones (2020), I was able to quantify the indicators for leverage and bottlenecks to specific metrics. The sticky explains the specific steps to identify leverage points. Following these steps I created a shortlist of 20 possible leverage points. These were evaluated not only based on metrics of leverage and bottlenecks, but their proposed impact chain through feedback loops in the social network was checked with logic based on personal knowledge about the system.

Social Network Analysis

The steps suggested by Murphy & Jones (2020) to execute social network analysis are to

- "Conduct structural leverage analysis to detect levels, subset and superset structures and **feedback loops** in the system
- Conduct centrality leverage analysis, particularly **eigenvector**, **betweenness**, **closeness** and **reach efficiency** values, for mapped phenomena.
- Find **high-eigenvector phenomena at core structural locations in the system** (e.g. at low levels and in inner loops). These relationships are powerful discriminators of leverage and, if they can be influenced, may yield significant change effects across the system.
- Find **reach-efficient** nodes (functions) that influence those high-eigenvector nodes as directly as possible. Develop strategies to change these reach-efficient functions that will lead to change in the targeted high-eigenvector nodes.
- Identify **high-betweenness and high-closeness** phenomena and map their potential influence on the reach-efficient and high-eigenvector phenomena identified by analysis or research. Develop a strategy to prevent these bottlenecks and resistant phenomena from impeding the planned interventions or change program."

5.3 Finding Leverage Points to Identify Key Intervention Areas

Eight Leverage Points

The eight phenomena, or sub-themes, which were identified to have the most opportunity for leverage can be seen in figure 5.3a. They are:

- Ability to reflect
- Ability to act on reflections
- Effective meeting goals
- Meeting design and setup
- Where the field goes with issues
- Balancing power relations
- Taking small and careful steps
- Knowing where to find the right people

A summary can be seen in figure 5.3b. Their full explanation can be found in appendix S.

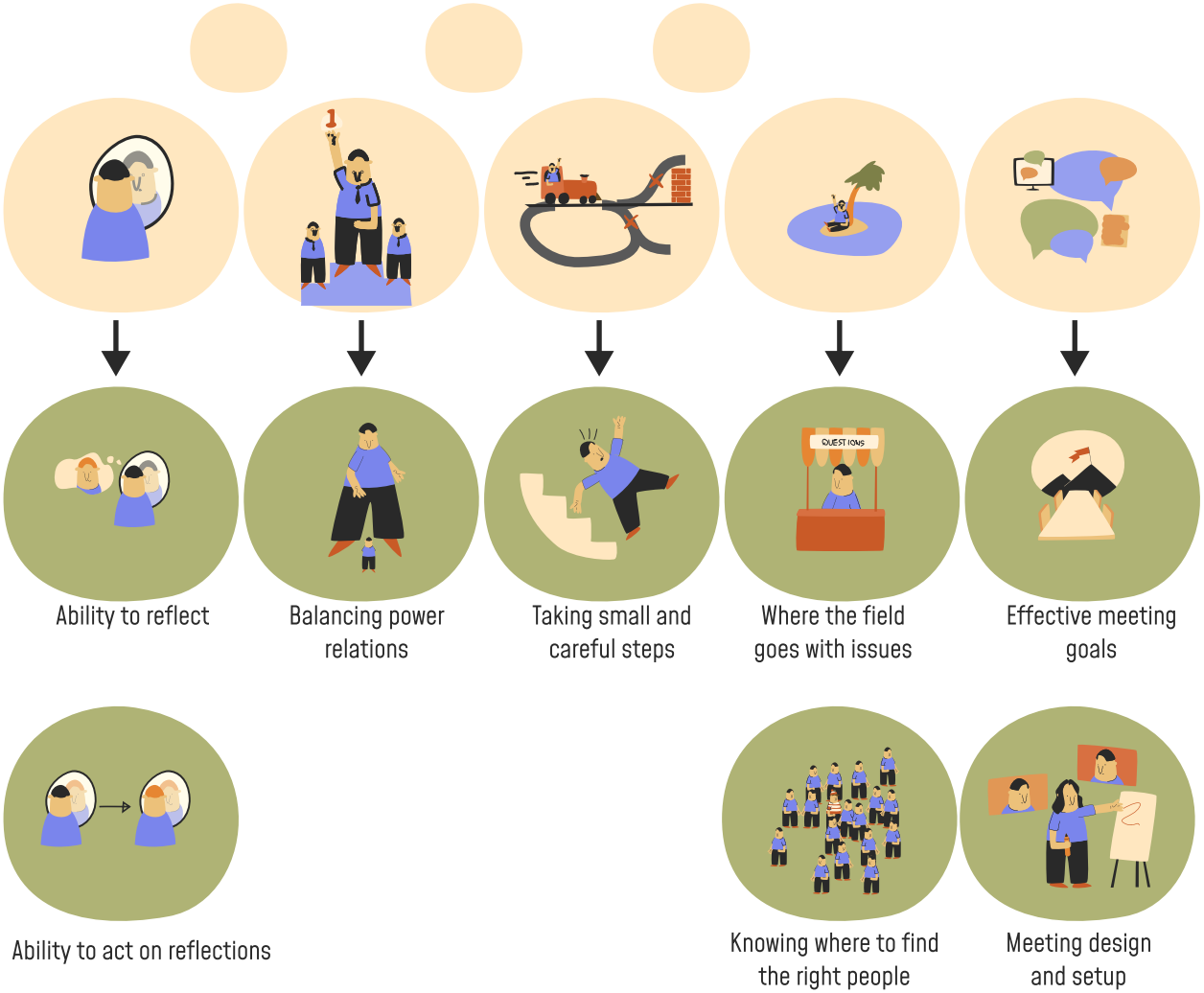
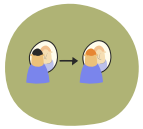


Figure 5.3a *Leverage points related to the overarching theme they came from.*

Ability To Reflect
The ability to reflect involves critically assessing actions, decisions, and outcomes to improve future performance. This practice is crucial for organizational learning and adapting to changing circumstances. Reflective practices help identify what worked well and what didn't, enabling continuous improvement and fostering a culture of openness and learning.



Ability to Act on Reflections
Acting on reflections is a critical leverage point that entails implementing changes based on reflective insights. While the ability to reflect involves assessing past actions and outcomes, acting on reflections is about taking concrete steps to address identified issues and enhance future performance. This process ensures that the insights gained from reflective practices lead to tangible improvements and prevent recurring problems.

Balancing Power and Control
Balancing power and control involves managing the distribution and exercise of authority within an organization to ensure effective governance and decision-making. It also involves managing decision making between organizations, taking into consideration who as authority, resources or responsibilities within the system, and who does not.

Figure 5.3b *Summary of 8 leverage points in the system*

Taking Small and Careful Steps
The leverage point of taking small and careful steps emphasizes the importance of incremental progress in complex systems. By focusing on small, manageable steps, organizations can better manage risks, adapt to new information, and steadily progress toward their goals. This approach contrasts with attempting large-scale changes, which can often lead to unexpected challenges and significant setbacks. The practice of taking small and careful steps is deeply rooted in the concept of iterative work, where continuous improvement and adaptation are prioritized over rigid, long-term planning.

Where the Field Goes With Issues
Understanding where the field goes with issues is essential for the smooth operation and coordination within and between organizations. It involves identifying and establishing clear, effective channels through which issues and challenges are communicated and addressed. This helps ensure that problems are recognized promptly and dealt with efficiently, minimizing disruptions and fostering a culture of proactive problem-solving.

Insights in Strategy
Some of these leverage points will be explored more in depth in chapter 11, the strategy.

Knowing Where to Find the Right People
Knowing where to find the right people is a critical leverage point that ensures the effective and efficient implementation of organizational goals. This involves identifying and engaging stakeholders, experts, and decision-makers who can contribute to achieving specific objectives. By strategically involving the right people, organizations can enhance problem-solving, decision-making, and overall project success.

Effective Meeting Goals
Effective meeting goals are crucial for ensuring that discussions are purposeful, focused, and productive. Clear, well-defined goals help guide the meeting's structure, ensuring that all participants are aligned and that the meeting outcomes contribute to the organization's objectives. Setting effective meeting goals requires understanding the broader context, the specific issues at hand, and the desired outcomes.

Meeting Design and Setup
Effective meeting design and setup are crucial for ensuring that meetings are productive, engaging, and achieve their intended outcomes. This involves careful planning, including selecting the right participants, defining a clear structure, and setting a conducive environment for discussion. Proper design and setup help in creating a focused agenda, ensuring active participation, and facilitating meaningful dialogue.

6

Evaluating Points for Leverage

Balancing Power and Autonomy as Focal Leverage Point

Which thematic leverage point can be argued to give the most impact with the least bottlenecks?

Introduction

What
This chapter explores the most effective leverage point for developing a future vision in the healthcare policy system. By focusing on key leverage points, we aim to create significant and lasting impact.

Why
Choosing the right leverage point is crucial for driving meaningful change. Considering the perspectives of system members is essential because they experience the system's challenges firsthand. Their insights help ensure that the proposed changes are practical and resonate with their needs. Additionally, successful change requires the motivation and commitment of the entire system. Engaging system members fosters collective buy-in and enthusiasm for the envisioned changes.

How
We co-evaluate key leverage points with system members through collaborative sessions. These sessions help us understand their perceptions, challenges, and desires. By mapping perceived impacts against potential bottlenecks, we prioritize leverage points that offer the highest potential for positive change with manageable obstacles. This participatory approach ensures that the strategies developed are practical, feasible, and supported by those most affected by the changes.

Contents

Conclusion

This chapter has explored identifying and evaluating key leverage points within the healthcare policy system to formulate a future vision. By closely examining relationships between overarching themes and sub-themes, we have pinpointed areas with significant potential for impactful intervention. Through influence mapping, soft systems modeling, and leverage analysis, we identified eight critical leverage points, with a particular focus on the ability to act on reflections, taking small iterative steps, and balancing power relations. Engaging system members in co-evaluating these leverage points provided invaluable insights into their perceptions and challenges. This collaborative approach revealed differing views on prioritization and bottlenecks, highlighting the importance of inclusive stakeholder engagement in policy design.

The findings underscore the complexity of implementing systemic changes, especially in a highly hierarchical and fragmented environment. However, they also point to clear pathways for improvement. Enhancing reflective practices, adopting iterative approaches, and addressing power dynamics are pivotal steps towards achieving a more adaptive, responsive, and effective healthcare system.

In summary, by focusing on these identified leverage points, the project aims to create a solid strategy that leverages stakeholder insights and systemic understanding to drive meaningful and sustainable improvements in healthcare data exchange and policy implementation.

6.1 Evaluating Leverage Points With System Members

To motivate a decision for leverage points to focus on, it's crucial to co-evaluate the leverage points with system actors. We do this by plotting perceived impact of leverage against perceived bottlenecks. Notice that this leverage versus bottlenecks analysis is directly analogous to the soft systems modelling (SSM) done in chapter 5. This is done to specifically evaluate these properties we found in the SSM against real world insights of system actors and refine our insights even more. Specific quotes per stakeholder can be found in appendix U.

Impact of Leverage
First, participants are asked to quantify perceived impact of pulling on a leverage point by placing it on the relative scale of the vertical axis.

Bottlenecks Toward Implementation
Then, participants are asked to quantify the perceived bottlenecks toward implementation. These include inhibitors like resources, culture or rigidity of a factor.

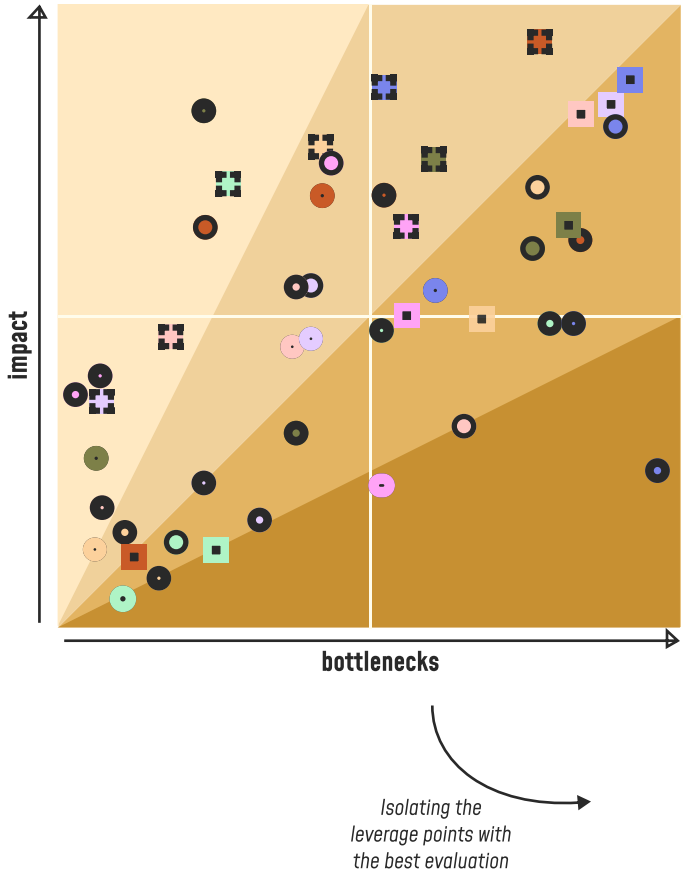
Qualitative evaluations are extracted by interviewing participants about choices.

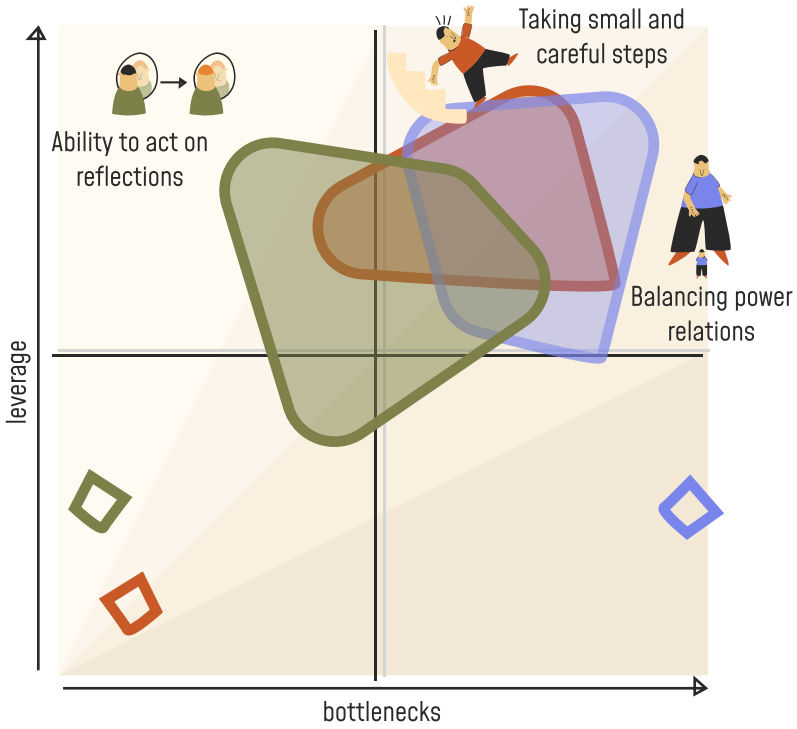
Relative Scales and Perceptions
Furthermore, the types of interactions in the system that these leverage points are projected on differs on personal experience. For example, our ICT coordinator will relate meeting goals to meetings between the field and policy, while a project manager a VWS might associate them more with inter-departmental meetings. This doesn't mean the definition of the leverage point is too fuzzy. It actually means the core thought behind the leverage point can be useful in different positions. For further design implementations it is important to define the context though.

Results
The resulting combined graph can be seen in figure 6.1a. Interesting to note is that, as expected, interpretations and definitions differed between participants. The knowledge of these interpretations in of itself is valuable information. Of course, participants noted their perceived leverage and bottlenecks differently as well. Part of this can be attributed to differing positions in the system. For example, a project coordinator ICT in a hospital noted immediately that taking small and careful steps without prioritization can't make sense, while people from VWS were less concerned with this. This reveals the different perspectives on prioritization between the two positions.

Leverage Points Interviews
- 6 review sessions
  - 4 from VWS
  - 1 from healthcare ICT
  - 1 from Nictiz

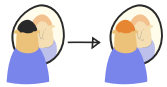
Three Most Promising Leverage Points
Further inspection reveals that there are three leverage points that score the best on impact, shown in figure 6.1b. Leverage points which are high in perceived leverage, and low in perceived bottlenecks are ideal. It's clear that in these three high impact comes also with high bottlenecks, or in human language, changes that will have much effect will be more difficult to pull off. I will go into more detail on my findings on the three identified leverage points in the next sub chapters. The full analysis can be found in appendix R, along with some more details about the other identified leverage points.





Leverage Evaluation
The leverage evaluation is done by comparing leverage against bottlenecks

Figure 6.1a *Results of co-evaluation with system members.*
Leverage points on the top left are considered easy wins, while those on the bottom right are dead weight, relative to each other.



6.2 The Ability to Act on Reflections

The ability to act on reflections is a powerful leverage point for several reasons. Acting on reflections is the second step after the ability to reflect. It is seen as more impactful and more difficult than the former. Acting on reflections means changing processes, going against the stream, and daring to do things differently. These are all things that my research has identified as things which are difficult in the current system.

Effect on Learning Systems
Reflecting is really a meta perspective on system functioning. The ability to act on reflections is grounded in several theoretical frameworks, including Argyris and Schön's theories on organizational learning and Senge's concept of a learning organization. Argyris and Schön (1978) highlight the distinction between single-loop and double-loop learning, where the latter involves questioning underlying assumptions and norms, leading to more profound systemic change. Senge (1990) further emphasizes that a learning organization is one that continuously transforms itself by allowing all members to contribute insights and act on them. "I the impact is in acting on reflections quicker." (VWS)

Feedback Loops
Effective feedback loops are vital for acting on reflections. Meadows (2008) describes feedback loops as mechanisms that enable systems to self-regulate and adapt. Acting on reflections effectively will help expand positive feedback loops quicker and more effectively. *"It might seem like we are doing it, but we are not acting on it. We have taken steps that are too big. We are not adjusting anything to it. You need to actually do something with it." (VWS)*

Spreading of Processes and Visions
Insights gained from reflections must be actionable. This means translating reflections into clear, strategic actions that can be implemented. This aligns with Argyris and Schön's (1978) concept of double-loop learning, which involves revising policies and strategies based on reflective insights. *"If you reflect well, your priorities will naturally improve. So, it seems like we are capable of learning from each other. However, the spread of that mindset is still limited." (VWS)*

Organisational Culture
An organisational culture that values and promotes reflection and action is essential. Schein (2010) notes that culture plays a critical role in how organizations learn and adapt. Encouraging a culture of openness, where feedback is valued and acted upon, can significantly enhance the ability to act on reflections. *"If you tell VWS we are going to try it differently, you will definitely encounter resistance." (Advocate)*

6.3 Taking Small, Iterative Steps

Taking small and careful steps, often referred to as an iterative approach, is a crucial strategy in systemic design. This approach emphasizes the importance of making incremental changes, learning from each step, and adjusting strategies accordingly. In complex systems, where uncertainties and interdependencies are prevalent, iterative processes enable more adaptive and resilient outcomes. This section will dive into the significance of iterative approaches.

The iterative approach is deeply rooted in design thinking and agile methodologies. Design thinking, as described by Brown (2009), involves a cyclical process of prototyping, testing, and refining solutions. Agile methodologies, popularized in software development, advocate for iterative development, continuous feedback, and adaptive planning (Beck et al., 2001). Both frameworks emphasize the value of small, manageable steps to navigate complex problems and deliver more effective solutions.
zijn."

Prototyping and Testing
Prototyping and Testing: Prototyping and testing are fundamental to iterative processes. They involve creating simple versions of a solution, testing them in real-world conditions, and gathering feedback to refine the design. As Brown (2009) notes, this cycle of prototyping and testing allows for rapid learning and adjustment. This is a mindset that has not yet been mastered by most members of the system. The tasks at hand are admittedly huge, and pressure from society warrants big steps. **"**We zijn alles in een keer aan het doen. Die neiging is groot, het is moelijk dat terug te brengen."

Incremental Development
Incremental development means breaking down large projects into smaller, more manageable parts. This approach is central to agile methodologies (Beck et al., 2001) and helps teams focus on delivering value in each iteration while minimizing risks associated with large-scale changes. "Prioriteren is een stap tegelijk nemen. Als je dat allemaal tegeijk aan het doen bent en niet het overzicht houdt dan werkt dat niet."

Flexibility and Adaptability
Iterative approaches emphasize flexibility and adaptability. Plans are continuously revised based on feedback and changing circumstances, allowing for more responsive and resilient solutions (Schön, 1983). This is also a goal that is difficult to achieve in the current system. Large and inflexible organizations and fragile relationships have a large impact on this. The organizations which have to make decisions on what and where to take steps are constrained by more factors than is desirable for flexible approaches. "Er zijn allerlei lobby groepen die zegen dat zijn nu aan de beurt

6.4 Balancing Power, Autonomy and Control

Balancing power relations is a critical component in the governance and management of complex systems like healthcare. Power dynamics significantly influence decision-making, resource allocation, and the implementation of policies and practices.

Power dynamics in organizations are well-documented in the fields of organizational theory and political science. French and Raven (1959) identified five bases of power: legitimate, reward, expert, referent, and coercive power. Understanding these bases helps in analyzing how power is distributed and exercised within an organization. Additionally, systems thinking, as described by Meadows (1999), highlights the importance of feedback loops and the role of power in influencing system behavior.

Transparency and Accountability
Transparency in decision-making processes and accountability mechanisms are vital for equitable power distribution. They help build trust and ensure that power is exercised responsibly and ethically (Denhardt & Denhardt, 2015). *"There is underlying suspicion. We are not doing much about it yet. Neither with our direct partners nor with the surrounding field parties." (Advocate)*

Who to Listen To
Stakeholder theory, as articulated by Freeman (1984), emphasizes the importance of considering all individuals and groups that can affect or are affected by the organization's actions. Systems thinking, as described by Meadows (1999), also underscores the importance of understanding the perspectives and influences of various stakeholders to manage complex systems effectively. Ensuring inclusivity means actively seeking out and listening to voices that are often marginalized or underrepresented. This includes front-line healthcare workers, patients with varying experiences, and minority groups (Arnstein, 1969). *"In the meetings I attended after the IZA was signed, I was an audience. Not a player. So they don't listen." (advocate)*

Dealing with Power
Excessive power held by certain stakeholders can create imbalances that hinder effective governance and decision-making in complex systems. Addressing these power imbalances is crucial for fostering collaboration and ensuring equitable outcomes. Encouraging collaborative leadership styles promotes shared decision-making and reduces the concentration of power. Leaders should facilitate dialogue, build consensus, and empower others (Heifetz, 1994). One interviewee expressed that the FMS has a lot of power to make things happen, or not.

Hierarchy as Conflict Resolution
Encouraging open communication within the hierarchical structure helps in identifying and addressing conflicts early. Leaders should promote a culture of transparency and openness (Denhardt & Denhardt, 2015). If this fails, as happens sometimes in our context, hierarchy can be the only effective way to solve a conflict. This remains an unfavorable approach because it impedes trust and collaboration. This shows in Vink's (2020) work on service ecosystem design, where comptetition and resistance emerge in feedback loops around the 'design' process. *"Exerting influence. Do we approve? Or should we have an opinion about it." (VWS)*

Another detrimental factor in the use of hierarchy is that increasing rank it often is paired with diminisheing expertise on the subjects being discusses. *"When a conversation takes place, it often involves people talking past each other at a high level. Just reading out things." (VWS)*

Accountability
Being held accountable is a major part in policy design. This culture seems to manifest itself in skewed priorities, where political sensitivity is more important than than the content that is being produced. *"The people they hire find political sensitivity more important than content. That doesn't help when you are technically dependent." (VWS)*

6.5 Choosing a Critical Leverage Point

With the knowledge or our research and evaluations it's now time to choose which leverage point will be the focus of a design intervention. To do so, we will take a look at the 12 leverage points of Meadows (1999). These are archetypical places to intervene in a system, and shown in figure 6.5xa. The more to the right you go, the larger the leverage is. The structure of these leverage points is such that the higher leverage points *define* the behaviour and structure of the leverage points below. Appendix R shows more considerations.

Let's explore these relations within our 3 selected leverage points.

- Balancing power relations is in it's core changing one of the fundamental paradigms of the system, who 'we as society and government' thinks should have power over what. The current *paradigm* is that power should reside within institutions that define interoperability and future strategy, not the end user.
- This paradigm then cascades into the *goals* of the system, which is a restricted representation of how BgZ implementation should be facilitated.
- This shows in the *structure* of the system. Organizations which focus on interoperability and organizational interests hold most of the power in the system, and the processes are defined around these organizations, not end-users.
- The *rules* of the system are also defined by that structure. The rules dictate that the FMS can block legislation by not signing the kwaliteitsstandaard.
- The allocation of power then also influences, and is influenced by *information* flows. Feedback from end-users has a hard time reaching the positions with power in the system structure.

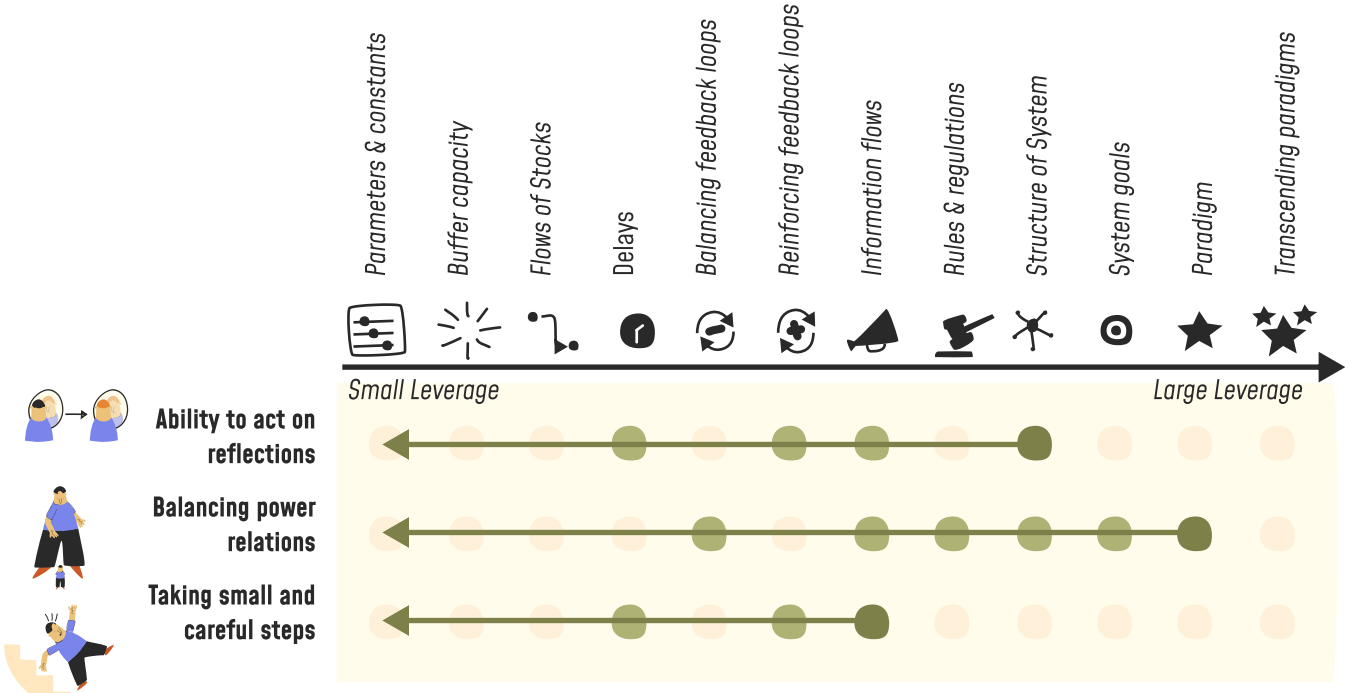
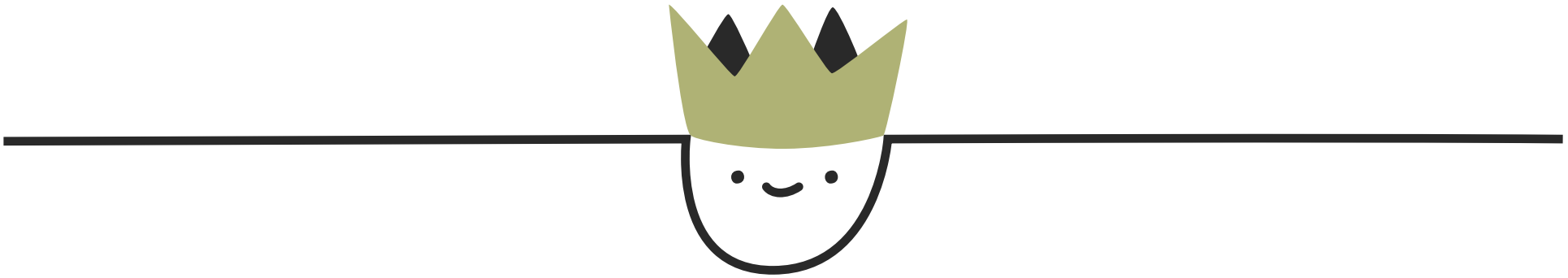


Figure 6.5a *evaluation of 12 leverage points by Meadows in relation with my three prioritized leverage points*

12 Points of Leverage
The 12 points of leverage are an indication of how much leverage you can expect from interventions. On the most influential side you have the ability to transcend paradigms. A paradigm is the mindset and value set out of which a system arises. On the other side, there are the parameters which can be changed. For example, amounts of financing or people hired. Appendix V shows these in depth.



Section B: Leverage

7

Future Vision

Enshrining the Influence of Healthcare Workers for Meaningful Use

How can we leverage balancing power control and autonomy to best achieve a future vision?

Introduction

What
This chapter focuses on formulating a future vision for healthcare data exchange, emphasizing the critical leverage point of balancing power, control, and autonomy among system actors. By identifying and addressing where power currently resides and where it should ideally be distributed, we can shape a more effective and equitable system.

Why
Balancing control and autonomy is crucial for overcoming existing bottlenecks and addressing the central question of 'how to exchange data' efficiently and securely. Properly understanding and redistributing power will pave the way for a more seamless, user-friendly, and resilient healthcare data exchange system. Ensuring that the right stakeholders have the appropriate level of influence is fundamental to achieving our long-term vision.

How
To formulate this vision, the three horizons framework is employed, guiding us through immediate actions, transitional initiatives, and long-term goals. This structured approach helps to identify concrete steps and milestones necessary for achieving the desired future state. By outlining specific strategies and initiatives for each horizon, we can create a roadmap that not only envisions the future but also provides practical steps for transitioning from the current state to the ideal scenario. This chapter will define the future vision, identify emerging opportunities, and propose actionable initiatives to drive systemic change.

Contents

Conclusion

The exploration of power dynamics and relationships within the healthcare data exchange system reveals critical leverage points that can drive meaningful change. By evaluating various aspects of power, including autonomy, opportunity, leverage, recognition, and value, we can identify areas where interventions can be most effective. Enshrining the influence of healthcare professionals emerges as a crucial focus, as their insights and needs are essential for creating usable, effective systems.

Incorporating healthcare professionals in policy-making and system design processes addresses immediate usability concerns and fosters long-term improvements in healthcare delivery. Effective leverage points include enhancing the ability to act on reflections, promoting small, iterative steps, and balancing power relations. These strategies align with the principles of meaningful use, ensuring that electronic health record (EHR) systems are not only technically solid but also user-friendly and integrated into clinical workflows.

Ultimately, achieving high-quality healthcare through digital data exchange requires a balanced approach that values technical interoperability and user-centric design. By empowering healthcare professionals and addressing systemic power imbalances, we can create a more responsive, effective, and sustainable healthcare system that benefits all stakeholders.

7.1 Aspects of Power

Throughout my contextual research, looking back, I recognize five distinct expressions of power. In the next paragraphs I highlight the characteristics of these expressions of power. Identifying and potentially quantifying these expressions of power is a great way to understand what the barriers to projecting power are for different actors. *"Power is The capability of one social actor to overcome resistance in achieving a desired objective" (Pfeffer, 1981).*

Pfeffer (1981) also describes how competing perspectives on how power should be positioned within and between organisations are a key issue to overcome. "*Choosing among the descriptive theories of power is a political act in the sense that each theory takes for granted certain assumptions about the world and how it operates, thereby accepts implicit values by a widely varying set of participants."* This is why understanding, highlighting and addressing the ways power is used and positioned within a system is so crucial. Figure 7.1a shows the aspects. The initial indexing of the meanings of power can be found in appendix H.

Autonomy
Autonomy refers to the ability of individuals or groups to make decisions and perform actions independently, with little or no approval from higher authorities. This internal freedom is crucial for efficient and effective decision-making, especially in hierarchical structures. One of your interviewees from VWS highlighted, *"Making decisions is sometimes challenging due to the lack of autonomy."* Because of this lack of autonomy, personal relations become critical to achieve change. "*The ability to coordinate things in violation of the rules-that is, to get along with other people-is highly valued." (Meyer and Rowan ,1977)*

Autonomy in organizational contexts is often linked to employee motivation and job satisfaction. Deci and Ryan's Self-Determination Theory (1985) emphasizes that autonomy is a fundamental human need that enhances motivation and performance. It is recommended to "*balance of corporate discipline (i.e., chain of command) with local autonomy to enhance the capacity of the total organization to respond to complexity at the front lines." (Jones, 2014)*

Opportunity
Opportunity refers to the ability to influence and manage outcomes practically. It involves the execution of power through specific mechanisms or actions, such as meetings or decision-making processes.
"Meetings are crucial for exerting control over outcomes. Without them, our power remains theoretical."

Leverage
Leverage involves using critical resources or positions to coerce or influence outcomes. This form of power is often strategic, utilizing key assets to achieve desired results.
"The FMS uses its power over the kwaliteitsstandaard to leverage actions at VWS, because VWS needs the kwaliteitsstandaard to implement their legislation." (VWS)

In the context of power dynamics, Pfeffer (1981) discusses how organizations and individuals can use resources and alliances strategically to exert influence and achieve their goals.

Recognition
Recognition pertains to the legitimacy and acknowledgment of one's power and authority by others. It is crucial for establishing perceived knowledge and relevance, and it largely depends on the perceptions of others in power. *"When working in one project, I could co-write the IZA, but when that was done and I was no longer involved directly, VWS didn't listen that much" (Advocate)*

Value
Value is the broader ability to affect decisions and actions within an organization. It is the capacity to shape outcomes through direct or indirect means, making it an essential element of power. *"I have to be at meetings, because they might discuss something I have a say in. Otherwise my ability to influence is lost" (Advocate)"*

It's important to realize that these 5 factors can be both causes and effects of dynamics and properties of actors. For example, influence can be the cause of power if the potential for valuable input is a source of *recognition.* Of course, when an actor has less power, their ability to influence will also decrease. Leverage might be a source of power, but we have to consider the factors that have caused this leverage to be shaped historically or culturally.

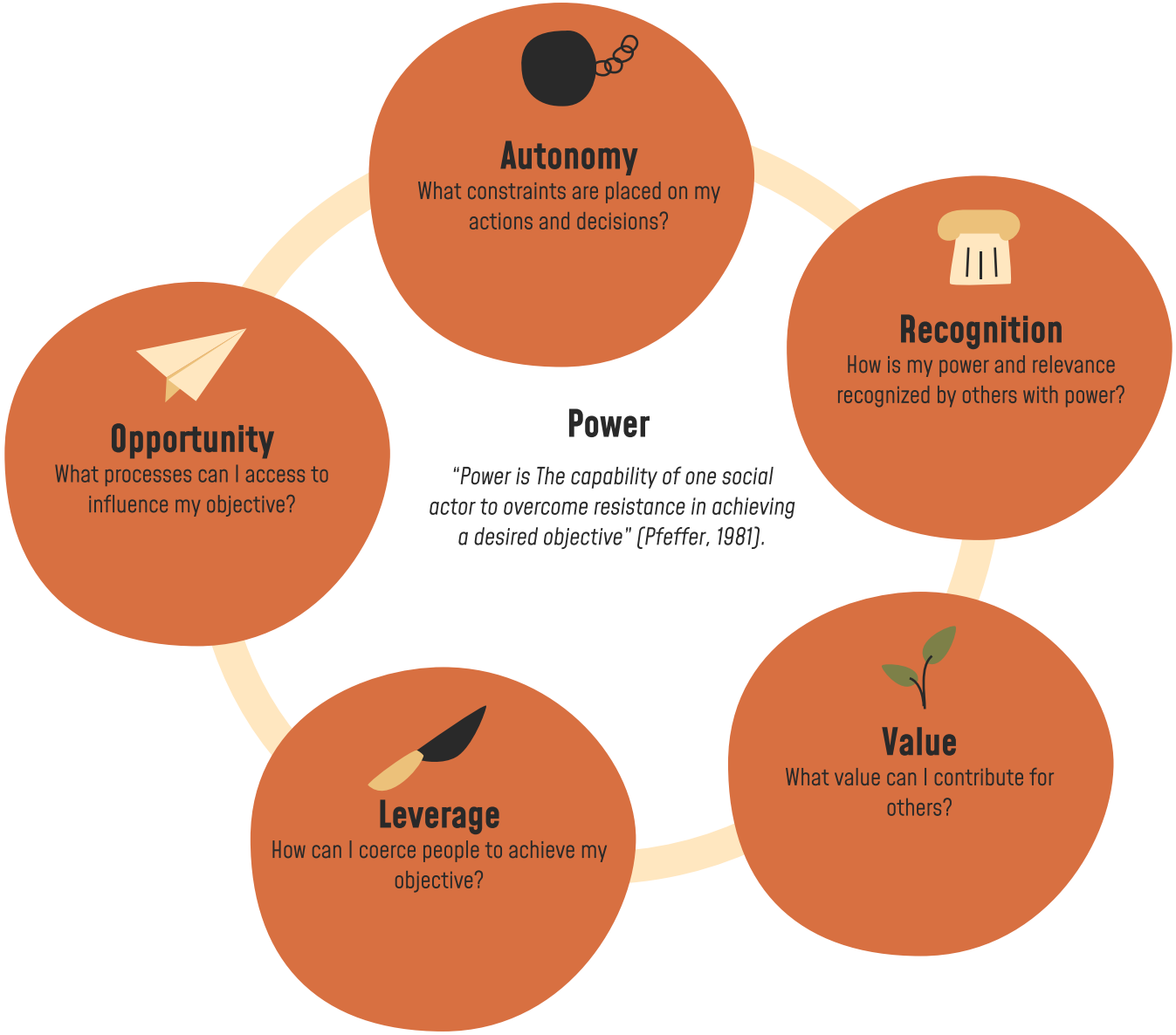


Figure 7.1a *Aspects of Power*

7.2 Relationships Affected by Power

In analyzing the dynamics of power within the healthcare data exchange system, it becomes evident that specific relationships and interactions are significantly influenced by power imbalances. These relationships can either facilitate or impede effective collaboration, decision-making, and implementation of policies. Below are the key relationships affected by power dynamics: The processes to which it relates originate from the map in appendix L.

1.0 Actors Need Meetings for Control

Opportunity

Attending meetings are essential for creating opportunities to influence outcomes. Meetings provide a platform for stakeholders to discuss, influence, and make decisions. Without participation in these meetings, stakeholders lose their ability to steer decisions and outcomes. According to Pfeffer (1981), influence within organizations is often exercised through structured processes like meetings, where power is enacted through decision-making protocols and agenda-setting. "*I have to be at meetings, because they might discuss something I have a say in. Otherwise my ability to influence is lost" (Advocate).*

2.0 Policy Makers and Accountability

Autonomy

Policymakers operate within strict accountability frameworks, which limit their autonomy. These frameworks are necessary for maintaining order and compliance but can also inhibit policymakers from taking necessary risks or making independent decisions. "*Making decisions is sometimes challenging due to the lack of autonomy.*" Meyer and Rowan (1977) discuss how formal structures and accountability mechanisms within institutions can constrain the autonomy of decision-makers, leading to inflexibility. "*Human relations are made very important. The organization cannot formally coordinate activities because its formal rules, if applied, would generate inconsistencies" (Meyer and Rowan, 1977).*

3.0 Influence of Healthcare Professionals

Value, Recognition

Healthcare professionals have valuable insights and experience but often lack formal channels to express their influence within the system. Their contributions are not systematically integrated into policy-making or system design, leading to a disconnect between policy and practice.

4.0 Debate Among Governing Bodies

Autonomy, Opportunity

The need for alignment among different governing bodies leads to excessive debates and meetings. Each body operates with a degree of autonomy, but this autonomy requires constant coordination to ensure coherent decision-making and policy implementation.

5.0 Taking Control Without Tools

Leverage, Opportunity, Value, Autonomy

VWS has been given the mandate to lead but lacks the necessary tools and resources to exercise effective control. While VWS has some leverage, such as the ability to legislate, its influence is limited by a lack of specific knowledge and resources.

6.0 Inhibiting Through Power

Leverage

Certain organizations leverage their power to unilaterally influence outcomes, often inhibiting collaboration. This power imbalance can create friction and resistance among other stakeholders who feel marginalized or overpowered. Such displays of coercive power can be used to control others, but can potentially lead to conflict and resistance in the long term, as indicated by one of the interviews.

7.0 Recognising Experts

Value, Recognition

This area concerns the differing Influence experts have within the system. There is an inconsistency on how much power experts can leverage in decision making based on. These differences have to do with recognition mostly.

8.0 Vendor Lock-in

Leverage, Autonomy

The last, but not least, disbalance in power relations is the leverage software suppliers have over the system. Due to there only being three major suppliers, market systems don't encourage innovation, resulting in high profits and sub-optimal products. (see chapter on

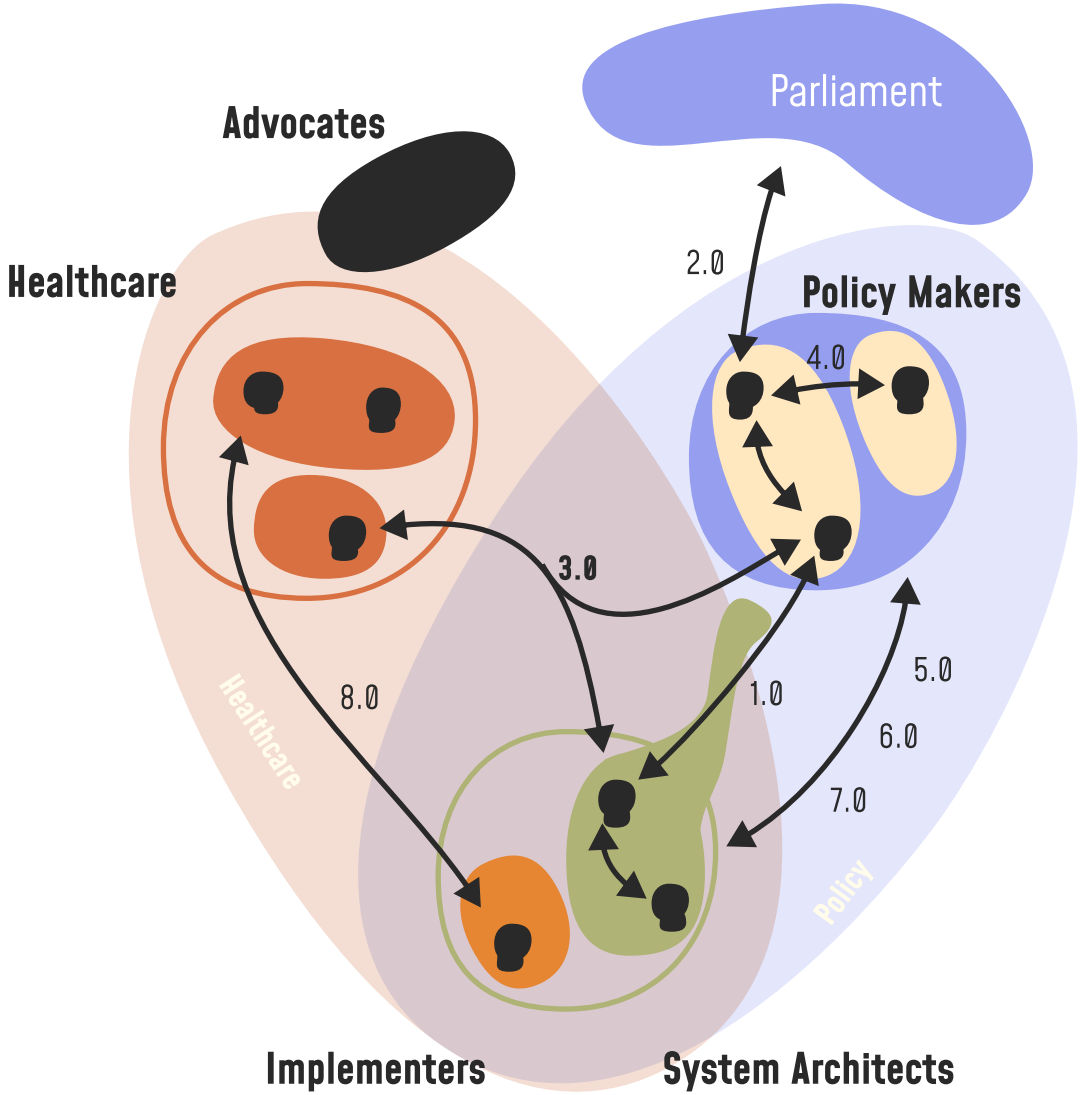


Figure 7.2a *Seven areas where the system is under stress due to autonomy and control*

1.0 Attending **meetings** is required for control
Opportunity

2.0 policymakers are held **accountable** and thus inflexible
Autonomy

3.0 Influence of healthcare employees is not **enshrined**
Value, recognition

4.0 issues are **endlessly debated** among different **governing bodies** to control directions
Autonomy, Opportunity

5.0 VWS has been given **control** but few of the necessary tools to exercise it
Leverage, Opportunity, Value, Autonomy

6.0 organizations leverage their power to control outcome **inhibiting** collaboration
Leverage

7.0 **Experts** whose influence is not recognized are often underrepresented
Value, Recognition

8.0 Software suppliers are autonomous from the system due to **vendor-lock in** and free market
Leverage, Autonomy

7.3 Evaluating Impact of Relationships Affected by Power

Understanding the eight areas of improvement now allows us to choose one to focus on going forward.

Criteria

To rationalize the decision, I use the 3 criteria of effective leverage by Jones (2022). These are

- **Direct influence** by design team. Murhpy (2022) shows that 'local leverage' which can be influenced directly should be preferred over global or long term leverage.
- Ability to achieve relatively **short-term** goals. How deeply rooted is the problem and can meaningful change be made, that motivates and inspires further change?
- Level of contribution to the strategic **long term** goals. Long term goals are not the first priority, but should be valued highly if the above criteria are met.
-

Due to the nature of system change in small steps, and the little resources, power and time available to this research project, the priority is to address a relationship which can be meaningfully impacted by me as a designer to achieve some short term goal.

Choosing Leverage Area

Figure 7.3a illustrates the valuation of three indicators for leverage implementation, showing that enshrining the influence of healthcare workers is both feasible and impactful.

Among the identified leverage points, "enshrining the influence of healthcare workers" stands out as a critical focus. This leverage point is actionable for several reasons:

- **Direct Influence:** Issue 3.0 can be relatively easily influenced by the design team. This is because one of the clients of this report is herself a CMIO in a hospital, which means a relatively sure access to healthcare professionals that can participate in any prototype interventions. Another reason is that processes to involve healthcare employees are hierarchically not very out of reach for a designer, meaning lower cycle and approval times, as well as easier access to activities.
- **Short-Term Impact:**It can also be argued that impacting short term goals is best achieved by enshrining the influence of healthcare professionals. The lack of input by healthcare professionals has directly lead to implementation efforts that failed on usability of the system. This failure has not only harmed trust of healthcare professionals, but also made the FMS withhold a crucial key towards legislation. It fears doctors will be forced to use an unusable software package.
- **Long-Term Goals:** Ensuring healthcare professionals' influence in the process will lead to sustainable improvements in policy-making and implementation. This kind of user centered thinking is a mindset that will benefit VWS and its allies in future projects regarding BgZ, but also other healthcare and non-healthcare related challenges.

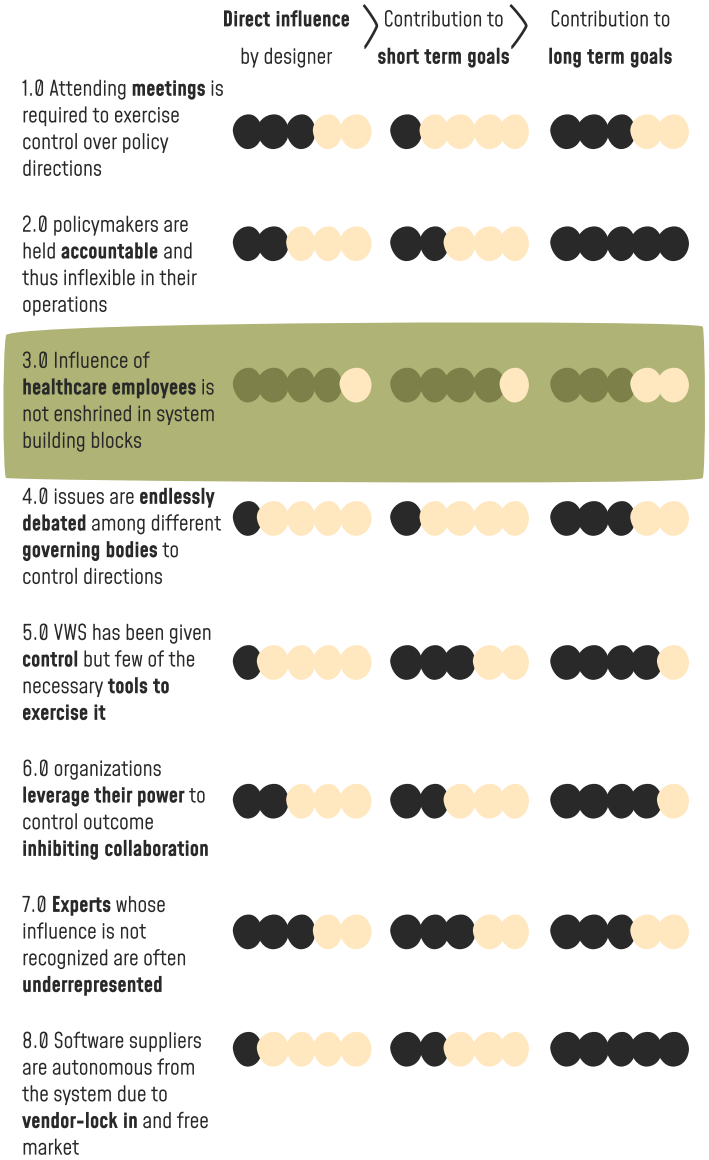


Figure 7.3a *Evaluation of the three indicators for where leverage can be most influential for first change processes*

7.4 Meaningful Use as a Balance Between Usability, Interoperability and Integration

To better understand why enshrining the influence of healthcare professionals is so important, let's discuss some context. The tension between healthcare professionals' processes and the broader societal and organizational benefits arises from the limited influence healthcare professionals have over policies that impact their work. Without proper discourse, these professionals may experience frustration due to top-down demands that afford them little autonomy. Empowering healthcare professionals in these discussions is crucial for addressing this imbalance. Additionally, if demands on the healthcare process are imposed from above, they must be implemented in a way that ensures meaningful usability.

Meaningful Use

The concept of meaningful use was introduced by Blumenthal and Tavenner (2010) and is described as follows: *"The meaningful use rule strikes a balance between acknowledging the urgency of adopting EHRs to improve our healthcare system and recognizing the challenges that adoption will pose to healthcare providers."* In essence, meaningful use represents a balance between the collective needs and the individual needs of healthcare professionals. Appendix Y goes into some quantifiable examples how meaningful use affects healthcare quality. In Chapter 3, I outlined the general benefits of digital healthcare data exchange. Some of these benefits stem from technical capabilities such as interoperability and data availability, which are essential to address before considering usability. Usability itself is a broad concept, and it is helpful to narrow down what it means in this context.

Usability

Usability refers to the ease with which healthcare professionals can use EHR systems to achieve their goals effectively and efficiently. Poor usability can lead to errors, reduced productivity, and clinician burnout. For example, Ratwani et al. (2018) found that EHR usability issues contributed to medication errors, some of which resulted in patient harm.

Interoperability

Interoperability is the ability of different EHR systems and software applications to communicate, exchange data, and use the information that has been exchanged. This capability is crucial for comprehensive patient care, as it allows for seamless data flow across various healthcare settings.

Integration

Integration involves incorporating EHR systems into the clinical workflow in a way that supports rather than hinders healthcare delivery. Effective integration ensures that EHR systems complement the daily tasks of healthcare professionals rather than disrupt them. This includes the alignment of clinical processes with EHR functionalities, which is often overlooked in the design phase (Bates et al., 2014).

Tension Between Needs

The concept of the 'innovation sweet spot' (figure 7.4b) provides a valuable perspective on the meaningful use of healthcare HDE systems. This approach involves balancing the various desires and needs of organizations, technology, society, and users. Currently, the policy system is overly focused on technical interoperability, often at the expense of user needs.

Conversely, users of Health Data Exchange (HDE) systems resist changes in their healthcare processes because these changes can negatively impact their work efficiency and satisfaction. As one healthcare professional explained, *"Why do I have to jump through all these administrative hoops? I just want to do my anamnesis in free text."*

By co-creating meaningful use through the collaboration of policy-makers, software developers, and healthcare professionals, it is possible to create EHR systems that are both technically solid and user-friendly. This balance ensures that EHR systems improve healthcare delivery without compromising the efficiency and satisfaction of healthcare providers. The meaningful use rule, as defined by Blumenthal and Tavenner, highlights the need for this balance, acknowledging both the urgency of EHR adoption and the challenges it poses. The ultimate goal is to create a healthcare environment where technology enhances rather than hinders the work of healthcare professionals

User Effect Value Chain

Perhaps the most simple reason why human centred design and usability matters is the user effect value chain. It describes how a design which is user friendly cascades down to organizational and societal goals (Kuijk, 2024). This also relates to outcome mapping (Jones & van Ael, 2022), where actions and preconditions based on societal goals are cascading down to strategic outcomes and impacts. In the case of my future vision, this strategic outcome is to *enable* the user effect value chain to be properly established (figure 7.4a).

A combined version is shown in figure 7.4b to indicate the relationships between a usable system and societal goals.

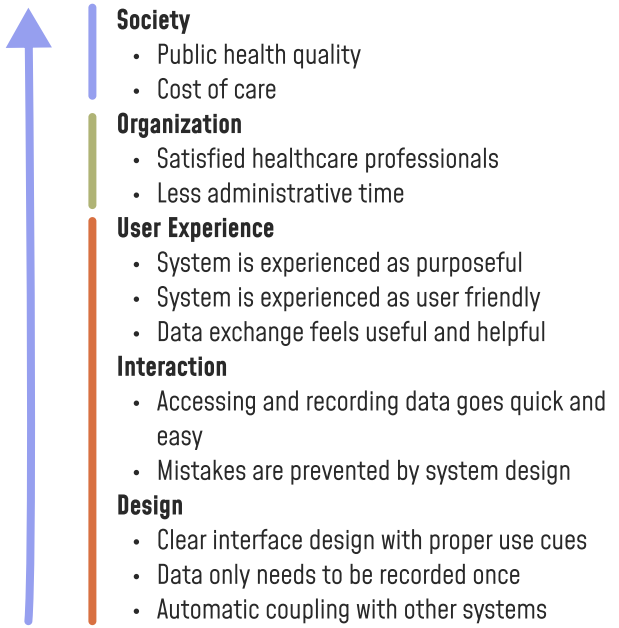


Figure 7.4a *User effect value chain*

Innovation Sweet Spot
The innovation sweet spot combined with the user effect value chain is a model that's very helpful in explaining the value of usability for both organizations and society

User effect value chain starts at value for user, and goes through interaction, user experience, organizational value an lastly societal value.

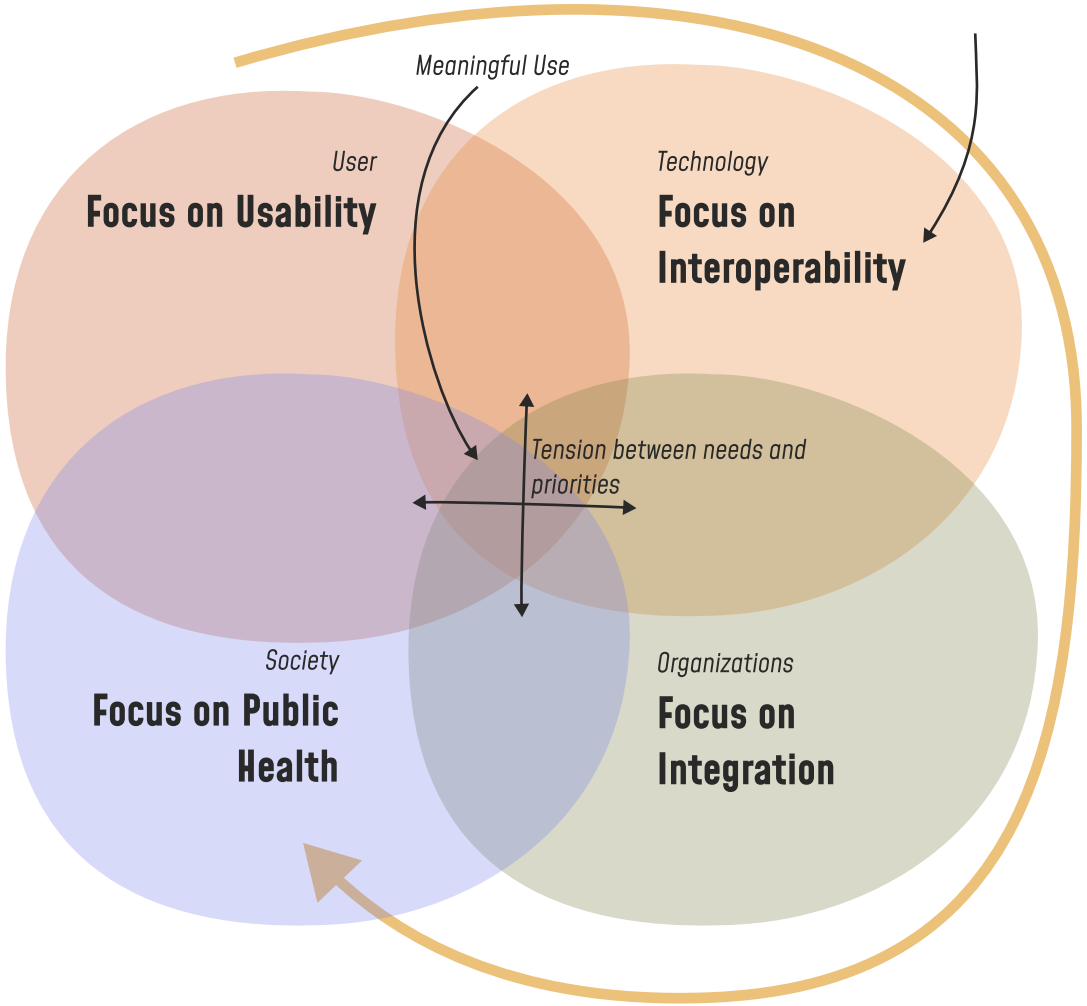
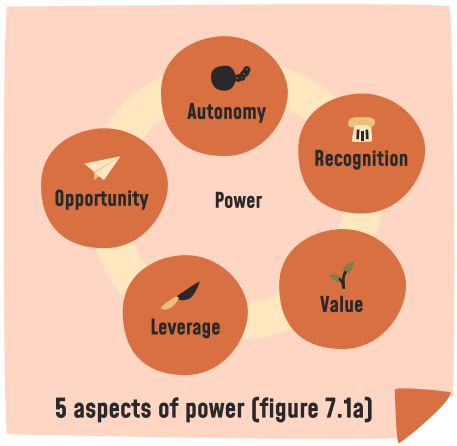


Figure 7.4b Sweet spot of innovation.
The yellow arrow indicates the User Effect Value Chain.

Understanding these tensions in prioritizing between different stakeholder levels, figure 7.6b explores an interpretation of how the 5 aspects of power might be used to influence outcomes regarding healthcare work processes. Note that the impacted group, healthcare profesisionals, have very little direct power, but they do have value to add if they are given the opportunity, autonomy, recognition and leverage.



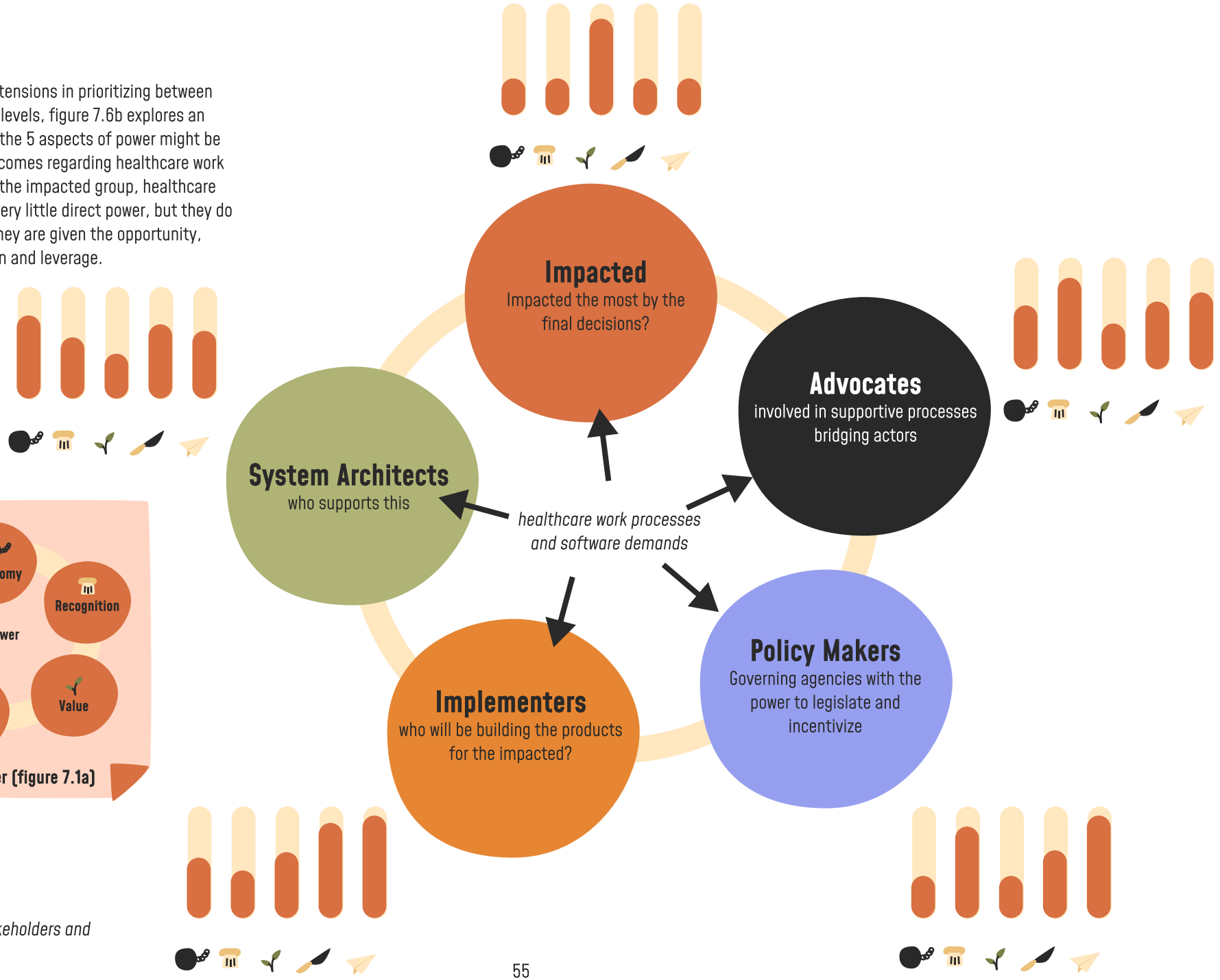


Figure 7.6b *Stakeholders and their power.*

7.5 How Can Healthcare Professionals Leverage Power?

Let's look at the position of healthcare professionals in the system of data exchange implementation through our lens of power (figure 7.6b).

Autonomy
Autonomy for healthcare professionals is a difficult one. Healthcare professionals in the time of digital data exchange are very dependent on the systems they have to use. They can't individually change or easily make improvements. There are opportunities within their in-house ICT systems, but autonomy across organizations is very limited.
Another barrier is the flexibility of schedules and time. Most medical professionals have busy schedules which do not allow for much 'side activities' like participating in policy making. This further narrows that representation of healthcare professionals.
"I can't go anywhere on a work day, I'm too busy for that. If you want my input you have to come here" (Medical Professional)

Recognition
Healthcare professionals are usually recognized when it comes to challenges in usability, it's more a question of where that recognition comes from and what the follow up is. Within a healthcare instituition, recognition might be most relevant with the ICT department.
My interviews indicate that these requests rarely seem to make it to the product they are using. Moreover, the national scale of the data exchange challenges mean that local feedback is very inefficient, as described earlier.
"I can request features or voice complaints, but I never see any results or positive feedback from our ICT department""(Medical Professional)

Value
When it comes to influencing results, healthcare professionals have some issues. First of all, healthcare professionals are not trained to express their needs in a way that is particularly useful to developers or designers by themselves. "*If you were to ask healthcare professionals what they want, they'd tell you things about buttons and screens, but we someone else to understand the underlying problem." (Software supplier)*

Another barrier is the trust in the results that participation might have. This is partly because of previous experiences, but also in part due to the lack of general knowledge about policy making and what kinds of input is requested. This results in a general apathy towards delivering input on a higher level than their local ICT department, if at all.
"I wouldn't even know what policy makers would have use for my knowledge. I have no idea what they are doing" (Medical Professional)

As a client, you want to have a singular relation with any company or organization, and don't want anything to do with the internal structure of that organization. (Van Belleghem, 2015). In the case of a healthcare professional there are multiple organizations and touch points which constitute a possible client relation.

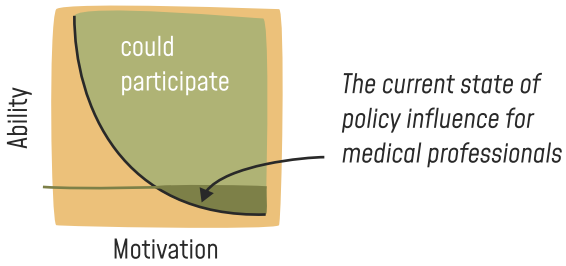


Figure 7.6a *Fogg diagram (Fogg, 2009)*

Opportunity
A common barrier towards getting help from institutions is 'institution capital', or the knowledge and trust to reach out to specific institutions which can be of help (Kremer, 2023). This institutional capital is critical to exerting control over decisions, as knowing where to exert control is a critical missing step. The results in participation of only the group that is motivated enough to overcome the friction of participation (figure 7.6a). Removing that friction is key to facilitating the participation of influence by a broader and more representative group of medical professionals.

Leverage
Healthcare workers also have little leverage to influence decisions. The most critical one that is more related to how little leverage healthcare *institutions* have. In a free market, users can influence a product by 'voting with their wallet'. This drives competing suppliers to best meet demands of their consumers and innovation will improve the product. This is unfortunately not how the EPD market works. First off, doctors don't get to decide the software they use, their hospital board does. Secondly the hospital boards also have limited say in what supplier they use due to vendor lock-in (Autoriteit Consument & Markt, 2021).

One other route of leverage is though the FMS (Federatie Medisch Specialisten), who have to sign off on the Kwaliteitsstandaard in order fo any legislation to be passed. This means at the very least that new software can't be legally imposed on healthcare professionals unless the FMS thinks that software would be usable. Individual medical professionals don't have a lot to influence here though, as there are no official channels such feedback could be implemented.

7.6 Importance of Participation by Healthcare Professionals

Efficient, Usable Solutions. Data must be available where and when it is needed, and in a useful format (American Hospital Association, 2019).

Validation of Digital Health Tools
Britisch EPD systems were rated a usability score (SUS) with a median of 53 out of 100. Americaln EPD systems scored a 48 (Bloom, 2021). Any score under 50 out of 100 is labeled as 'unacceptable' by the SUS metric. Unfortunately, SUS evaluations of Dutch EPD systems are not publicly available, but signals from interviewed healthcare professionals indicate that the usability of Dutch EPD systems could be concerning too. Research about Dutch EPD systems indicate a similar trend (Bansie, 2022):
"*The trend is that usability of the EPD doesn't facilitate registration of information and rather adds to the administrative load" (Bansie, 2022)*
The World Health Organization also indicates the importance of validating digital health tools:
"a framework allowing individual feedback in validating the performance of digital health tools and services" (WHO, 2021)

Participating in Designing Digital Health Tools
Apart from validating the usability of digital health tools, it's also crucial that end users are engaged in the design and development processes.
"that all end-user communities and beneficiary populations are adequately engaged in the design and development phases" (WHO, 2021)

Participating in Vision
Lastly it's also important for stakeholders to participate in creating and executing the vision of healthcare digitization. Policy must:
"facilitate a systematic engagement of all relevant stakeholders in the realization of the vision and its strategic objectives as part of an integrated digital health ecosystem at the national level" (WHO, 2021)

Secondary Use
Usability of systems not only affects the quality of healthcare in the moment, it also severely affects the quality of data for secondary use. Without proper incentive or facilitation of data input for medical professionals, data inputs will be near useless (Bloom, 2021).

7.7 Formulating a Future Vision Through the Three Horizons Model

The Three Horizons Model (Curry & Hodgson, 2008) provides a structured approach to envisioning and achieving systemic change. This model divides the journey into three perspectives:

- Horizon 1, **current** regime or system that shows signs of pressure. This horizon is the collective set of challenges that have been found in the previous chapters.
- Horizon 2, **initiatives** necessary to transition. These are practical applications to initiate change, and will be discussed in the next chapters
- Horizon 3, **future vision** to guide the way and dream of possible future system states. This future is defined in figure 7.8a.

A future where the **power** of healthcare professionals is enshrined in system **values, processes and actions** so their healthcare process can be shaped by not not only **technical or societal** relevance, but also their **experience, knowledge and needs**

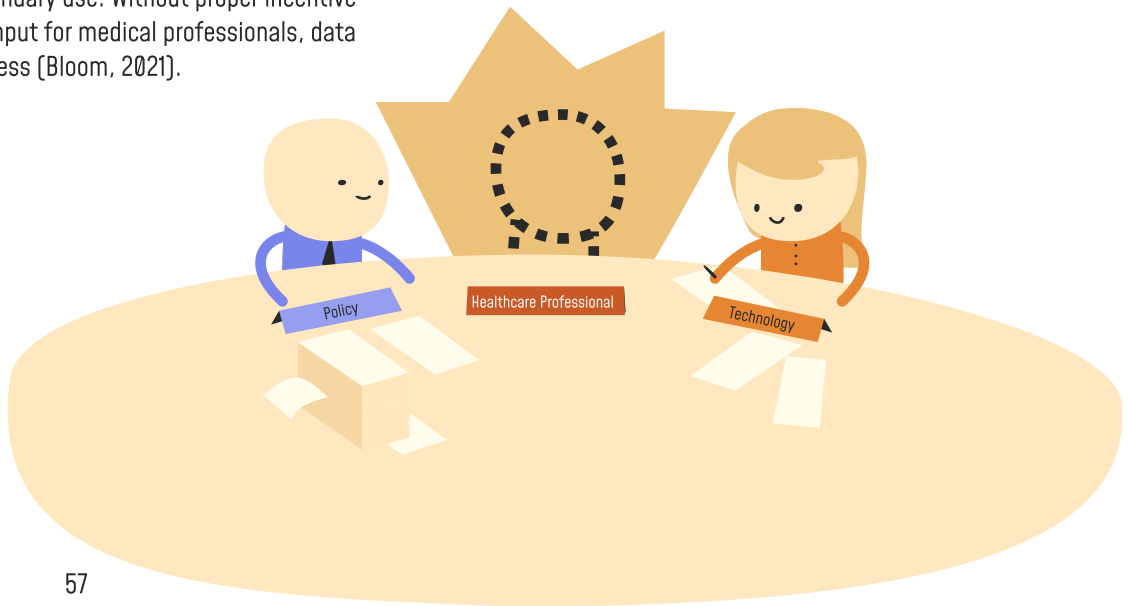
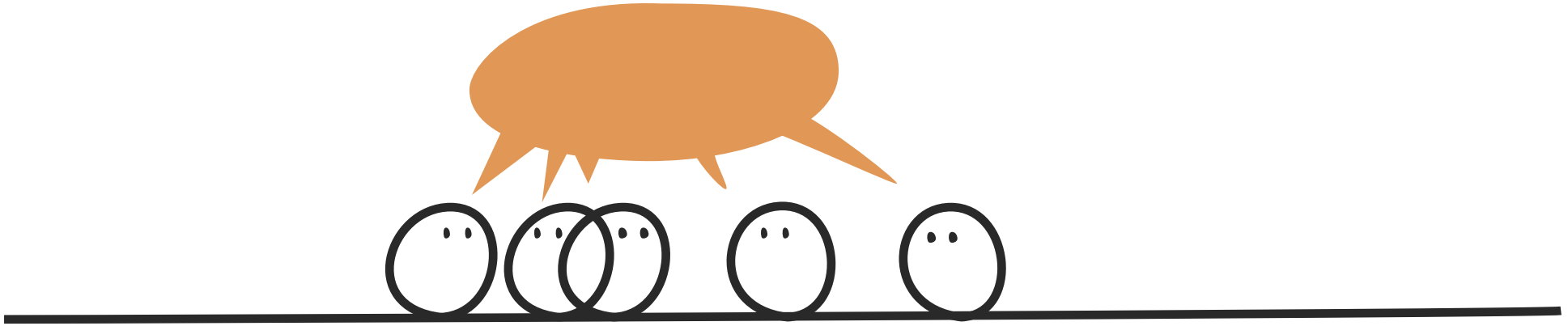


Figure 7.8a *Future Vision*



8

Case Study

Aiming for Collective Request Articulation

What initiatives have been set up that are first steps towards our future vision, and what can we learn and improve there?

Introduction

What

This chapter explores an innovative initiative, the Designathon for BgZ MsZ (Basisgegevensset Zorg for Medisch specialistische Zorg). This Designathon aims to unite key stakeholders, including healthcare professionals, software suppliers, and Nictiz, at a single discussion table. The goal is to collaboratively formulate requirements for Electronic Patient Dossier (EPD) software, ensuring that the needs and insights of healthcare professionals are directly integrated into the design process.

Why

Analyzing this existing use case offers a valuable learning opportunity. It provides concrete examples of progress and challenges, offering insights that can be applied to other initiatives. By studying the Designathon, we can identify best practices and potential pitfalls, which are crucial for developing a future vision that enshrines the influence of healthcare professionals in system design.

How

This chapter utilizes the Designathon by Nictiz as a case study to advance the future vision of empowering healthcare employees. Through detailed examination of the Designathon process, interactions, and outcomes, we can gather insights and lessons that inform the development of more effective and user-centered EPD systems. This approach helps in refining the strategies needed to ensure that healthcare professionals' experiences, knowledge, and needs are central to the design and implementation of digital healthcare tools.

Contents

Conclusion

The Nictiz Designathon initiative represents a significant step toward improving the usability of Health Data Exchange (HDE) systems by fostering collaborative request articulation among stakeholders. This initiative's primary goal is to ensure that the voices of healthcare professionals are effectively integrated into the design and development of Electronic Patient Dossier (EPD) software. Through a structured process involving healthcare professionals, software suppliers, and Nictiz experts, the Designathon aims to create explicit, relevant, and representative requirements that software developers can use to enhance system usability.

The analysis of the Designathon process highlights several key areas for improvement. Firstly, there is a need for more explicit formulation of requirements to ensure clarity and actionability. Secondly, the process must ensure that the insights gathered are representative of the diverse user base, including regular healthcare professionals who are often under-represented. Thirdly, the initiative should foster collective action among healthcare institutions to amplify the impact of request articulation. Lastly, integrating the request articulation process across organizational boundaries is crucial for creating a seamless and collaborative development environment.

By addressing these areas, the Designathon can achieve its goal of enshrining the influence of healthcare professionals in the system values, processes, and actions. This will lead to the development of HDE systems that are not only technically solid but also user-friendly, ultimately enhancing the quality of healthcare delivery and the satisfaction of healthcare providers.

8.1 Why Collaborative Request Articulation Matters

Starting from the vision:
A future where the power of healthcare professionals is enshrined in system values, processes and actions so their healthcare process can be shaped by not not only technical or societal relevance, but also their experience, knowledge and needs we can come to the conclusion that collaborative request articulation is a key factor in achieving that desired influence of healthcare professionals. Here's why.

Usually within design firms, the request articulation is done in a partnership with the developer as well as client and end users. For the pilots of the VIPP 5 programma this step had been excluded, because usability was not one of the criteria for subsidy. This means that to have chance at systems that provide meaningful use, there needs to be a centralized set of requirements or standards on meaningful use. Only then can this be evaluated and then become part of a incentive or legislation for software supplieres to deliver.

Figure 8.1a *Competing priorities*

Collaborative Requests
Crucially defining for the exchange of healthcare data is the need for collaborative request articulation. Autoriteit Consument & Markt (2021) writes
"*that groups of hospitals with the aim of uniforming functional requests for their EPD supplier, these are in practice not always successful in formulating such a request.*"
Such collaboration is critical, as research shows that hospitals are competing for the scarce capacity of resources. To better understand the impilications of this dynamic, figure 8.1b illustrates the nature of the relationships between software suppliers and healthcare institutions. There is not one supplier and one homogeneous client, there are multiples of everything. This is the reason collaboration is so critical. Further, it has been shown that *"evaluations early in development processs are argued to have more impact than late evaluations" (Folstad, 2017).* The Designathon provides an awesome opportunity to involve early evaluations.

Prioritization in Policy
This competition is also visible within policy prioritization within VWS. Strictly speaking, there are 5 prioritized data exchanges as formulated in the Wegiz Planning. Interviews have however revealed that these data exchanges are all being pushed to hospitals at the same time, resulting in a fight over development time and prioritization (figure 8.1a). Lack coordination on this front from VWS is concerning. Also outside of the Wegiz prioritization keeps being relevant, as there are always competing demands for implementation.

Figure 8.1b illustrates the relationships between software suppliers and it's clients. It should be noted that the fragmentation of this system is one of the most defining factors in achieving influence in request articulation. Request articulation needs to overcome organizational and specialization differences before it can become truly collaborative.

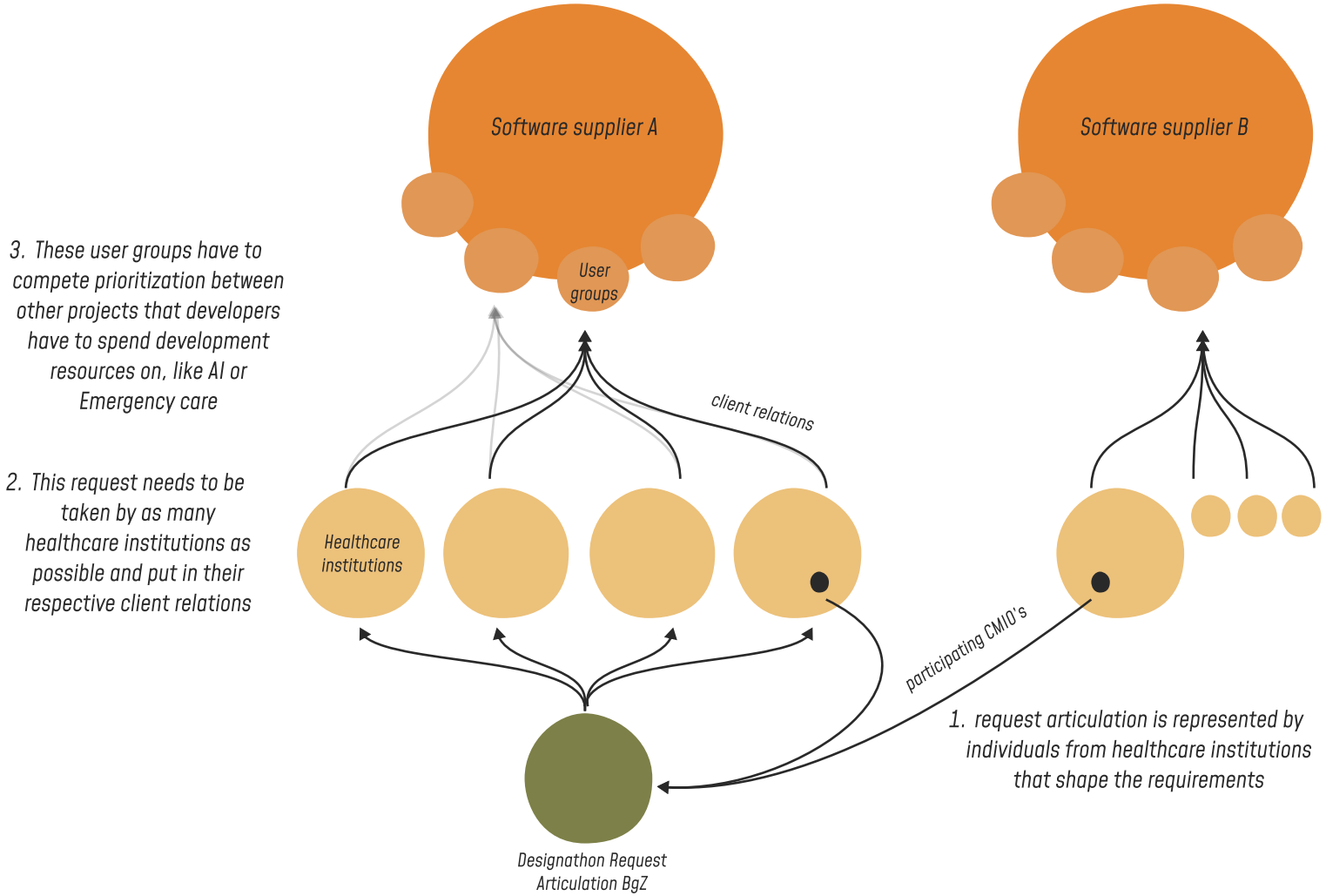


Figure 8.1b *Notice that any request can't be made directly to software suppliers, but has to be done through the separate healthcare institutions and user groups of every specific software supplier*

8.2 Goals of the Nictiz Designathon

Collaborative request articulation is one of the key goals of a new initiative, the Designathon by Nictiz. What is a Designathon? In the words of Nictiz (Nictiz.nl, 2024). *"it is a process which utilizes 'a system in a room' which involves medical professionals, software suppliers and experts from Nictiz to work on a redesigned version of the BgZ."*

Relation to Informatiestandaard

To place these goals in the context of a systemic overhaul, it's important to further examine how Nictiz, the Informatiestandaard and software development are related.

We already know that Nictiz is responsible for one of the 5 building blocks of the systemic BgZ process; the Informatiestandaard. The informatiestandaard are the technical and architectural design of the data exchange that is facilitated, basically, how is data exchanged.

These guidelines are the main source of input and standardization that makes sure software developers will all create software that is interoperable and will thus allow the seamless flow of information.

VIPP 5

Under the VIPP 5 program (dus-i.nl, 2023).standard a pilot software had been implemented in several hospitals. Nictiz and VWS had received complaints about the usability of this system through active healthcare professionals. They went to HMC hospital for a demonstration, and were *"shocked we could make software healthcare professionals really don't want to use" (Nictiz employee).*

Leverage to Demand Usable Systems

The conclusion was that the information standard had not been enough to actually make a meaningfully usable system, although technically everything worked according to specifications. The FMS, representing healthcare specialists, thus refused to sign the kwaliteitsstandaard, one of the key components of the Wegiz that VWS needs to start legislation. "*The most direct goal and cause of the Designathon is therefore to get the Kwaliteitsstandaard signed, not a desire by VWS to address usability in the policy systematically." (VWS)*

Designathon observations

I have been at three Designathon day sessions, and one evening session. Appendix T shows the physical setup.

- 3 Designathon day sessions
- 1 Designathon evening session
- 1 VWS meeting

5 Interviews

- 2 with system architects
- 1 with software representative
- 1 with facilitator
- 1 with VWS

Creating a Plan of Requirements as Request Articulation

In order to get the FMS to sign the Kwaliteitsstandaard, the proposal was to create a PvE (Plan van Eisen / Plan of Requirements). This PvE is then meant to guide software developers to design their software in a way that is more usable in the healthcare process of different users.

To summarize the key goals of the Designathon that make it a unique opportunity to let healthcare professionals influence the system, see figure 8.2a. For an illustration of how the Designathon came to be, view appendix AB.

Figure 8.2a *Key goals of Designathon*

Figure 8.2b *Photo of the first Designathon session. Photo credit: Nictiz.nl*

8.3 Designathon as a Process

To understand how the goal of the Designathon is aimed to be realised, it's crucial to better understand how the process is structured and who is involved at what stage in which way. Figure 8.3a shows the basic process outline from the gathering of participants and stakeholders in a coalition, to final use of the product. The most important steps will be examined in this chapter. Steps A and H are outside the scope of this evaluation. A stakeholder centred perspective can be found in appendix F.

B - Alignment of Requests
The coalition process refers to the core process or request articulation by the stakeholders involved. This is done in the Designathon sessions, in the figure indicated in the yellow triangle (or lovingly called the Nacho). The goal here is to align the views and preferences of different healthcare professionals, and software suppliers in a dialogue.
Key challenges
- Guiding the subject and scope of dialogue
- Fostering shared understanding of the subject

C - Refinement of Requests
Not all participants are always able to attend these sessions, therefore there are refinement and feedback sessions online.
These are aimed to involve a broader and more representative section of stakeholders, and add a layer of feedback and iteration to proposed requirements.
Key challenges
- Continuity of semantics, understanding and nuance between sessions
- Level of representation of healthcare professionals

D- Formulation of Requests
After alignment and refinement the concluding requirements are formulated into a PvE. This assembly is not yet started and therefore functionally out of scope. However, some issues are already being foreseen.
Key challenges
- Articulating requests generated during dialogue

E - Support for Requests
This is where the systemic fun starts. The PvE has no enshrined position to influence software design. It has to be accepted by the boards of all hospitals that plan to use it.
Key challenges
- gathering enough support from hospital boards to collectively request from their suppliers

F - Adoption of Requests
Even when boards support the PvE and it's contents, it's still a battle to get the developments adopted in the timeline of software developers. This prioritization is done based on request from their paying clients, or pressure from legislation.
Key challenges:
- Difficulty to centralize adoption of PvE or prioritization
- Scattered user base prioritization making requests difficult to get adopted

G - Development Based on Requests
When a request has made it through the previous steps and has come to the development timeline of the software supplier, it has to result in a meaningful change to the development process.
Key challenges:
- Providing enough detail and nuance to actually influence the final design meaningfully

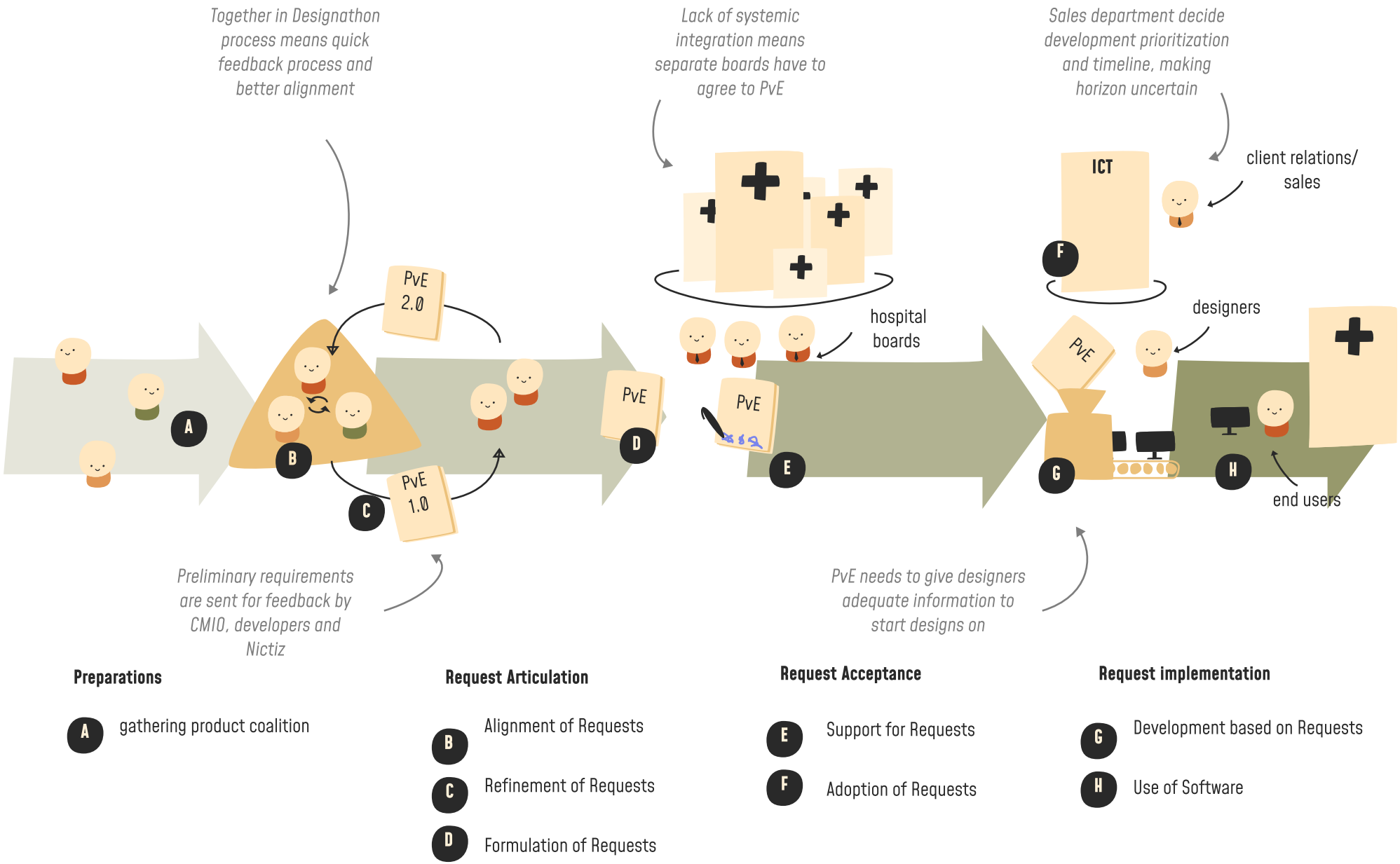


Figure 8.3a *Broader Designathon process as a flow of steps*

8.4 Software Design Process

The process of the Designathon is inherently trying to be a part of the software design process, by providing requirements that need to be integrated in a final design. To understand the implications of trying to connect two processes it's helpful to look at the basic process of interaction design in figure 8.4a (Kuijk, 2024). Real life versions of process will differ vastly in approach and methods, but the core of the process remains the same.

Interaction Design

The interaction Design Process is generally considered in four main goals.

- be goals, defining what the scenario's are the product will be used, and why.
- do goals, defining what things the product needs to facilitate, usually explored in a user journey
- Tasks, defining what specific tasks the product needs to facilitate and what user interaction flows are associated
- Sub-tasks are detailed explanations of the interaction steps required, usually done though wireframing
- Finally coming together in an interaction design.

How Far to Go?

With the knowledge that the Designathon is aiming to be part of the design process, let's look at which parts exactly are included. The proposed deliverable is a list of requirements, but for what? *"Some requirements are about interface, some interaction." (software supplier)* Evaluation reveals that the requirements have no structured scope, but are sometimes describing structural UI design, and sometimes interaction principles. Structural UI design and interface concepts are things that can differ vastly between software developers, and including these concepts in requirements will be tricky.

Missing Some Steps

Observations and interviews also show that several steps are missing in achieving the requirements. "*There is a single generic 'healthcare process' chart which has been generated at the start of the designathon. This chart has never been used since in the sessions" (software supplier)*

This means that where in a thorough design process, requirements are created through use scenario's, user journey, interaction concepts and use cases, in the Designathon the requirements are made through dialogue, missing a structural approach for the steps in between.

Preliminary Requirements

It's important to note that the requirements I based these insights on were not final insights. I was also not allowed to access the complete list of requirements, so I have to work with the requirements handled in the three Designathon sessions I was present at. This means that the final requirements will still get iterated on. Having said that, the *process* of generating these requests is still key in how requirements are generated and must be addressed.

Reflectivity

Perhaps even more important is the fact that *"I have put this feedback on the individual requirements, but I was never asked about that in an evaluation. In fact, I was never involved in any kind of evauation on the process." (software supplier)*

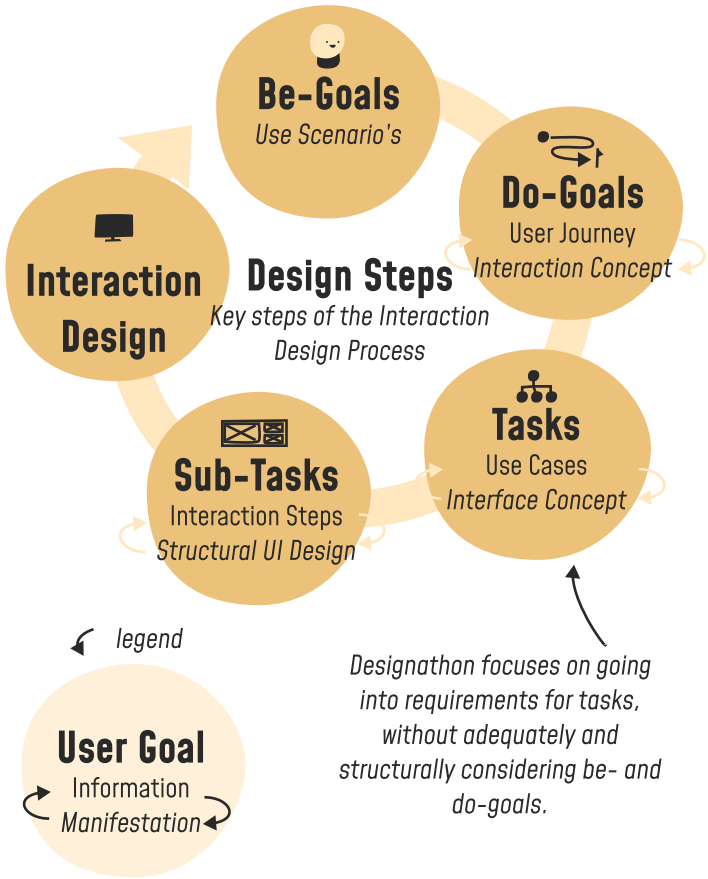


Figure 8.4a *Software Design Process*

8.5 Requirements for Request Articulation

There are five big roadblocks that need to be addressed for any deliverable to be achieve its intended goal of collaborative request articulation. These roadblocks were gathered by observing and interviewing with participants and can be seen in figure 8.5a.

- Explicit formulation
- Relevant to the receiver
- Representative insights
- Collective action
- Integrated process

Explicit Formulation

Explicit formulation is crucial for ensuring that requests are clear, precise, and actionable. When requests are well-articulated, they are less likely to be misinterpreted or overlooked. This involves structuring findings in a way that is easy for all stakeholders to understand, with clearly defined goals and outcomes. Explicit formulation also means that the language used is unambiguous, and the context is well-documented, making it easier to trace, relate, and categorize findings. This clarity facilitates common understanding among all parties involved, which is essential for effective collaboration and implementation. If possible, deliverables should be visual and transfer nuances and depth of the information gathered.

"Almost every requirement has a comment from every software supplier: this is not concrete enough. If you see through the requirement, you see it only applies to certain scenario's, and not for every ZIB." (software supplier)

Relevant Information

For requests to be effective, the information they contain must be relevant to the goals that need to be achieved. Irrelevant information can mislead developers and designers, leading to efforts being wasted on non-essential features or improvements. Ensuring relevance involves aligning requests with the practical needs and priorities of both the users and the development team. This alignment helps in solving real problems that users face and ensures that the efforts of the development team are directed towards impactful changes. Relevant information is thus crucial for prioritizing tasks and ensuring that the development process is both efficient and effective. "*Some requirements are about the interface, but we can't use that. Every developer has their own specific implementations for that*"

Representative Insights

Representative insights are essential for ensuring that the requests reflect the needs and challenges of the entire user base. When insights are gathered from a narrow segment, they may not adequately represent the diversity of user experiences and requirements. It is important to collect data from a broad and diverse group of users, considering factors such as age, background, specialization, and institutional affiliation. This inclusivity ensures that the solutions developed are comprehensive and meet the needs of all users. Representative insights help in creating a balanced view of user requirements and in developing features that enhance usability for the entire user population.

"In my experience, every institution and professional group wants something different. I don't think the current Designathon has enough representation to accurately fit to the requirements of individual institutions." (software supplier)

"You have to consider that CMIO's are vastly different when it comes to software than a regular doctor" (EPD expert)

The last two are factors more on the organizational and governance side of request articulation.

Collective Action

Collective action is necessary to amplify the impact of request articulation. Individual efforts can have limited influence, especially in the context of software development where resource allocation is tightly controlled. Collective action involves coordinated efforts by healthcare institutions to articulate their requests in a unified manner. By leveraging their collective bargaining power, these institutions can ensure that their needs are prioritized by software developers. This coordination helps in pooling resources and focusing efforts on the most critical developments. *"We hadn't really thought about where our requirements would need to land. I hope we can convince the individual houses to integrate our requirements "(organizer Designathon).*

Integrated Process

An integrated process for request articulation ensures that the entire procedure is seamless and collaborative across different organizational boundaries and development stages. When the process is integrated, it transcends organizational silos and fosters continuous collaboration among all stakeholders. This means that request articulation is not a one-time event but an ongoing dialogue that involves iterative feedback and refinement. This becomes especially critical when the current state of HDE systems needs to be evaluated *outside* the boundaries of software developers. *"You have to remember, the Designathon is not a client of ours, we only listen to what our paying customers ask us to build." (Software supplier)*

Are findings explicit enough to translate into nuanced insights and understanding through stakeholders

Is the presentation of findings structured, explicit and visual?

Can findings be traced, related and categorized?

Does the session design facilitate common understanding?

Is the process supported on a governance level by relevant institutions?

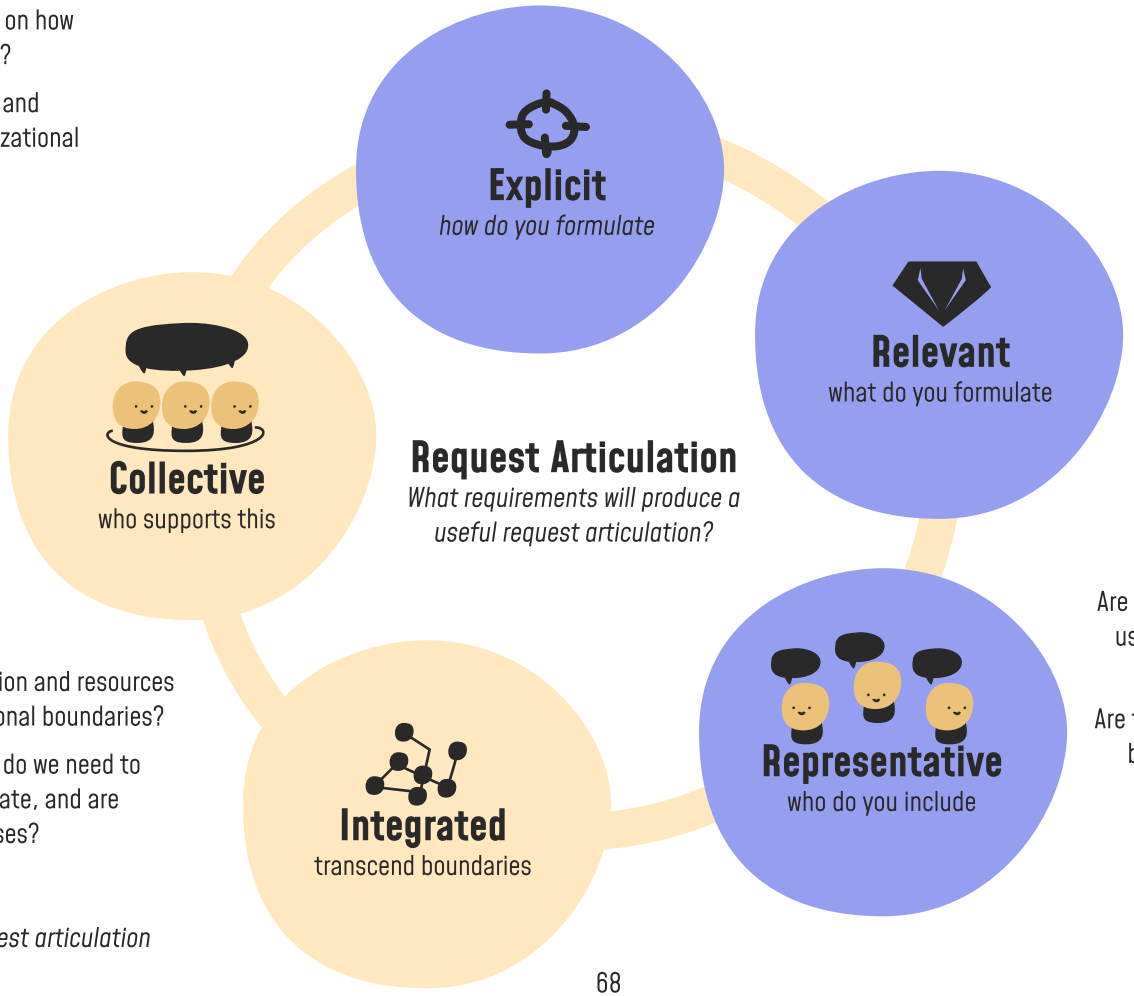
Is there committent or agreement on how outcomes will be acted upon?

How will difference in priorities and preferences be solved on an organizational level?

Is the nature of the findings relevant for software developers?

Are findings relevant and useful for UX/UI designers?

Are the findings helping solve a problem which is relevant enough to be prioritized?



How open are we in sharing information and resources towards the project over organizational boundaries?

What institutional collaborations do we need to engage that structurally integrate, and are responsible for processes?

Are the findings representing a broad enough user group, considering age, background, specialization and institution?

Are findings representative within a use case, between CMIO's and regular healthcare professionals?

Figure 8.5a *Key components of request articulation*

8.6 Design Goals

These requirements for request articulation are then integrated into two design goals for the short term, and two for the long term. The long term ones can be found in chapter 11. The short term ones are shown in figure 8.6. These design goals will be the start of developing an initiative in chapter 9.

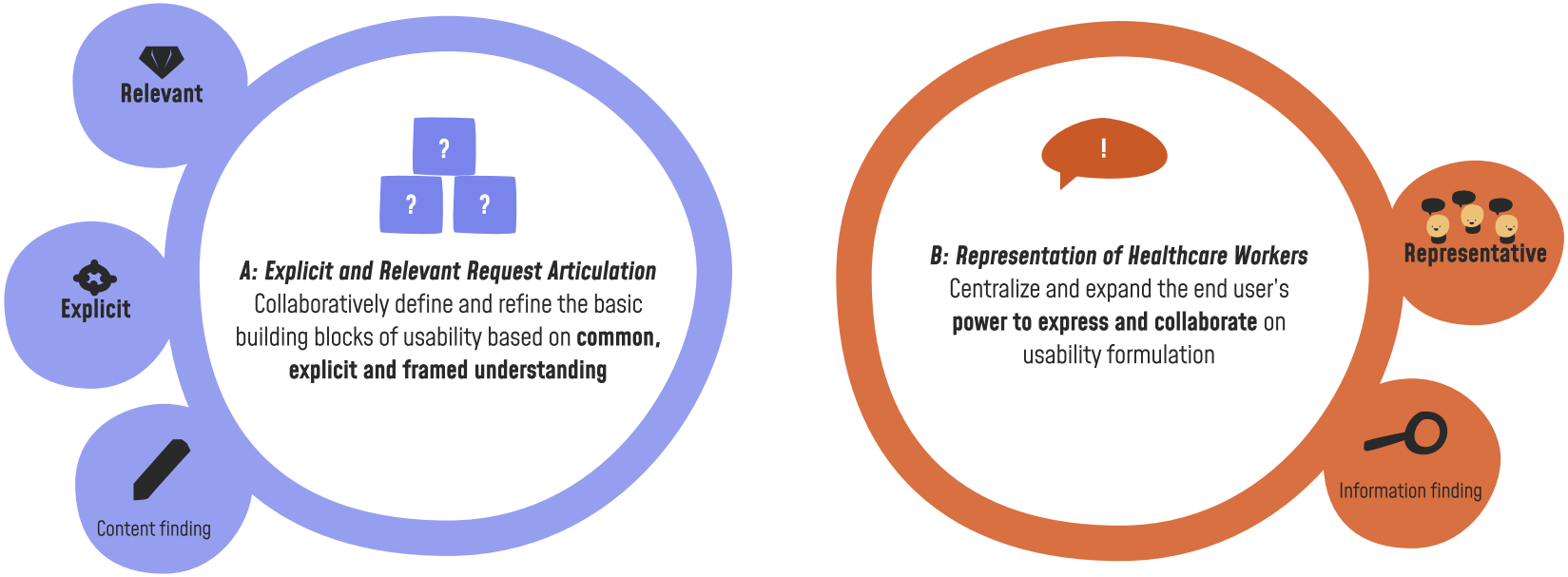
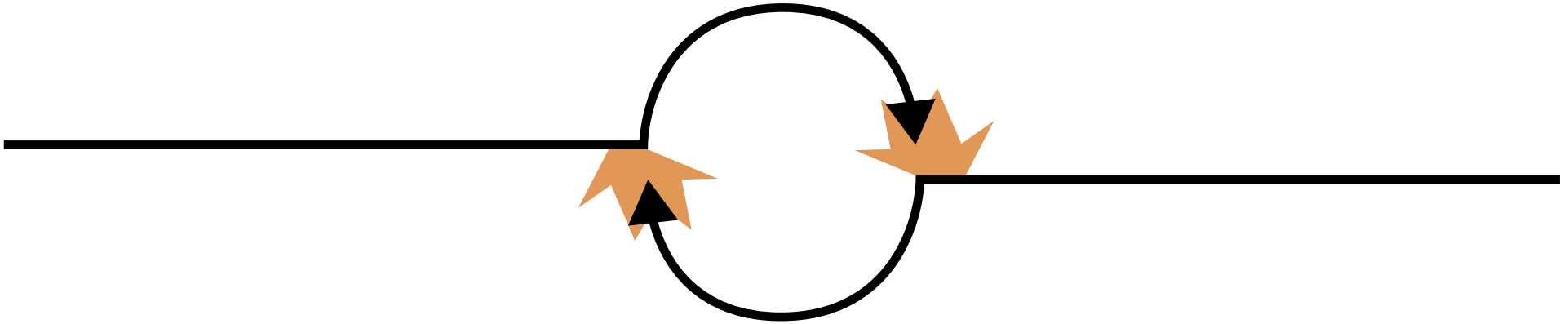


Figure 8.6a *Short term design goals.*



9

Process Design

Creating a Relevant, Representative and Explicit Deliverable for Request Articulation

How can we design a process in which healthcare professionals can influene the usability of data exchange systems?

Introduction

What

This chapter explores a future iteration of the process for collective request articulation focused on usability. This refined process aims to empower medical professionals by ensuring their insights and requirements significantly influence the software they use.

Why

The process of request articulation is a critical leverage point for incorporating medical professionals' perspectives into software development. It is essential because it offers a structured way for healthcare professionals to convey their needs and preferences, thereby improving the usability and effectiveness of healthcare software. While not the sole method, it is a vital component in the broader effort to enhance user-centric design in medical software.

How

By thoroughly analysing the strengths and weaknesses of the current process design, I have identified key areas for improvement. This chapter presents two actionable interventions targeting the most significant bottlenecks hindering effective request articulation. These interventions are designed to streamline the process, making it more efficient and responsive to the needs of medical professionals. The proposed changes aim to create a more inclusive and representative framework, ensuring that the articulated requirements are explicit, relevant, and actionable for software developers.

Contents

Conclusion

The Designathon for BgZ MsZ marks a pivotal step towards integrating healthcare professionals' insights into EPD software development. By facilitating collaborative request articulation, it unites healthcare professionals, software suppliers, and Nictiz to co-create software requirements that enhance usability and effectiveness. The process design emphasizes the need for explicit, representative, and relevant requests. Focusing on use scenarios and user journeys, the design establishes a strong informational foundation for interaction design, ensuring requirements are clear, actionable, and reflective of diverse healthcare scenarios.

Key recommendations include involving healthcare professionals directly in generating and selecting scenarios, leveraging a broad participant network, and processing results to create archetypical data touchpoint journeys. This ensures comprehensive and actionable insights, aligning requirements with real-world healthcare processes.

The chapter advocates for a structured approach to requirement synthesis and refinement, involving CMIOs and usability experts to bridge the gap between healthcare needs and technical implementation. Continuous feedback and iteration are emphasized to maintain relevance and facilitate effective integration into software development.

In conclusion, the proposed process design provides a framework for enhancing the articulation and integration of healthcare professionals' insights into EPD software development. By focusing on collaboration, explicitness, and relevance, this approach aims to create more usable and effective healthcare IT systems, improving the quality of patient care.

9.1 Process of Request Articulation Co-creation

To give a practical implementation to design goal
A: Explicit and Relevant Request Articulation
Collaboratively define and refine the basic building blocks of usability based on **common, explicit and framed understanding.** I present an update process model for request articulation. The process addresses several key improvements over the current Designathon approach. The ultimate goal of this process redesign has the purpose to Generate a deliverable containing **requirements and argumentation** which is

- *explicit,*
- *representative and*
- *relevant*

so it can provide a valuable addition to the design process of software developers.

Furthermore, the process should be designed in a way that wherever possible it provides the foundation for future improvements in

- collective organizational request
- integrated across organizational boundaries

These requirements will play a role in every step of the process in differing weights. I will highlight which design decisions are related to the relevant requirement.

Intention
The intention of this process design is not to describe the ideal, perfect process design. That process would need much more expertise, time and research before implementation. It also would require supporting processes, capacities and resources which are not expected to be available in the short term.

Therefore, my proposal for a process design aims to accomplish three things (figure 9.2a):

- identify key steps that are required to achieve improvement towards explicit, representative and relevant request articulation towards software developers and the argumentation for their relevance of which I believe would be possible in the *short term*
- where possible, identify actions which would provide a *minimum version* to achieve the core of the desired goals to outline low hanging fruit.
- where possible, identify *recommendations* for further research or a more accurate process outside of my scope.

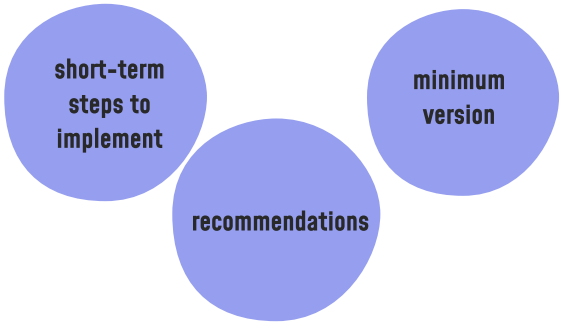


Figure 9.2a *Goals of process design explanation*

Design Steps
Figure 9.2b. shows the five key steps of interaction design. The process scope can be explained by referencing the interaction design process (Kuijk, 2024).

My process design focuses on the steps *use scenario's* and *user journey* because these steps form the informational foundation for interaction design. It is also the most feasible and relevant to address these steps in a broad public process *outside* of software suppliers organizations.

- Use scenario's identify the different general ways a system is used. In our case that is defining different medical specialties and healthcare settings of use.
- Creating a user journey or cycle is critical to understand the context of the user in design. The most basic user journey for HDE is the way a user interacts with data touch points. From this, you would usually create an interaction concept.

These steps have to transcend multiple convening modes. These are

- Systemic Coalition. The stakeholders involved need to work together in *acceptance finding* and supporting roles for the process
- Research Group. A core set of researchers, facilitators and CMIO's need to work together in *content finding*,

Convening Types within Process
The process is supposed to be collaborative and carried by multiple stakeholders, not only in input of content, but also decision making. During the process, there are different kinds of convening which need to happen, where different modes of power are dominant. Let's explore the differences. Note that these convening types are not only relevant to my process design, but are also generally what should happen within software suppliers. The convening types are based on the ICPS model by Buijs (2012). Appendix G explains that in more detail.

Information Finding - Healthcare Professionals
Information gathering is the foundational step in project management. This mode focuses on collecting relevant data, insights, and feedback that will inform the project's direction. It involves understanding the project's scope, identifying key stakeholders, and gathering initial requirements and constraints.
This information Finding is centred around healthcare professionals, in their medical environments.

Content Finding - Research Group
Content development involves creating detailed plans, designs, and prototypes based on the information gathered. This mode is essential for translating project requirements into actionable plans and deliverables. Collaboration among team members is crucial to ensure that all aspects of the project are considered and integrated.
Content Finding is centred around the Research Group

Acceptance Finding
Acceptance finding aims to achieve consensus and buy-in for proposed solutions. This mode focuses on building support among all stakeholders, ensuring that the solutions are not only feasible but also widely accepted. It often involves piloting solutions, gathering feedback, and making necessary adjustments to address concerns and improve adoption.
Acceptance finding is a mostly governance question that takes place to support the Research Group

Project Management
Project management is the process of finding resources, people and processes to facilitate the other three. This means creating a planning, setting goals and fostering competencies.

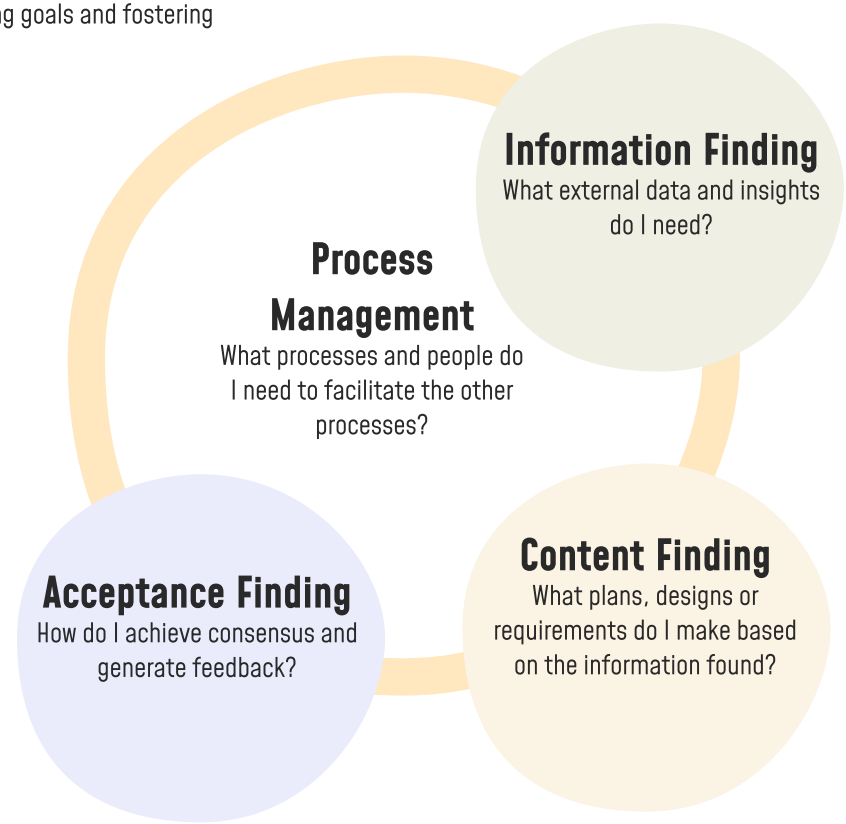


Figure 9.2b *ICPS (Buijs, 2012)*

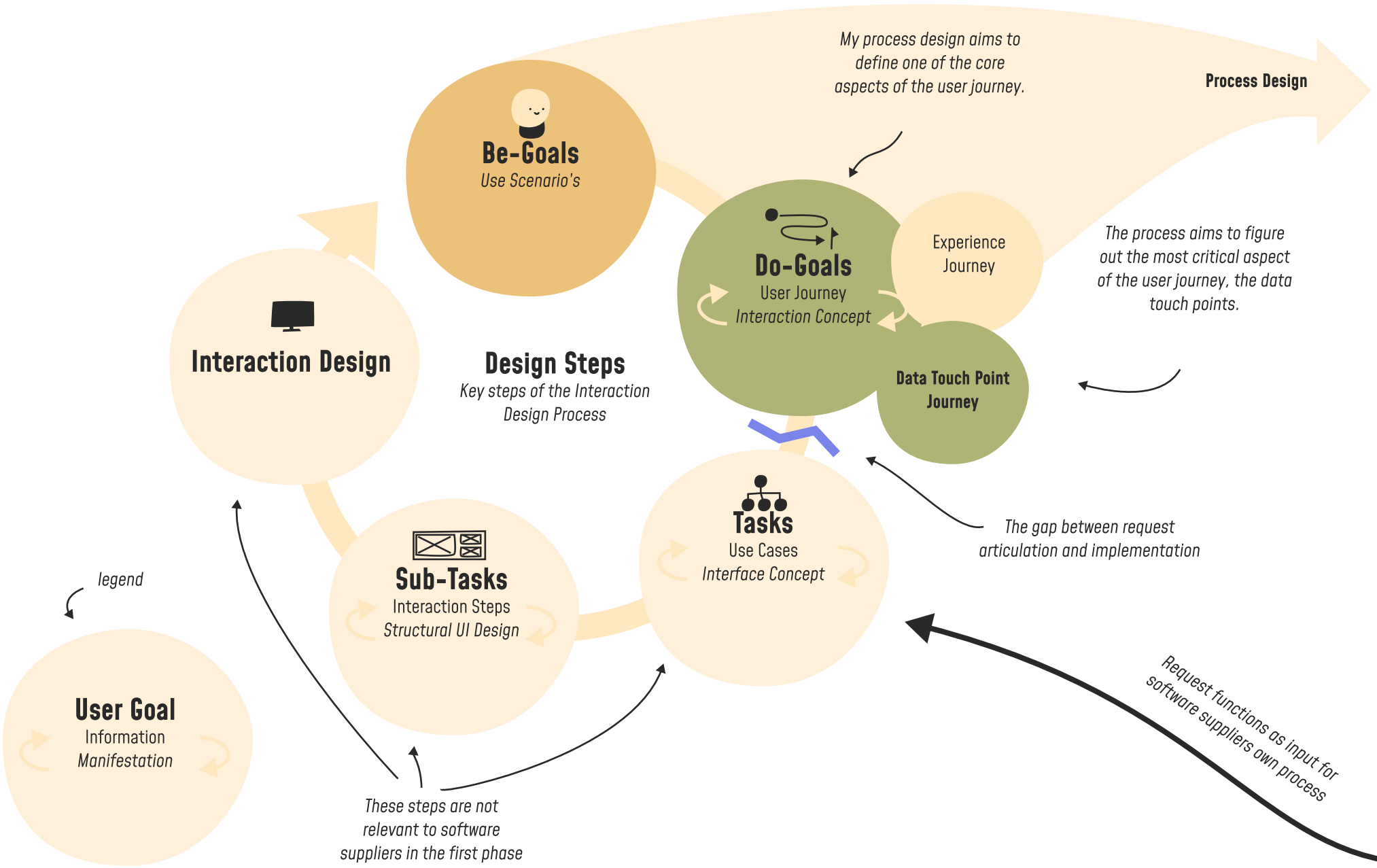
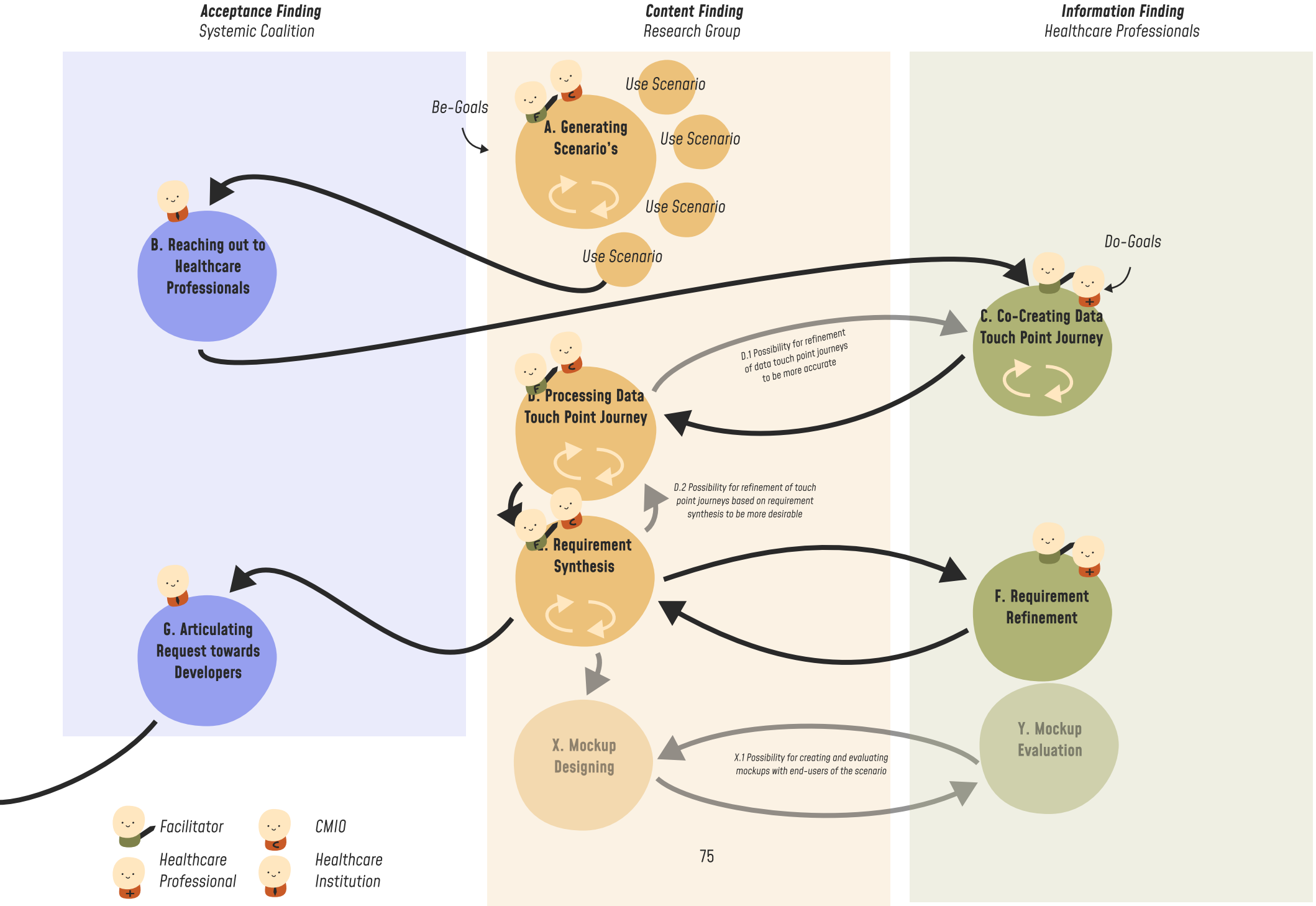


Figure 9.2c *Interaction Design Process*


Acceptance Finding
Systemic Coalition
Content Finding
Research Group
Information Finding
Healthcare Professionals
Be-Goals
Use Scenario
Use Scenario
Use Scenario
Use Scenario
A. Generating Scenario's
B. Reaching out to Healthcare Professionals
Do-Goals
C. Co-Creating Data Touch Point Journey
D. Processing Data Touch Point Journey
D.1 Possibility for refinement of data touch point journeys to be more accurate
D.2 Possibility for refinement of touch point journeys based on requirement synthesis to be more desirable
E. Requirement Synthesis
F. Requirement Refinement
G. Articulating Request towards Developers
X. Mockup Designing
X.1 Possibility for creating and evaluating mockups with end-users of the scenario
Y. Mockup Evaluation
Facilitator
CMIO
Healthcare Professional
Healthcare Institution

9.2 A - Generating and Selecting Scenario's

What
The convening group defines relevant scenario's that need requirements in order to function properly in the field. A selection is made that require extra attention. Scenario's are specific healthcare processes in which data exchange plays an important role. Understanding that scenario's differ greatly, and focusing on the critical ones is crucial for the next steps.

Why
Without specific scenario's, the connection with diverse healthcare processes is difficult to make. Requirements must be not too genereric nor too specific. They should refer to specific sets of scenario's. *"I need to be able to see at which part of which healthcare processes I need data in what way" (software supplier)"*

- The scenario's create an ***explicit*** way to define what processes to look at, and which not. It will therefore be able to differentiate between processes
- The scenario's are ***relevant*** to software suppliers because this is information they are not experts in. Supplying information in that way is critical.

Healthcare Processes
The scope of this research and design is to understand the *design* processes around healthcare journeys, not the journeys themselves. Therefore the examples given are hypothetical and may not be accurately depicting healthcare processes.

Who
This step requires the knowledge of healthcare professionals, both CMIO's and regulars. This ensures that the understanding of healthcare scenario's is thorough and representative of the different specializations

How
Scenario's should be generated in generative sessions lead by facilitators with experience in healthcare. These sessions should include

- generative phase
- clustering phase
- selecting phase

Minimum
Depending on resources, time and future development, some features can be removed or added. A MVP would allow scenario's to be created by only CMIO's as a first indication to work on, while in future iterations of this process would integrate healthcare professionals more thoroughly.

Recommendations
In future, this process of generating and selecting scenario's should be ***integrated*** into the larger research network. This integration should mean that the scenario selection and definition can be connected to other research and knowledge centres.

Clinical Specialty
- Pediatrics
- Cardiology
- Radiology
- ...

Healthcare Setting
- Primary care
- Emergency care
- Operative care
- ...

Type of Procedure
- Diagnostic
- Therapeutic
- Preventive
- ...

Types of Data
- Administrative
- Clinical
- Diagnostic
- Prescription
- ...

Actors Involved
- Administration
- Nurse staff
- GP
- Medication

Example Scenario: **Chronic Disease Management for Diabetes**
- Clinical Specialty: General Practice, Endocrinology.
- Healthcare Setting: Primary Care, Outpatient Care.
- Type of Medical Procedure: Preventive Procedures, Therapeutic Procedures.
- Type of Data Involved: Clinical Data, Prescription Data.
- Actors Involved: Medication, Nurse,

9.3 B - Selecting & Reaching out to Healthcare Professionals

What
In order to actually create the data touch point journeys, healthcare professionals who experience these scenario's should be reached out to.

Why
Involving regular healthcare professionals is one of the core value increasing properties of this process. Healthcare professionals have knowledge about their own healthcare process and can be a diverse and **representative** selection of knowledge and needs. CMIO's have knowledge about many processes, yes, but you want to talk to the experience experts in their own fields. Representation should be realised between medical institutions, medical speciality and digital disposition (figure 9.5a)

How
Participants are selected through a network of hospitals and user groups. Participants are selected on basis of their specialization that is connected to the scenario.

Who
This step requires CMIO's and support from as many healthcare institutions as possible to create a network of participants.

Minimum
Depending on the quality and reach of the support network, reaching healthcare professionals can be easy or difficult. To start out, CMIO's in the Research Group might utilize personal connections within their hospitals. Ideally, hospitals will dedicate to gathering participants for these sessions.

Recommendations
In future, more thorough research projects, the option of sensitizing participants might be taken into consideration. Sensitizing is a process where *"participants are triggered, encouraged and motivated to think, reflect, wonder and explore aspects of their personal context in their own time and environment." (Visser et al., 2005)*

The communication design of this reaching out should also be considered carefully. What is the message and tone, and how do you attract attention and interest from possible participants?

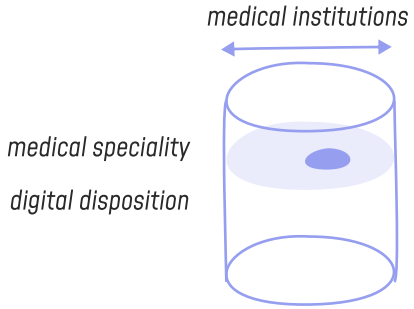
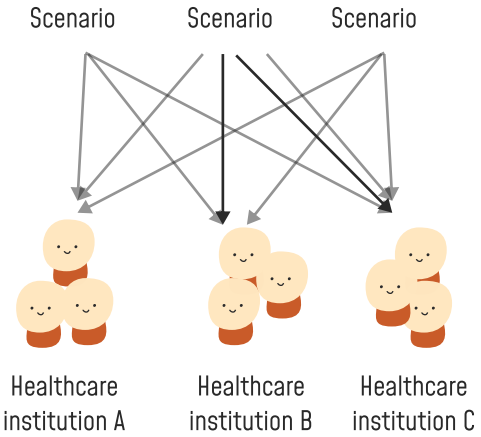
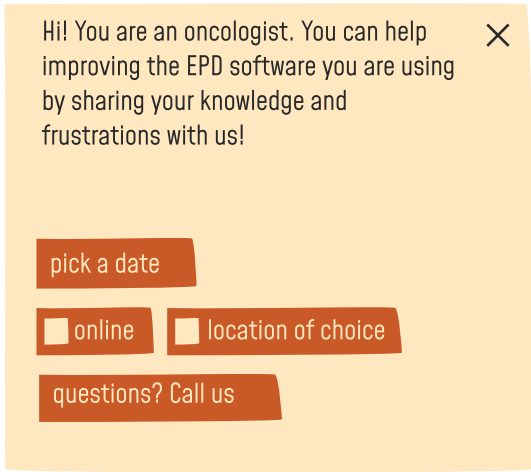


Figure 9.5a *Scope dimensions of representation*





9.4 C - Co-Creating Data Touch Point Journey

What
Experience gathering session uses a specific toolkit to guide healthcare professionals in expressing the experience and knowledge they have with a specific scenario they are familiar with. This scenario focuses on data, and is therefore called a data touch point journey.

Why
By providing healthcare professionals with a toolkit designed to give insights in data touch points, the information gathered will be guaranteed to be ***relevant*** to the project. The toolkit guides the information gathering to keep the interview on track and ***explicit***. Doing these sessions with experts in their own process makes sure the results are ***representative*** of actual workflows.

Who
The process requires one healthcare professional per session. Sessions are ideally facilitated by people who are experienced both in healthcare processes and creative facilitation. Healthcare experience is especially helpful to enable more direct questions about the scenario being addressed. I personally noticed that my lack of healthcare knowledge was hindering my critical understanding of the data touch points being created.

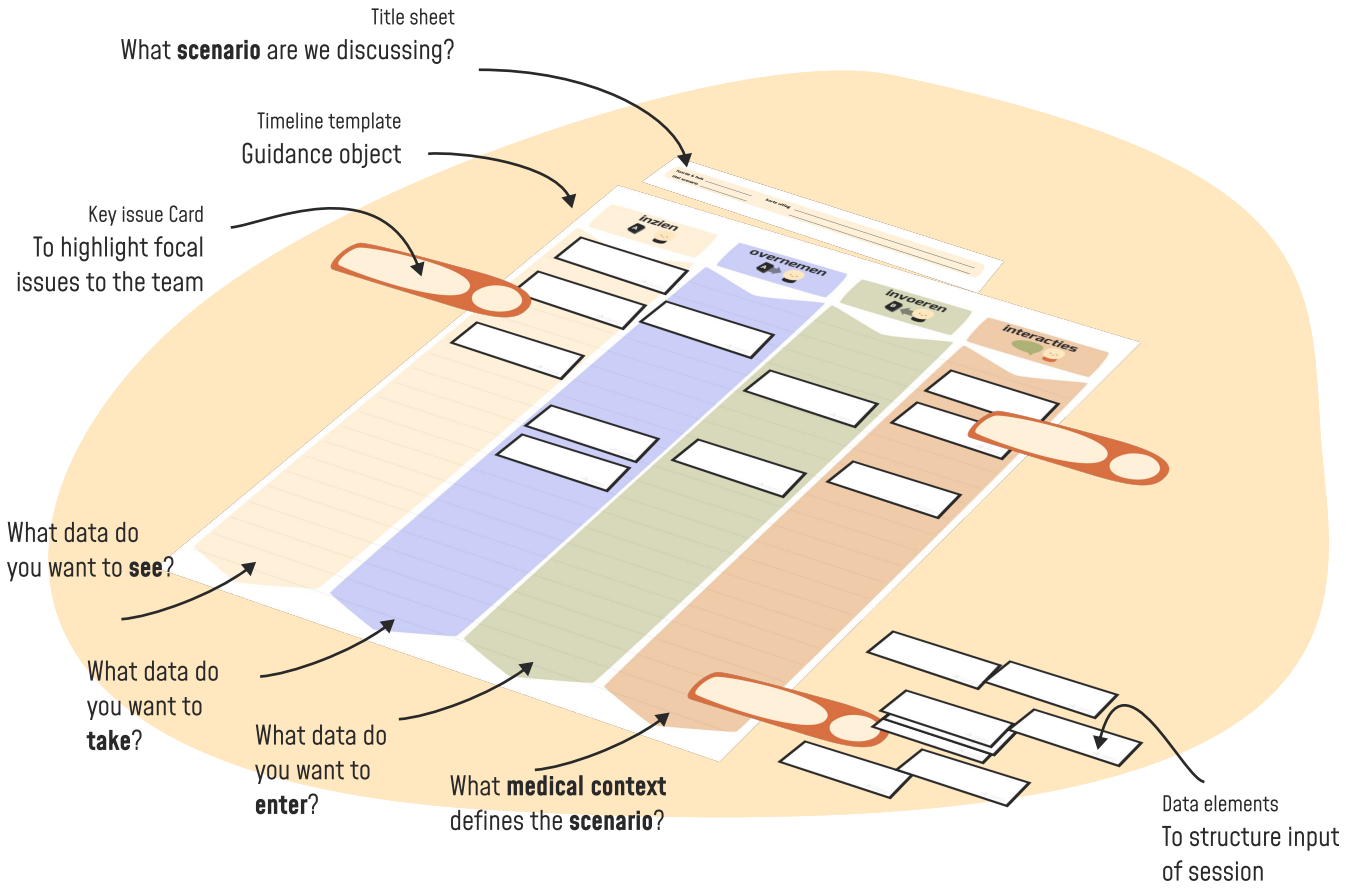
How
- The session uses a sheet that outlines the foundation of the data health journey, including 5 critical elements
  - what data do you want to *see*?
  - what data do you want to *take*?
  - what data do you want to *enter*?
  - and in what *sequence* do you do that?
  - and in what medical *context* do you do that?

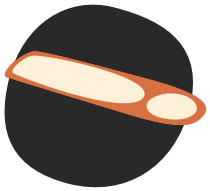
These questions are answered by populating the template with data touch points and medical context, in the order of the journey of that specific scenario.

After the data touch points are identified, *key issues* in the current process are identified and related to the journeys. These key issues are related to be- and do-goals, not tasks or subtasks because we want to address the interaction concept, not the interface concept or UI design.

Chapter 10 goes into detail about this interaction design

Minimum
Sessions might be held online with a digitized tool to save time but lose a real life connection. Sessions might be done through a portal at a time the participant desires individually, without a facilitator present.





Key issues are ways for participants to express their frustrations explicitly, building trust and releasing tension.

Key issues address be- and do-goals that interfere with the healthcare process.

Data touch points are pieces of information that the healthcare professional requires for good care. They are open ended interpretations of needs, not tied to the form of ZIBs.

9.5 D - Processing of Results

What
When sufficient scenario's are worked out with healthcare professionals the results need to be processed. If multiple sheets were worked out for a single scenario, these need to be clustered into an archetypical data touch point sheet.

Key issues are also clustered and documented in relation to their data touch point.

Why
Processing results is the necessary preparation for the next phase, requirement synthesis. Cleaning up and clustering the data touch point sheets allows them to be used in the core session of the Research Group to guide the process of request articulation.

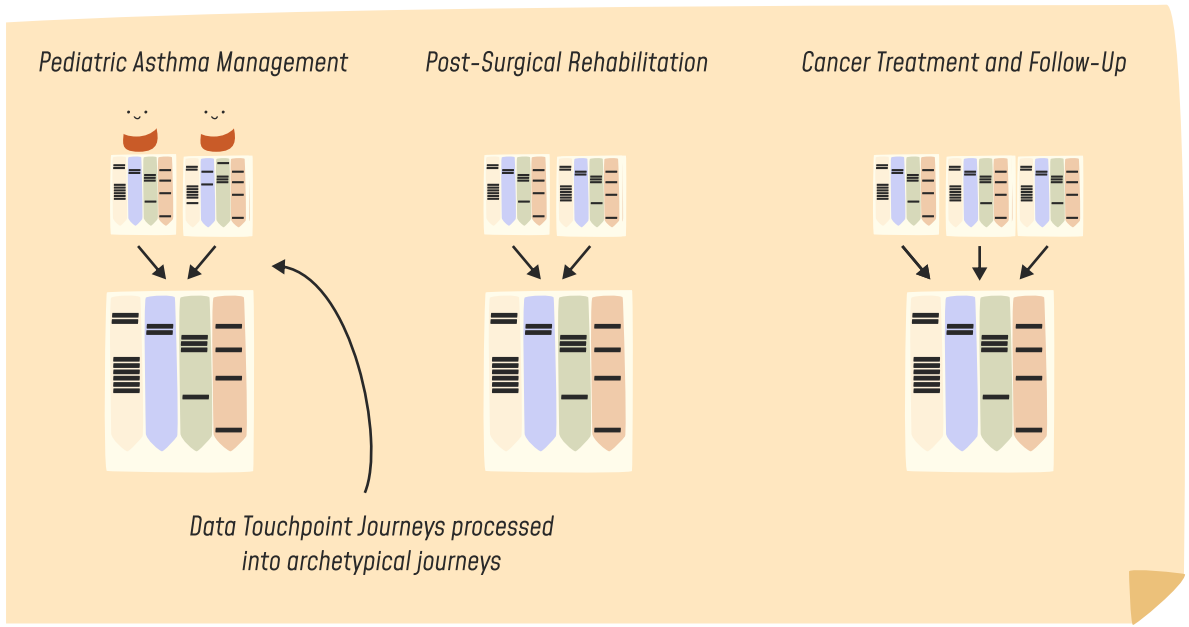
Who
Processing should be done by small groups of CMIO's and a facilitator to guide the process. The CMIO's provide the knowledge of healthcare processes, while a facilitator can guide the process.

How
There are two main activities,finding archetypical scenarios and documenting key issues. Archetypical scenario's are created by clustering different scenario's into one. The exact process of how decisions have to be made is up to recommendations for later research. The key issues can be clustered more simply using a method similar to context mapping. With key issues it's important they can be used for evalution and feedback, and therefore it needs to be tracked how often a type of issue is mentioned, and what scenario's have the most (relevant) issues associated with them.

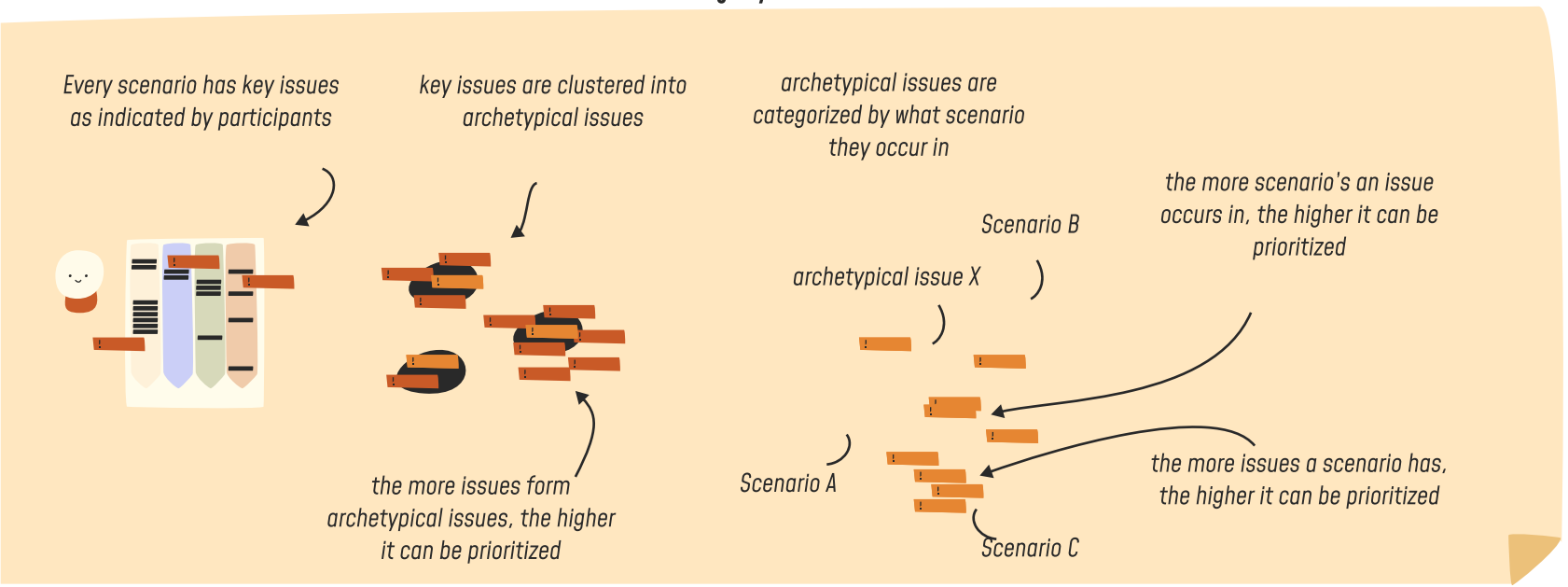
Minimum
If possible, processing should be done by 2-3 CMIO's in breakout sessions. It is also possible to simplify the processing step by only generating a single data touch point sheet per scenario, so processing does not involve clustering, but only refining.

Recommendations
The clustering and creating archetypical scenario's has not been tested in practice and might give varying results. It needs to be better defined and researched.

Finding Archetypical Scenario's



Documenting Key Issues



9.6 E - Requirement Synthesis

What
With data touch point sheets processed, they can provide the catalysing point for generating requirements in co-creating sessions. These requirements have a dual purpose. First, they are a way to translate insights into more actionable and measurable function. Because requirements are more specific, this opens up possibilities for the request articulation to be more explicitly enforced by healthcare institutions.

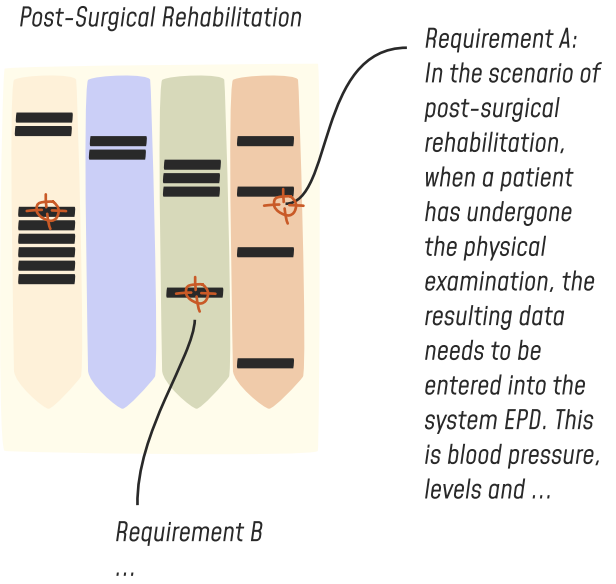
Why
Using data touch point sheets achieves 2 important effects. Firstly, it creates a boundary object which makes articulating perspectives easier. Now, during the generation of requirements there should be less discussion about what the healthcare process we are looking at is actually about, and can focus on where requirements should be made.
"What we really needed were images, to make sure we are talking about the same thing" (software supplier)

The second purpose it fulfils is allowing requirements to be anchored to specific steps in the healthcare process, enabling them to specifically answer the question of what data to take, see enter and when in the process.

Who
The requirement synthesis should be done by a team of CMIO's and usability experts, since "u*sability cannot only come from end-user evaluation, and other experts are required for thorough analysis."(Kokol, 2022)* This way, the first disagreements between healthcare and software can be ironed out, in the sense of technical limitations and understanding of formulations.

How
Requirements are created in a facilitated session where the archetypical data touchpoint journeys and key issues are the source of requirement generation. Requirements have to be connected to a specific step, or set of steps in the journey if possible. This ensures that the requirements are explicit enough for software suppliers, and provide adequate context of the healthcare process.

Recommendations
The synthesis of requirements is necessary to be able to effectively convey the request articulation, but is itself not the most important information to gain insights. It is only needed to bridge the *enforcing* part of the relationship between the software supplier and healthcare institutions, not the *informing* part. Further and more elaborate research processes need to be added to this process to gain the maximum value of the knowledge and experience of healthcare professionals.



9.7 F - Requirement Refinement

What
With a first conceptualisation of requirements, it's important to gather feedback from relevant parties. Firstly, this feedback should come from the participants that created the data touch point sheets. Other relevant feedback should come from

- CMIO's in network
- Software supplier
- UX/UI designer
- Nictiz

Why
Generating feedback to refine requirements is essential to ensure accuracy and representation in generated requirements. Most crucially, it is important to check if the requirements resonate with the end users, especially the ones who participated earlier. This not only builds trust and validation of their efforts, but will also generate the most useful feedback. The key issues which were reported by these participants should be reflected in the requirements where relevant and possible.

Who
Feedback should be gathered by the facilitator of the original session, if possible.

How
Since every requirement is crated based on one or more specific scenario's or key issues, they can be traced back to the original participants that defined those scenario's. These participants can now be reached out to for feedback on the requirements that were generated for their scenario. The interaction might look something like this.

Minimum
The most crucial thing is that healthcare professionals can leave explicit feedback on the specific requirements that were drafted. Ideally you would have a call with them to create iterations.

Recommendations
For this to work it's crucial to find a way to consistently track the relationship between a participant, scenario's, issues and drafted requirements. If this is organized well, reaching out to the specific healthcare professionals should be relatively easy.

Bird (2021) has developed a generative co-design framework for healthcare innovation (figure 9.10a). It would be valuable to explore the opportunities this model can bring in a more developed process of request articulation. This process is a comprehensive way to come from contextual inquiry to requirements translation and, resources allowing, would fit quite will in the proposed process.

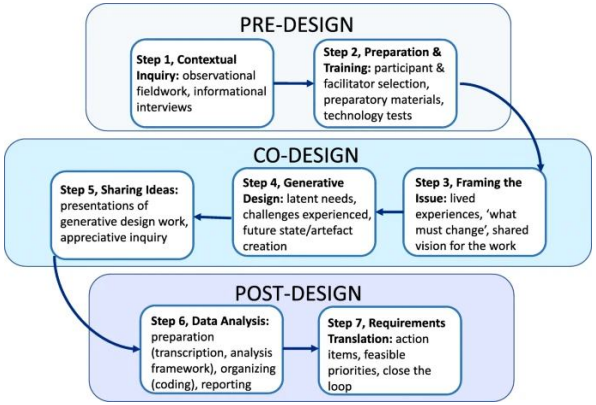
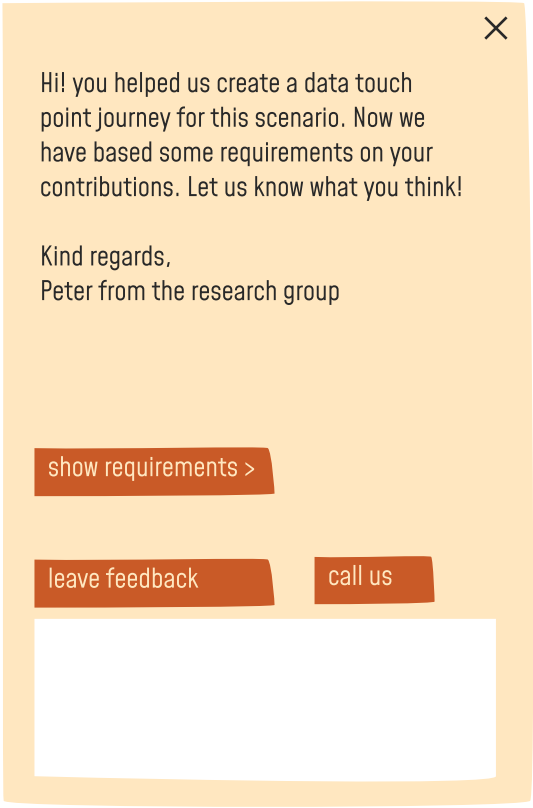


Figure 9.9a *Co-design framework in healthcare innovation*



10

Interaction Design

Reaching out to Healthcare Professionals to Help Express Their Experience and Needs

What interaction design will enable healthcare professionals to be reached out to and express their needs and experience?

Introduction

What

This chapter introduces a specific interaction design aimed at effectively gathering input from healthcare professionals. The goal is to create a process that enables these professionals to articulate their needs and experiences regarding healthcare software.

Why

Developing an interaction design is crucial for transforming abstract process-level requirements into practical, actionable steps. This design provides a structured approach to capture the nuanced insights of healthcare professionals, whose influence on software development has traditionally been challenging to harness. By making the process more accessible and user-friendly, we can ensure that the voices of healthcare professionals are effectively incorporated into software development.

How

Through prototyping and user testing, we developed an interaction design that facilitates the expression of healthcare data touchpoints by healthcare professionals. This design was rigorously evaluated with the target user group, allowing for iterative refinement. The final design not only captures the specific data touchpoints but also ensures that the process is intuitive and minimally disruptive to the participants' busy schedules. This approach bridges the gap between theoretical requirements and practical implementation, fostering a more inclusive and responsive development process.

Contents

Conclusion

The process of collective request articulation is essential for integrating the needs of healthcare professionals into software development. This chapter emphasizes the importance of creating an interaction design that is reliable, efficient, and independent to gather meaningful data from healthcare professionals.

Key to the success of this process is its ability to be representative, relevant, and operationally feasible. The refined interaction design ensures that healthcare professionals from diverse specialties can easily participate and provide actionable insights with minimal facilitator intervention.

User testing validated that the design effectively guides participants, maintains a focus on process rather than interface solutions, and fosters engagement by allowing healthcare professionals to express their frustrations and needs explicitly. This not only enhances the usability of the resulting software but also builds trust and collaboration between healthcare professionals and developers.

In conclusion, this refined approach to gathering data touch points through interaction design represents a significant step forward in ensuring that healthcare software development is driven by the real-world needs of its users, ultimately leading to more effective and user-friendly systems.

10.1 Choosing a Process Step to Design For

In order to make my process design more tangible and actionable, I decided to make an interaction design for one of the steps within the process, since a thorough working out of steps through an interaction design would be very helpful. But which one?
The seven distinct steps and sessions can each add value to the design, but we also need to consider the viability to test such a design, as well as what action would provide the most short term value.

Touch Point Journey
Considering the closed, high pressure and sensitivity nature of the Designathon, the choice is made to focus on the co-creation of a data touch point journey. This is the part of the process which has high value for an interaction design, because user research requires specific skills and knowledge which a designer can provide value in. Figure 10.1a shows the C-box of possible intervention areas.

One of the core challenges of creating a data touch point journey is to fluently and explicitly extract these data touch points that occur in a clinical process. One of the key design challenges in this regard is

how to abstract the data exchange away from screens and interfaces, and towards the core data that is being interacted with? This abstraction of the system is one of the pivotal roles of any session design.

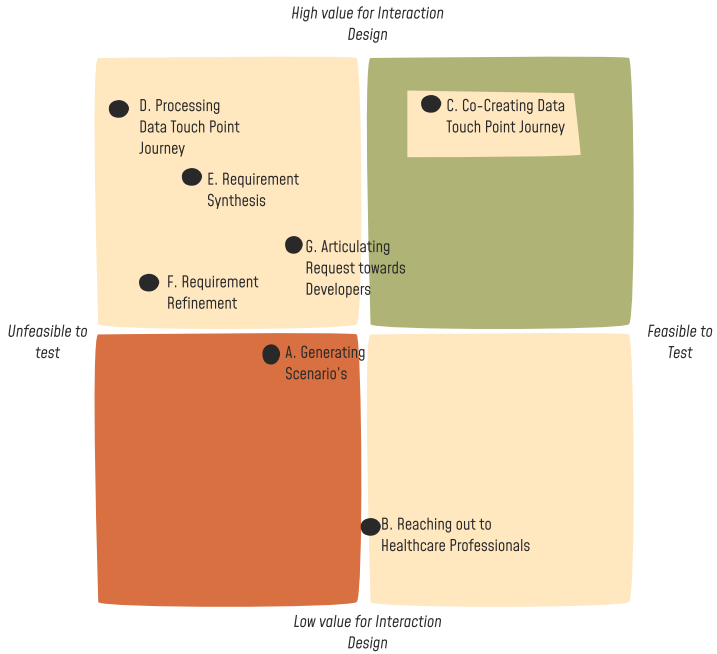


Figure 10.1a *C-box for process step*

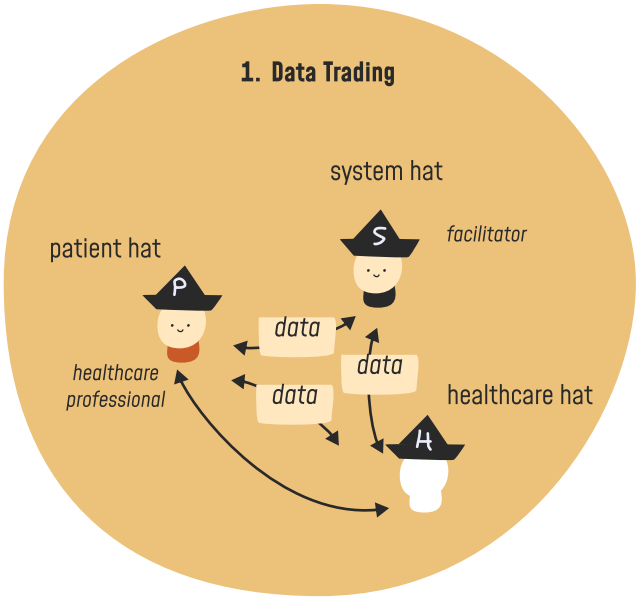
10.2 Three Concepts to Gather Data Touch Point Journey

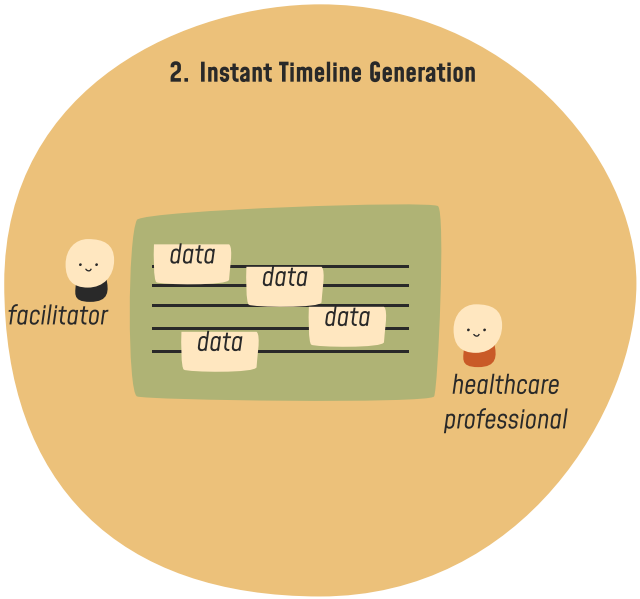
The goal of the concepts should be to guide facilitators and healthcare professionals *to take one of the defined healthcare process scenario's and create data touch point journeys.* I create three different concepts. For every concept I know there are three key components that need to be addressed, the data, the timeline and the documentation. Figure 10.2a explains how the three designs approach these three different aspects.

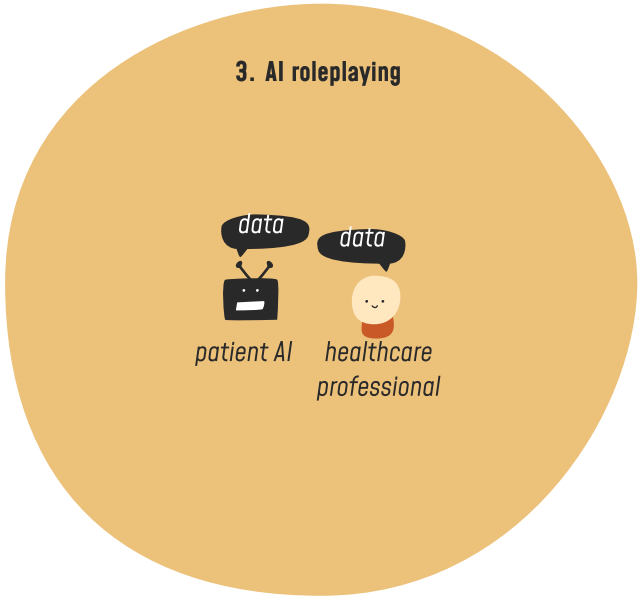
1. Data Trading
In this concept, the scenario is played out by roleplaying the system, patient and healthcare with the facilitator and healthcare professionals. The healthcare professional switches between the patient and doctor roles.

2. Instant Timeline
This concept relies on talking through the scenario and filling out the timeline as we go. The healthcare professional fills in the data cards and explains in voice how the scenario plays out in their experience.

3. AI Roleplaying
This concept takes the scenario and prompts an AI with the specifics of that use case to guide the healthcare professional through what data would be required.







	Concept 1	Concept 2	Concept 3
Data Representation How is the data represented in the scenario?	Data is represented by blocks that get passed around in a roleplay of the scenario, doing live interactions with the system, patient and healthcare	Data is represented by cards that are placed directly on the timeline	Data is verbally transferred in a live recollection of the scenario
Timeline Representation How is the time aspect represented in the session design?	The timeline is represented by the stacking of exchanged data cards resulting from the trading during the scenario, but has no other physical representation	The timeline is represented physically instantly and filled out together with the facilitator	The timeline is created afterward by reconstructing the conversation with the patient AI
Documentation Journey After the session, how is the final journey created and documented?	The final journey is reconstructed by taking a look at the exchanged stacks of data and in what order. They can then be used to construct a journey map.	The final journey is constructed mainly within the session and needs to be cleaned up after	The final journey is recreated by re-listening to the audio play-back

Figure 10.2a *Three concepts*

Requirements
For the first three concepts I want to evaluate on a select set of criteria that are related to the core of the interaction and flow of the session design.

- *Reliability*, the design needs to be as consistent as possible between uses, as it must be used by many different participants and is executed by many different facilitators.
- *Low time cost*, the session should be as short as possible considering healthcare professionals are busy and this will increase the likelihood they will want to join.
- *Independence*, if possible the design should be able to be used with as little facilitator interference as possible, removing as many training and uncertainties as possible in the results

Evaluation of Concepts
These interaction concepts were prototyped roughly and tested with design students to identify their key flaws and benefits from an interaction standpoint. Figure 10.2b shows the evaluation of the different concepts on these 5 key requirements.

Reliability
It became clear that the biggest bottleneck was the reliability of the interaction design to create the desired results. I found that the instant timeline generation was the most reliable at guiding the user to perform the tasks. The other two concepts proved more difficult to explain.

Low time Cost
Although this will differ with design students versus healthcare professionals, I was still able to make an assessment about the time cost of these session concepts. The data trading concepts was the quickest to execute because it requires no real time notation, the other two concepts performed similarly.

Independence
Independent operation was perceived to be mainly concerning for the data trading concept, because it is very dependent on facilitation to be successful, and because it is a flexible setup it is more prone to mistakes of interpretation.

Student Testing
- 3 interaction tests with students

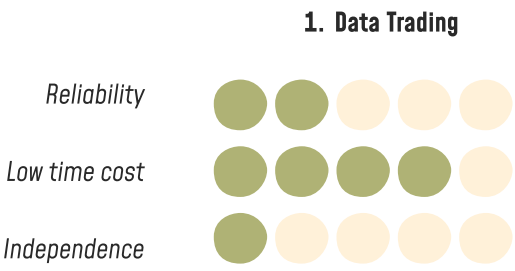


Figure 10.2b *Evaluation of concepts*

10.3 Requirements for Design

Based on the insights from the first user tests I drafted the first real set of requirements for the Design.

Requirements Related to Design Goal

Explicit

The design should

- provide the opportunity to visually indicate the sequence actions are performed in
- separately address data touch points that are interacted with
- provide feedback on one specific use scenario
- distinguish the use of data for entering, taking or inputting.
- give the data touch points context of the healthcare process
- enable requirements to be linked to specific data touch points and sequences
- present data touch points that are not ZIB's explicitly

Representative

The design should

- be able to be used in various hospitals or medical specialties
- appeal to healthcare professionals with lower information, interest and involvement with HDE
- be mandated by the hospitals sessions are operated in

Relevant

The design should

- provide insights in the data touch points healthcare professionals experience
- provide the opportunity to
- make a clear disconnect from interfaces and ask about experience and healthcare processes
- focus on healthcare process and frustrations, not possible (interface) solutions.
- enable structured clustering of different variations of the same use scenario

Representative

The design should

- be able to be used in various hospitals or medical specialties
- appeal to healthcare professionals with lower information, interest and involvement with HDE
- be mandated by the hospitals sessions are operated in

Figure 10.3a shows the most critical attributes of the design.

Relevant

- The design should
- provide insights in the data touch points healthcare professionals experience
- provide the opportunity to
- make a clear disconnect from interfaces and ask about experience and healthcare processes
- focus on healthcare process and frustrations, not possible (interface) solutions.
- enable structured clustering of different variations of the same use scenario

Requirements Related to Expression and Trust by Healthcare Professionals

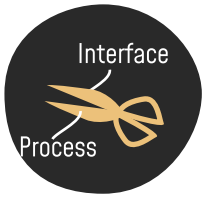
The design should

- Help define the scope of the session through affordances and guidance
- Collect input that is credibly accurate
- Take little time from Medical Professionals
- Works with medical professionals who are not familiar with ZIBS
- Generate trust that input of healthcare professionals are valued
- Enable healthcare professionals to express frustrations

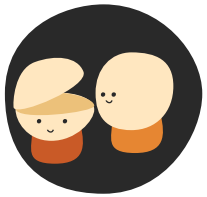
Requirements Related to Operational Feasibility

The design should

- take as little time as possible for facilitation
- easy to implement research by non-researchers or designers
- easy to bring to sessions in hospitals
- be easy to process into concrete insights
- be cheap to produce and implement
- be possibly used digitally
- be possibly used independently
- be as consistent as possible between uses and facilitators
- be able to be used with as little facilitator interference as possible

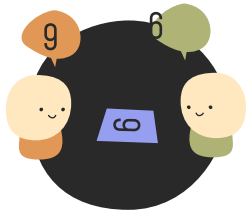


The session design focuses on abstracting the healthcare journey and highlights the interactions with data



The design lets participants recall a specific scenario so the most details can be collected

The design helps participants express their frustrations through key issues, and gives them feedback based on those issues during later phases of the research



The design guides participants in the expression of their data touch point journey with the template that ensures explicit understanding of the contents of discussion

The design is as easy as possible to process into requirements and further research insights

The design is created to be as efficient as possible with the time healthcare professionals can spend, while being structured in order to ease the task of facilitation

Figure 10.3a *6 attributes of design*

10.4 Final Design in Depth

Using the combined insights from previous research and testing, I present the final interaction design (figure 10.4b) that enables healthcare professionals to express their experience of clinical healthcare processes that

- is *relevant* for the request articulation process
- facilitates *explicit* expression of insights
- can *represent* healthcare professionals of different specializations and institutions.

Context

The session is designed to be used as a moderation tool between a facilitator/researcher and a healthcare professional. The design is intended to be used in the healthcare institution of the participating healthcare professional. *"Make sure you accommodate and visit your target group"* (Design Council, 2024)

Facilitation

Although the moderation tool is designed to create as much structure as possible, there are still some important roles the facilitator needs to perform.

- explain the process
- ask clarifying questions
- ask broadening questions

The facilitator *explains* the process, meaning they guide the participant through the steps they have to perform.
The facilitator also asks *clarifying* questions, to make sure the communicated insights are understood by both participant and facilitator. This ensures the collected data touch point journey is a **accurate** as possible.
The facilitator may also ask *broadening* questions, where the aim is to see if there are any insights or actions that might have been missed. This ensures the collected data touch point journey is as **complete** as possible

Steps of Session

The session has several distinct steps to collect the data touch point journey, they are shown in figure 10.4a, and in the storyboard.

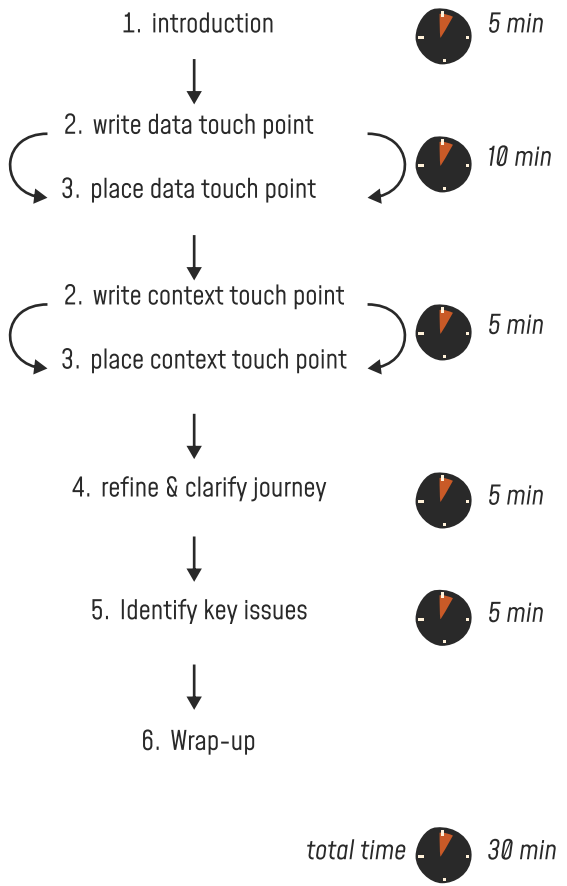
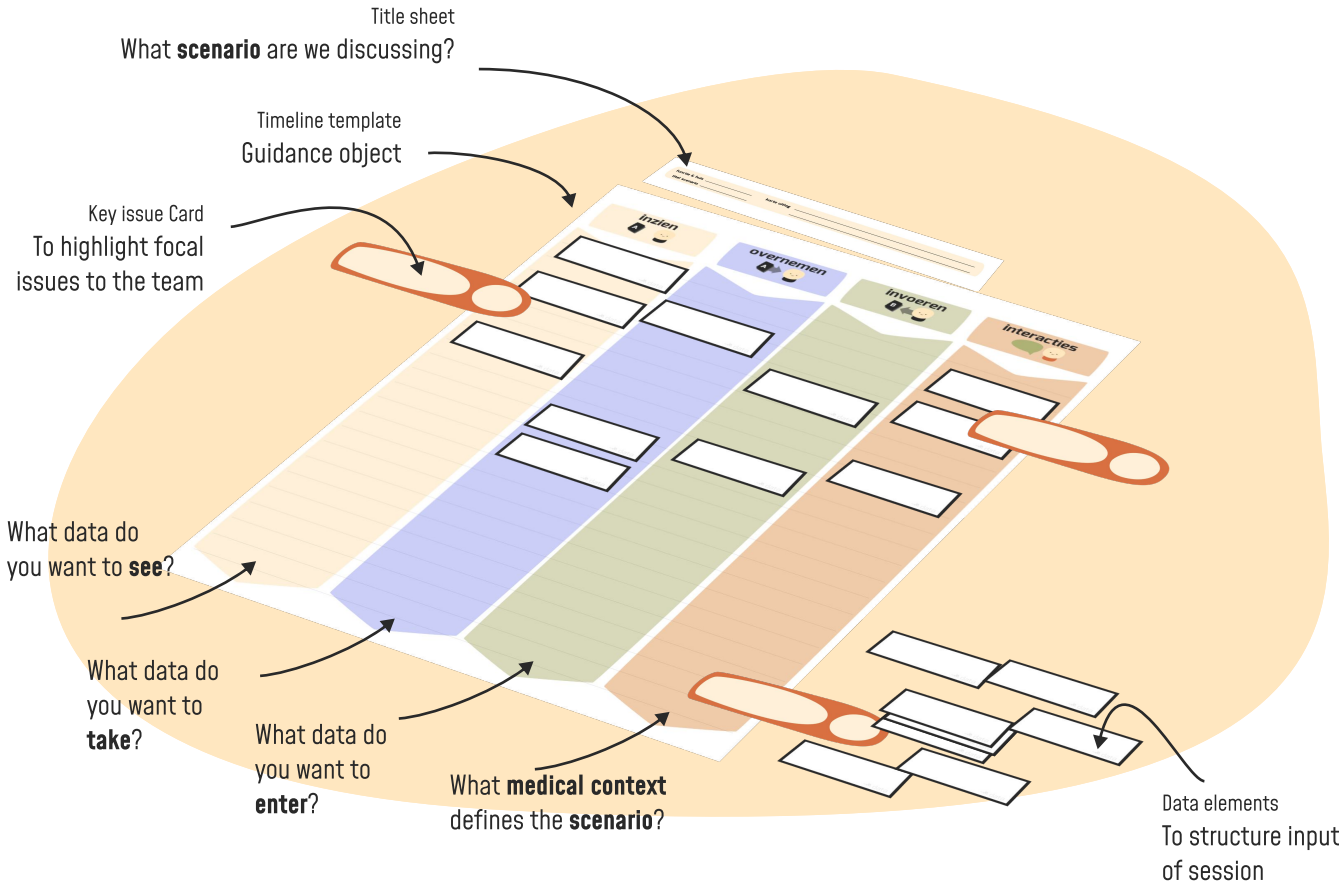
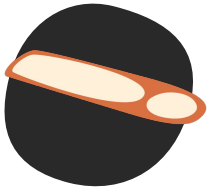


Figure 10.4a *Steps of session*



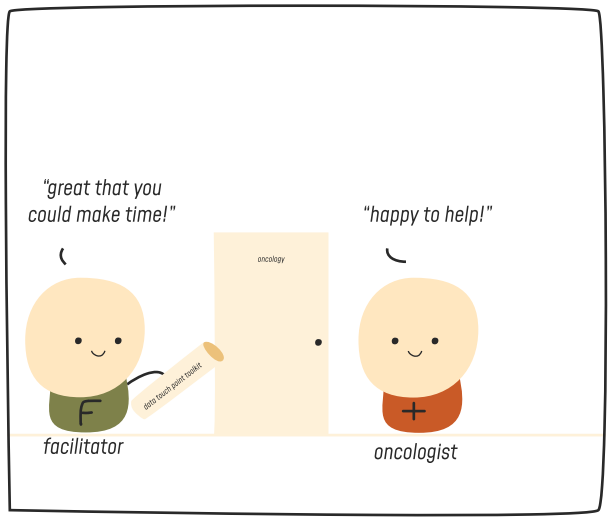


Key issues are ways for participants to express their frustrations explicitly, building trust and releasing tension.

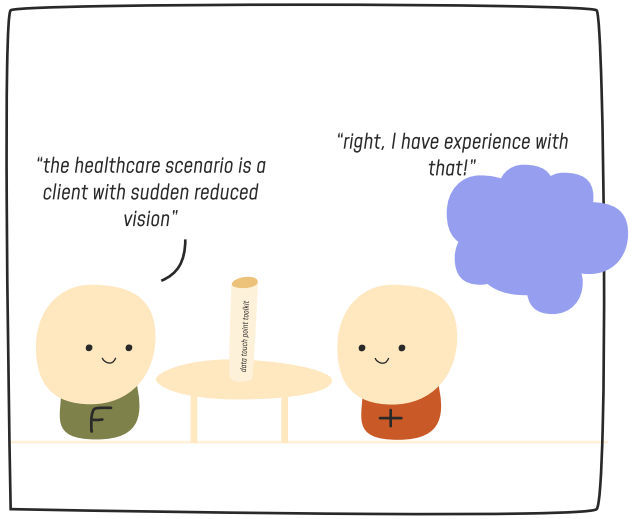
Key issues address be- and do-goals that interfere with the healthcare process.

Data touch points are pieces of information that the healthcare professional requires for good care. They are open ended interpretations of needs, not tied to the form of ZIBs.

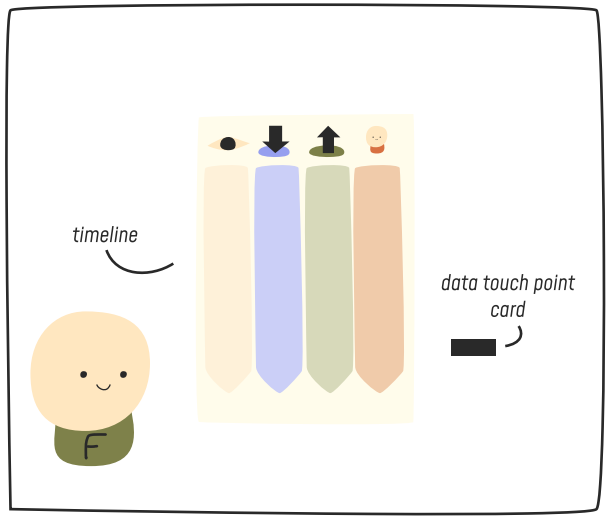
Figure 10.4b *Design overview*



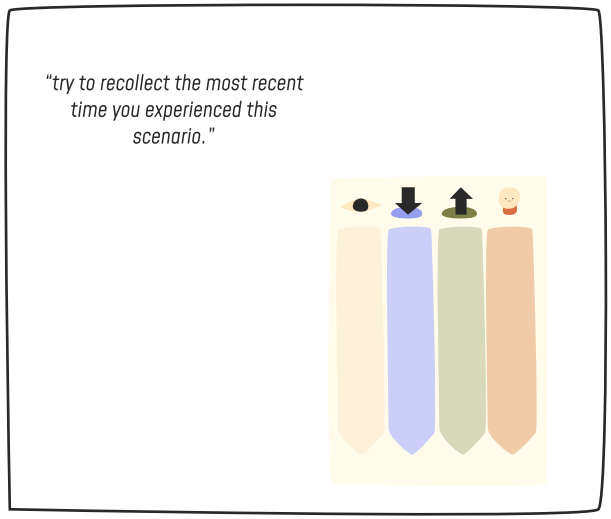
Greeting. The facilitator visits the healthcare professional at their work, carrying the data touch point toolkit. They introduce each other.



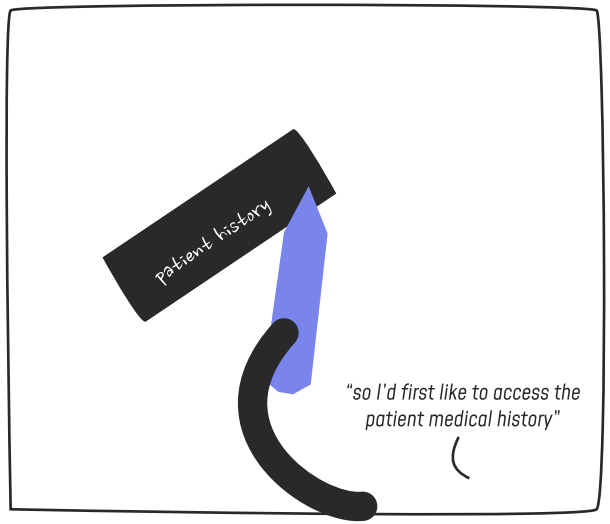
Introduction. The facilitator introduces the goal of the session and what healthcare scenario they are discussing today. This is a scenario that is known by this participant.



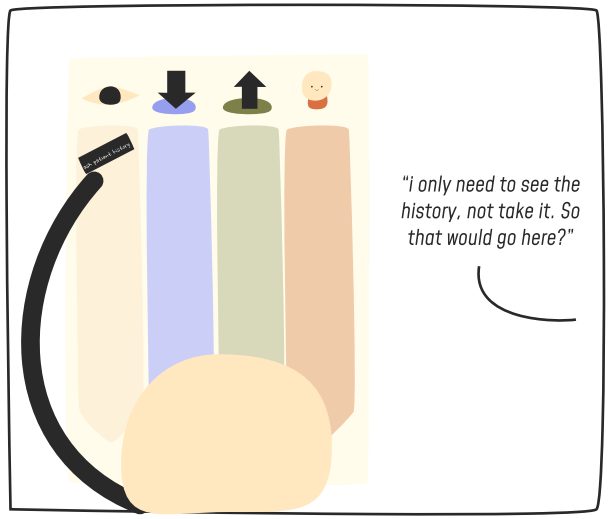
Introduction. The facilitator introduces the tools of the session: the timeline, data touch point cards and role indicator.



Introduction. The facilitator explains the healthcare scenario to be worked on in this session.

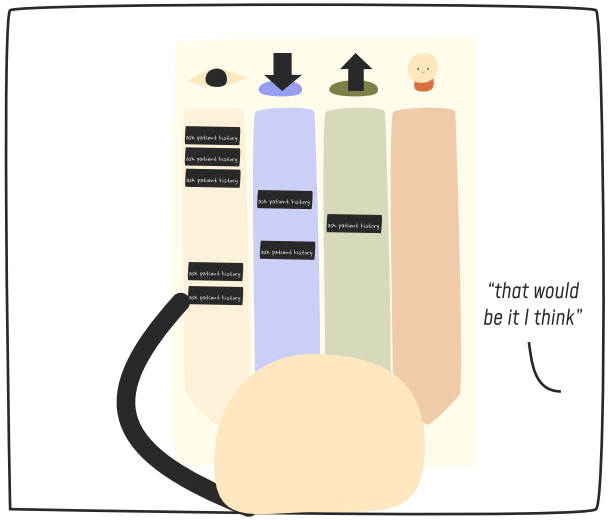


Writing data touch points. The participant writes the data they require, in the form of data touch points.

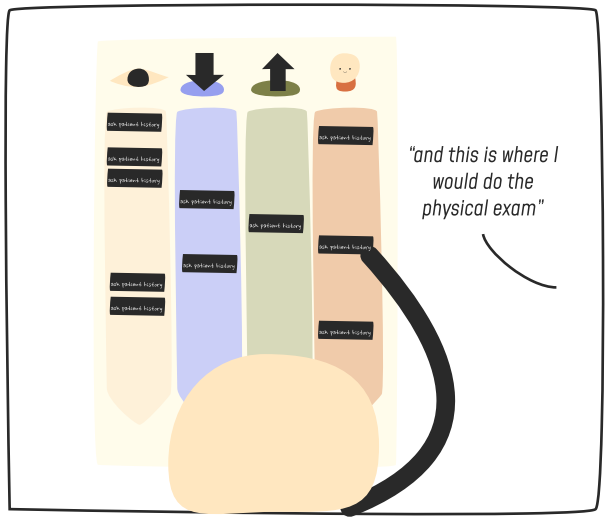


Placing data touch points. The participant places the data touch point on the appropriate column of the timeline.

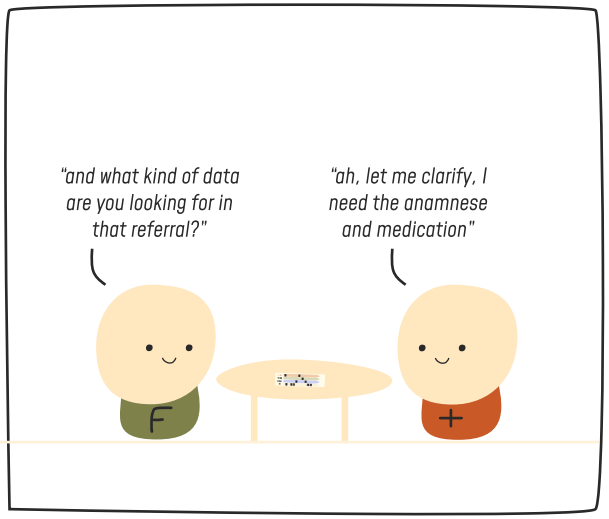
Figure 10.4d *Storyboard*



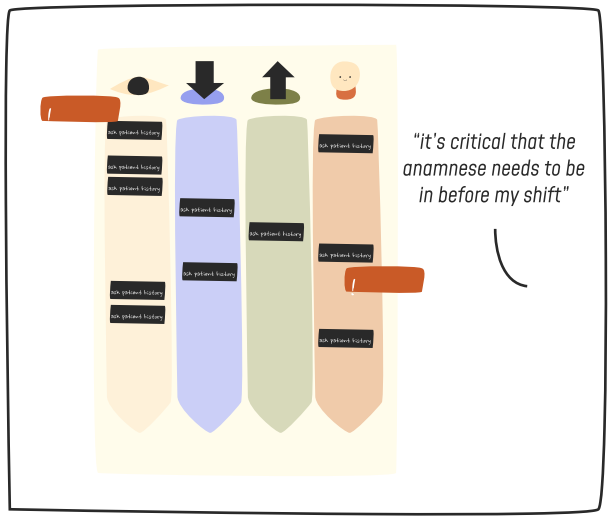
Placing data touch points. The participant does this for other data touch points. The facilitator asks clarifying and broadening questions.



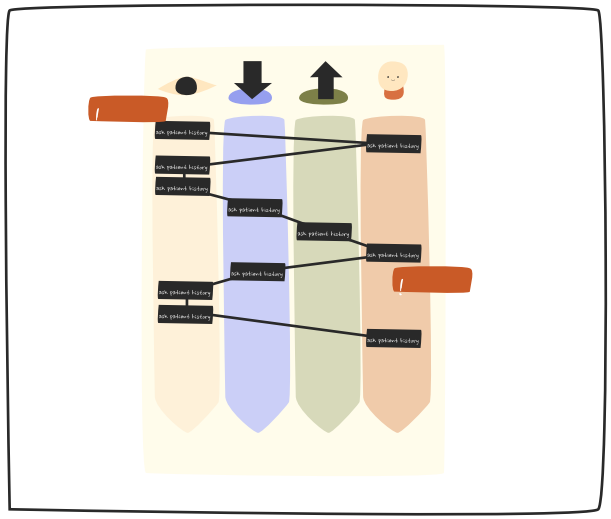
Placing context touch points. To give the data touch points context, the participant goes through the data touch points and adds medical context where nessecary.



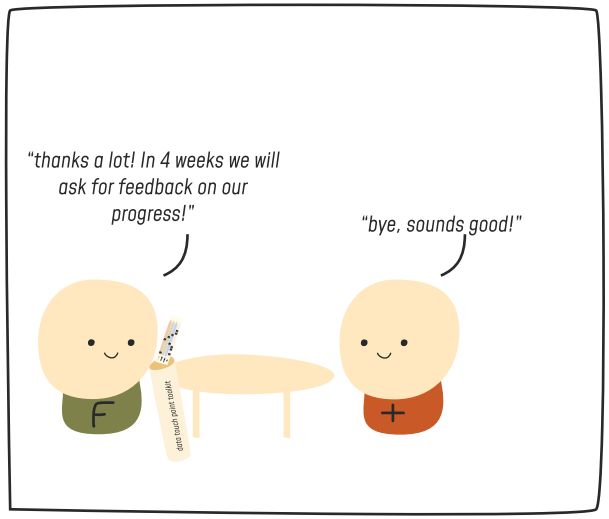
Refine & clarify journey. The facilitator now asks to go over the journey once more, clarifying and refining where necessary.



Identify key issues. The facilitator asks the participant to identify and place 1-5 key issues, which are critical moments or bottlenecks in current software.



Wrap up. The facilitator now has a data touch point journey, which is now a data touch point journey for this specific healthcare scenario.



Wrap up. The facilitator thanks the participant for their time and prepares for the next visit.

10.5 User Test Evaluations

To get first iterations in, I tested different prototypes with IDE students to better understand the interactive implications of co-creating a healthcare scenario timeline (appendix C).

To evaluate the prototype 4 user tests are conducted. The goals of the evaluation are:

- to test the usability of the template through observation and evaluative interviews
- to gauge opportunities to integrate such a session in the process through interview

Figure 10.5a shows the evaluation results.

I have knowledge of policy & development process
Participants acknowledged that the policy process was completely unknown, but some had a little understanding of the in-house ICT processes. *"I really have no idea what the development process looks like" (P3)*

Urser Testing

- 4 user tests & interviews at hospital

I consciously reflect on how software could be implemented
Conscious reflection on how they use software is mixed, but generally high. Some participants actively send out request to the ICT department, others are involved in development programs. It is good to note that this means the participants are probably more involved and articulate in their software usage and reflections during this test.

"I often send issues to our ICT department, but I never have seen improvement" (P1)

the session helped me keep the distinction between the process and interface
The toolkit helps to focus on the scope of the healthcare process, and not go towards interface solutions.
"it was difficult to stop thinking about screens at first, but at the end I got it with your help!" (P1)
Some participants had initial trouble and kept mentioning interface elements, but after some time and corrections they were fully able to abstract the data touch points away from their physical or digital manifestation.
"It was hard to not think of my screen, but the blocks helped me focus" (P3)

I felt like I could share the steps and frustrations I wanted to
This evaluation question had some varying answers. Participants noted that they were able to share their knowledge of the healthcare scenario discussed, and had not missed a lot. Some would have liked for more space to share some other frustrations, however that was of course exactly what this session was not designed for. Fortunately, the participants felt that they were guided in channelling those complaints in the end.
"yeah you noticed I wanted to complain all the time, it was nice that I had a spot for that!" (P2)

I found the length of session acceptable
The length of the session was overall considered to be fine, and definitely not too long.
"I can miss this amount of time, but I might want some more time to go deeper into other matters" (P4)

the template helped me to define the data touch point journey
Overall participants were happy with the setup of the session and the tools they were given to create the data touch point journey. While the first few touch points there were some questions, it quickly became clear what was expected of them.
"It was helpful to build the story step by step with the tools you provided" (P3)

I would be willing to spend [...] time on aiding in this kind of research

Most participants were willing to provide between 30 and 60 minutes per month on helping with research like this. This amount of time had surprised me, as I had thought it might be less. This might be partially due to the high level of conscious reflection on software, and two participants were already actively involved in testing other projects in the hospital. This indicates to me that it is reasonable to expect healthcare professionals are willing to aid in research, provided the research comes to them:

"Yeah I am not going anywhere for interviews, they have to come to me" (P2)

It would be beneficial for the researcher observes beforehand

This was very different between researchers. While the idea was definitely appreciated, and it felt like researchers would learn a lot about their process in general.

"I'd love to show how I work so the researcher understands" (P1)

However, they also mentioned that the specific scenario put up in the session might not come up that often during a workday, so an observing researcher might not actually experience the topic of the scenario they would be discussing.

"This issue might not come up often, so I doubt visitation might be useful" (P4)

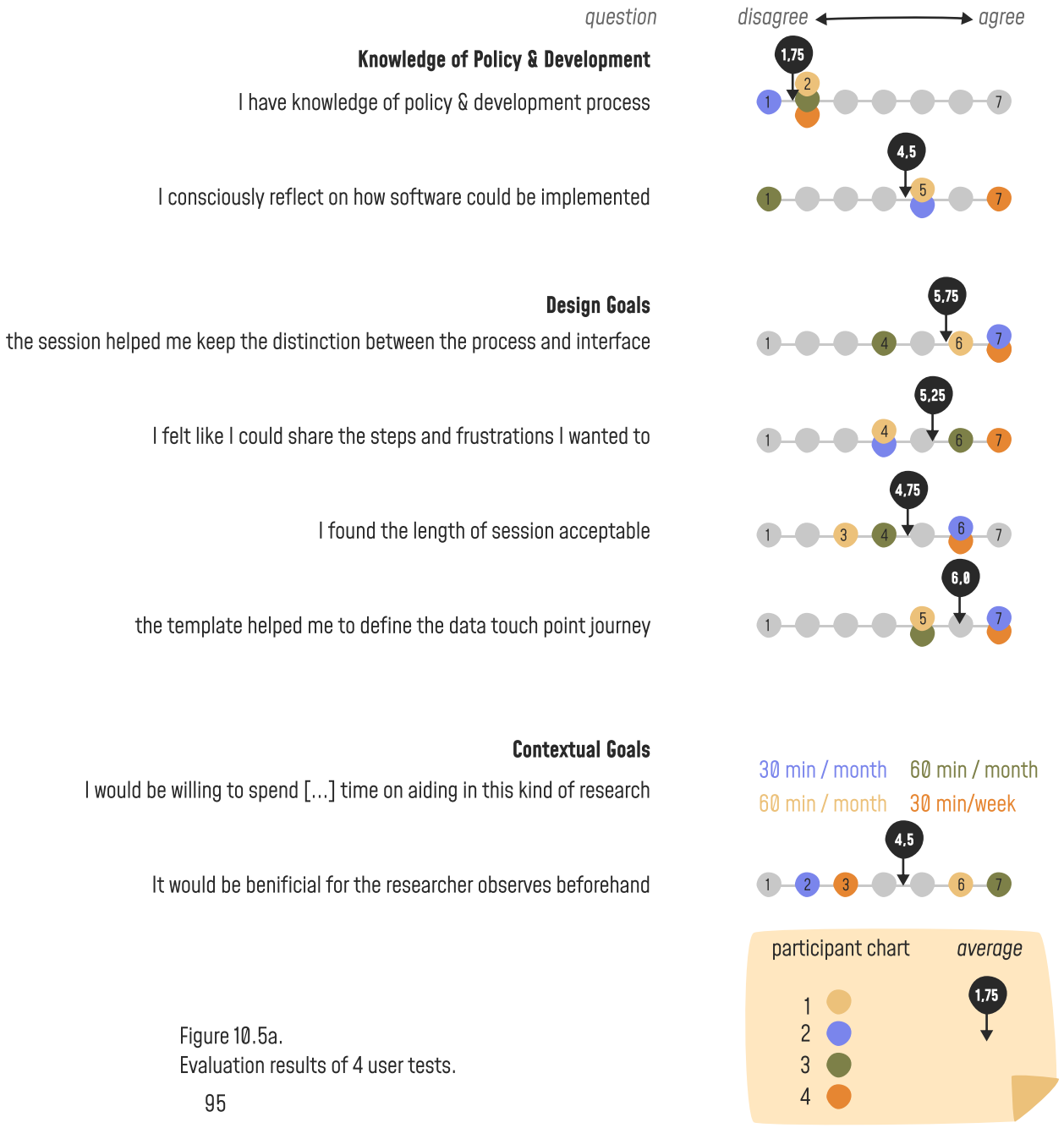


Figure 10.5a.
Evaluation results of 4 user tests.

10.6 Design Recommendations

Based on observations and evaluating conversations there are some iterations that should be made to this concept. There are **changes**, of which I have enough feedback to confidently suggest changes. Then there are **considerations**, which are aspects that I know should be changed but can't fully articulate how. Apart from this there are also **confirmations,** which are qualities of the design of which I have confirmed they achieve the intended effect.

Changes

- add separate title card
- remove update section
- rename patient to interaction
- design example timeline
- print visual steps of session and goals
- add option to cluster actions
- resize interaction timeline
- remove differentiation between data and interaction card design
- roleplaying is mostly helpful for experiences that are more complex than data touch points

Considerations

- consider data writing sequence parallel to storytelling or compiling list of data beforehand
- reconsider time frame required to be longer
- consider a more thorough sensitizing to better prepare for session
- consider how to gain trust input will be used.
- consider to add the role of system to the indicator
- Adding guidelines for semantics of data input in cards
- consider how to make participants write more

Confirmations

- recalling a specific scenario helps with recalling input
- tools help keeping on scope of timeline
- tools help with expression
- researcher coming to visit is required for participation of healthcare professionals
- researcher observing work would help
- 30-60 minutes is maximum
- appealing frustrations helps engagement

Physical Properties

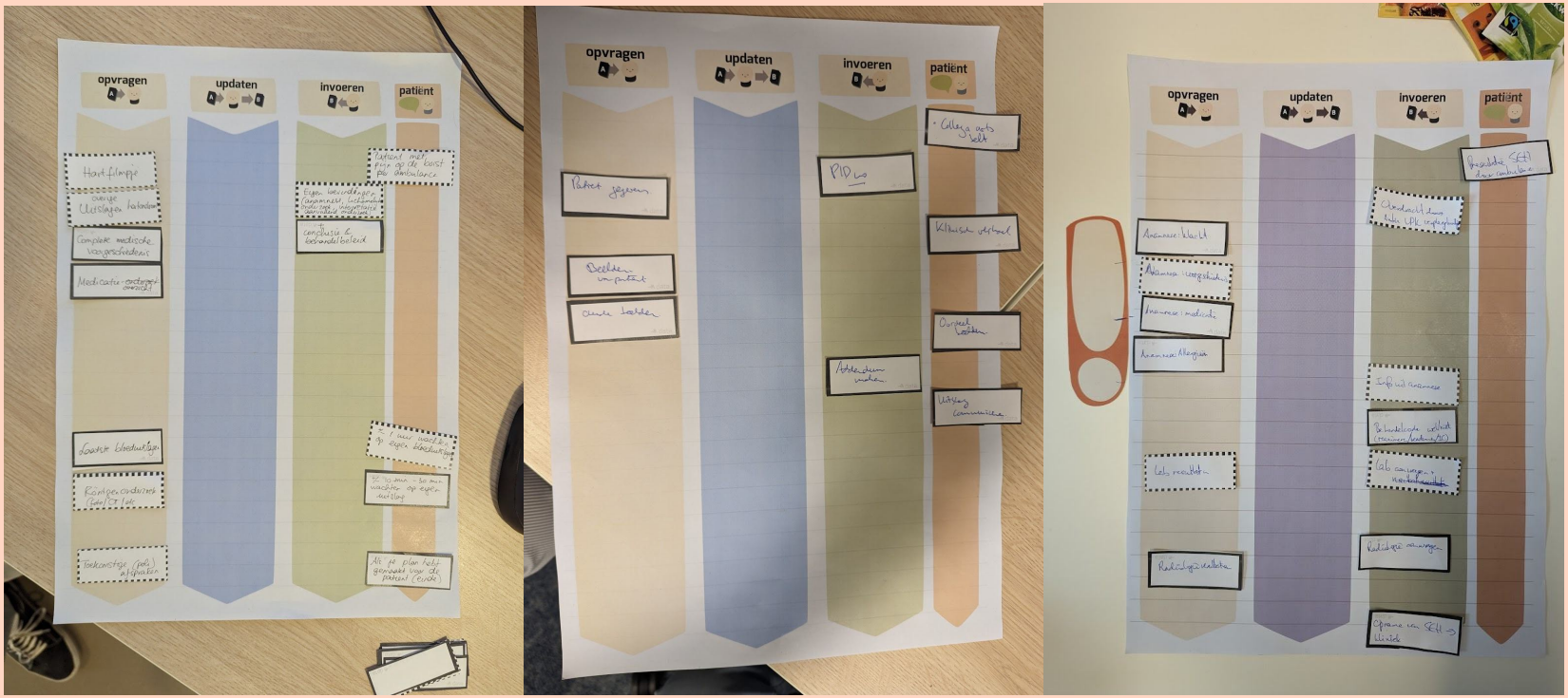
- Make data packs sticky for easy and safer transportation.
- Design a carrying pouch

Recommendations

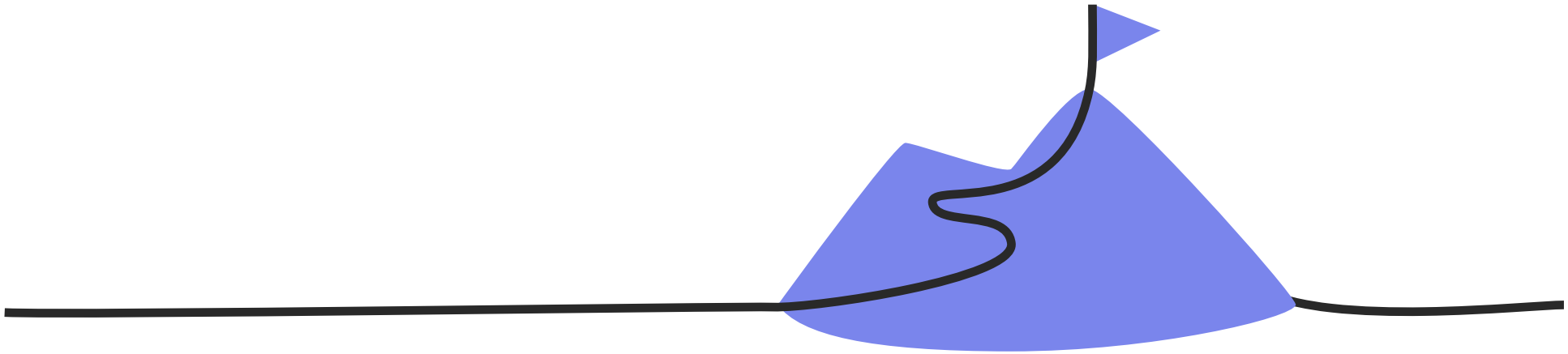
If this design were to be developer further, more research and testing needs to be done to evaluate the specific needs of healthcare professionals regarding expression of healthcare data touchpoints, and user journeys in general. The design I have created is based in large part on the need for a low-investment opportunity to gather the experience of healthcare professionals, but in the future a more thorough, deeper and broader research approach and session design would be preferrable.

Reflection

I have also noticed that when testing these prototypes, I found that my lacking knowledge of healthcare professes made the process more difficult to evaluate as a facilitator. This is why I have recommended that when implementing this design it's very helpful that the facilitator has knowledge of healthcare processes in general. This ensures that the reflective and deepening questions the facilitator can ask are more relevant ans provide a more valuable journey map than I was able to, although the testing experience itself has been very helpful in evaluating the concept itself.



Three of the gathered data touch point journeys
Often due to lack of time and/or lack of knowledge on my part the data touch points collected were not as detailed as might have been helpful. I have however deliberately chosen to not focus on this aspect, as time was short and I'd rather test the experience and have time for evaluation, than fully go into the healthcare process.



11

Planning the Change Process

Strategy Towards a Future System

What long term phases need to be accomplished to achieve the future vision?

Introduction

What
This chapter provides the process and interaction design with the systemic nuances and complexity in which my proposed process and interaction design exist and will evolve.

Why
By connecting back to systemic factors, this chapter provides a long term perspective on changing the system, and how the proposed process and interaction design help that change. Developing the future vision into concrete and actionable chunks helps realize the transition towards the future functioning of the system, and provide a foundation for further research, activities and pilots.

How
A strategic map including four phases is presented to explain the different dimensions of the transition phases. Each phase is expanded on by addressing value impact, activities, power shifts and more. The setup and content of these phases are characterized by distinct questions, which systemic stakeholders are advised to use in future convening activities.

Contents

Conclusion

The proposition of a four-phase model towards a future system is critical for improving healthcare data management. This chapter provides a structured approach to defining goals, assessing value impact, initiating activities, and evaluating outcomes.
Each phase focuses on different aspects of enhancing healthcare data exchange:

1. Explicit and Relevant Request Articulation - Ensuring that requirements are explicit and relevant to software suppliers, thus facilitating better usability and meaningful use of healthcare processes.
2. Representation of Healthcare Workers - Empowering healthcare professionals by involving them in the request articulation process, ensuring their needs and insights are adequately represented.
3. Organizational Collaboration on Usability - Integrating research and design processes across organizations to ensure that usability findings are effectively incorporated into software development.
4. Collective Responsibility of Usability - Fostering shared responsibility and cooperation among stakeholders, thus promoting a culture of continuous improvement and collaboration.

The proposed initiatives, such as forming Clinical Process Research Groups, Data Touchpoint Journey Mapping, and creating collaborative platforms, aim to build conditions that enable effective and sustainable improvements in healthcare data management. These initiatives emphasize the need for resources, stakeholder commitment, and continuous evaluation to achieve the desired value impact and systemic change.
By focusing on incremental steps and leveraging key aspects of power distribution, this strategic approach aims to create a more efficient, user-friendly, and collaborative healthcare data exchange system.

11.1 Three Horizons Moving Towards a Future Vision

We now have explored a future vision, process design for request articulation & an interaction design to support representation of healthcare professionals. It's now important to put these findings into perspective and relate them to that future vision. The Three Horizons Model (Curry & Hodgson 2008) provides the framework to do so. It handles 6 main questions. I will take the opportunity to do a recap of the entire research project.

1 What does the Ideal Future look like?

This is the vision of the future system state. There are many different aspects of this future regarding healthcare policy implementation. It is important to note again that while the BgZ might be successfully implemented in the future, there will always be healthcare (digitalization) challenges that require collective, integrated policy design. Such future challenges should be approached with the end-user in mind. It should be:

*A future where the **power** of healthcare professionals is enshrined in system **values, processes and actions** so their healthcare process can be shaped by not not only **technical or societal** relevance, but also their **experience, knowledge and needs***

2 What Pockets of the Future can we Identify?

With every system, there are some processes and values that reflect the core values of the future. These are valuable to learn from and provide a hopeful window into the future. These are the rising feeling that the current approach might need changing, and that the end-user needs to be better involved somehow.

3 What System Concerns can We Find?

The formulation for the ideal future and therefore pockets of the future is based on thorough systemic analysis of behaviour and processes within the design. The system concerns that have been identified to have the most leverage are *Ability to reflect, Ability to act on reflections, Effective meeting goals, Meeting design and setup Where the field goes with issues, Balancing power relations, Taking small and careful steps. Knowing where to find the right people*

4 What elements of the current system should we repurpose?

In order to *get* to that future vision, the first step is to look at the current system, and find processes and values that also be of value in the future system. This is the Nictiz Designathon, including the perception that the value of the end-user is rising within different layers of governance. How to realise that value is still a question that's mostly up for debate. Refining and improving this initiative is the most efficient way to leverage the balancing of power to influence the future system state. To realise this leverage, I have created a process for a research group that is the version 2.0 of the Designathon. It is designed to best realize the power of healthcare professionals by taking into account their *autonomy, recognition, value, leverage and opportunity* to exercise that power.

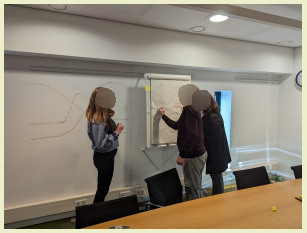
5 What initiatives could enable the transition?

There are multiple initiatives that could enable the transition towards the future system. The first of these are the design and development of the Research Group. The further down the road we go, the more initiatives could be setup to foster collaboration and integration of these research projects *with* other research, as well as integrated them into the design processes of software suppliers.

6 What elements of the current system can we repurpose?

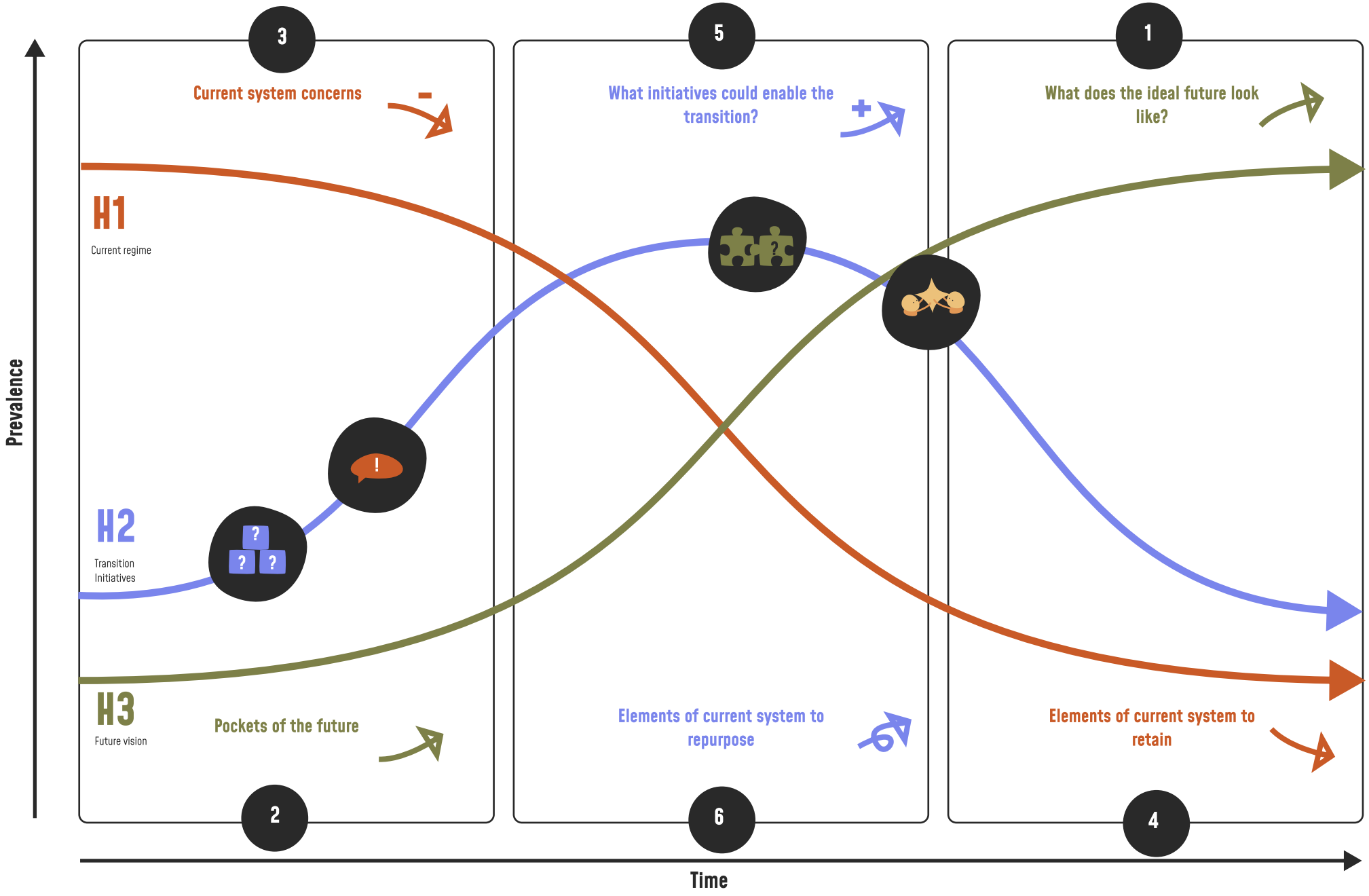
The elements of the system to repurpose are many. More evaluation on this part is required, but there are two elements that need to be repurposed.

- Nictiz should evolve to not only develop information standards, but also use their knowledge of the healthcare process and technology to foster the usability of this technology.
- VWS should stay prominently active within the system, engaging in strategising, incentivize and legislating to keep producing results within the healthcare space. However, in the future VWS should focus on the collaboratively strategizing not only the future of healthcare, but also the future of *the very system* that shapes the future of healthcare. This means convening with system stakeholders.



Strategy co-creation

The very first kick-start of this strategy was co-created with system stakeholders from VWS and Nictiz (appendix Q)


3
Current system concerns
5
What initiatives could enable the transition?
1
What does the ideal future look like?
H1
Current regime
H2
Transition Initiatives
H3
Future vision
Pockets of the future
Elements of current system to repurpose
Elements of current system to retain
2
6
4
Prevalence
Time

11.2 Four Phases to Realize a Paradigm Shift

To understand how the future vision might be realized it's good to refer back to the twelve leverage points of Meadows (1999). It's important to know that while the rightmost points provide the most leverage, they are also less and less tangible and actionable. That is why my long term strategy focuses on utilizing leverage points lower on the ladder to *propagate* the change of the system through initiatives that change the information flows, structure, goals and then ultimately can fully change the paradigm under which the system operates (figure 11.2a)

Four Phases Towards the Future Paradigm

This means that the first two initiatives focus on changing information flows, the third on the structure and goals of the system, while the fourth aims to soak the paradigm deep into the functioning of the system. Taking these considerate steps is crucial in achieving the desired paradigm change. We can't expect that the paradigm of embedding the power of healthcare professionals to create meaningful use for healthcare data exchange will magically live in every actor's mind. *We have work in smaller steps to build that future.* These steps originated in the outcome map in appendix K.

Figure 11.2b shows the four phases and the leverage they focus on achieving.

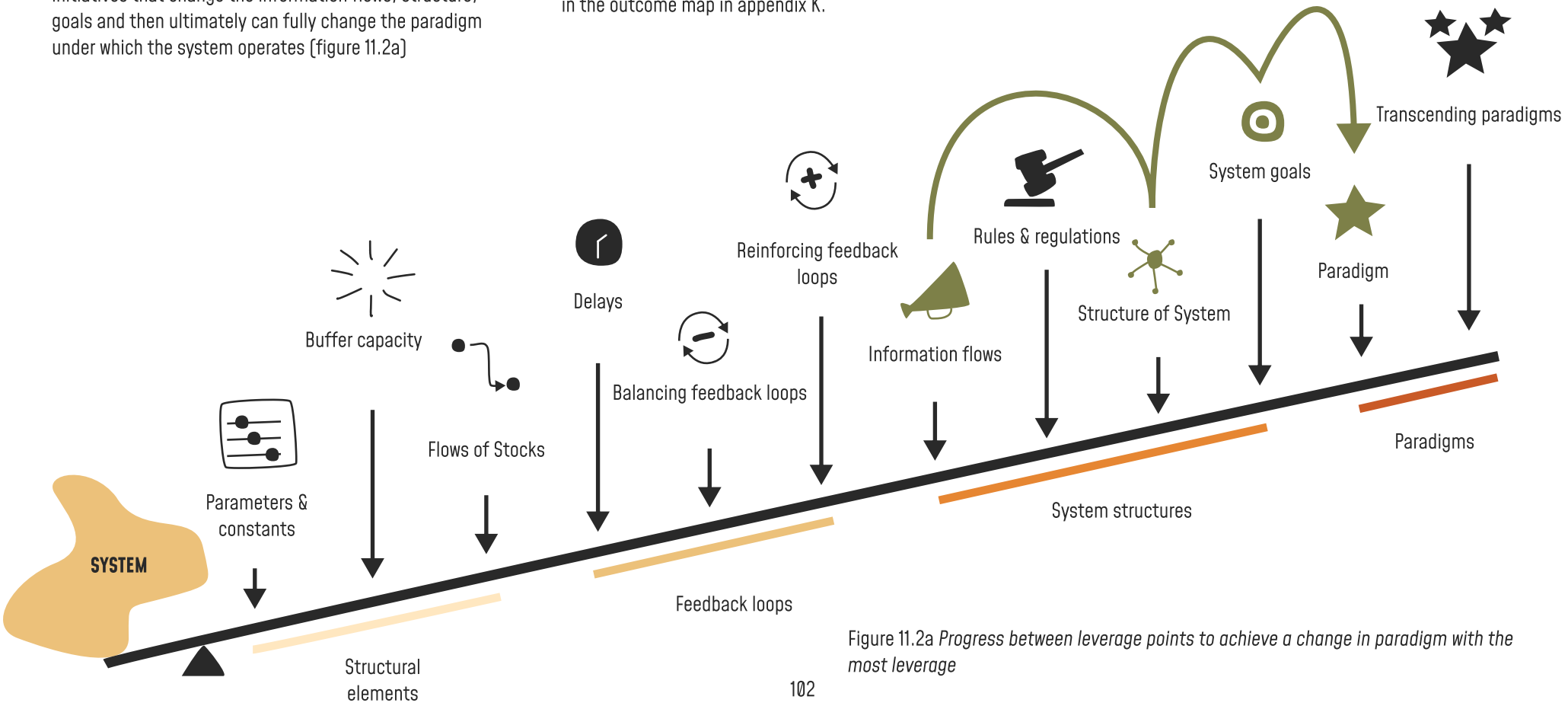


Figure 11.2a *Progress between leverage points to achieve a change in paradigm with the most leverage*

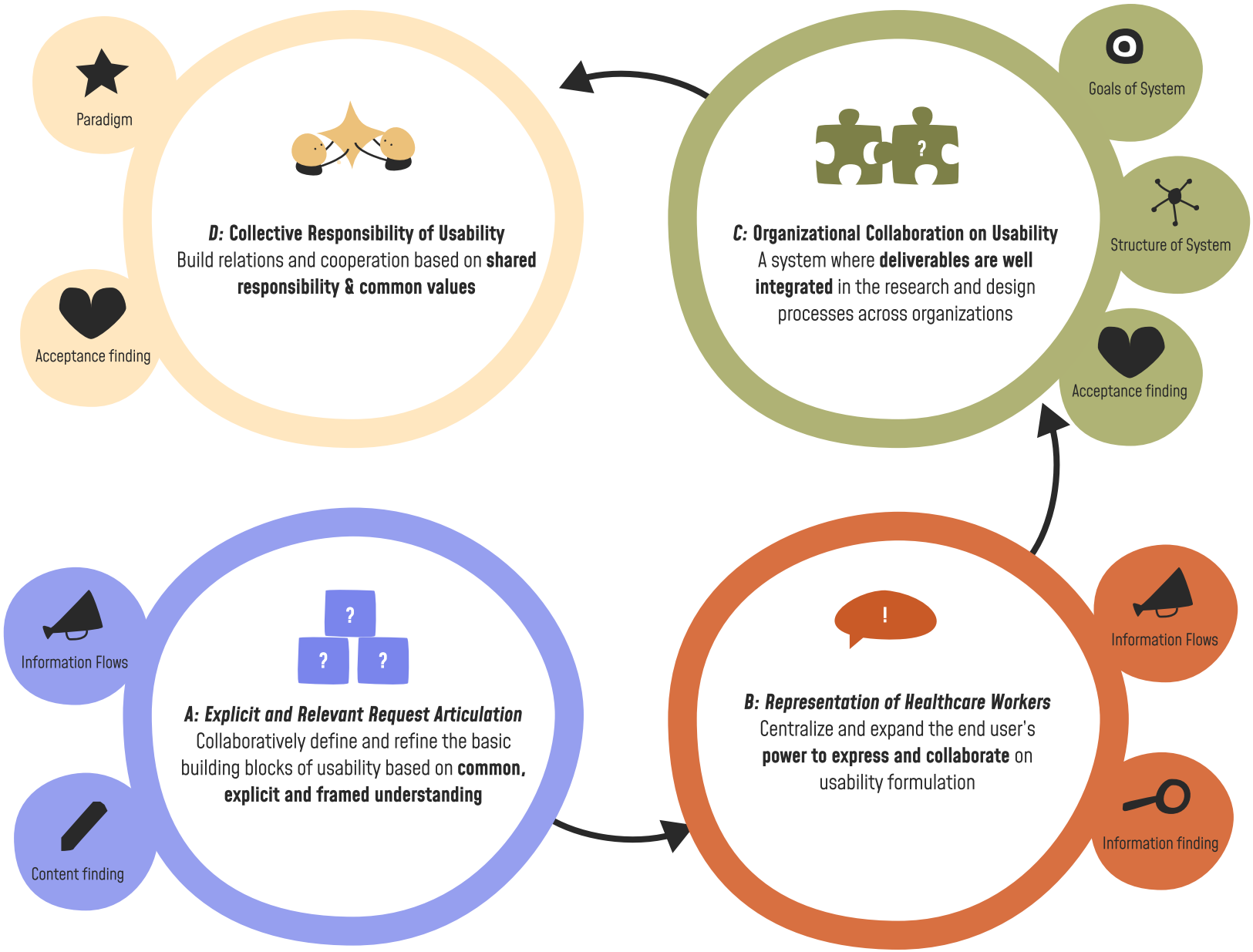


Figure 11.2b *Four phases towards the future system. Each phase aims to influence a different archetypical leverage point, and focuses on different aspects of ICPS.*

Collaboration Model

The proposition of four phases towards a future system is important, but it's critical to give the system actors a tool to collaboratively shape and evaluate that system. To give more concrete guidance on the conditions, initiatives and value that could be created in each step, it's helpful to use the collaboration model (Jones & van Ael, 2022). It uses 9 factors that together define how value can be created within and between organizations. I used this canvas to prompt five system actors on how they would envision the creation of value towards my future vision of healthcare data exchange with meaningful use embedded within system functioning. I have adapted this model to better express these nine building blocks in a way that communicates their purpose better (figure 11.3a).

Leverage Points

The specific collaboration model is chosen and adapted because it can address some of the key leverage points we found that inhibit system performance.

Reflecting and acting on reflections: The collaboration model is designed specifically to reflect on the one side, and then shape these collaborative reflections into actions and initiatives. This explicit nature means a lot for realizing reflection

Taking small and careful steps: the collaboration model is built to be taken in incremental steps, focusing on one purpose and specific conditions and actions within that purpose.

Where the field goes with issues: Using the collaboration model while convening enables VWS to not only function as a place to go to with issues or request, but also a structural place to go to for strategizing and collaboration.

0.0 Goal

The purpose is defined as what the ultimate goal is to be achieveved together. In this strategy that purpose is defined as the purpose of the phase (figure 11.2b).

1.0 Value Impact

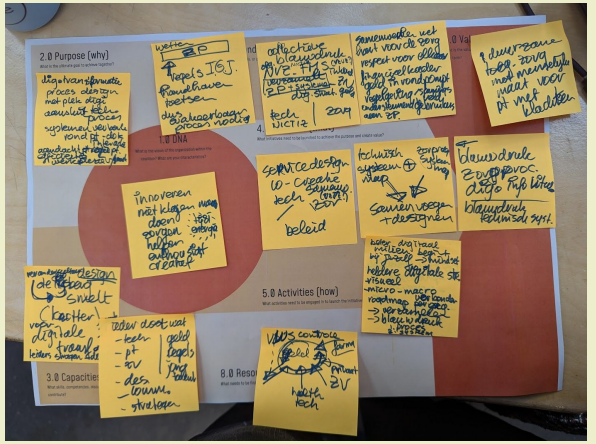
What is the value that is being co-created, and how does it affect stakeholders? I have defined this value in different categories:

- Power aspects: how is the power of the relevant stakeholders (re)distributed on the scales of
  - Recognition
  - Autonomy
  - Value
  - Leverage
  - Opportunity
- Request pillars: how are the pillars of request articulation provided in?
  - explicit
  - relevant
  - representative
  - collective
  - integrated
- Meaningful Use & UX Maturity level (Nielsen Norman Group, 2021): How much is usability embedded in the organizations? See appendix AZ.
- Stakeholder Dynamics: what is the relationship between key stakeholders and how are they positioned in collaboration?

2.0 Initiative

What are major initiatives which will meet the purpose and vision?

- What activities are to be done to engage in the initiative
- What are the core components of this activity?
- Who is responsible for organizing the activity?
- Is there a deliverable for this activity?



This collaboration canvas was created in 5 sessions system actors: VWS, Nictiz, EPD expert, healthcare and software supplier. Template in appendix W.

3.0 Conditions

Conditions can be divided into

- Resources and costs: who is paying for the initiatives, and provides necessary resources?
- Preconditions: what policies, attitudes, or processes are required to make the initiative successful? Also includes organizational readiness
- Capacities: what roles, skills and competencies are required? What roles will each member contribute?

4.0 Evaluation

- How can we evaluate and measure the conditions before we start the initiative?
- How can we evaluate initiatives and activities? It's not only crucial to know if the initiatives have provided the right results, but also whether the setup, goals and activities are sufficient.
- How can we evaluate the value impact the initiatives have had? Are we achieving the value we intended to?

Building Initiatives, Conditions and Value to the Future Vision

It's important to realize that the four phases are not independent of each other, and that each phase has to deliberately build conditions to enable initiatives that provide value. This building of conditions, initiatives and value means that when the figure mentions specific aspects of that phase, it does not mean the aspects of previous phases are not relevant, or those of future phases. These aspects still exist on a spectrum and merely peak in specific phases (figure 11.2h). The specific curves of these focuses remains to be developed further and would only cause confusion.

Initiatives from earlier phases for the most part build upon to multiply the value of these initiatives. Chapter 11.4 expands on the building and evolutions of conditions, initiatives and value for each phase.

Four Phases Overview

Figures 11.2d -11.2g show an overview of the four phases and their respective focus. Figure 11.2h provides a more indepth overview of the aspects of every phase.

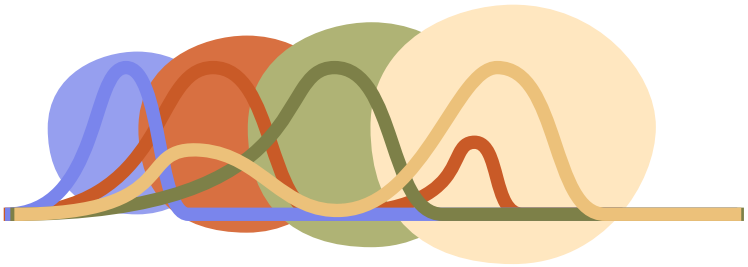


Figure 11.2h

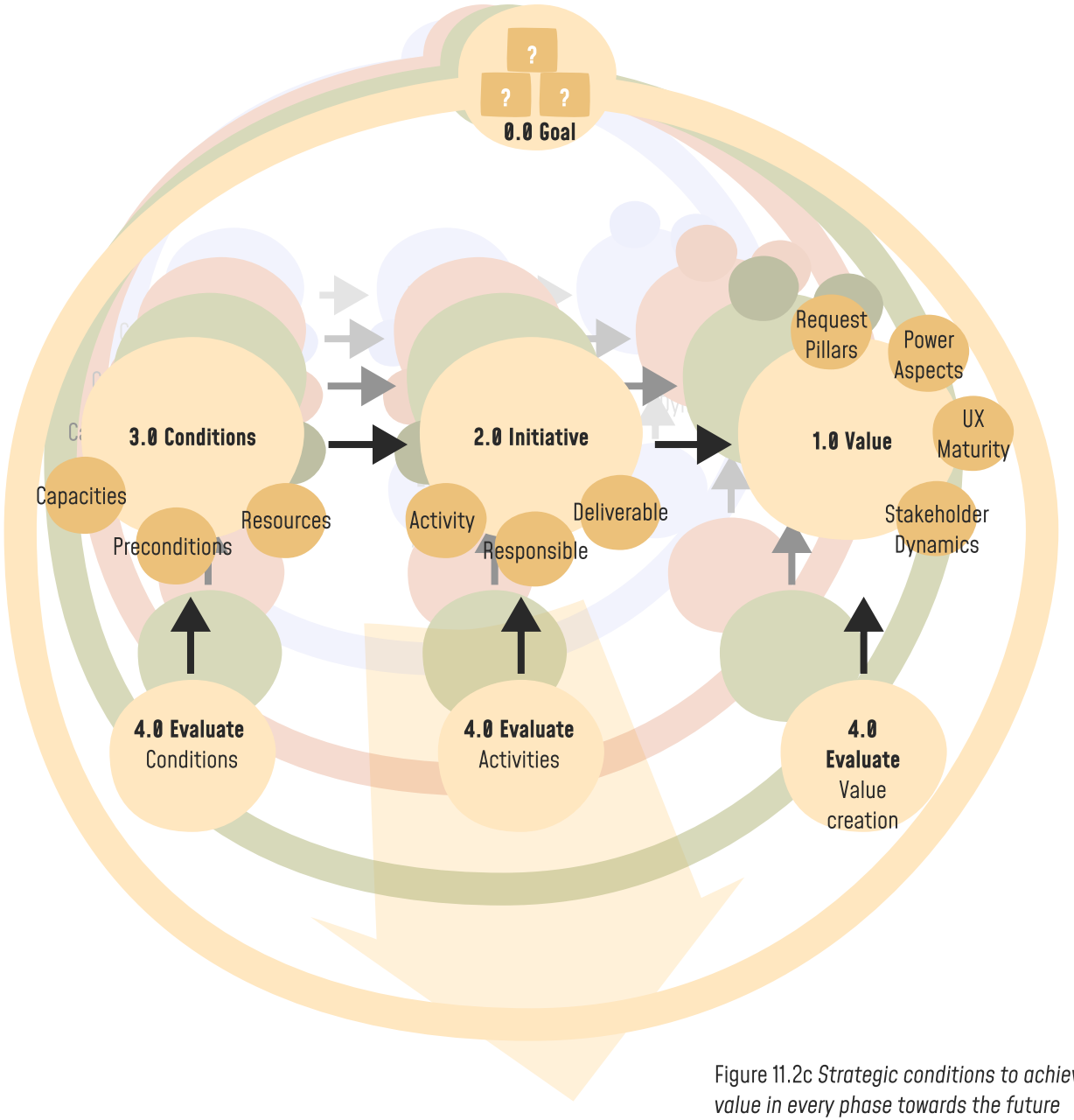
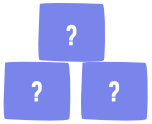


Figure 11.2c *Strategic conditions to achieve value in every phase towards the future system.*

Figure 11.2d
Phase A



A: Explicit and Relevant Request Articulation
Collaboratively define and refine the basic building blocks of usability based on **common, explicit and framed understanding**

Conditions
Basic external realization of design research skills and CMIO's

Capacities
Visual Designers
Design Researchers

Preconditions
CMIO network
investmentsVW

Resources
VWS financing

Initiative
Clinical Process Research Group

Activity
Data Touch Point
Journey Creation

Responsible
Nictiz

Deliverable
Plan of Requirements
Data touch point
journeys

Value
Empowering the collaborative request articulation to influence the development of software through relevant and explicit requirements.

Request Pillar
Explicit
Relevant

Power Aspect
Value

UX Maturity
Emergent

Stakeholder Dynamics
VWS
doctor

Evaluate
Stakeholder Engagement

Evaluate
Requirements Quality

Evaluate
Usability Metrics

Figure 11.2e
Phase B

B: Representation of Healthcare Workers
Centralize and expand the end user's **power to express and collaborate** on usability formulation

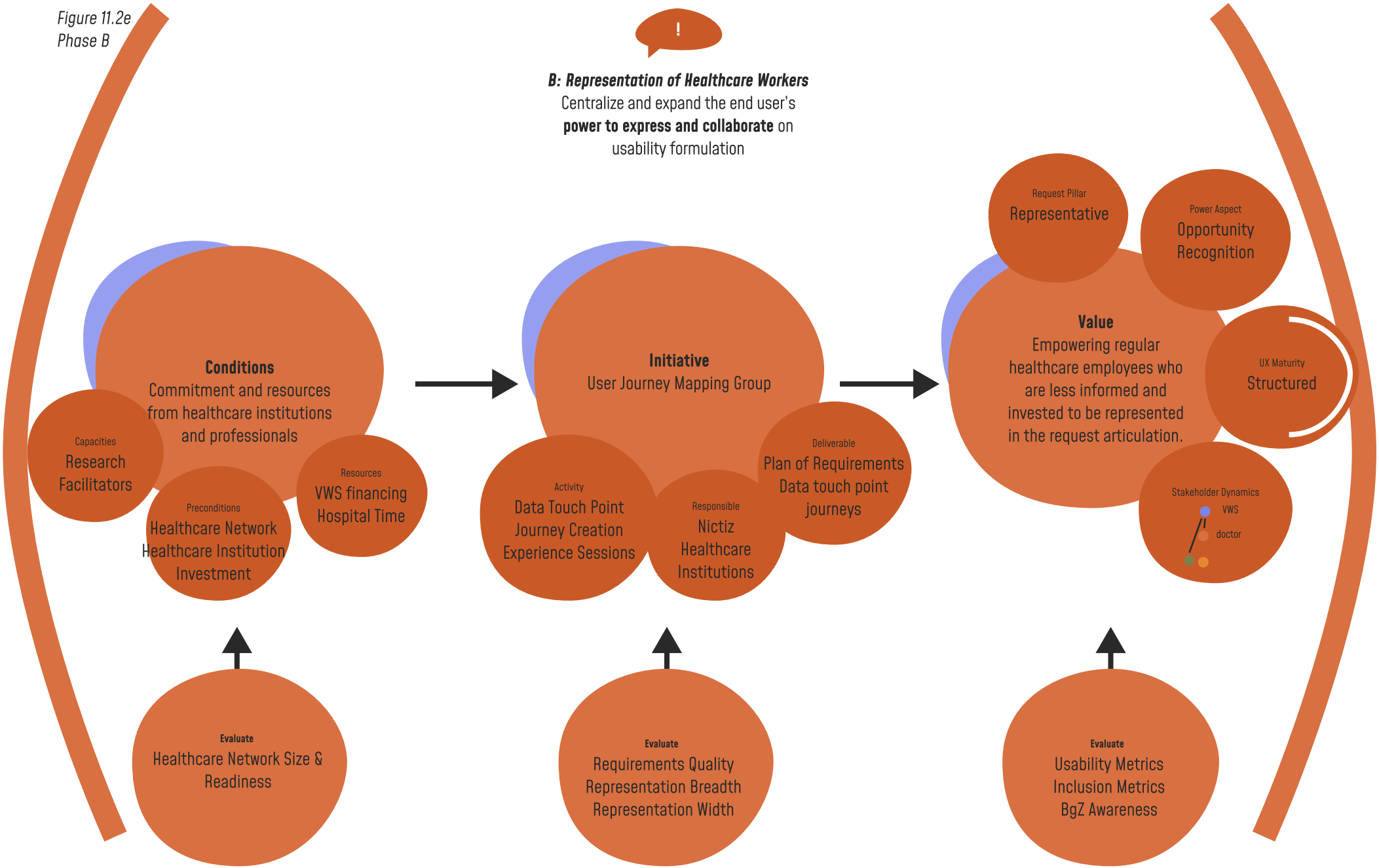


Figure 11.2f
Phase C

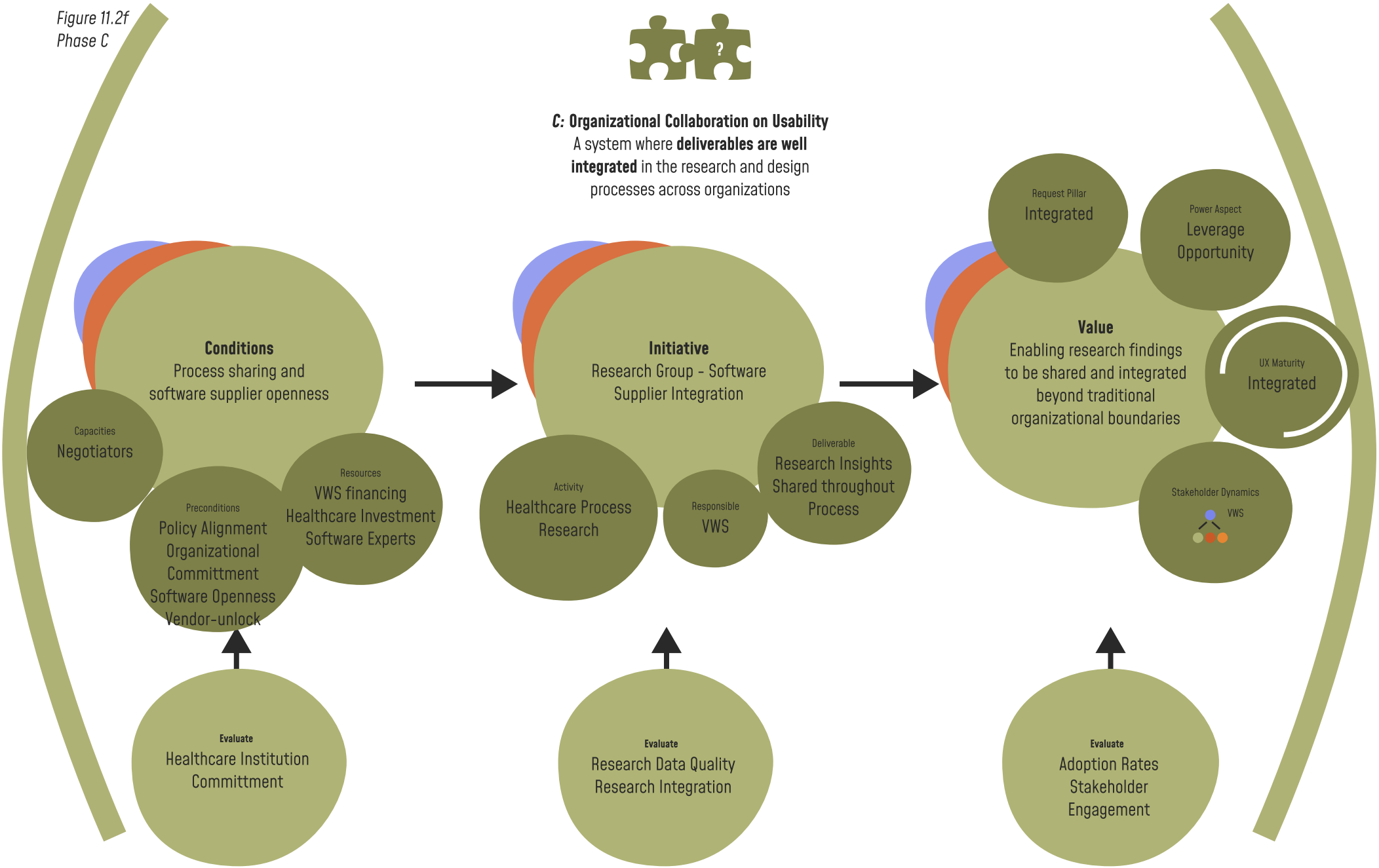


Figure 11.2g
Phase D

***D:* Collective Responsibility of Usability**
Build relations and cooperation based on **shared responsibility & common values**

Conditions
Shared willingness to convene on shared values

Capacities
Convenors

Preconditions
Shared Values & Goals
Collective prioritization of Meaningful Use

Resources
Collective Finance

Initiative
Convening & Decision making Platform

Activity
Healthcare Process Research

Responsible
All

Deliverable
Healthcare data exchange with meaningful use

Value
Shifting from the need to *control* collaboration towards shared responsibility and values.

Request Pillar
Collective

Power Aspect
Autonomy
Value

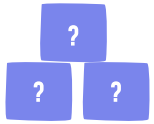
UX Maturity
User Driven

Stakeholder Dynamics

Evaluate
Healthcare Institution Committment

Evaluate
Research Data Quality
Research Integration

Evaluate
Usability Metrics
Collaboration Index



A: Explicit and Relevant Request Articulation Collaboratively define and refine the basic building blocks of usability based on **common, explicit and framed understanding**

B: Representation of Healthcare Workers
Centralize and expand the end user's **power to express and collaborate** on usability formulation

request
The value is focused around making sure request articulation is explicit and relevant to software suppliers.

power
The aspect of power this phase focuses on is facilitating the transfer of value in the form of knowledge about healthcare processes.

request
The value centres around empowering regular healthcare professionals to represent themselves in the process of request articulation

power
The value is aimed at providing opportunity for healthcare professionals to influence the request articulation, and thus be recognized as deserving effort and prioritization.

value
The value impact focuses on creating explicit and relevant requirements for software suppliers, so they can independently create software with more meaningful use and consideration of the healthcare process.

stakeholder
Stakeholder dynamics focus on bringing healthcare professionals closer closer to software suppliers. Nictiz is the catalysing organisation and VWS is the financing role

value
The focus is on creating representation of healthcare professionals which are less informed and involved, and still give them a voice in the request articulation.

stakeholder
The focus is on bringing the healthcare professional closer to the Research Group at Nictiz and through them closer to software suppliers. VWS is financing.

initiative
Initiatives include forming the Clinical Process Research Group, creating data touch point journeys and a plan of requirements.

deliverable
The deliverable that will be able to leverage value is the plan of requirements combined with data touch point journeys. This deliverable needs to be accepted by both healthcare institutions as well as software suppliers.

initiative
Initiatives focus on the User Journey Mapping Group, organizing focus groups and workshops, and launching pilot programs.

deliverable
The deliverable that will be able to leverage value is the plan of requirements combined with data touch point journeys. This deliverable needs to be accepted by both healthcare institutions as well as software suppliers.

capacities
Requires more knowledge about research processes for usability, and visual designers that can facilitate the content finding of meaningful use.

preconditions
Requires investments of CMIO networks and financing for external experts.

capacities
Conditions include a strong healthcare professional network that spans across healthcare institutions. It requires facilitators and usability researchers with experience in the field as well as healthcare.

preconditions
Requires stronger initiatives from healthcare institutions and the network of CMIO's. Time investment is the biggest factor.

Figure 11.2h Spread of most important aspects of every phase

***C:* Organizational Collaboration on Usability**
A system where **deliverables are well integrated** in the research and design processes across organizations

***D:* Collective Responsibility of Usability**
Build relations and cooperation based on **shared responsibility & common values**

request
This pillar of request articulation aims to integrate the request articulation into further design processes, an therefore transcend request articulation and become about shared research output.

value
Request articulation is focused on transcending the boundaries between research project and organizations. This means that request articulation can be transitioned into research findings

initiative
An initiative to facilitate Research Group - Software Supplier integration, focussing on shared resources and expertise to achieve common goals.

capacities
Requires strong negotiators and pressure from VWS. This phase focuses on integration, and decisions need to be made that enable that.

power
This aspect of power concerns resisting leverage of software suppliers and creating opportunities for research to be shared more effectively.

stakeholder
VWS needs to take the largest role in organizing the convening of stakeholders and using incentives and pressures to foster integration of processes

deliverable
Key deliverables are research data and insights that can be shared within the collective quest for meaningful use within healthcare data exchange. The process ends with sharing research data, the final product is still the sole responsibility of software suppliers

preconditions
VWS policy should be aligned to express a united front that shows commitment and asks that of software suppliers. Software market must be broken open to a degree to have leverage.

request
Request articulation, or the battle for usability becomes a collective effort.

value
Value is created by realising organizational collaboration on prioritizing usability.

initiative
The intitiative is creating a platform for collaborative decision making and power sharing. This ensures that the stakeholders can equally hold power and design their own future, without VWS having to take control.

capacities
Convenors are a capacity that is needed to bring organizations on a level playing field in a structural manner. Financing should be done minimally from VWS but found collectively, through insurers or else.

power
Focuses on fostering autonomy for stakeholders to make decisions, while simultaneously achieve a common goal, and sacrificing.

stakeholder
Stakeholder dynamics are equal and collaborative, VWS withdraws as leading policy maker but supports the collaborative platform where needed.

deliverable
The collective deliverable of initiatives is now not capped at requirements or research insights, but the complete implementation of healthcare data exchange with meaningful use.

preconditions
The collective prioritization of meaningful use is needed to bring forth a value shift that allows the system to operate radically different.

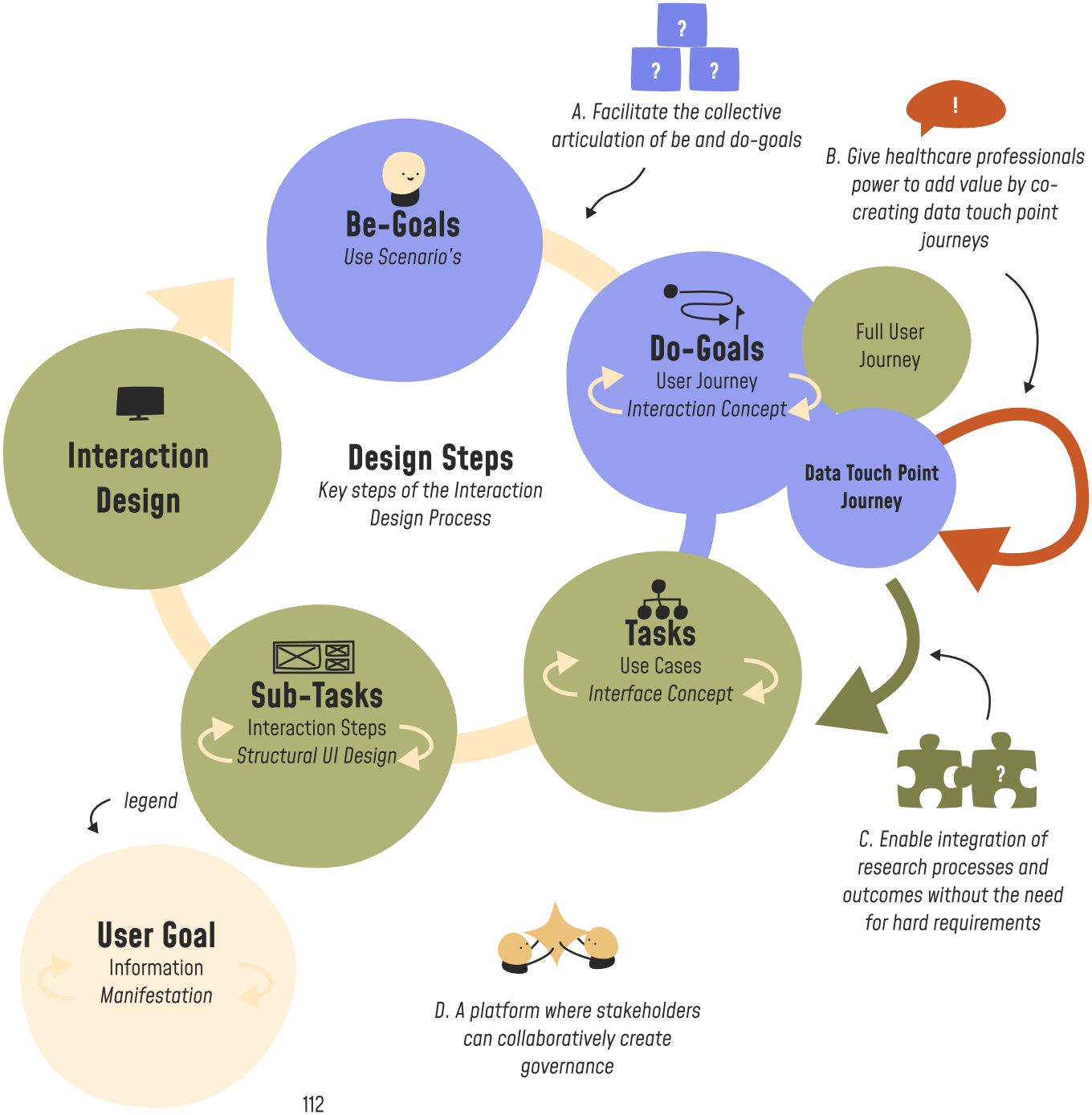
11.3 Impact on Design Process

The phases towards the future vision all have a different impact on the design and research processes that occur within organizations. Before the Designathon, the bulk of activities took place within the boundaries of software suppliers.

- With phase A, the process of design and research can be enriched by explicit and relevant data touch point journey and requirements.
- With phase B, regular healthcare professionals are added into the loop to enable the request articulation to become representative of a broader and deeper user group.
- In phase C, the processes of the Research group and software suppliers should be better integrated to ensure effective incorporation of knowledge and insights.
- In phase D, this process is upheld by stakeholders from the front-line to governance, provided by a platform of convening for shared value.

Reflection

While it could be understood from my propositions and strategy that there is a single determined path towards success. This is far from the truth, as "*the process and results of collective impact are emergent rather than predetermined [...] and these processes have a higher chance of succeeding where participation of numerous private, government and nonprofit organizations is required." (Kania & Kramer, 2011).* This is why I must stress that the *principles* of my research and strategy are perhaps more important than the specific processes I propose.



Recommendations
First Steps
12

With the insights and propositions presented in this report, it is crucial to outline the recommended initial steps to drive the vision forward effectively. These steps aim to ensure that the proposed changes are actionable, sustainable, and aligned with the overall goals of enhancing healthcare data exchange through a collaborative, user-centered approach.

Convening & Collaboration Model

Engage Stakeholders Early: The future vision outlined in this report is based on extensive interviews and evaluations with system experts, structured into four distinct phases. The first step is to actively involve the Ministry of Health, Welfare, and Sport (VWS) and other key stakeholders in adopting and internalizing this vision.

- Adopt the Collaboration Model Template: Begin by using the collaboration model template provided in Appendix Z. This model facilitates discussions around each phase, helping stakeholders identify their needs and the value they perceive in the collaborative vision.
- Inclusive Stakeholder Involvement: Include stakeholders who hold the least power in the current system. These individuals are often the primary beneficiaries of the proposed changes, and their insights are crucial for designing practical and impactful solutions.
- Early Birds: Involving stakeholders *before* decisions on policy are made lead to better iterated policy and trust among stakeholders. (Ansell & Gash, 2007).
- Facilitate a systematic engagement of all relevant stakeholders in the realization of the vision and its strategic objectives as part of an integrated digital health ecosystem at the national level (WHO, 2020)

Research also concludes that collective impact efforts sharpen the community's collective vision *(Kania & Kramer, 2011),* one of the key aspects we have discussed previously.

Involve Usability Experts

Integrate Usability Expertise into Policy Development: While it may seem unconventional for a policy organization to employ usability experts, their expertise is vital for advancing VWS on the user-centered organization scale, as highlighted by the Nielsen Norman Group (2021). These experts will not only provide a fresh perspective but also help embed a user-centered approach in policy development and implementation.

- Recruit Usability Experts: Begin by hiring or consulting with usability experts who have experience in healthcare systems and user-centered design. Their role will be to guide the development and implementation of policies that prioritize user needs and experiences.
- Establish User-Centered Practices: Usability experts should work with VWS to establish best practices for user-centered design, including conducting user research, usability testing, and iterative design processes that involve end-users at every stage.
- Training and Capacity Building: Organize training sessions for VWS staff and other stakeholders to build internal capacity for user-centered design, ensuring that the principles of usability are understood and applied consistently across projects.

Choose Powerful Evaluations

Effective Policy Evaluation: Choosing what to evaluate is a critical task for policy making. Evaluations form the basis of decision-making, allowing for the measurement of progress and value impact. Powerful evaluations be used to drive incentives and push change even further.

- Define Clear Evaluation Metrics: Establish clear and measurable evaluation metrics aligned with the goals of the initiatives. This includes user satisfaction surveys, usability metrics, clinical efficiency metrics, and compliance and safety records.
- Iterative Feedback Loops: Implement continuous feedback loops to refine usability standards based on real-world insights. Regularly review and adjust the evaluation criteria to ensure they remain relevant and effective.
- Transparent Reporting: Ensure transparency in the evaluation process by regularly publishing progress reports and updates. This helps maintain stakeholder engagement and trust.

Be Patient

Lastly I cannot stress enough that proposed transition will take time. Long-term results will not become visible instantly, and short-term collaboration goals may also take time to materialize. Initially, stakeholders may be reluctant and distrustful towards initiatives to convene on collective value creation, particularly software suppliers.

- Build Trust Gradually: Foster trust by consistently demonstrating the value and benefits of collaboration. Regularly communicate progress and successes to all stakeholders to build confidence in the process.
- Sustain Engagement: Maintain continuous engagement with stakeholders, addressing their concerns and feedback promptly. Ensure that all participants feel heard and valued throughout the process.

Investigate Leverage Points

I have defined 8 key leverage points which have a large effect on the functioning of the policy system. I have focused on one of these for this report. I believe there is still very much value to be had in addressing these other leverage points.

Ability to Reflect

- Implement Regular Reflection Sessions: Establish a routine schedule for reflection sessions involving all key stakeholders. This can be monthly or quarterly, depending on the project's scope.
- Facilitated Workshops: Utilize experienced facilitators to guide reflection workshops, ensuring that discussions remain focused and productive.
- Feedback Loops: Develop mechanisms for collecting feedback continuously and ensure that this feedback is reviewed and acted upon in subsequent reflection sessions.

Where the Field Goes with Issues

- Environmental Scanning: Regularly conduct environmental scans to identify emerging trends and issues in the healthcare field.
- Engagement with Experts: Establish partnerships with academic institutions, research organizations, and industry experts to stay informed about the latest developments.

Effective Meeting Goals

- Clear Agendas and Objectives: Ensure every meeting has a clear agenda and set objectives. Distribute this information in advance to all participants.
- Skilled Facilitation: Employ skilled facilitators to manage meetings, keeping discussions on track and ensuring all voices are heard.
- Actionable Outcomes: End each meeting with a summary of actionable outcomes, responsibilities, and deadlines to ensure follow-through.

Ability to Act on Reflections

- Resource Allocation: Ensure that adequate resources (time, funding, personnel) are allocated to implement the changes identified during reflection.
- Monitoring and Evaluation: Establish systems for monitoring the implementation of action plans and evaluating their effectiveness, making adjustments as needed.

Taking Small and Careful Steps

- Pilot Projects: Start with pilot projects to test new initiatives on a small scale before wider implementation.
- Incremental Implementation: Break larger projects into smaller, manageable phases, allowing for adjustments and learning at each stage.

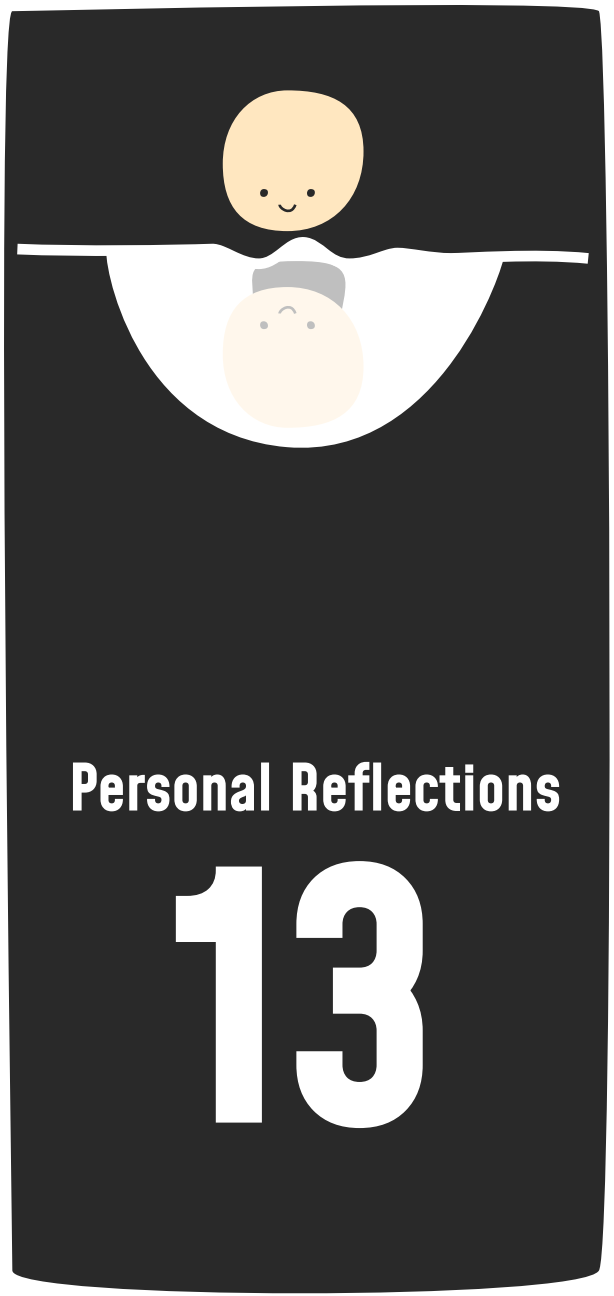
Knowing Where to Find the Right People

- Stakeholder Mapping: Conduct a thorough stakeholder mapping exercise to identify all relevant stakeholders, including those who might be less obvious.
- Networking: Invest in building and maintaining networks with key stakeholders across different sectors.

Meeting Design and Setup

- Diverse Meeting Formats: Use a variety of meeting formats (e.g., roundtables, breakout sessions, virtual meetings) to suit different purposes and participant preferences.
- Post-Meeting Reviews: Conduct post-meeting reviews to gather feedback on the meeting's effectiveness and identify areas for improvement.

These steps might collectively contribute to providing some direction towards a better functioning policy system.



Personal Reflections

13

The journey through this project was incredibly diverse, challenging and educational for me. I have never used so many new techniques in so many different contexts as I have in the past half year. For that I am grateful. These are some of my reflections on the journey I took.

Exploring a New Approach
Embarking on the journey to explore new methods and theories of systemic design has been both challenging and gratifying. Diving into systemic design required stepping outside the familiar territories of traditional design thinking. This shift in approach was initially daunting. I had to learn new methods, theories and mindsets. This was especially challenging on the project planning, since without prior experience in systemic design it was nearly impossible to predict what findings I would produce, and which methods would best fit further processing of these findings. I had to let go of the desire for close control and granular definitions of design goals in the beginning of the project.

Sensitivity
The political sensitivity inherent in public policy projects added another layer of complexity to this project. Navigating these sensitivities required a delicate balance of empathy, tact, and persistence. Engaging with stakeholders who were cautious about sharing information highlighted the intricate power dynamics and vested interests at play. It was crucial to build trust and foster open communication, ensuring that participants felt safe and valued in the process. This often meant creating a space where their voices could be heard without fear of repercussion and demonstrating a genuine commitment to addressing their concerns. The challenge was not only to gather relevant insights but also to read between the lines and understand the underlying motivations and constraints that influenced their participation.

Flexibility
One of the most profound lessons from this experience was the necessity of letting go of certainties in both process and design direction. Systemic design, by its very nature, thrives on adaptability and responsiveness to emerging insights. This required embracing ambiguity and being open to iterative cycles of learning and adaptation. Letting go of predetermined outcomes and being willing to pivot based on new information was both liberating and unsettling. I have also had to be very flexible regarding the scope and opportunities that I could take to further my project. The main challenge was always to balance systemic design with an interaction design that fits within that framework, and always being on the hunt for opportunities and leads to choose a scope.

Prototyping and Testing
From the start, I intended to test prototypes and learn through frequent testing. However, I quickly discovered that the scope and processes of systemic design made thorough and frequent testing challenging. The large, diverse, and sometimes remote organizations further complicated real-environment testing. After a few weeks, I realized that my approach required more background analysis and knowledge of specific issues. While researching for the Designathon, I found that testing in the real context wasn't feasible due to time and space constraints for an external researcher. Although I am pleased with designing sessions for healthcare professionals, I would have liked to explore and change internal organizational processes more. This endeavor, I now realize, requires much more commitment and time than I initially anticipated.

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Appendices

A

Appendix A: Original Project Brief

Project Title

Effective and empathetic co-creation between healthcare policy and the healtcare sector

Introduction

The Dutch healthcare system is transitioning towards digitalization to maintain quality and control costs. The Ministry of Health, Welfare and Sports (VWS) is developing the Wegiz (Wet elektronische gegevensuitwisseling in de zorg), a framework for digital patient information exchange. Currently, systems in hospitals, GP practices, and emergency care hinder seamless information transfer, often requiring manual transfer of documentation. The introduction of BgZ (Basisgegevensset Zorg) aims to standardize the exchange of essential information. This legislative process requires collaboration between VWS and healthcare sector stakeholders to ensure effective patient information exchange. VWS seeks to formulate policies reflecting political decisions, emphasizing clarity, completeness, and actionability. Healthcare professionals desire policies that integrate easily into their workflow, with their feedback considered and implemented. They advocate for policies that are practical and beneficial for both staff and patients. The common goal is a smoothly implemented policy, from VWS down to the healthcare workers executing it. However, current strategies are falling short in achieving this. To design effective policies, it's crucial to understand the disconnect between policy creation, communication, and implementation. Potential solutions include developing communication tools or strategies to foster empathy and understanding between VWS policymakers and healthcare workers. An essential step is mapping stakeholders' interactions, needs, and resources to identify friction points and potential solutions. Approaching this from an interaction designer's perspective could yield innovative and effective solutions. Design challenges may include bureaucratic obstacles within VWS, healthcare workers' demanding schedules, organizational rigidity, and technical and financial constraints. Understanding these limitations is vital for successful design outcomes.

Problem

The problem at hand is the alignment and communication between VWS and the healthcare sector. These problems could be caused by a number of factors. I will highlight some that have come to my attention. Firstly VWS and healthcare workers have very distinct experiences and knowledge on the matter. This means communicaiton must always bridge the gap between these worlds. Secondly, the organizational structure seems to inhibit direct communication between policy maker and end user, resulting in a kind of 'whispering circle' where inevitably information exchange is slowed and distorted. Third, the healthcare landscape is incredibly complex with every sector and institution having their own distinct needs and resources. Making and evaluating policy that works for everyone would be a difficult task even with streamlined communnication. Possible power struggles from trade associations (brancheorganisaties) to influence policy further impedes progress. These factors together lead to a situation where the different stakeholders have difficulty understanding and empathizing with each other. This lack of understanding generates even more friction and dissatisfaction about the presented policy.

Assignment

To prototype a toolbox to empower VWS policy makers working on BgZ to shape their policy creation process in such a way that VWS and healthcare workers can communicate and collaborate with intent, empathy and understanding towards each other.

Problem

My approach will be based on contextmapping to uncover the experiences of the different stakeholders in the context of policy communication. These insights can then be used with the VIP method to develop a shared vision that can lead to actionable concepts. I will use the contextmapping approach where I will observe, sensitize, interview and collaborate with users to uncover their experiences. Because I expect the worlds of VWS and healthcare workers to be vastly different, it is also crucial to make sure that my research results in a shared vision that can bridge those worlds. I aim to achieve this by developing a vision, interaction scenarios and concepts that can address the identified needs and opportunities of the different stakeholders. I intend to take a more hands on approach where I will start prototyping early in the process. This way I can get stakeholders input on a shared object. That way I can ensure future iterations are an actual reflection of stakeholder needs and fit the context it is meant to work in.

Appendix C: Evaluation Questions

Vragen vooraf

Hoeveel weet jij af van hoe het **beleidsproces** werkt om nieuwe software wettelijk en inhoudelijk af te stemmen?
1 o o o o o o o 7

Hoeveel ben jij in je dagelijkse werk bewust bezig met **gegevens uitwisseling** en ICT systemen?
1 o o o o o o o 7

Evaluatie

Open vraag
Wat vond je van de sessie?

Op basis van mijn design goals
In hoeverre vond je het makkelijk om weg te blijven van **techniek & UI?**
1 o o o o o o o 7

In hoeverre heb je er **vertrouwen** in dat jouw input goed ontvangen zou worden door de designathon?
1 o o o o o o o 7

Procesmatig
In hoeverre heb je de **onderwerpen** kunnen delen die je wilde?
1 o o o o o o o 7

Wat vond je van de **lengte** van de sessie?
1 o o o o o o o 7

In hoeverre vond je dat de **tools** je hebben geholpen om de tijdlijn in te vullen?
1 o o o o o o o 7

Zou je meedoen
Als je benaderd zou worden door een beleidsmaker, hoeveel tijd zou je willen geven om **input te leveren** op een manier zoals deze?
_____

Zou het helpen als de onderzoeker een korte tijd **meekijkt in jouw poli**?
1 o o o o o o o 7

Wat zou jij willen zien als beleid naar je **uitreikt**?
_____

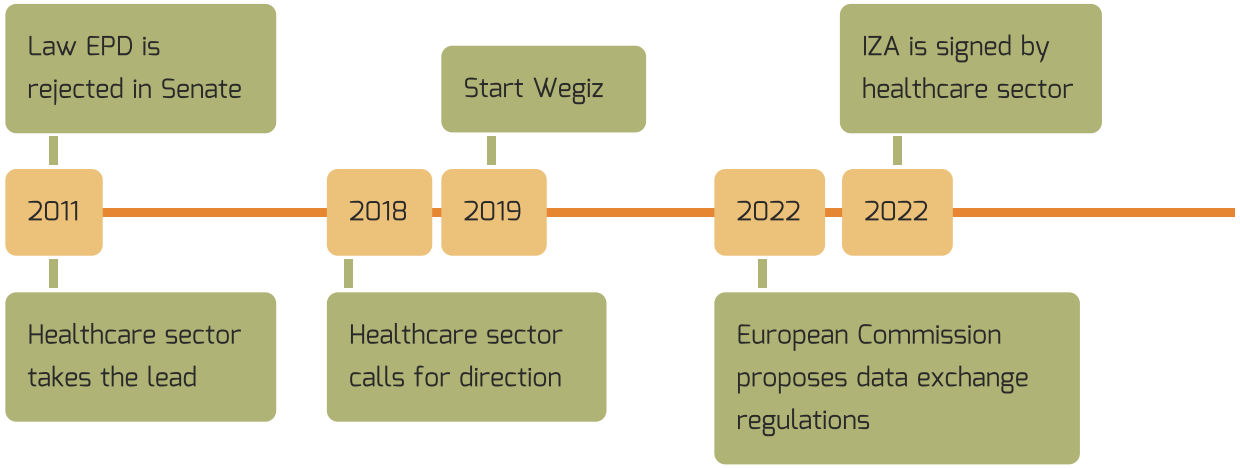
Heb je suggesties of dingen die je nog kwijt wil?

Appendix D: Timeline of BgZ

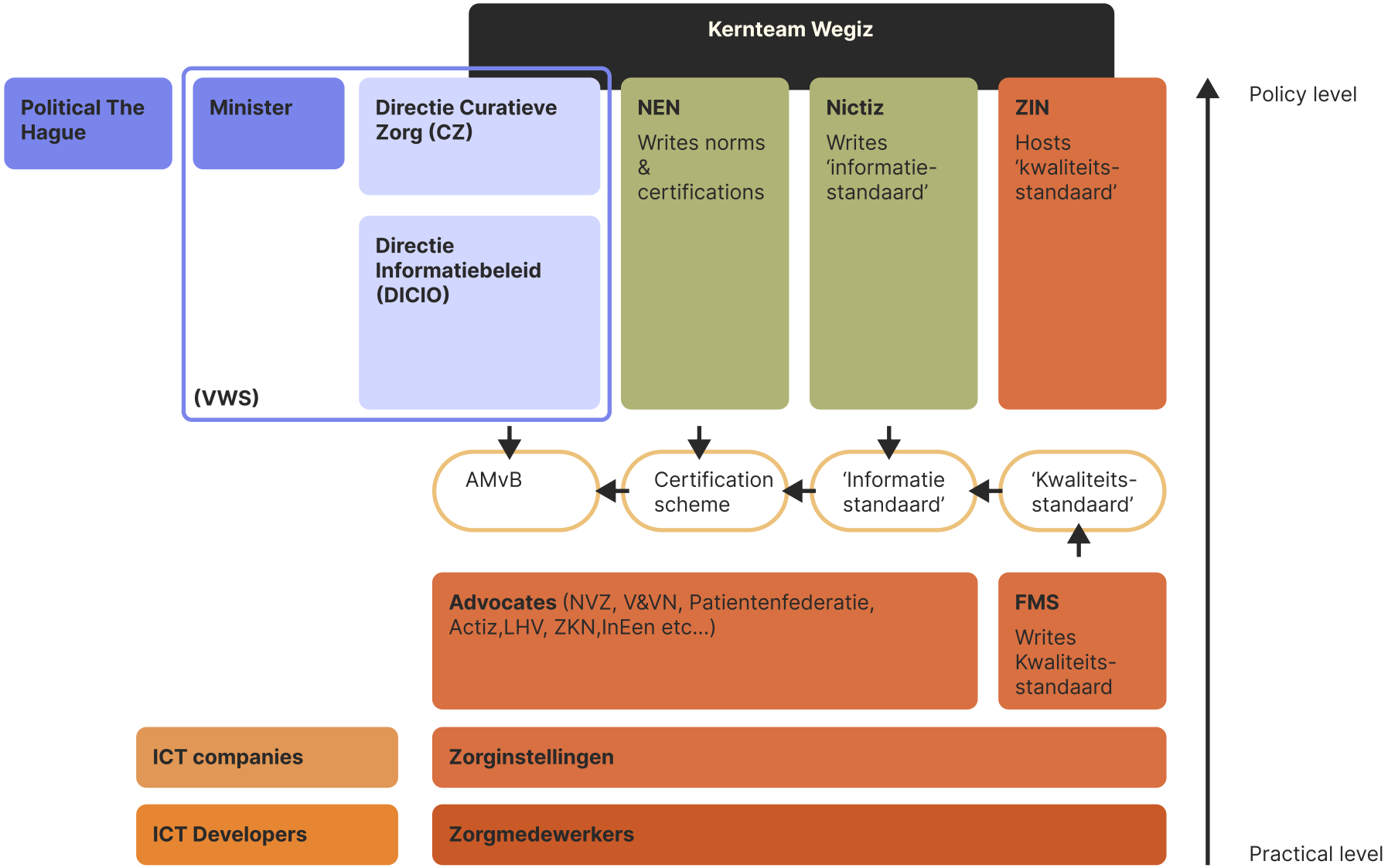
For a quick run-down to see the chronology in context let's look at the timeline (figure xx) To fully understand the current context we need to travel all the way back to 2011. De Eerste Kamer is voting on a law that would mandate a countrywide EPD (Elektronisch Patientendossier). It was not approved due to privacy concerns. The decision was made to withdraw government intervention and let the healthcare sector take the lead. In the meantime, several accords were signed by different parties, but follow through lacked. (xx example nuts?) Finally, in 2018 the healthcare sector and the House of Representatives call for the government to take control. VWS needs to take the lead and thus, in 2018 the Wegiz (Wet Elektronische Gegevensuitwisseling in de Zorg.) goes in effect.

Early 2022 the European commision proposes a data exchange regulation, the EHDS (see knowledge nugget). The concept is mostly similar to the BgZ, and the BgZ has since then tried to align with these future regulations to facilitate the transition.

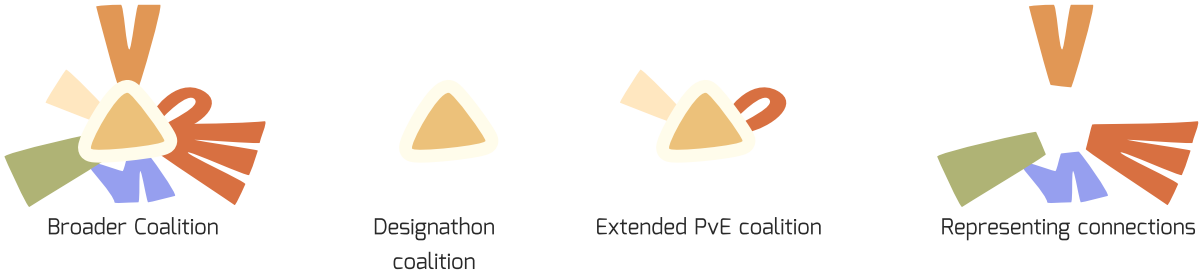
Then later in 2022 the IZA is signed, which then refers to the BgZ.

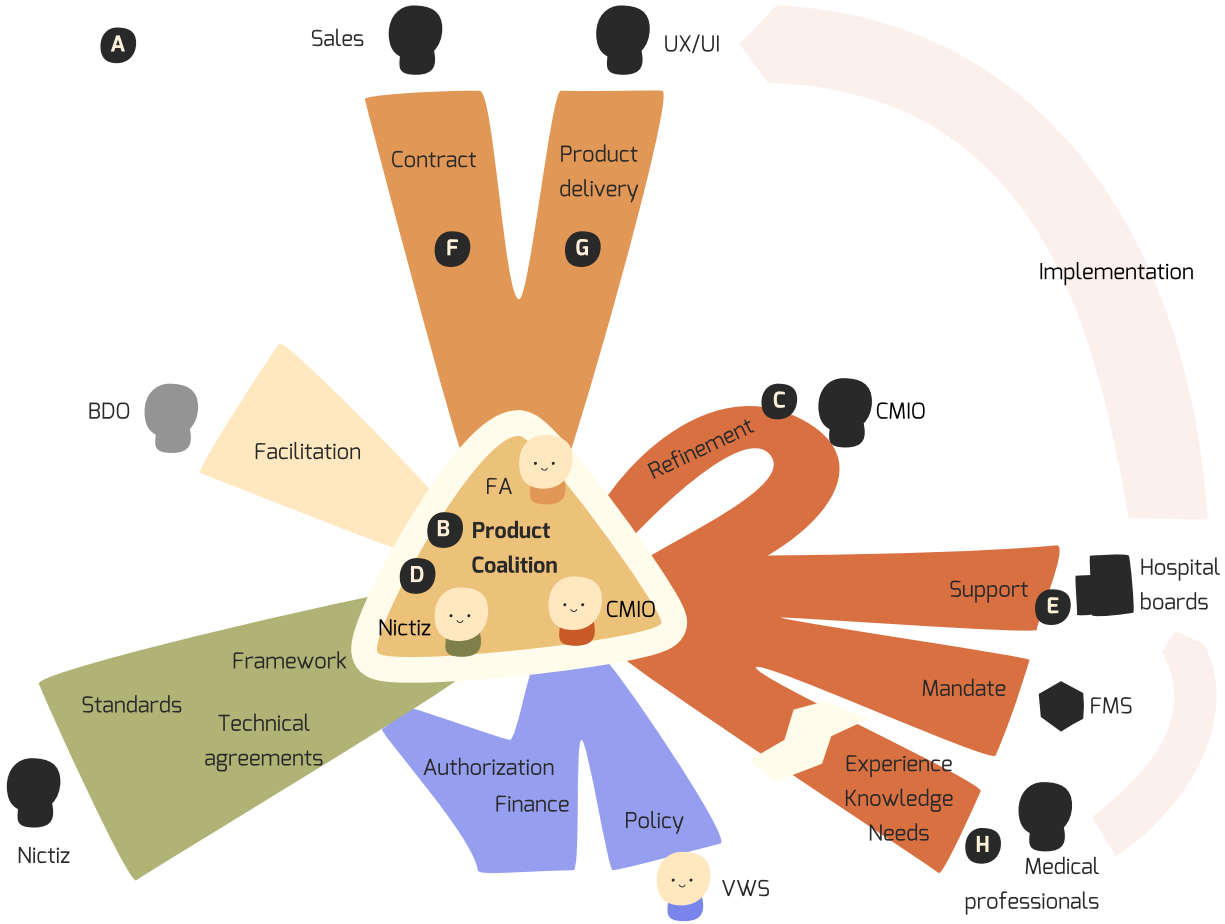


Appendix E: Wegiz



Appendix F: Designathon Actors





Appendix G: ICPS

To summarize, there are 4 process which need to be happening in the Integrated Creative Problem Solving (iCPS) frame. They are a frame for looking at innovation processes (Delft innovation method). There is Project management, content finding, information finding and acceptance finding.

- Content finding is the generation of ideas, concepts and decisions. Anything that is in the memory of participants.
- Information finding is the process of gathering information from the outside, like interviewing or research. This can then complement the information finding.
- Acceptance finding is the process of gaining support from relevant stakeholders.

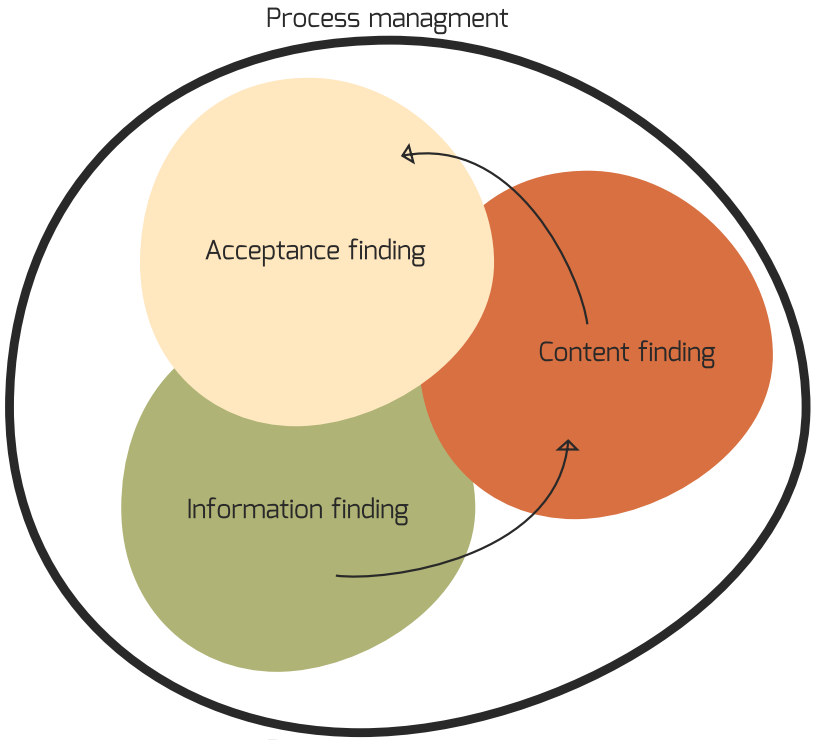
So what you see in the designathon process, is that acceptance finding is limited because of the limited reach of the project.

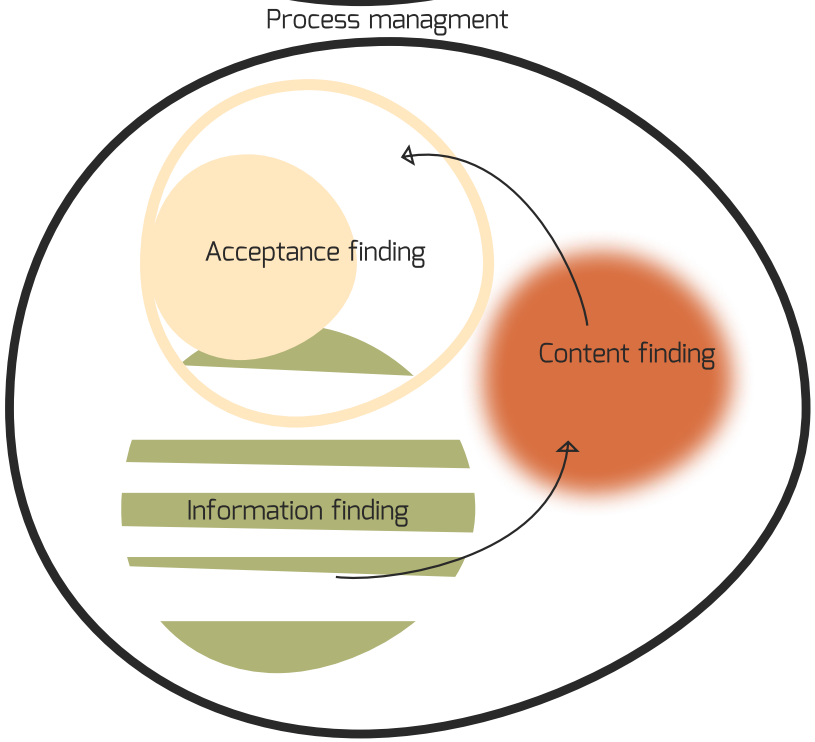
Content finding is limited by meeting setup and management. Observations have shown that there are several xxxx

Information finding is

Main organizational characteristcs for innovation are (delft innovation method)

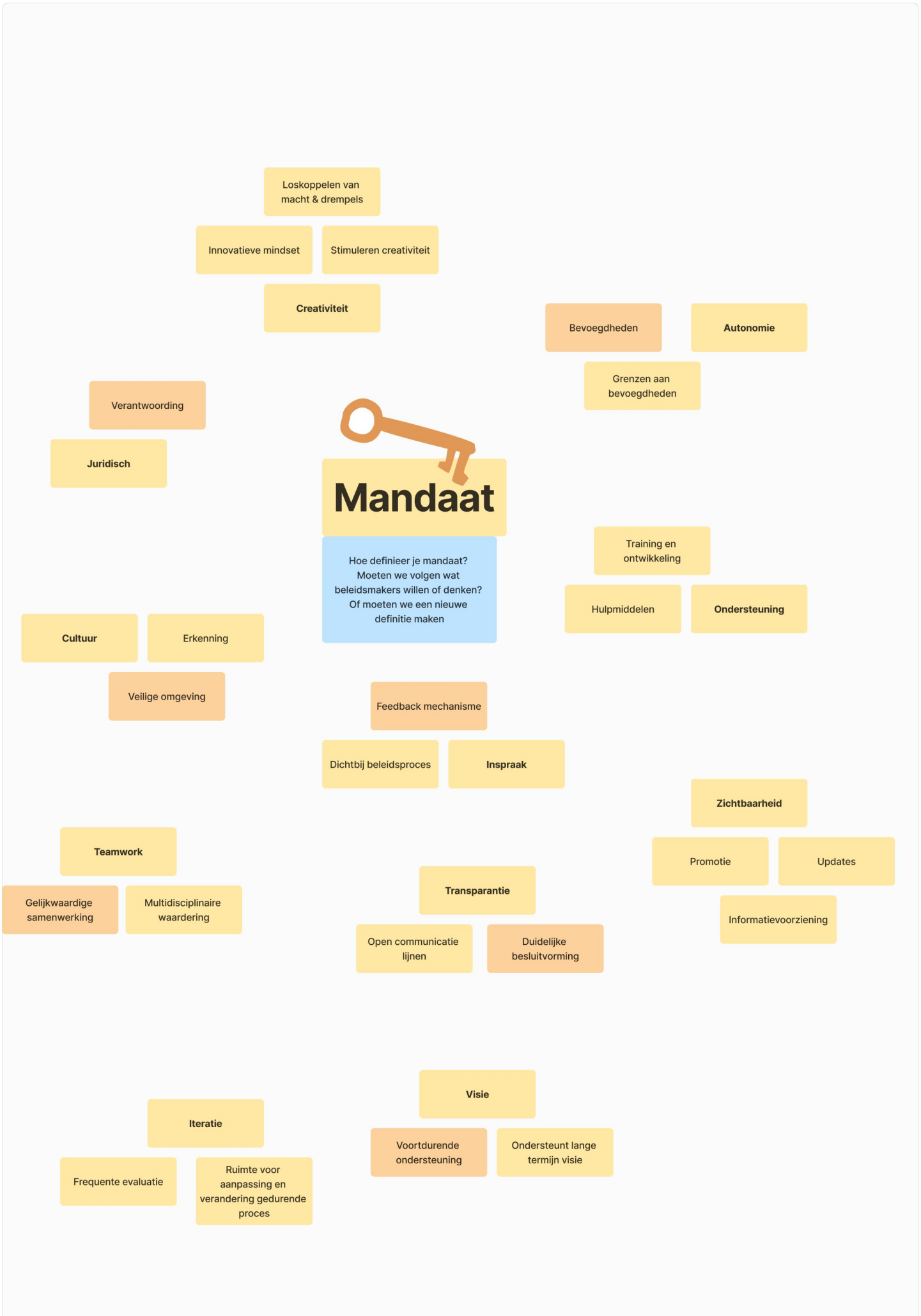
- insight in market needs
- attention to marketing and promotion
- use of external expertise and knowledge
- product champions
- systematic way of innovating



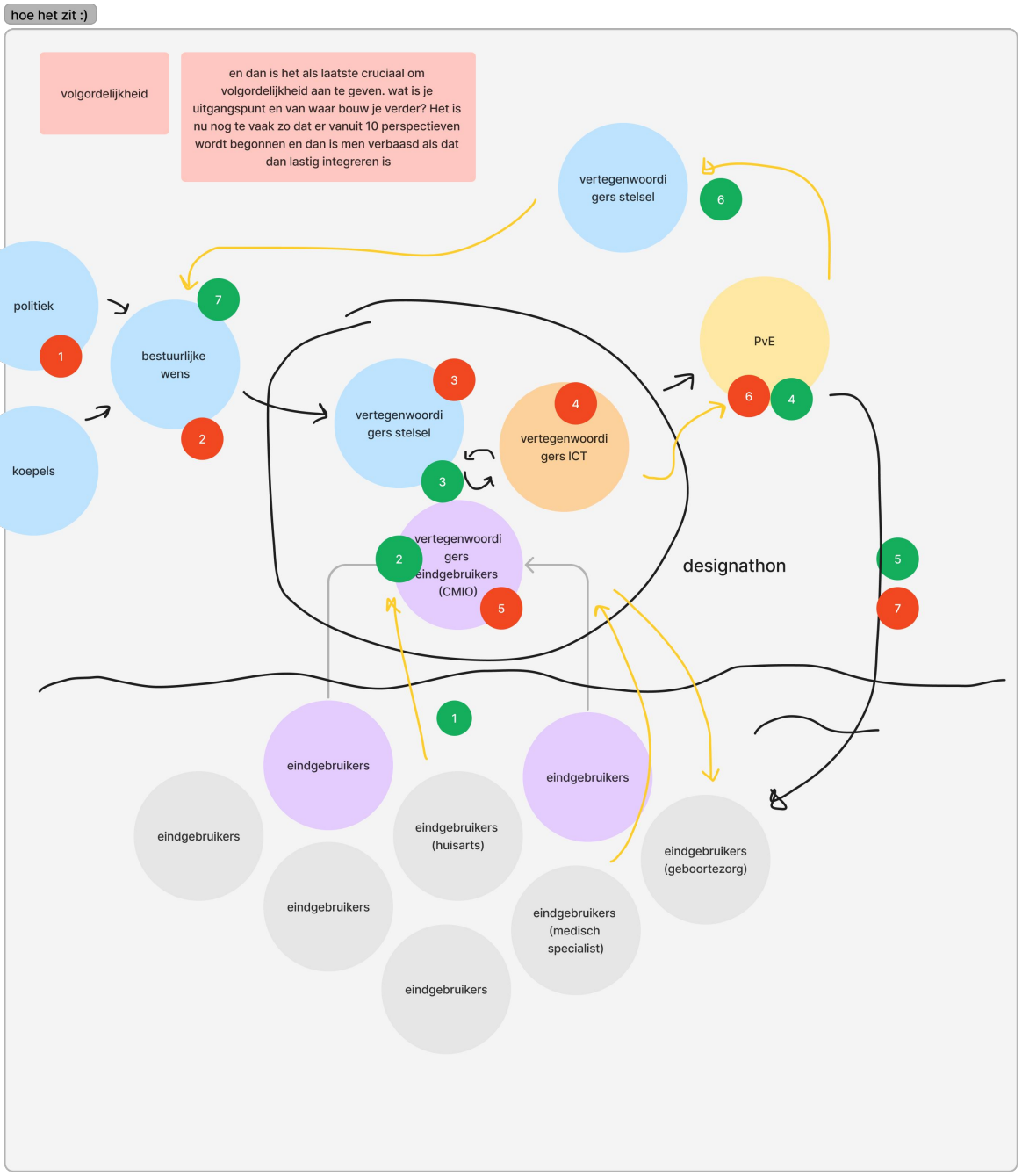


Appendix H: Mandate

Verder uitwerken van mandaat

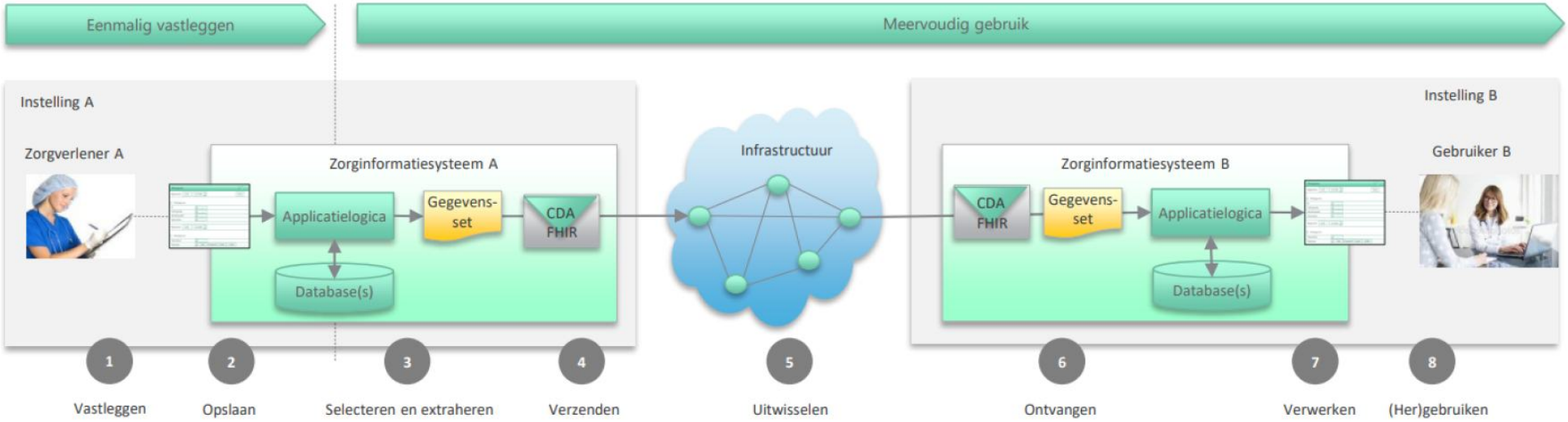


Appendix I: Designathon Analysis



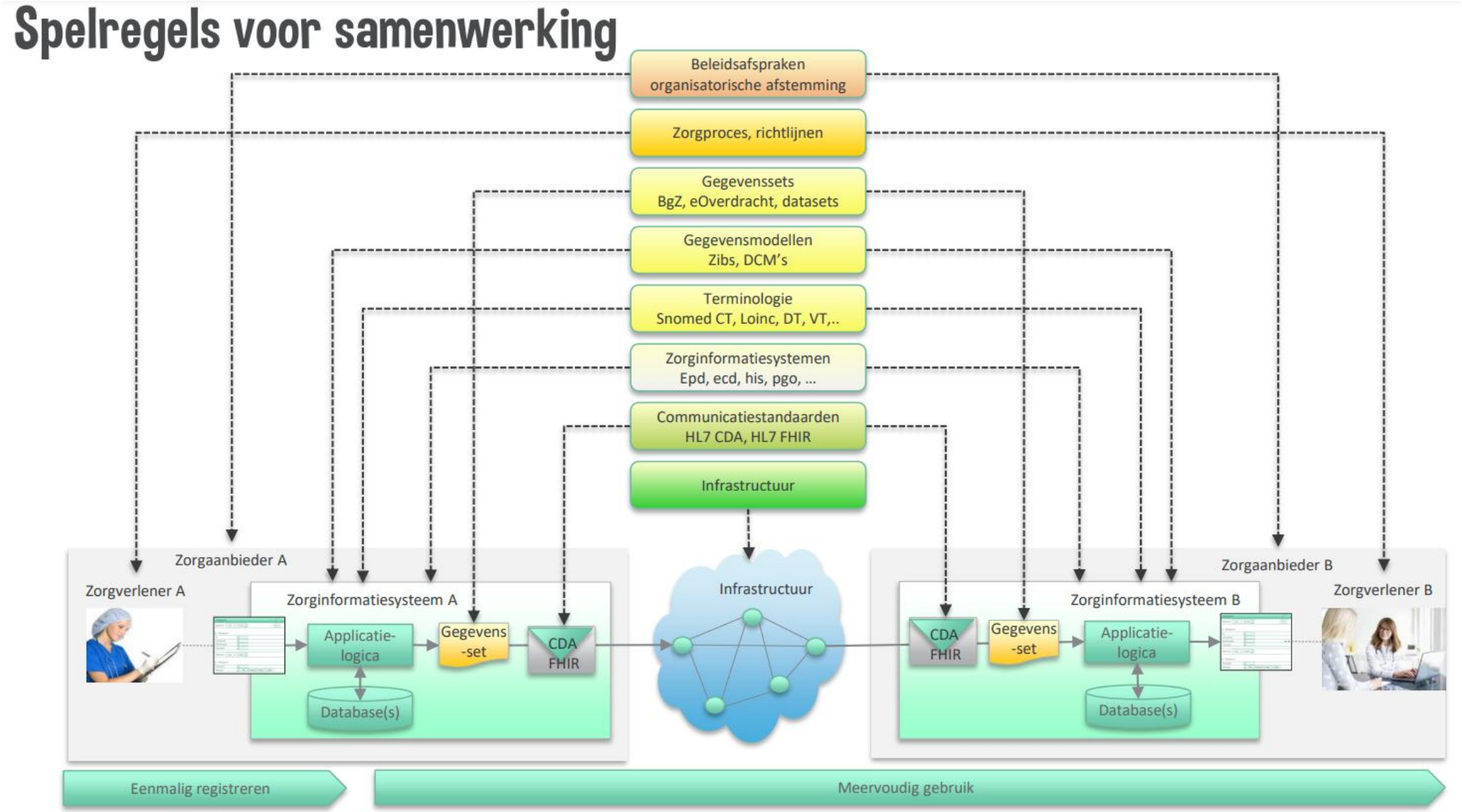
Appendix J: Implementation Model (Nictiz.nl)

Implementatiemodel - 8 stappen

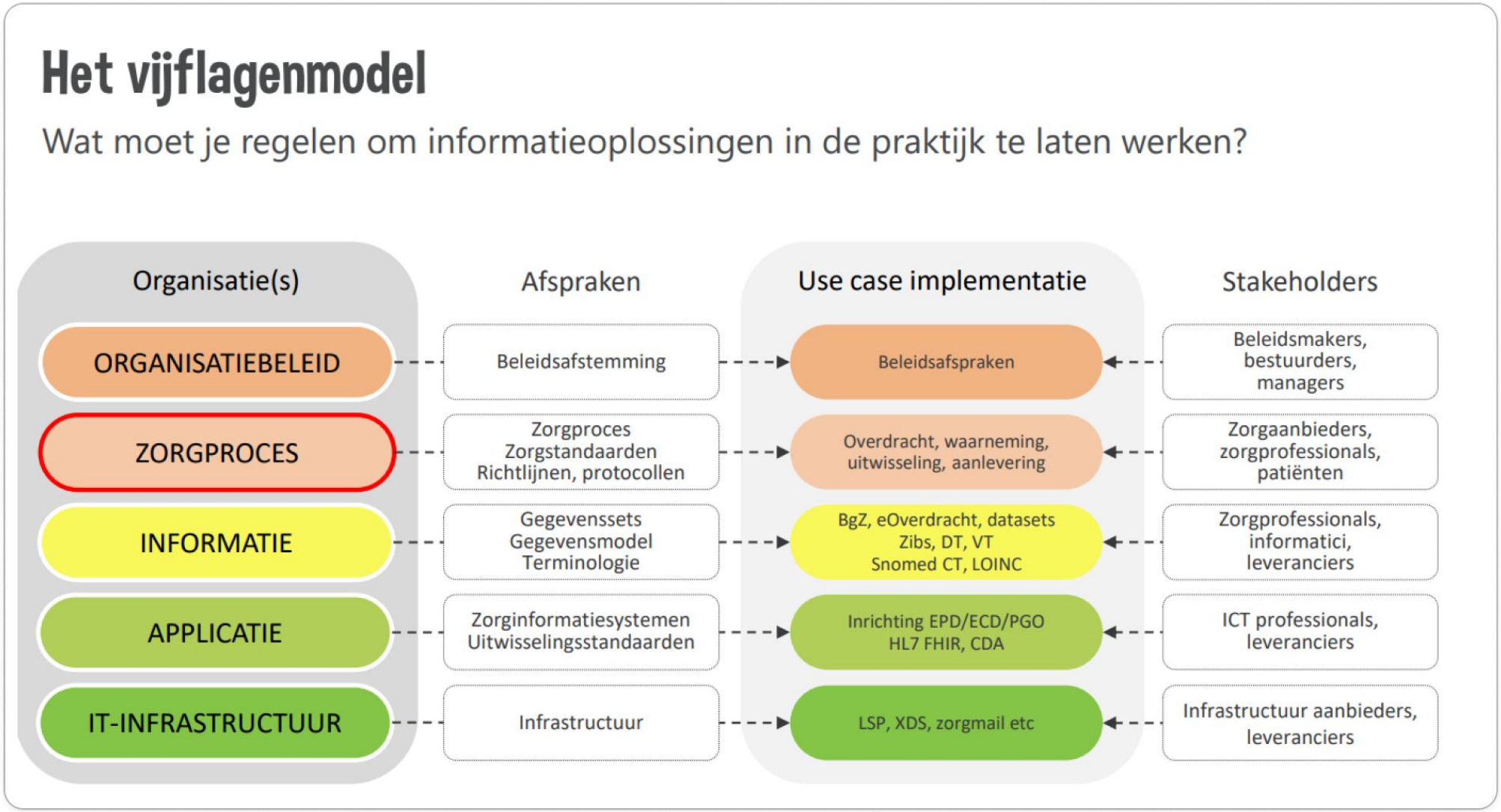


- Stappen 1 en 8 gaan vooral over zorgverleners/gebruikers (“zorg”)
- Stappen 2 t/m 7 gaan vooral over de systemen (“technisch”)
- Met stappen 1 t/m 4 bouwen we de nodige ervaring op
- Stappen 5 t/m 8 zijn nog heel nieuw

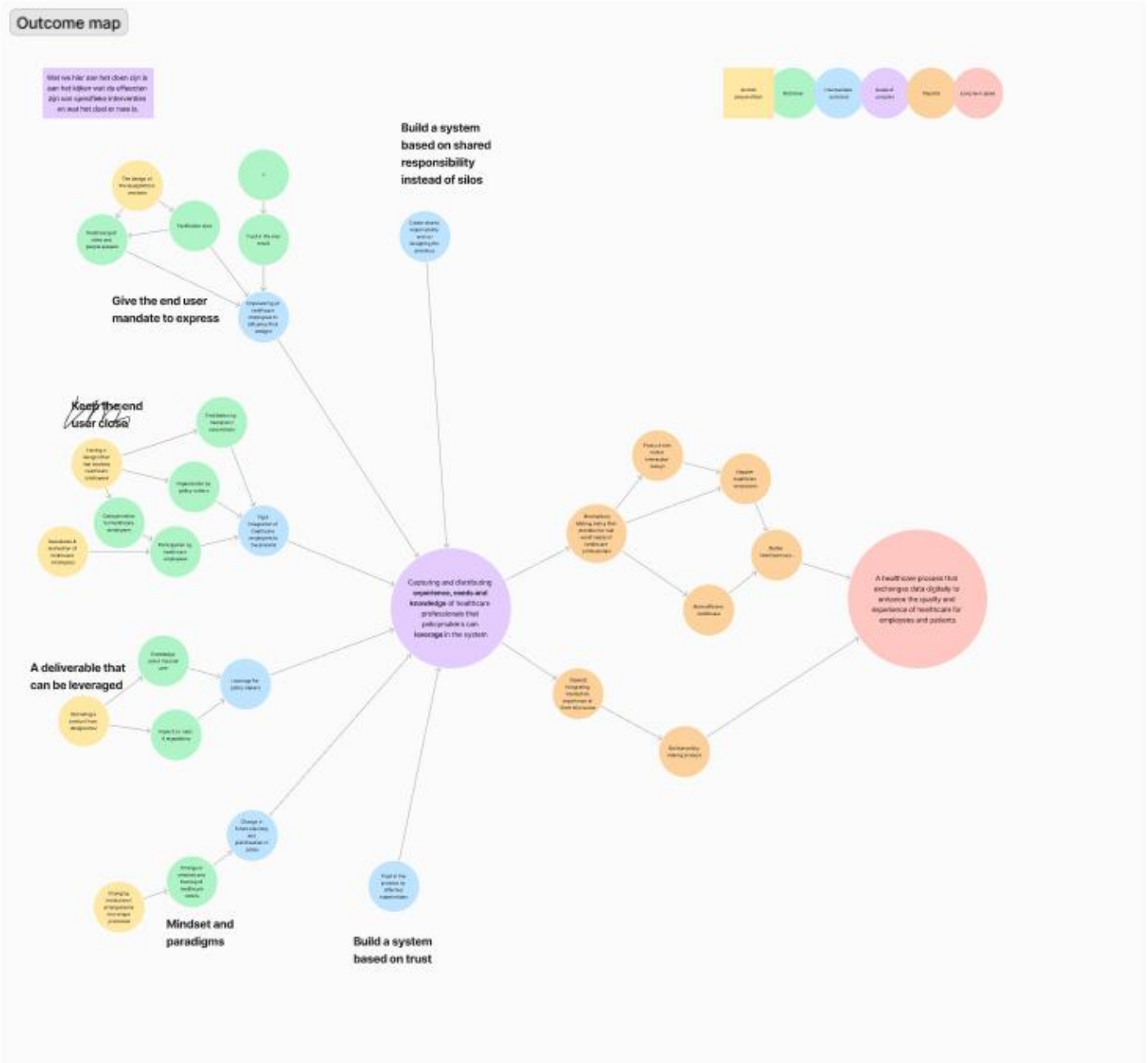
Appendix J: Implementation Model



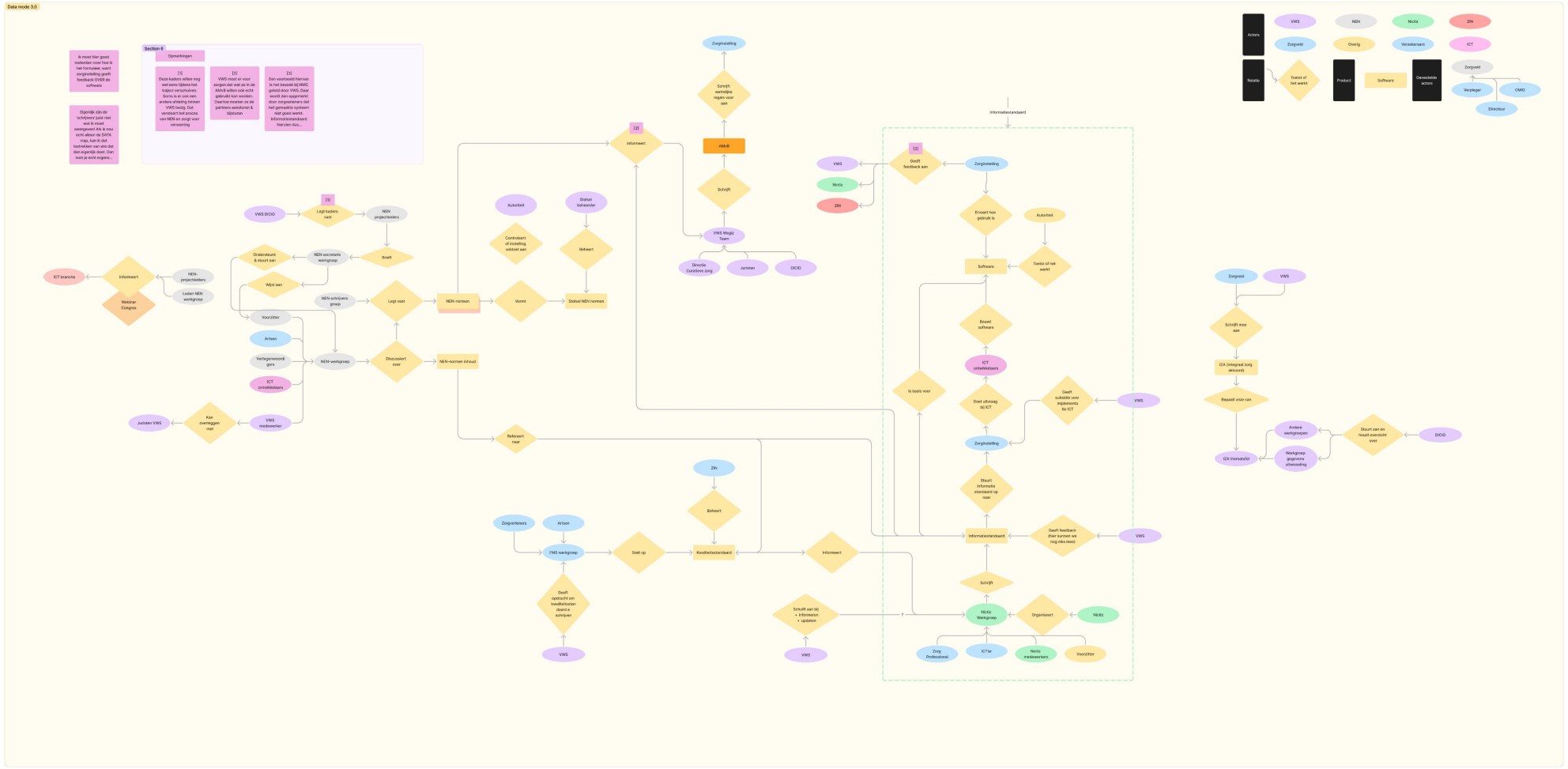
Appendix J: Implementation Model



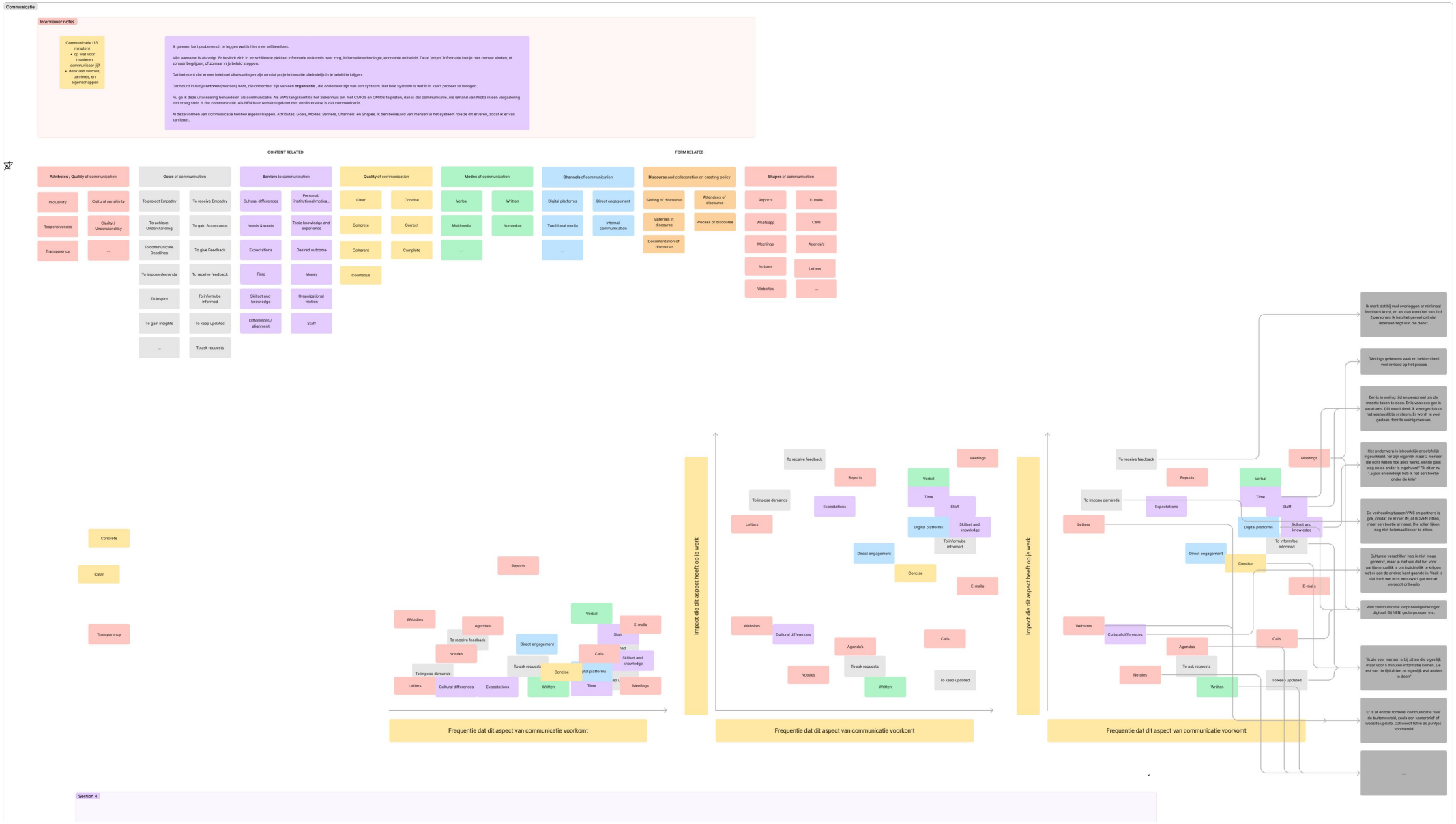
Appendix K: Original Outcome Map



Appendix L: Data Model for Ecology



Appendix M: Original observation results



Appendix N: Flows and processes

What data needs to be exchanged

- The FMS drafts the kwaliteitsstandaard, outlining what information must be exchanged to facilitate quality healthcare
- Nictiz builds an information standard based on what needs to be exchanged
- Software supplier builds software based on information standard

What boundary conditions must we comply with?

- Agreements with field are made about common vision, for example through IZA.
- National and international legal frameworks are guarded by VWS

How should data be exchanged technically

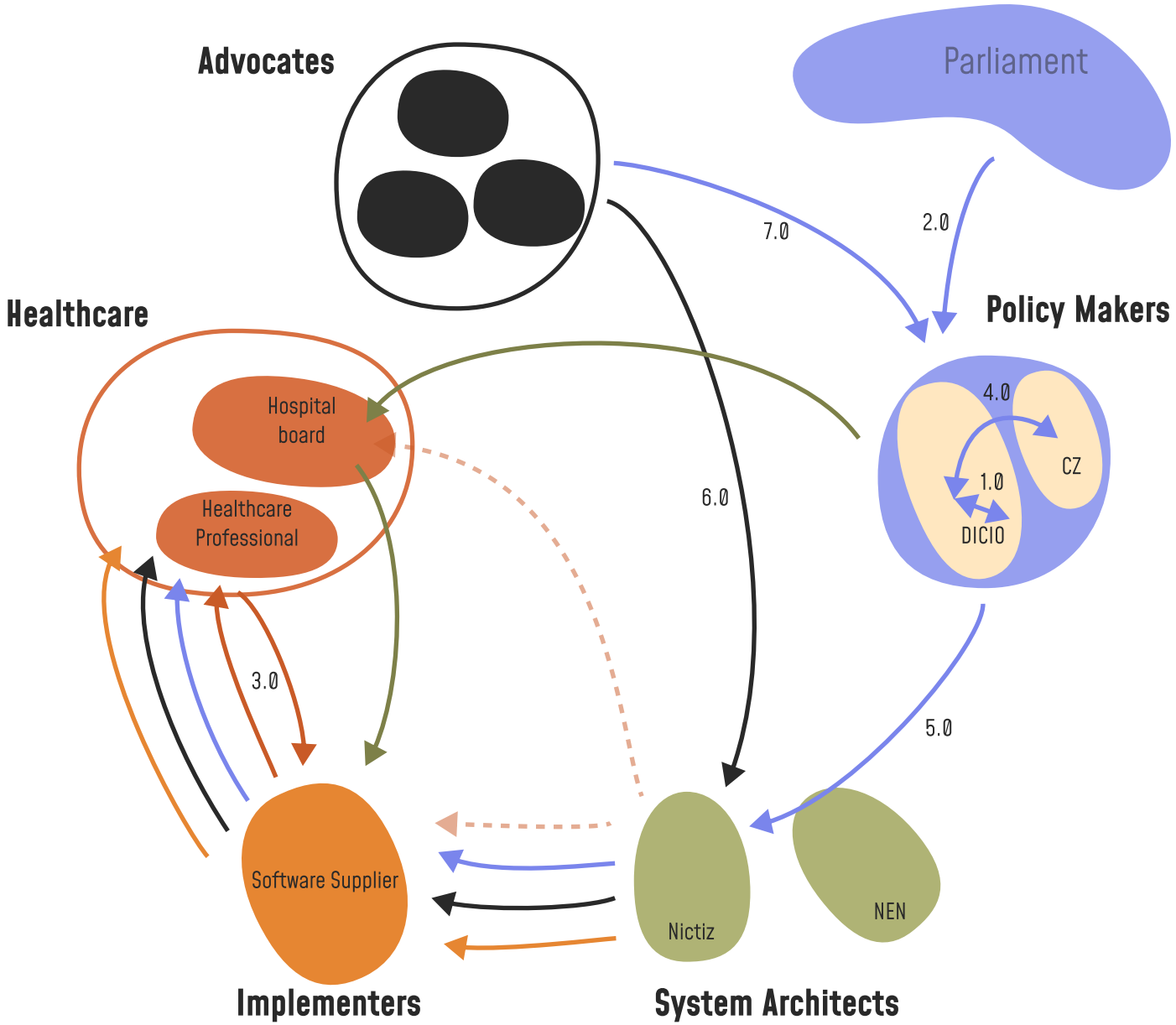
- Nictiz writes the informatiestandaard, outlining how data exchange needs to be technically standardized
- Software developers integrate this informatiestandaard

How should data be exchanged user friendly?

- Software developer is responsible for creating a usable product within their client relations with healthcare

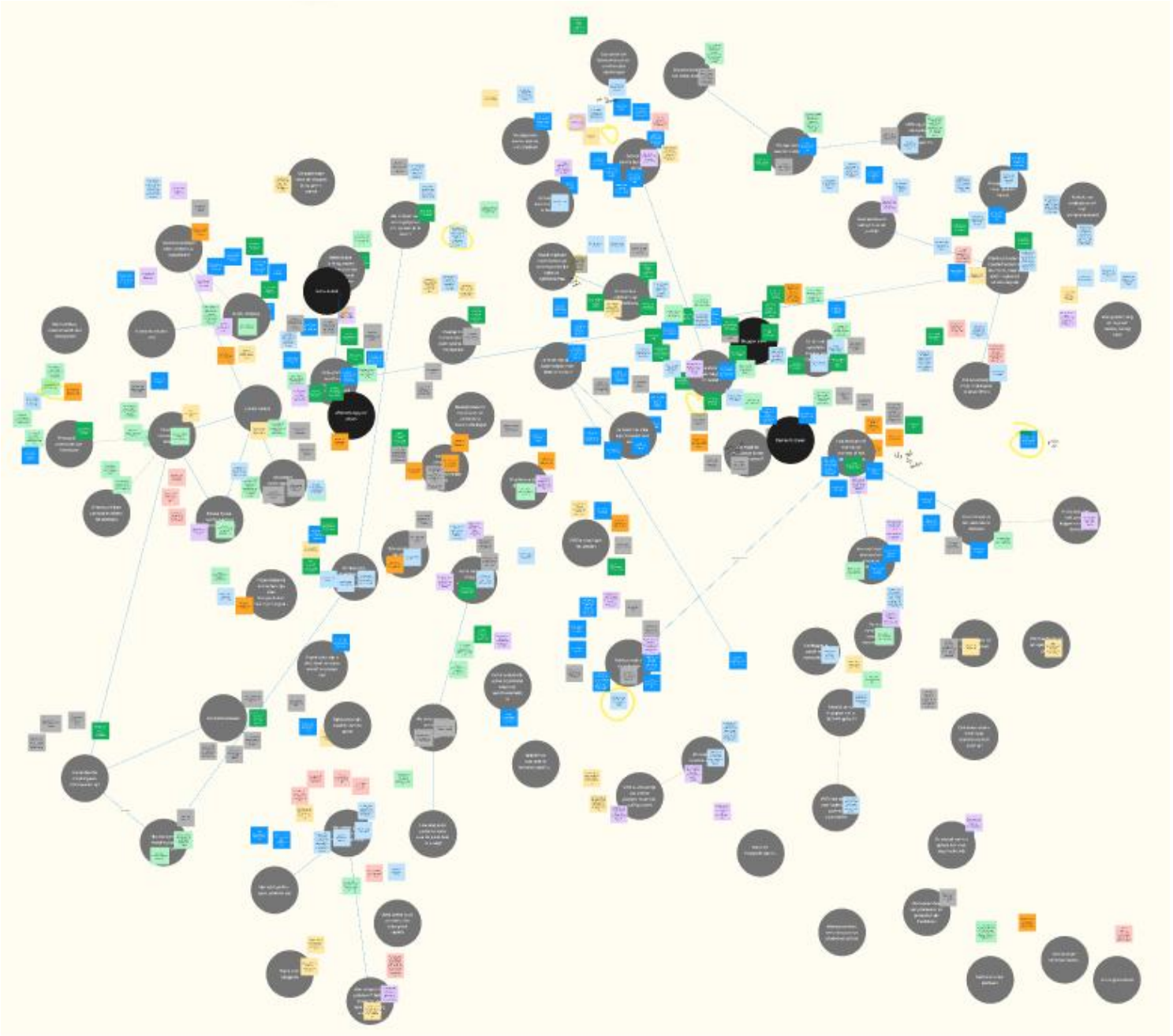
How should data be exchange be financed?

- VWS finances initiatives for now through VIPP 5.
- Hospitals purchase software from supplier.



Appendix 0: Network Analysis

Unfortunately the file is too large to share here. If you are interested you can take up contact with me.



De grote 8 themas

C. Interventies en **bijsturen leidt tot verwarring** en onvrede over proces

Shape of communication & managing expectations

Intervening in process

Knowledge gaps slipping in

6. Amount of confusing and time consuming interventions

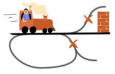
3. Vastleggen in schrift wekt verwachtingen

105. Clarity of interventions

5. VWS krijgt van alle kanten vragen, opmerkingen en klachten

2. Management of expectations

7 Delayed information or knowledge impacting process



H. Lage mate van **iteratief werken** leidt tot verassingen, hoge kosten en matige integratie van bronnen

Taking small steps

??Gewenste resultaten

Linear thinking and surprises

13. Reflecting on small steps

8. Ability to take smaller steps

9. Testing large scale

7. Vaak worden we verrast door de praktijk

14. Prevalence of linear thinking

D. **Hierarchische en versnipperde instellingen** zorgen voor veel dubbele lijnen en ingewikkelde machtspelletjes

Power relations

Taking the reins

Roles of VWS

Conflict resolution

16. Role of VWS to assign

23. Role of VWS to steer

21. Amount of rules and regulations

20 + 24. Distribution of autonomy

Obvious power relations

18. Ability to take the reins

18. Taking the reins

107. Conflict resolution through escalation

106. Conflict resolution through collaboration

19. Role of VWS to set boundaries and expect certain results

108. Having control and oversight from management

109. Need for sticks to motivate field

G. Intentie tot **implementatie** is schommelend en inzet vanuit de zorg is wisselend

Reins and steering from policy makers

Field prioritization

Effect on participation

41. Need for field to prioritize

32. Intention to implement policy

33. Motivation for field to put in effort

40. Need for field to have munitions to invest

34. How do you make and argue policy choices?

39. Feeling of reins from policy makers

?? Effect on participation

B. Reflectiviteit kan beter worden geïntegreerd in organisatie & samenwerking

Reflecting on internal structure

Reflecting on processes and results externally

23. Ability to reflect to other organizations

100. Ability to act on reflections from other organizations

13. Ability to reflect

57. Ability to act on reflections

F. Benodigde **kennis over de context** is versnipperd, vluchtig en enorm

Difficult to grasp all knowledge

Difficult to gather people with right knowledge

Effective use of limited staff

44. Amount of context and knowledge required

45. Amount of knowledge required

48. Proper knowledge being available

49. Spread places of knowledge

110. Using staff effectively

111. Having enough staff

A. Invulling van overleg is mensen erbij halen die niet nodig zijn & mensen niet erbij halen die wel nodig zijn

Shape of meetings

Connections

Cost of meetings

Communication

55. Meetings online or hybrid

51. Difficulty to be at meetings

101. Structure of meetings

52. Need for personal connections

56. Vulnerability of personal connections

102. Participants in meetings (amount and type)

43. The amount of meetings to get in one line

50. Need to be present at many meetings

103. Implementing proper form of communication

104. Short communication loops

E. **Eilandjes** van beleid, afdelingen, partners en zorgveld hebben moeite tot elkaar te komen

Missing insight and empathy for

58. VWS mist kennis over kaders van partner organisaties

59. Moeilijk om te begrijpen wat er bij VWS gebeurt

60. Wens tot integratie van processen

61. Er zijn ook specifieke kanalen om afstand te verminderen

62. Er is afstand tussen zorgveld en beleid

63. Connecties cultiveren op beleidsniveau

64. Wens tot integratie van processen

65. Het is lastig het veld zover te krijgen om mee te denken

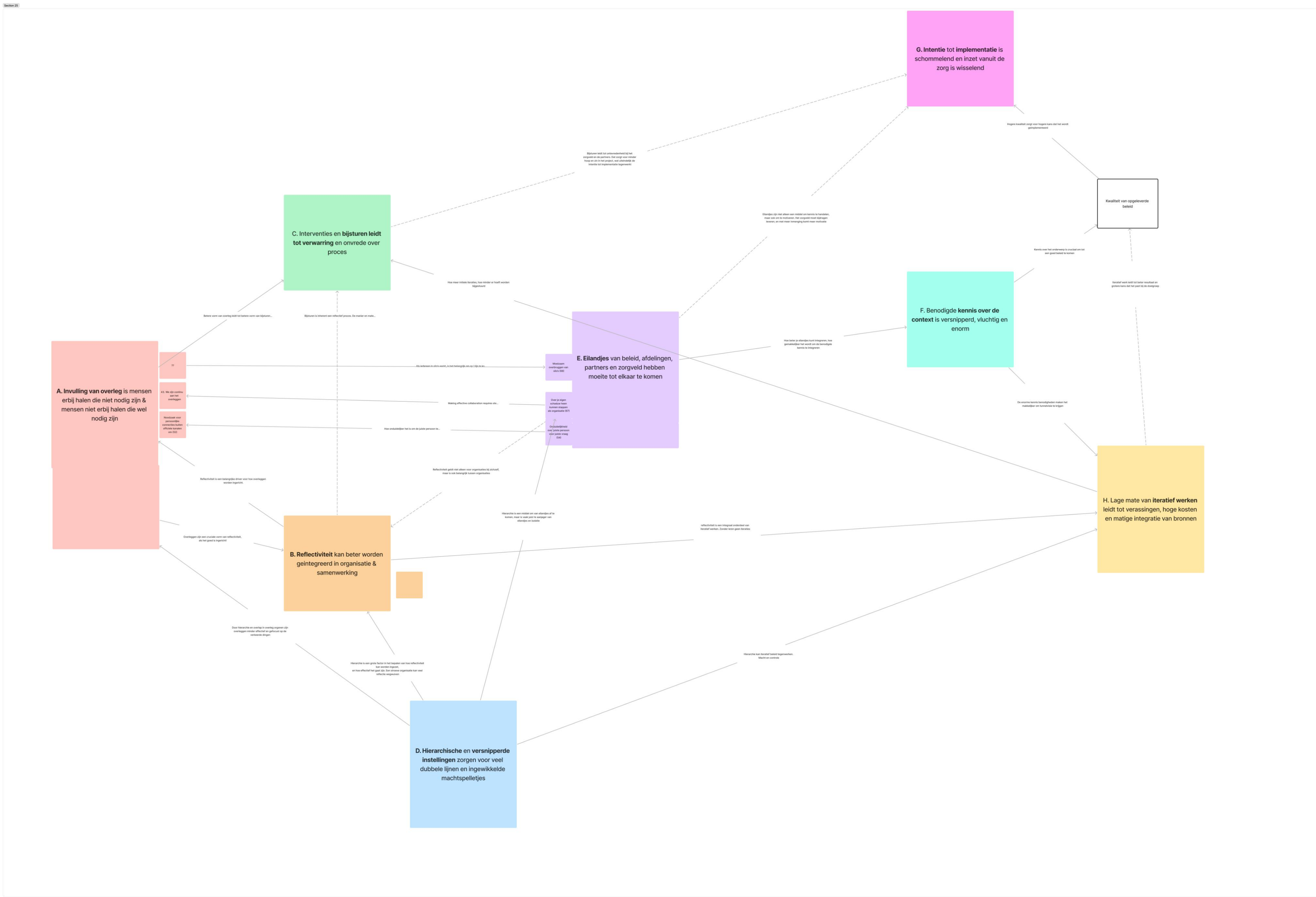
66. Onduidelijkheid over loketten en verantwoordelijkheden op beleidsniveau

67. Over je eigen schaduw heenstappen

68. Moeizaam overbruggen van silo's

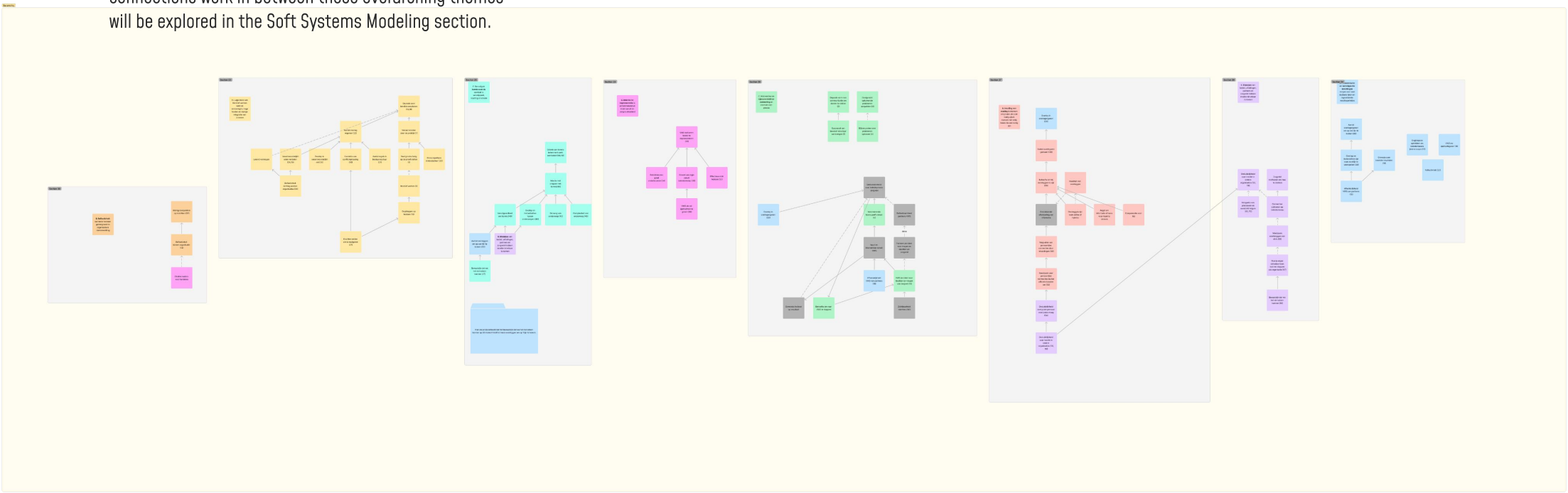
69. Bewustzijn dat we het niet alleen kunnen

70. Het is lastig een integraal overzicht te krijgen


Section 25
G. Intentie tot implementatie is schommelend en inzet vanuit de zorg is wisselend
Hogere kwaliteit zorgt voor hogere kans dat het wordt geïmplementeerd
Bijsturen leidt tot ontevredenheid bij het zorgveld en de partners. Dat zorgt voor minder hoop en zin in het project, wat uiteindelijk de intentie tot implementatie tegenwerkt
Kwaliteit van opgeleverde beleid
Eilandjes zijn niet alleen een middel om kennis te handelen, maar ook om te motiveren. Het zorgveld moet bijdragen leveren, en met meer inmenging komt meer motivatie
C. Interventies en bijsturen leidt tot verwarring en onvrede over proces
Kennis over het onderwerp is cruciaal om tot een goed beleid te komen
Hoe meer initiele iteraties, hoe minder er hoeft worden bijgestuurd
Iteratief werk leidt tot beter resultaat en grotere kans dat het past bij de doelgroep
F. Benodigde kennis over de context is versnipperd, vluchtig en enorm
Betere vorm van overleg leidt tot betere vorm van bijsturen...
Bijsturen is inherent een reflectief proces. De manier en mate...
Hoe beter je eilandjes kunt integreren, hoe gemakkelijker het wordt om de benodigde kennis te integreren
??
Als iedereen in silo's werkt, is het belangrijk om op 1 lijn te ko...
Moeizaam overbruggen van silo's (68)
E. Eilandjes van beleid, afdelingen, partners en zorgveld hebben moeite tot elkaar te komen
A. Invulling van overleg is mensen erbij halen die niet nodig zijn & mensen niet erbij halen die wel nodig zijn
43. We zijn continu aan het overleggen
Making effective collaboration requires ste...
Over je eigen schaduw heen kunnen stappen als organisatie (67)
De enorme kennis benodigheden maken het makkelijker om tunnelvisie te krijgen
Noodzaak voor persoonlijke connecties buiten officiele kanalen om (52)
Hoe onduidelijker het is om de juiste persoon te...
Onduidelijkheid over juiste persoon voor juiste vraag (54)
Reflectiviteit geldt niet alleen voor organisaties bij zichzelf, maar is ook belangrijk tussen organisaties
Reflectiviteit is een belangrijke driver voor hoe overleggen worden ingericht.
H. Lage mate van iteratief werken leidt tot verassingen, hoge kosten en matige integratie van bronnen
Hierarchie is een middel om van eilandjes af te komen, maar is vaak juist te aanjager van eilandjes en isolatie
reflectiviteit is een integraal onderdeel van iteratief werken. Zonder leren geen iteraties
Overleggen zijn een cruciale vorm van reflectiviteit, als het goed is ingericht!
B. Reflectiviteit kan beter worden geintegreerd in organisatie & samenwerking
Door hierarchie en overlap in overleg organen zijn overleggen minder effectief en gefocust op de verkeerde dingen
Hierarchie is een grote factor in het bepalen van hoe reflectiviteit kan worden ingezet,
en hoe effectief het gaat zijn. Een stroeve organisatie kan veel reflectie wegwuiven
Hierarchie kan iteratief beleid tegenwerken.
Macht en controle
D. Hierarchische en versnipperde instellingen zorgen voor veel dubbele lijnen en ingewikkelde machtspelletjes

If we want to go into more detail an influence map is a useful tool. The tool is designed to articulate the depth of influences to gain a better understanding of different factors.

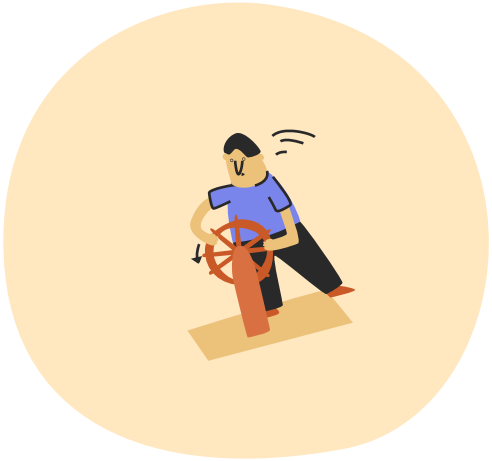
Chains of influences are then linked to that question, each factor signifying a deeper level of influence than the previous. The tool also allows influences to be drawn skipping multiple levels to indicate a multitude of influenced or influencing factors. For added clarity, the influences are mapped to the 8 overarching themes. Even though factors are related across overarching themes, the focus lies in exploring them within overarching themes to maintain a reasonable scope for analysis. How connections work in between these overarching themes will be explored in the Soft Systems Modeling section.



Appendix P: Overarching Themes

A. Interventions and Steering Cause Confusion, Delays, and Discontent in the Process

The interventions and steering in healthcare policy are meant to improve processes and outcomes, but they often result in confusion, delays, and dissatisfaction among stakeholders. This is due to several factors including the frequent changes in directives, lack of clear communication, and the overwhelming volume of documentation required. These interventions can create unrealistic expectations, as stakeholders may assume that documented plans will be promptly executed, leading to frustration when progress is slow. Additionally, large-scale testing without sufficient iterative steps can result in unexpected challenges and increased costs.



Themes

- Amount of Confusing and Time-Consuming Interventions: Frequent changes and interventions without clear direction cause stakeholders to feel overwhelmed and uncertain.
- Documenting Things Creates Expectations: Extensive documentation creates an expectation of immediate action, which is often not met, leading to frustration.
- Testing Large Scale: Large-scale testing of initiatives without iterative steps leads to surprises and high costs.
- Reflecting on Small Steps: There is a need to reflect on smaller, manageable steps rather than large, overwhelming initiatives.
- Proper Knowledge Being Available: Ensuring that all necessary knowledge is available to stakeholders is crucial, yet often lacking.
- Difficulty to Be at Meetings: Logistical challenges in attending meetings contribute to communication gaps.
- Clarity of Interventions: Clear communication regarding the purpose and expectations of interventions is often missing.

"There is a TA missing in the information standard. Many people start working on it, and then it goes in all directions with full force."
"There are quite a few objections to things outside the scope, things we can't do much about."
"It goes through many people, and then a lot of information gets lost."
"I find it difficult to filter out the high risks."
"Sometimes I have to discuss the same things with the core team and policy directorates."
"We have worked with a 'deliver it and it will be fine' approach. Linear thinking."
"We keep discovering unexpected things."
"Without physical meetings, I can't just chat about the agenda."

B. Setup of Meetings and Communication Lacks Sufficient Thought and Vision of Who Should Attend and Why

Effective communication and meeting setups are critical in coordinating complex projects. In the healthcare policy environment, the lack of sufficient thought and vision regarding who should attend meetings and why often leads to inefficiencies and miscommunication. This theme highlights the importance of purposeful meeting planning and targeted communication strategies to ensure that the right people are involved, information is effectively shared, and objectives are clearly defined.

Themes

- Participants in Meetings: Including unnecessary participants or excluding essential ones can lead to confusion and lack of progress.
- Structure of Meetings: Poorly structured meetings can result in wasted time and unclear outcomes.
- Need for Personal Connections: Building personal relationships is crucial for effective communication but can be challenging in a fragmented system.
- Management of Expectations: Clear communication about what is expected from each participant can help manage and align expectations.
- Vulnerability of Personal Connections: Over-reliance on personal relationships can be risky if those individuals leave or their roles change.
- Delayed Information or Knowledge Impacting Process: Timely sharing of information is essential to keep the process moving smoothly.
- Need to Be Present at Many Meetings: The requirement to attend numerous meetings can be overwhelming and counterproductive.
- *Effective Meeting Goals: Setting clear, achievable goals for meetings ensures that discussions are focused and productive.*
- *Meeting Design and Setup: Thoughtful design and setup of meetings, including selecting the right participants and defining the structure.*

"It is very easy to bring in a lot of people."
"I see that people then drop out during such a meeting."
"We have a tendency to keep things internal."
"We have worked with, we will deliver it, and then it will be fine. Linear thinking."
"You miss small details that make the whole thing impossible."
"In those working groups, I don't talk to healthcare workers much."
"Organizations don't like being pointed at."
"Personal contacts are very nice, but they can also disappear quickly."
"It is difficult to find each other."
"Without physical meetings, I can't just chat about the agenda."
"We don't chat about things outside the agenda anymore."

C. Drifting Islands of Institutions in Healthcare, Partners, and Policy Have Trouble Gaining Alignment

The challenge of aligning various institutions, partners, and policies in the healthcare sector often results in inefficiencies and fragmentation. This theme emphasizes the difficulties in achieving cohesive and coordinated efforts among diverse entities, each with its own priorities and ways of operating. The lack of alignment leads to disconnected actions, redundancy, and sometimes contradictory efforts, which hinder overall progress.

Themes

- Difficulty to Find Each Other: Organizations struggle to identify and connect with the right partners and stakeholders.
- Lack of Clear Roles and Responsibilities: Ambiguity in roles and responsibilities leads to confusion and overlap.
- Fragmented Communication Channels: Multiple and disconnected communication channels make cohesive action difficult.
- Need for Integration of Processes: There is a critical need to integrate processes across different entities to ensure smooth collaboration.
- Independent Operations: Entities often operate independently rather than collaboratively, leading to isolated efforts.
- Confusion Over Responsibilities: Unclear demarcation of responsibilities causes delays and inefficiencies.
- Mismatched Priorities: Different priorities among organizations lead to conflicting actions and strategies.
- *Where the Field goes with Issues: The pathways through which issues and challenges are communicated and addressed. Ensuring that there are clear, effective channels for raising and resolving issues is vital for smooth operations.*
- *Knowing Where to Find the Right People: Identifying and connecting with the right stakeholders is crucial for effective problem-solving and decision-making. Ensuring that the right people are involved in discussions and decisions can significantly enhance the effectiveness of initiatives.*

"The lines go all over the place. Suppliers, it then lands somewhere at Nictiz."
"We have a wild growth of meetings."
"Different lines still have to come together."
"We come to an impasse around the quality standard."
"You find out by chance that things overlap. That causes a lot of unrest."
"The norm does not work. Because it is not finished yet."
"You must better integrate it."
"We have no chain test, to send from A to B."
"We see that a lot of money has been invested in it, but it has not yet achieved the desired goal."
"The healthcare system is in silos but the patient cannot be boxed in."
"We have worked with, we will deliver it and then it will be fine. Linear thinking."
"Other lines must come together."
"We need to prevent the wheel from having to be reinvented."

D. Hierarchy and Divided Institutions Are Causing Difficult Communication and Struggle with Alignment

The theme highlights how hierarchical structures and divided institutions create barriers to effective communication and alignment within the healthcare system. The complexities and bureaucracies inherent in hierarchical setups often lead to misunderstandings, delays, and inefficiencies. This theme explores how these organizational structures impact the overall coordination and cooperation among different entities.

Themes

- Obvious Power Relations: The presence of clear hierarchies often dictates interactions and decisions, sometimes hindering effective communication and collaboration.
- Difficulty in Navigating the Political Landscape: The complex political environment within and between institutions complicates decision-making and alignment.
- Need for Clear Responsibilities: Clear delineation of roles and responsibilities is often lacking, leading to confusion and inefficiencies.
- Struggles with Alignment: Different priorities and methods within hierarchical structures lead to difficulties in aligning efforts and achieving common goals.
- Lack of Control and Oversight: Inconsistent oversight and control mechanisms result in fragmented actions and uncoordinated efforts.
- Escalation as a Conflict Resolution Method: The reliance on hierarchical escalation to resolve conflicts often delays solutions and exacerbates tensions.
- Challenges in Coordination: The divided nature of institutions creates challenges in coordinating actions and aligning strategies.
- *Balancing Power Relations: Managing power dynamics within and between organizations.*

"It is very hierarchical here."
"It is difficult to navigate the political minefield."
"The upper people have to make the decisions."
"How do you make and argue policy choices?"
"There are multiple governance structures, with several lines."
"There is no line for constructive cooperation."
"We often find ourselves behind unexpected things."
"Conflicts are escalated, and it takes time to resolve."
"The decision-making process is cumbersome."
"In principle, we are not dependent on the standards, but we do want them."
"Hierarchical thinking can be a barrier to innovation."
"Responsibility is divided and unclear, leading to delays."
"When working in one project, I could co-write the IZA, but when that was done and I was no longer involved directly, VWS didn't listen that much" (Advocate)

E. Inconsistent Reflectivity is Affecting Organizational Learning and Changing Approaches

This theme addresses the issue of inconsistent reflectivity within organizations, which hampers their ability to learn from past experiences and adapt their approaches effectively. Reflectivity, in this context, refers to the process of critically assessing actions, decisions, and outcomes to improve future performance. The lack of consistent and systematic reflection can lead to repeated mistakes, inefficient processes, and missed opportunities for improvement.

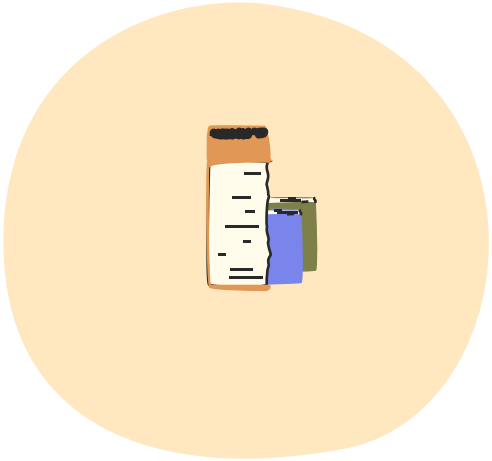
Themes

- Reflecting on Small Steps: The importance of incremental reflection on smaller tasks and processes to ensure continuous improvement.
- Ability to Reflect: The capacity of the organization to critically assess its actions and decisions.
- Ability to Act on Reflections: The organization's capability to implement changes based on reflections and feedback.
- Delayed Information Impacting Process: How delays in reflecting on and disseminating information affect organizational processes.
- Reflectivity Across Organizations: The need for organizations to reflect not just internally but also in relation to their interactions with other entities.
- Integration of Reflectivity in Organizational Culture: Embedding reflective practices into the daily routines and culture of the organization.
- *Ability to Reflect: The ability to reflect involves critically assessing actions, decisions, and outcomes to improve future performance.*
- *Ability to Act on Reflections: The importance of not just reflecting on past actions but also implementing changes based on those reflections.*

"We need to prevent reinventing the wheel."
"Reflectivity is a big word… (at VWS)"
"Reflectivity towards other organizations often goes unheard."
"You see the same faces at such a working group."
"You need to integrate it better."
"There is no moment or person responsible for evaluation."
"I have asked the Wegiz team to look at the results. If you had done that, you could have seen that it doesn't work."
"We need to use what the frontrunner learns from the five exchanges."
"Often, feedback is asked, but I don't hear anything back."

F. Required Knowledge is Separated, Difficult, and Complex to Grasp for All Stakeholders

This theme addresses the issue of fragmented, difficult, and complex knowledge within organizations and how this affects stakeholders. In an environment where necessary information is scattered across various sources and not readily accessible, stakeholders find it challenging to make informed decisions, leading to inefficiencies and errors.



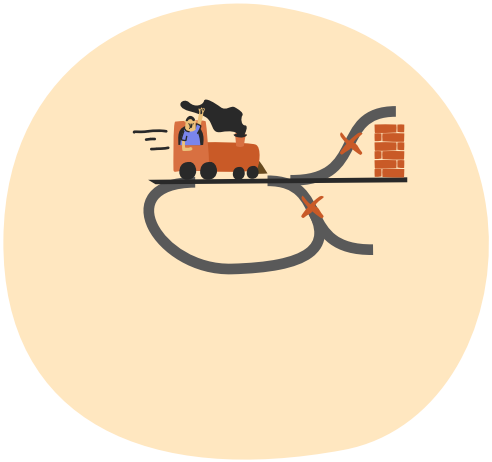
Themes

- Amount of Context and Knowledge Required: The extensive and detailed information needed to understand the full scope of tasks.
- Amount of Knowledge Required: The sheer volume of knowledge that stakeholders need to acquire to perform effectively.
- VWS Lacks Knowledge of Partner Organizations' Frameworks: The Ministry of Health, Welfare and Sport (VWS) does not fully understand the frameworks and operational contexts of partner organizations.
- Difficulty Understanding VWS Processes: Challenges stakeholders face in understanding how processes within VWS operate.
- Spread Places of Knowledge: Information is dispersed across various sources, making it hard to access the necessary details.
- Proper Knowledge Being Available: Ensuring that accurate and relevant information is available when needed.

"The amount of context and knowledge required to understand everything is enormous."
"I'm so often busy with double work. Planning, taking things along, organizing, and then doing it all over again with different people."
"There's no one here who's been involved since the beginning."
"Knowledge is a bottleneck."
"If you don't thoroughly understand the legislation, you risk making mistakes."
"Field parties have questions and they call VWS."
"Policy officers are not hugely substantive, so discussions often go strangely."
"Because it's so much!"
"We keep discovering unexpected things."
"It is difficult to find each other."

G. Low Levels of Iterative Work Lead to Surprises, High Costs, and Mediocre Integration of Information from Sources

This theme highlights the impact of inadequate iterative processes on projects and policies. Iterative work involves a cyclical approach to development, where continuous improvements and adjustments are made based on feedback and new information. In its absence, organizations face unforeseen challenges, elevated costs, and poor integration of data and resources.



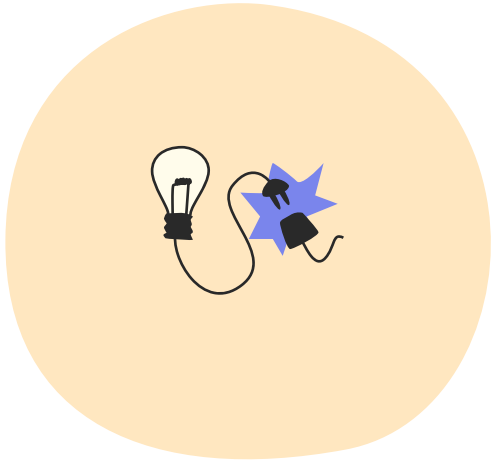
Themes

- Testing Large Scale: The tendency to prioritize large-scale testing over smaller, more manageable iterations.
- Surprises from Practice: Unexpected challenges and obstacles that arise due to a lack of ongoing, iterative testing and refinement.
- Amount of Rules and Regulations: The burden of extensive regulations that can stifle flexibility and iterative approaches.
- Prevalence of Linear Thinking: A focus on linear, one-time processes rather than iterative cycles.
- Iterative Approach Acceptance: The organization's willingness or resistance to adopting an iterative approach.
- Iterative Process Benefits: The advantages of incorporating iterative methods, such as better integration and reduced surprises.
- Reflectivity and Adaptation: The capacity of the organization to reflect on outcomes and adapt accordingly.
- *Taking Small and Careful Steps: Emphasizing iterative, incremental progress helps manage risks and allows for adjustments based on feedback and new information. This approach prevents large-scale failures and ensures steady, manageable progress.*

"We have a wild array of meetings to get everyone on the same page."
"I've asked the Wegiz team to look at the results. If you had done that, you would have seen that it doesn't work."
"Because it's so much!"
"Reflectivity is a big word at VWS."
"We are continuously surprised by the practicalities."
"We have worked with a mindset of delivering it and then assuming it will be fine. Linear thinking."
"We need to prevent reinventing the wheel."
"We really keep discovering unexpected things."
"When you implement something, you need to be able to explain it on the news."
"We need to use what the trailblazers learn from the five exchanges."
"It's crucial to steer things so they work in practice."

H. Intention to Implement and Collaborate on Policy from the Healthcare Field is Wavering

This theme addresses the fluctuating commitment and motivation within the healthcare field to implement and collaborate on policy initiatives. It highlights the challenges of securing consistent engagement and effort from healthcare providers, which is crucial for successful policy execution and integration.



Themes

- Motivation for Field to Invest: The need for healthcare providers to have incentives to invest in policy implementation.
- Consistency in Policy Implementation: The variability in commitment to applying policy across different healthcare settings.
- Stakeholder Engagement: The level of active participation and collaboration from stakeholders in the healthcare sector.
- Perceived Value of Policies: How healthcare providers perceive the importance and practicality of new policies.
- Support and Resources: The availability of support and resources to facilitate policy implementation.
- Regulatory Compliance: The impact of regulatory demands on healthcare providers' willingness to engage with new policies.
- Feedback and Adaptation: The role of feedback mechanisms in adjusting policies to better suit the needs and capabilities of healthcare providers.
- Integration Challenges: Difficulties in integrating new policies with existing systems and practices in the healthcare field.

"It's hard to get the field to think along with us."
"Sometimes, people throw their dissatisfaction over the fence if they don't know you."
"It is very hierarchical here."
"We have fewer physical meetings."
"Interdepartmental communication is fragmented and difficult."
"In healthcare, we really focus on ourselves and our own patients."
"We need healthcare providers with a mandate."
"It's mainly broadcasting from VWS."
"We need to actively seek contact to know what's going on, which takes a lot of energy."
"We have no moment or person responsible for evaluation."
"There is a lot of discussion within the policy team and directorates about missing connections."
"We must ensure that the one directorate does not make promises that another cannot fulfill."
"I don't know what VWS can and cannot do, or what they can enforce."
"There's no clear understanding of what VWS is doing."
"There is a lot of interference."
"I miss a detailed plan."
"Everyone starts working, but then we don't achieve the desired result."

Appendix Q: Co-creation of vision future

Introduction (10 min)
Participants are first introduced to the session. They are asked to take of their shoes in an attempt to break the ice and level the power dynamics that exist in this group. The facilitator introduces the goals of the workshop and provides a small planning. Then a quick exercise of squiggly birds is done. One time regular and individual, the second time the group has to collaborate. One participant is responsible for the beak, one for the feet and one for the eyes, this then rotates.

Goal (5)
The goal of the workshop is to collectively explore a future vision in the context of the 3 leverage points through the 3 horizons model.

Familiarizing with leverage points (5 min)
Then, participants are asked to silently read some documentation on the 3 leverage points. This includes a story that gives context to the leverage points in a tangible way, as well as a visualization of this leverage point. The interviews in the week before can be considered a soft form of sensitizing on the subject.

To put it plainly, we want to dream of a future where we have a system that has effective and fair division of power, where we can learn from our mistakes and take action in appropriate sized steps.

Introducing 3 horizons model (60)
An explanation of the 3 horizons model is given.
We look at 6 points in the graph.

1. What does the ideal future look like?
2. What are pockets of the future in the current system?
3. What evidence can we find of current system concerns?
4. What are elements of the current system to retain?
5. What initiatives would we need to set up for the transition?
6. What are elements of the system we can reiterative?

In order the 6 sections of the graph are brainstormed. For every section, a 2 minute silent brainstorm is done to generate as much on post its individually. Those are then placed and discussed on the graph in the next 10 minutes.
The focus lies in sections 1 through 4. Ideation on possible initiatives is useful, but can also be done by the designer later, or in a more focused session.

Wrap-up (5)
Thanking the participants and asking how it went.

Appendix R: Leverage Analysis

Since interpretations of scales differ between participants, it might be more helpful to look at the extremes within each participant. For every one of the 6 participants the leverage points that fall into 3 categories were picked.

- the one with the **most leverage**, ignoring perceived bottlenecks. This is the ambitious choice.
- the one with the least perceived bottlenecks but highest leverage in that category. This is the **easy win**
- the one that has the best balance between leverage and bottlenecks. This is the **efficient choice**

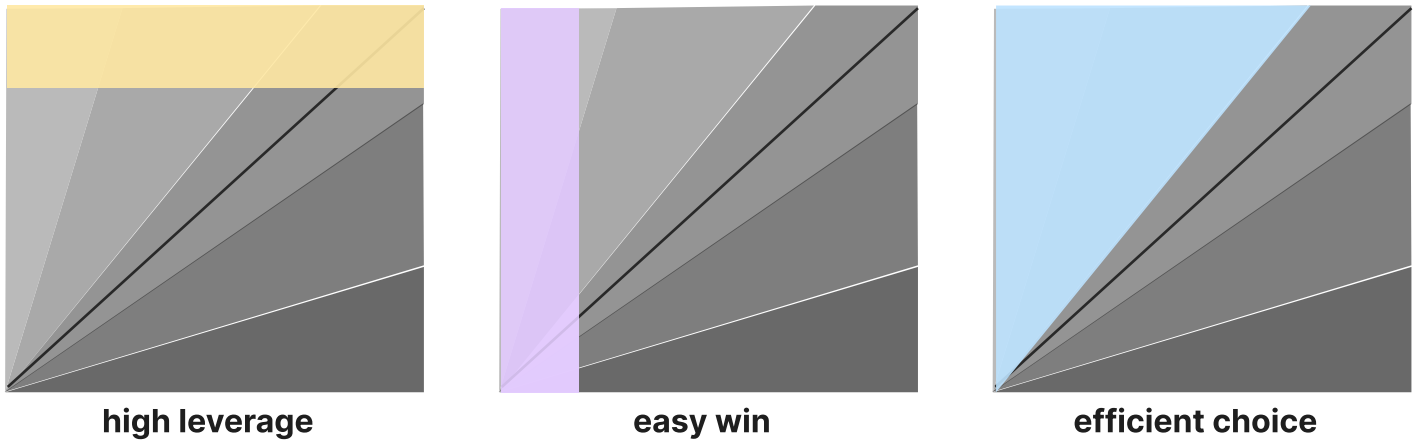


Figure xx. Where to look for our 3 categories of leverage points. Note that of course not all leverage points will exist in these regions, but are the extremes we are striving to find.

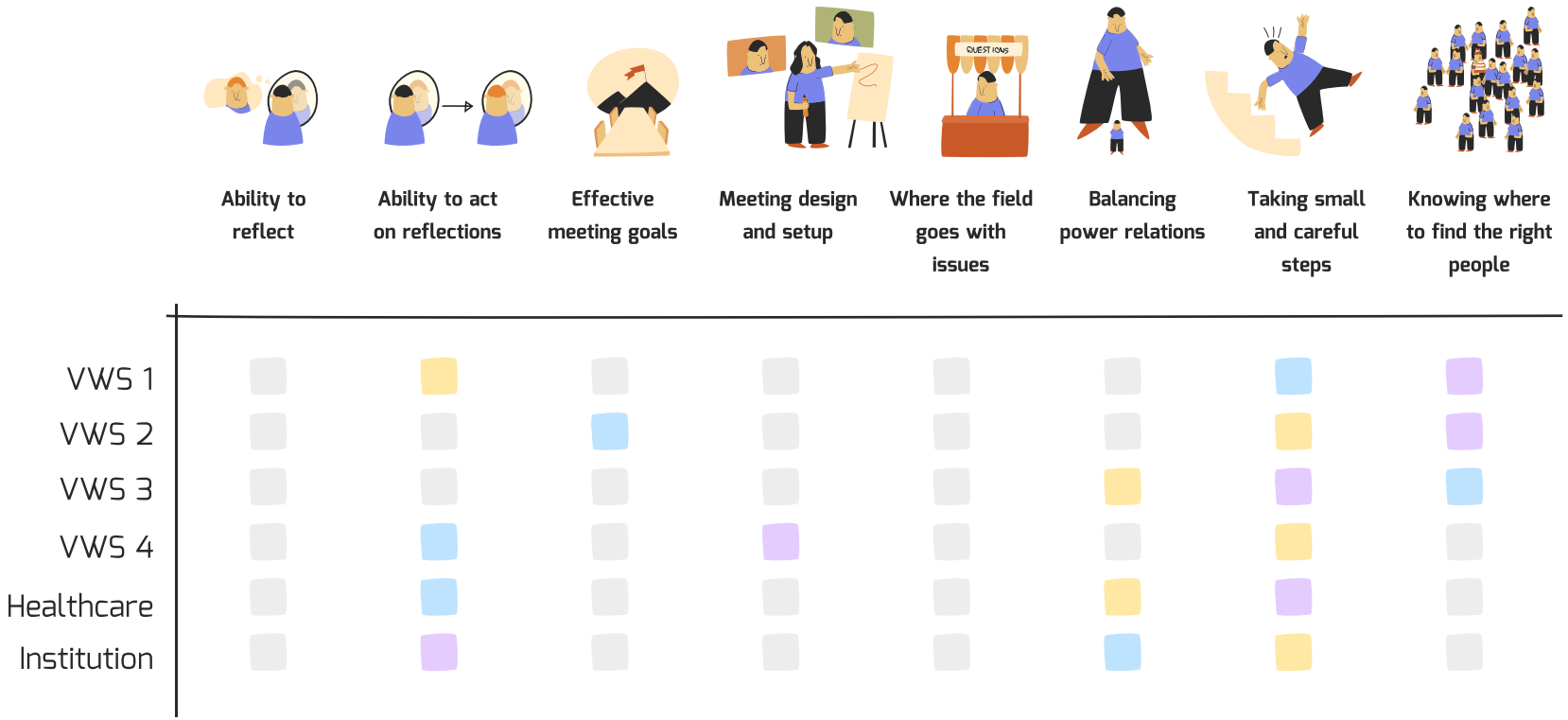


Figure xx. Per participant my analysis of the best leverage regardless of bottlenecks, the easy win that has the highest leverage for a low-leverage point. Lastly there is the balanced mix of bottleneck and leverage. Perhaps more realistic than the pure best leverage, but more ambitious still than the easy win.

6.5 Choosing a Critical Leverage Point

Acting on Reflections

Feedback Loops

Reflections are a form of feedback that informs decision-making. Acting on these reflections involves using feedback loops to continuously improve the system.

Information Flow

Reflections require comprehensive and accurate information. Ensuring that information flows freely and is accessible to those who need it is critical for effective reflection and action.

Structure of Systems

Implementing changes based on reflections can alter the structure of the system, leading to more efficient and effective operations.

Rules of the System

Acting on reflections may necessitate changing the rules that govern the system. This ensures that new insights and learnings are integrated into the system's operations.

Delays

Effective reflection and action can reduce delays in the system by enabling quicker responses to emerging issues. By promptly addressing problems and opportunities, the system becomes more agile and responsive.

By aligning these leverage points with Meadows' framework, we can see how each point fits into a broader context of system dynamics, offering pathways to more effective and sustainable interventions.

Small and Iterative Steps

Goal of the System

Iterative steps help achieve smaller goals that cumulatively contribute to the overarching objective of the system. By breaking down large tasks into manageable parts, each small step can be seen as a milestone towards the larger goal.

Feedback Loops

Small steps involve frequent feedback loops, allowing for continual learning and adaptation. Each step provides insights that inform the next, creating a dynamic process of improvement.

Information Flow

Successful iteration depends on timely and accurate information. Information must be communicated effectively between steps to ensure each iteration is based on the latest data and insights.

Structure of Systems

Iterative processes gradually shape the structure of the system by allowing for adjustments and refinements. This ensures the system evolves in response to real-world conditions rather than rigid, unchanging plans.

Rules of the System

Iterative approaches often involve modifying the rules that govern system behaviour. By testing and refining rules through small steps, the system becomes more efficient and effective.

Balancing Power

Information Flow

Balancing power involves ensuring all stakeholders have access to the necessary information. Transparent information flow is crucial to prevent power imbalances and ensure informed decision-making.

Structure of Systems

Power dynamics influence the structure of the system. By balancing power, the structure can be reformed to be more equitable, ensuring that all voices are heard and considered.

Rules of the System

Power balancing often requires revising the rules that dictate how decisions are made and resources are allocated. Fair and inclusive rules help prevent domination by any single group.

Self-Organization

Empowering various actors within the system enables self-organization. When power is balanced, individuals and groups can organize themselves to address issues and innovate effectively.

Goal of the System

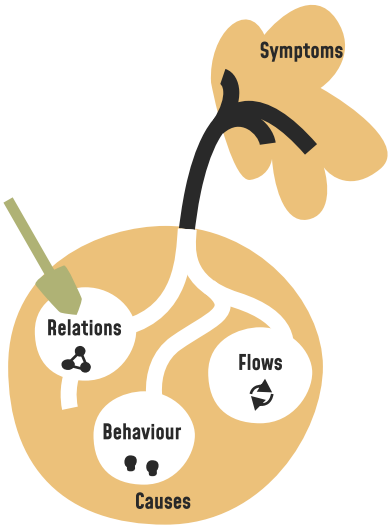
The goal of the system fundamentally drives all its components and processes. When discussing power relations, aligning these with the system's goals is crucial for ensuring that power dynamics support, rather than hinder, the system's overall purpose.

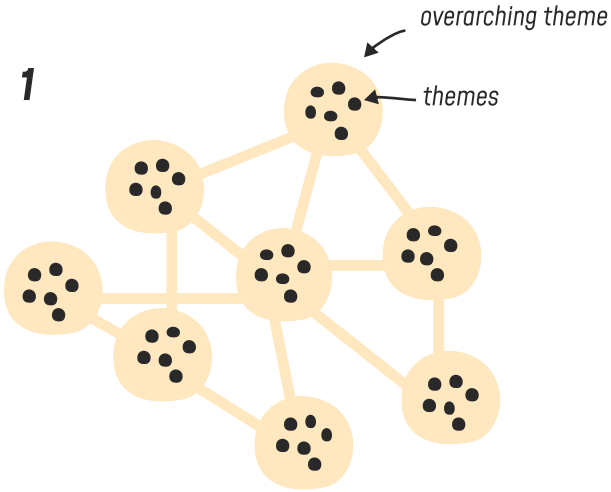
Appendix R

5.1 Relating themes to understand system relations, flows and behaviour

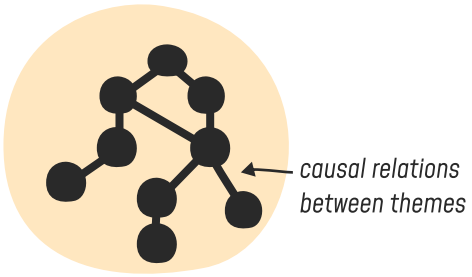
Understanding causal relations is a big part of systemic design. It allows the designer to construct feedback loops and helps understanding where challenges fit in the symptomatic-fundamental scale. This method is complex and time consuming, finding out how 64 themes relate to each other in causal relations is nearly impossible and therefore best divided into more manageable steps. Figure xx shows the process schematically.

Remember the causes and symptoms from chapter 2? These are the relations, behaviours and flows we were talking about.

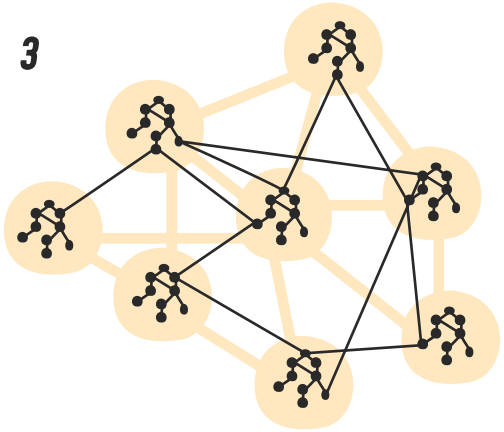




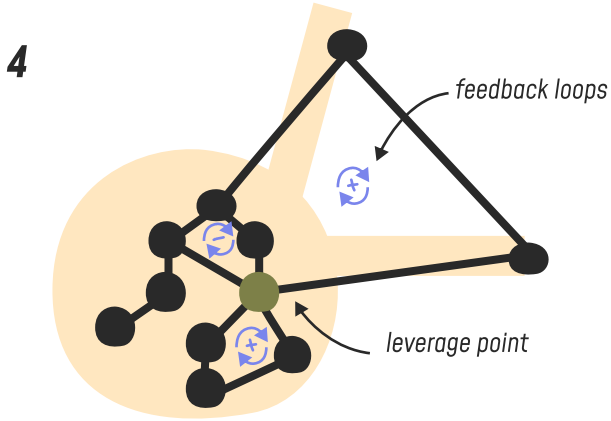
The first step is to find out how the overarching themes are related causally.



Then, the sub-themes which relate to each overarching themes are related in an 'influence map', where causes are on the bottom and symptoms on top. This creates the first hierarchical structure



The third step is to create the true social network system by connecting all sub themes together, with the framework of the 8 sub-themes to help.



Within this network, feedback loops are identified. themes which can influence crucial feedback loops the most efficiently are leverage points. That's the themes we are after!

Leverage

Leverage in network analysis is a combination of eigenvector and reach-efficiency.

- Eigenvector describes how well connected an element is with other well-connected elements. In 'social' network theory I would have a high eigenvector if I knew the president, because he has many connections.
- Reach-efficiency is how many other elements are in a certain number of steps away, divided by the number of direct connections a node has. In 'social' network theory, I would have high reach-efficiency if I *only* knew the president, because I would only need one connection to connect many through the president.

eigenvector reach-efficiency

Leverage in network analysis is therefore an indicator of how efficient a phenomenon is at influencing other phenomena. In complex systems, research (Murphy & Jones, 2020) indicates that targeting these phenomena can lead to change in system that far exceeds the energy of the nudge.

Bottlenecks

Bottlenecks are the opposite of leverage points. They inhibit the propagation of change in a system. In social network analysis, bottlenecks are characterized by between-ness and closeness.

- Between-ness is the measure of participation in the shortest path between two other elements. Consider how a manager has high between-ness, because it's a frequent connection between employees and upper management.
- Closeness is the average number of steps to reach every other element in the system.

between-ness closeness

Bottlenecks in network analysis are an indicator of resisting change. This means not only that these elements themselves might be difficult to change, but also that leverage points might have difficulty affecting these bottlenecks. Bottlenecks are therefore crucial to consider when choosing a leverage point.

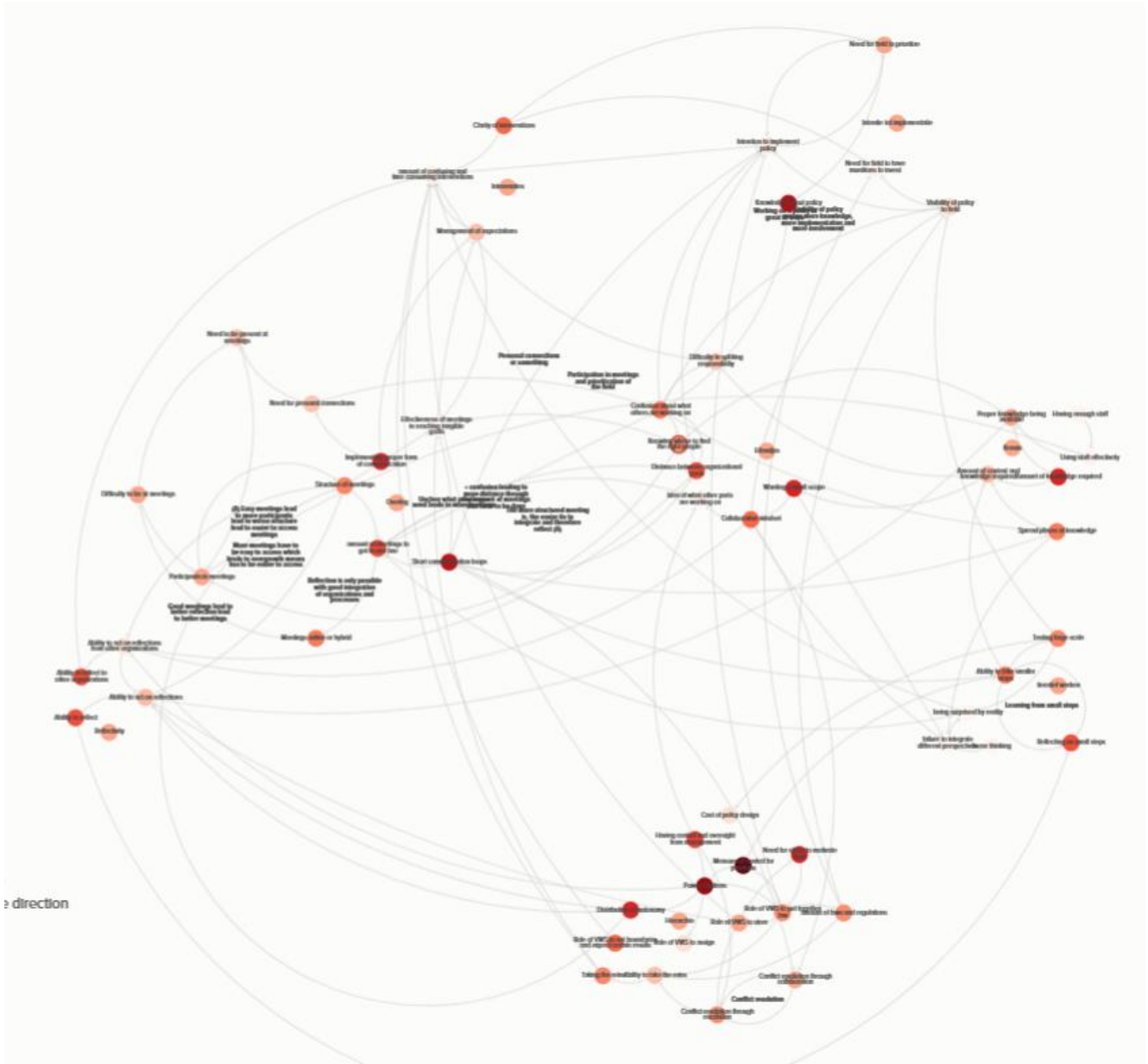
Social Network Analysis

Conducting the analysis on my data requires some additional steps. First, the 64 sub-themes I identified are connected with over 100 relations. These relations are based on those found in the influence map (figure 5.1). When identifying connections, special care is given to identifying feedback loops, where phenomena are connected in a self reinforcing or balancing loop. The results of this connection can be seen in figure 5.3.

Limitations of Social Network Analysis

It is important to consider the limitations to the approach that was carried out. Even though research has shown that insights from social network analysis, if combined with proper deductive reasoning, can predict leverage and bottlenecks.

It is however important to note that usually such an analysis might be done with more data and a team of researchers. This place extra emphasis on the understanding of system behaviour on a more 'human' level.


Need for field to practice
Clarity of expectations
Intender to implement
Intention to implement policy
Need for field to know members to enrol
Amount of overlapping and time consuming interventions
Interventions
Knowledge of policy
Visibility of policy to field
Management of expectations
Need to be present at meetings
Personal connections at meetings
Difficulty in splitting responsibility
Participation in meetings and prioritization of the field
Need for personal connections
Confusion about what others are working on
Unclearness of meetings to members (unable to plan)
Proper knowledge being received
Having enough staff
Knowledge of policy to find the right people
Education
Known
Using staff effectively
Implementation gaps from lack of communication
Distance between implementers and field
Amount of (narrow, org) knowledge required/amount of knowledge required
Structure of meetings
Difficulty to be in meetings
Deadline
Mix of which others posts are working on
Working outside scope
Collaboration mindset
Spread pieces of knowledge
(-) Long meetings lead to passive participants, lead to serious attendees lead to easier to access meetings
Short meetings lead to be easy to access which leads to unorganized persons have to be realist to access
Short communication loops
Participants in meetings
Reflection is only possible with good integration of organizations and processes
Good meetings lead to better reflection lead to better meetings
Working online or hybrid
Ability to act on reflections from other organizations
Ability to act on reflections
Ability to reflect
Inflexibility
Ability to reflect in other levels
Involved in project
Learning from small steps
Being surprised by reality
Inherit to integrate different perspectives
Reflection on small steps
Cost of policy design
Having oversight from management
Need for
Power relations
Distribution of autonomy
Interaction
Role of VMG to client
Role of VMG to design
Conflict resolution through collaboration
Conflict resolution
Conflict resolution through mediation
e direction

Appendix S: Leverage Points

See next page

Ability To Reflect

Overview

The ability to reflect involves critically assessing actions, decisions, and outcomes to improve future performance. This practice is crucial for organizational learning and adapting to changing circumstances. Reflective practices help identify what worked well and what didn't, enabling continuous improvement and fostering a culture of openness and learning.

Influence on Effective Meeting Goals

Reflective practices are integral to setting and achieving effective meeting goals. One interviewee from VWS highlighted, "*We often reflect on the outcomes of our meetings, but the challenge is ensuring that these reflections lead to concrete actions.*" This underscores the importance of using reflections to set clear, achievable goals for future meetings. By doing so, meetings become more focused and productive, as participants are aware of what needs to be addressed and improved.

Effective meeting goals are not only about discussing issues but also about planning actionable steps based on reflections. As another interviewee mentioned, "*Reflectivity needs to be more than just a theoretical exercise; it should lead to real-world improvements.*" This sentiment emphasizes the need for meetings to translate reflective insights into actionable plans.

Reflecting on actions is a starting point for continuous improvement. "*Reflecting on what we do is crucial, but it's equally important to implement those insights,*" said a system architect. This iterative process of reflecting and acting on reflections creates a dynamic environment where learning and improvement are continuous.

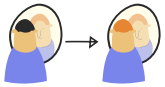
Effective reflective practices also require a supportive organizational culture. As one interviewee from VWS pointed out, "*Reflecting on meetings is one thing, but ensuring that these reflections are taken seriously and acted upon is another challenge altogether.*" This underscores the need for an environment that values and encourages reflective practices.

Influence on Stakeholder Engagement

Reflective practices can significantly enhance stakeholder engagement. When stakeholders see that their feedback is taken seriously and leads to real changes, their commitment and involvement increase. An interviewee remarked, "*Reflectivity towards other organizations often goes unheard, but when it does lead to change, it builds trust and engagement.*" This illustrates how reflecting on and acting upon feedback can strengthen stakeholder relationships.

Moreover, the ability to reflect helps in managing expectations and aligning priorities. "*Reflecting on feedback from stakeholders helps us understand their needs better and align our actions accordingly,*" noted a healthcare advocate. This ensures that stakeholder expectations are met and their input is valued.

The relationship between reflecting on actions and acting on reflections creates a powerful feedback loop that promotes ongoing learning and adaptation. Each reflection informs the next set of actions, and each action provides new data for reflection. "*Reflecting on and acting upon feedback fosters an iterative approach to problem-solving and policy implementation,*" explained a system architect. This feedback loop enhances organizational agility and responsiveness to changing circumstances.
Reflective practices are essential for identifying areas of improvement and ensuring that these insights lead to concrete actions. "*We need to move from reflection to action more swiftly to keep up with the dynamic healthcare environment,*" emphasized a VWS employee. This highlights the importance of agility in implementing reflective insights.



Ability to act on reflections

Acting on reflections is a critical leverage point that entails implementing changes based on reflective insights. While the ability to reflect involves assessing past actions and outcomes, acting on reflections is about taking concrete steps to address identified issues and enhance future performance. This process ensures that the insights gained from reflective practices lead to tangible improvements and prevent recurring problems.

Reflectivity & Iterations

Effective meetings often result from the ability to act on reflections. A participant from VWS emphasized, "*Maybe it looks like we are doing this, but we are not acting like it. We have taken too large steps and we are not changing our processes.*" This highlights the importance of translating reflective discussions into actionable steps. When meeting outcomes are based on reflective insights, they become more targeted and productive.

Meeting goals and setup

Meetings that focus on acting on reflections tend to set clearer, more achievable goals. As another interviewee noted, "*We often reflect on the outcomes of our meetings, but the challenge is ensuring that these reflections lead to concrete actions.*" By addressing this challenge, meetings can drive meaningful progress and prevent the same issues from arising repeatedly.

"It is scary to change because you don't know if it will work."

Feedback Loops

The relationship between reflecting on actions and acting on reflections creates a powerful feedback loop that promotes ongoing learning and adaptation. Each reflection informs the next set of actions, and each action provides new data for reflection. "*Reflecting on and acting upon feedback fosters an iterative approach to problem-solving and policy implementation,*" explained a system architect. This feedback loop enhances organizational agility and responsiveness to changing circumstances.

Acting on reflections is essential for identifying areas of improvement and ensuring that these insights lead to concrete actions. "*We need to move from reflection to action more swiftly to keep up with the dynamic healthcare environment,*" emphasized a VWS employee. This highlights the importance of agility in implementing reflective insights.

Effective Meeting Goals

Effective meeting goals are crucial for ensuring that discussions are purposeful, focused, and productive. Clear, well-defined goals help guide the meeting's structure, ensuring that all participants are aligned and that the meeting outcomes contribute to the organization's objectives. Setting effective meeting goals requires understanding the broader context, the specific issues at hand, and the desired outcomes.

Reflection
Effective meeting goals are deeply intertwined with the organization's ability to reflect and act on reflections. Meetings that regularly incorporate reflective practices tend to set more precise and achievable goals. As one VWS employee noted, *"Reflecting on our past meetings has allowed us to identify what works and what doesn't, helping us to set clearer goals for future meetings."* This reflective practice ensures that each meeting builds on the lessons learned from previous sessions, leading to continuous improvement.

Management of Expectations
Setting clear meeting goals is also crucial for managing expectations. When participants know what to expect from a meeting, they are better prepared and more likely to contribute meaningfully. One healthcare advocate mentioned, "*Clear goals help us manage expectations and ensure that everyone knows what we're trying to achieve."* This clarity reduces misunderstandings and ensures that all participants are on the same page, which is essential for effective collaboration.

Influence on Logistical Challenges
Logistical challenges such as difficulty being at meetings can be mitigated by setting clear goals. When goals are clearly defined, meetings can be more concise and focused, making it easier for participants to attend and contribute effectively. A system architect remarked, *"When we have clear goals, our meetings are more efficient, which helps us overcome the challenge of getting everyone together."* This efficiency not only saves time but also ensures that meetings are accessible to all necessary participants.

Influence on Hierarchical Structures
Effective meeting goals also play a significant role in navigating hierarchical structures within organizations. Clear goals help ensure that meetings are not dominated by a few voices but are inclusive of all relevant stakeholders. "Having specific goals helps us ensure that everyone's input is valued, not just those in higher positions," said a healthcare advocate. This inclusivity is essential for making sure that decisions are well-rounded and consider all perspectives.

Influence on Iterative Processes
Setting effective meeting goals is crucial for supporting iterative processes within an organization. Clear goals help ensure that meetings contribute to ongoing cycles of reflection and improvement. As one VWS employee noted, "Our iterative processes have improved significantly because our meetings now have specific goals that align with our broader objectives." This alignment ensures that each meeting contributes to the overall progress and helps keep projects on track.

Clear meeting goals are also vital for effective knowledge management. When goals are well-defined, it becomes easier to capture and disseminate relevant information. *"With clear goals, we can ensure that the right information is shared and documented,"* said a system architect. This documentation is crucial for maintaining a repository of knowledge that can be referred to in future meetings and projects, ensuring continuity and reducing redundancy.

The relationship between setting effective meeting goals and acting on reflections creates a powerful feedback loop that drives continuous improvement. Each meeting provides an opportunity to reflect on what worked and what didn't, and these reflections inform the goals for the next meeting. "Our ability to set effective meeting goals has improved significantly because we constantly reflect on our meetings and act on those reflections," said a healthcare advocate. This feedback loop ensures that meetings are always improving and evolving based on the insights gained from previous sessions.

Meeting Design and Setup

Effective meeting design and setup are crucial for ensuring that meetings are productive, engaging, and achieve their intended outcomes. This involves careful planning, including selecting the right participants, defining a clear structure, and setting a conducive environment for discussion. Proper design and setup help in creating a focused agenda, ensuring active participation, and facilitating meaningful dialogue.

Management of Expectations
Clear meeting design also helps in managing expectations. When meetings are well-structured, participants have a clear understanding of the agenda, their roles, and what is expected of them. A healthcare advocate mentioned, *"In the end I am happy if every participant is halfway present mindfully."*

We do an hour with 16 people. The fact that you have a meeting means you have to be there. That keeps each other in place.

Influence on Knowledge
Effective meeting design significantly influences communication and collaboration within an organization. By carefully selecting participants and structuring the agenda, meetings can become a platform for open dialogue and collaborative problem-solving. A VWS employee stated, *"You can only reflect when you are above the subject. If we can improve there we can have a huge impact."* This structure ensures that all voices are heard and that discussions are productive and goal-oriented.

Influence on Stakeholder Engagement
Proper meeting setup is crucial for stakeholder engagement. Engaging the right participants and providing a clear structure ensures that stakeholders are actively involved and invested in the meeting outcomes. A healthcare advocate stated, *"The right setup can make a huge difference in stakeholder engagement, ensuring that everyone feels involved and valued."* This involvement is key to securing buy-in and driving initiatives forward.

Influence on Iterative Processes
Meeting design plays a vital role in supporting iterative processes. By setting clear objectives and ensuring focused discussions, meetings can contribute to continuous improvement cycles. *"We need to take so many small steps, and those all take meetings. Look at how much work that is"*

Influence on Resource Allocation
Effective meeting design can also impact resource allocation by ensuring that time and effort are directed towards the most critical issues. Clear agendas and well-chosen participants help focus discussions on priority areas. *"With a well-designed meeting, we can better allocate our resources and focus on what truly matters,"* noted a healthcare advocate. This focus ensures that resources are used effectively and that meetings drive meaningful progress.

The relationship between meeting design and acting on reflections creates a powerful feedback loop. Reflecting on past meetings informs the design and setup of future meetings, leading to continuous improvement. This iterative process ensures that meetings evolve and improve based on previous experiences and feedback.

Where the Field Goes with Issues

Understanding where the field goes with issues is essential for the smooth operation and coordination within and between organizations. It involves identifying and establishing clear, effective channels through which issues and challenges are communicated and addressed. This helps ensure that problems are recognized promptly and dealt with efficiently, minimizing disruptions and fostering a culture of proactive problem-solving.

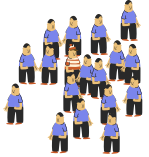
Communication and Coordination
Effective channels for addressing issues are fundamental for maintaining clear and consistent communication across the field. "*It is difficult to find each other,*" one participant mentioned, highlighting the struggle to connect with the right stakeholders when issues arise. Another noted, *"We have a wild growth of meetings,"* pointing to the challenge of navigating through numerous, often overlapping communication channels. This disorganization can lead to delays and inefficiencies, underscoring the need for well-defined pathways for issue resolution.

Responsibility
Effective issue resolution channels enhance responsibility within organizations. "Sometimes I have to discuss the same things with the core team and policy directorates," a participant mentioned, pointing to the need for accountability in resolving issues. Clear pathways ensure that responsibilities are defined, and stakeholders are held accountable for addressing and resolving problems.

Strategic Alignment
Where the field goes with issues supports strategic alignment within organizations. Ensuring that issues are addressed promptly helps align actions with strategic goals. "There is a lot of discussion within the policy team and directorates about missing connections," noted a participant, emphasizing the need for alignment. Effective issue resolution ensures that strategies are implemented cohesively and that all parts of the organization work towards common objectives.

Knowledge Management
Where the field goes with issues influences knowledge management practices. Properly addressing issues ensures that knowledge is shared and utilized effectively. "The amount of context and knowledge required to understand everything is enormous," noted a VWS participant, highlighting the need for accessible and organized knowledge. Effective issue resolution helps in creating a robust knowledge base that informs future decisions and actions.

So we actively seek contact with others. Hear what is going on. That does take a lot of energy at times.(VWS)



Knowing Where to Find the Right People

Knowing where to find the right people is a critical leverage point that ensures the effective and efficient implementation of organizational goals. This involves identifying and engaging stakeholders, experts, and decision-makers who can contribute to achieving specific objectives. By strategically involving the right people, organizations can enhance problem-solving, decision-making, and overall project success.

Integration Challenges
Integration of new policies and systems can be complex, especially when the necessary expertise is not involved. Knowing where to find the right people helps in overcoming these challenges by ensuring that those with relevant experience and knowledge are part of the process. *"There's a lot of talent, but it's scattered. Bringing the right people together is a challenge" (VWS).* This highlights how the dispersion of talent can complicate integration efforts.

Reflectivity and Adaptation
Reflecting on past actions and adapting future strategies requires input from various stakeholders. Knowing where to find the right people ensures that reflections are comprehensive and that adaptations are well-informed. *"Sometimes, the people with the most knowledge are not included in discussions because we don't know where they are" (System Architect).* This quote underscores the importance of involving knowledgeable individuals in reflective processes to improve outcomes.

Stakeholder Engagement
Effective stakeholder engagement is crucial for the success of any project. Knowing where to find the right people enhances engagement by ensuring that all relevant parties are involved. *"We need better systems to identify and involve key stakeholders"* (Healthcare Advocate). Engaging the right stakeholders from the outset can prevent issues and facilitate smoother project execution.

Support and Resources
Identifying the right people also means having access to the necessary support and resources. This can include technical expertise, administrative support, and other critical resources. *"Finding the right people should be more systematic, not based on personal networks"* (System Architect). A systematic approach to identifying stakeholders can ensure that all necessary resources are available and properly utilized.

Attracting and retaining talent is critical for maintaining the effectiveness of an organization. This involves creating an environment that values expertise, offers opportunities for professional growth, and ensures that contributions are recognized and rewarded.

"Het is belangrijk om te verbinden. Om met groepen en partijen die te verbinden en te zoeken en constructief mee te denken met VWS." (healthcare)

We, as VWS policy departments, face this issue: we are quite compartmentalized." (VWS)

They give us enough opportunities to be a thorn in their side. They often appreciate that (advocates)

Taking Small and Careful Steps

The leverage point of taking small and careful steps emphasizes the importance of incremental progress in complex systems. By focusing on small, manageable steps, organizations can better manage risks, adapt to new information, and steadily progress toward their goals. This approach contrasts with attempting large-scale changes, which can often lead to unexpected challenges and significant setbacks. The practice of taking small and careful steps is deeply rooted in the concept of iterative work, where continuous improvement and adaptation are prioritized over rigid, long-term planning.

Embracing an iterative approach is essential for effectively taking small and careful steps. Organizations that accept and integrate iterative processes are better equipped to handle the complexities and uncertainties inherent in large projects. This approach allows for frequent reassessments and adjustments, ensuring that each step is informed by the latest insights and data. *"We are constantly surprised by the practicalities,"* noted a system architect.

"It's not going fast enough, so there's pressure to take big steps. Because it took a long time to get started. We are now trying to catch up. That will never work." (VWS)

It has to be a whole series of very small steps." (VWS)

"We need to do it more incrementally. That also makes it more manageable; now, the steps are very large."

Resources and Risks

A very explicit example of failing to take small and careful steps is part of the implementation of the VIPP 5 subsidy programme. In this programme, healthcare providers are compensated to implement a pilot software, which ended up meeting the required demands. On technical interoperability, as usability was not demanded. This surprise meant that millions of euros on subsidies were spent on piloting software that was deemed a failure by many healthcare professionals. Doing small pilots in a controlled environment would have prevented these costs largely.

"We have worked with, we will deliver it and then it will be fine. Linear thinking" (VWS)

Balancing Power and Control

“If you know that the IGJ (inspectiegezondheidszorg en jeugd) is involved, you will do things differently. I then try to translate it into policy, and on a micro level, it translates into the file. If you miss that, the conversation gets stuck. (healthcare)”

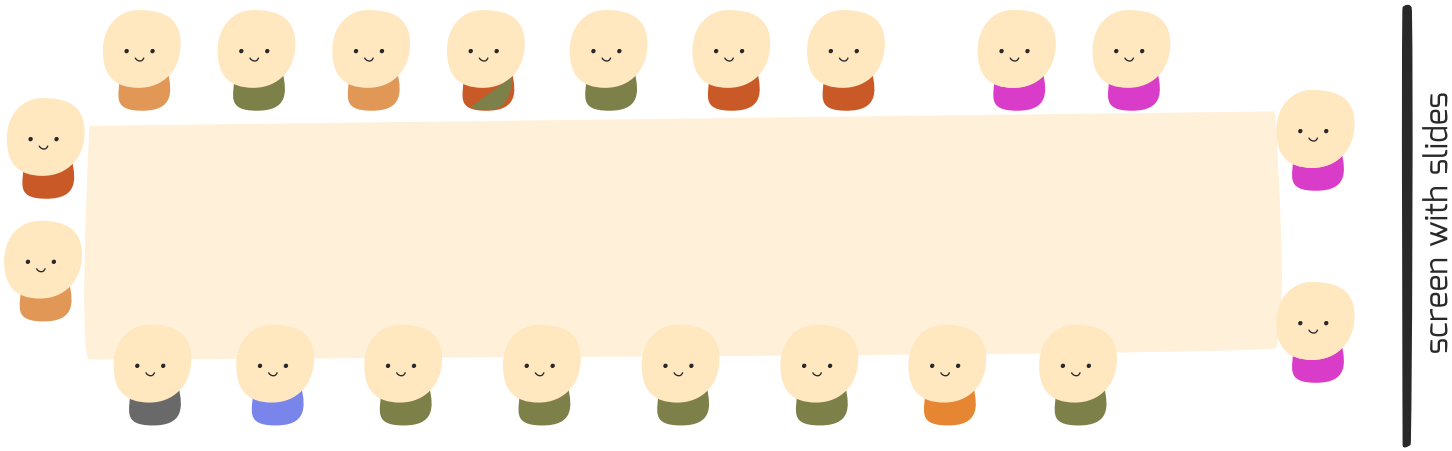
We ask VWS to take the lead. But they can’t do that yet. The field asks for direction, that power has been granted, but we also want to see coherence and overview.”(healthcare)

Het feit dat je een meeting hebt moet je er bij zijn. Dat houdt elkaar in stand.

“It's difficult that on policy employees level relations are well balanced, but to get anything done we need management levels” (healthcare) These managers have power, but not knowledge about subjects. This clashes and results in slow processes.

You really have to be able to think through walls in this hierarchical landscape. (VWS)

Appendix T: Designathon Setup



4 software representative

1 policy

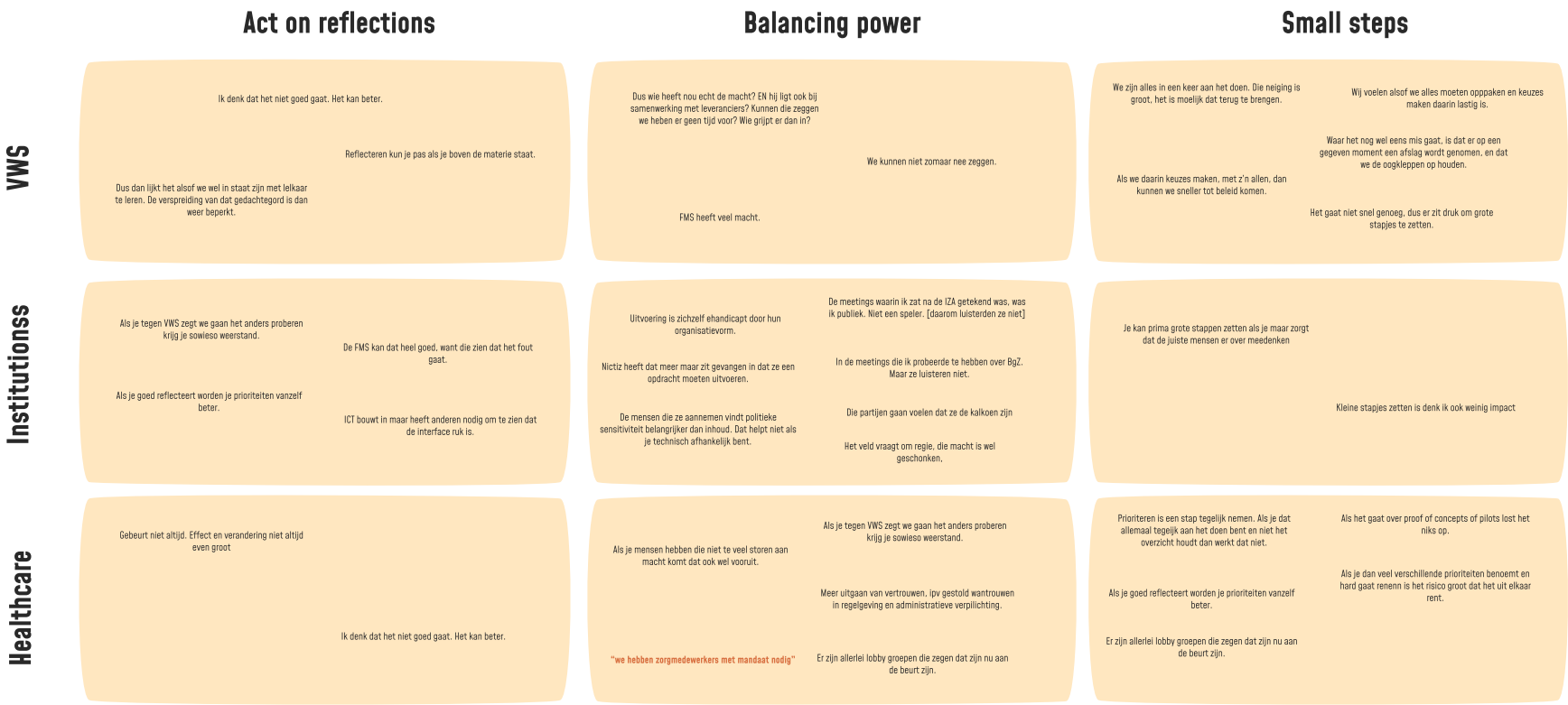
8 Nictiz

3 CMIO

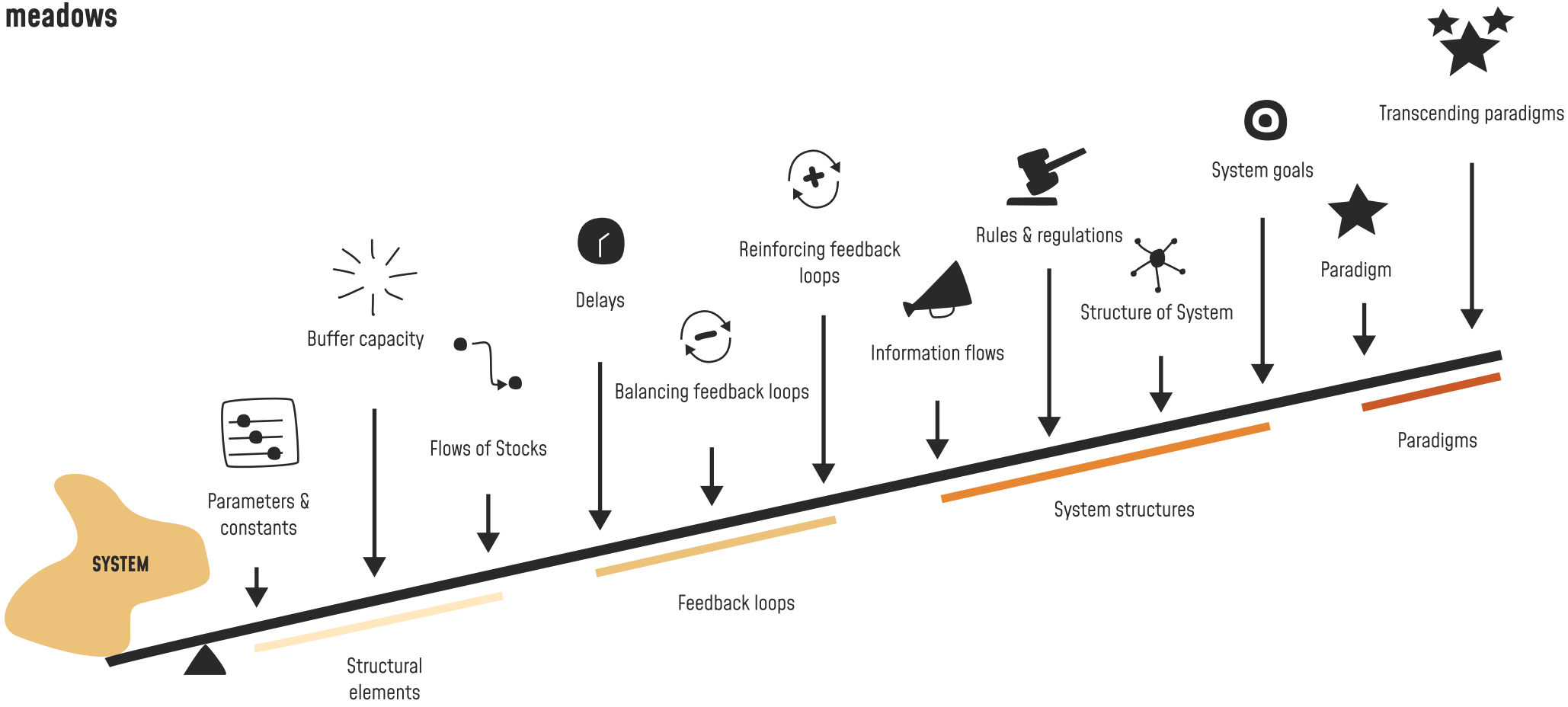
4 BDO (facilitation)

20 in total

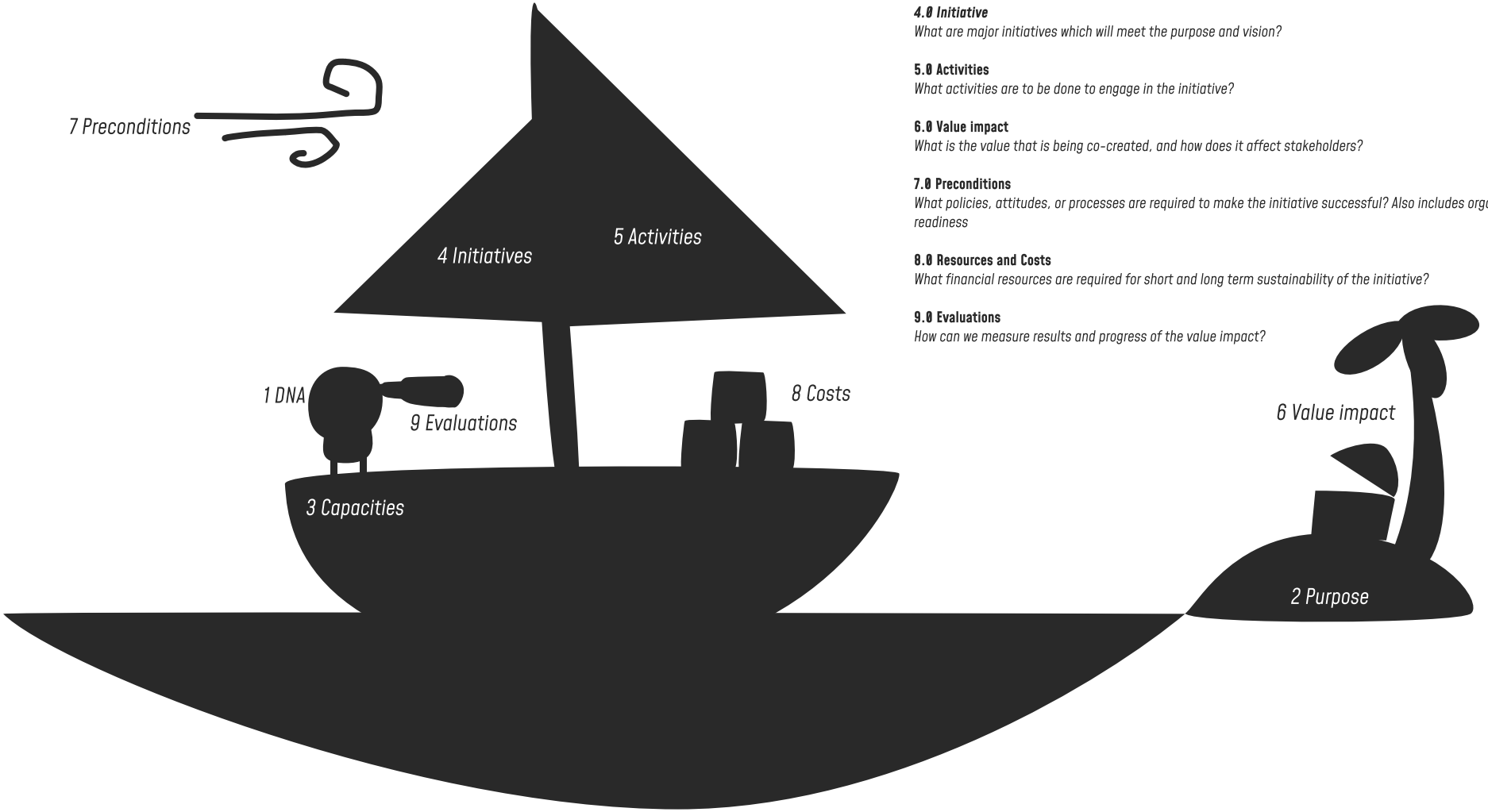
Appendix U: Stakeholder Evaluation of Leverage



Appendix V: 12 leverage points meadows



Appendix W: Collaboration Model



1.0 DNA
What is the vision of the organization, what values underpin that vision?

2.0 Purpose (together)
What is the ultimate goal to be achieved?

3.0 Capacities
What roles, skills and competencies are required? What roles will each member contribute?

4.0 Initiative
What are major initiatives which will meet the purpose and vision?

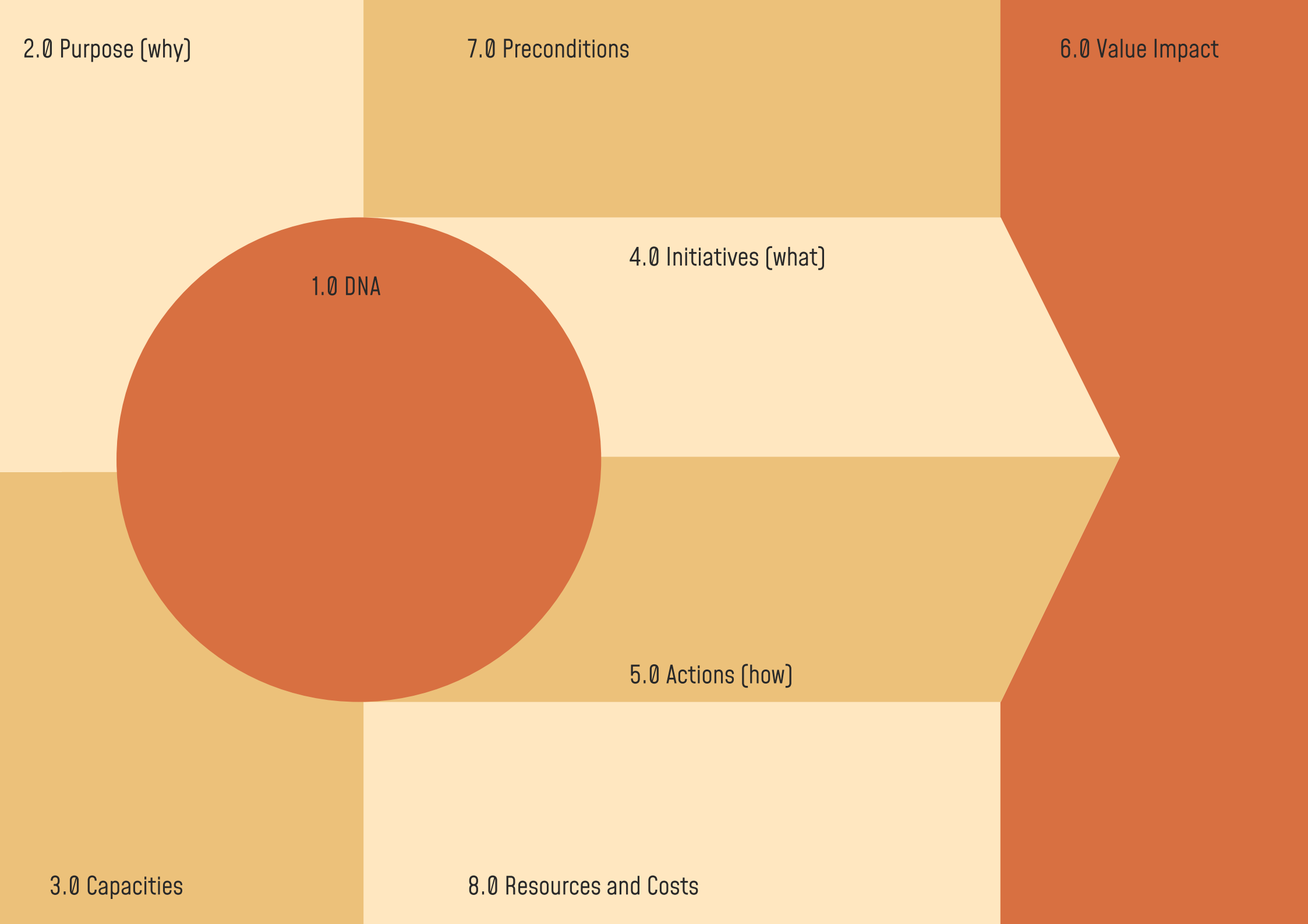
5.0 Activities
What activities are to be done to engage in the initiative?

6.0 Value impact
What is the value that is being co-created, and how does it affect stakeholders?

7.0 Preconditions
What policies, attitudes, or processes are required to make the initiative successful? Also includes organizational readiness

8.0 Resources and Costs
What financial resources are required for short and long term sustainability of the initiative?

9.0 Evaluations
How can we measure results and progress of the value impact?


2.0 Purpose (why)
7.0 Preconditions
6.0 Value Impact
1.0 DNA
4.0 Initiatives (what)
5.0 Actions (how)
3.0 Capacities
8.0 Resources and Costs

Appendix X: Collaboration Model

2.2 How Systemic Design Is Different Than Other Design Disciplines

Systemic design is grounded in the recognition that complex problems cannot be effectively addressed by examining their components in isolation. Instead, it focuses on understanding the system as a whole. This holistic perspective considers the interdependencies and feedback loops that influence the system's behavior. By mapping these interactions, systemic design helps identify leverage points where interventions can have the most significant impact (Meadows, 2008).

Importance of Individual Actors

While systemic design might seem abstract, it is essential to remember that systems are composed of individuals with unique thoughts, problems, goals, and values. This perspective aligns with the insights of systems thinker Junginger (2021), who stated: *"The real problem is not that people err; it is that they err because the system design asks them to do tasks they are ill-suited for."* Recognizing the dynamic relationship between the system and the individual is crucial. Individuals shape the system, and the system, in turn, influences individual behavior. This reciprocal relationship necessitates a design approach that considers both system-level and individual-level interactions.

Addressing Complex Challenges

Healthcare data exchange policy is inherently complex, involving multiple stakeholders, intricate workflows, and stringent regulatory requirements. Systemic design allows for a comprehensive analysis of these complexities. By mapping out relationships, identifying leverage points, and understanding the broader ecosystem, systemic design ensures that interventions are not only targeted but also sustainable.

One of the strengths of systemic design is its ability to address the root causes of problems rather than merely treating symptoms. This approach is particularly relevant in the context of BgZ policy, where the goal is to develop solutions that address fundamental issues in healthcare data exchange, such as interoperability, usability, and stakeholder alignment.

Systemic Design in BgZ Policy Implementation

The BgZ policy implementation exemplifies a complex system, making systemic design the preferred approach. Systemic design aims to: "Understand the flows, relationships, and behavior of parts within a system to enable the potential for changes or improvements to produce intended behaviors and outcomes effectively." This project aims to understand the intricate interactions, relationships, and behaviors within the BgZ policy system. The systemic design approach provides a comprehensive lens through which these elements can be analyzed and addressed.

By employing systemic design, we can better understand and address the multifaceted challenges of healthcare data exchange. This approach not only ensures that interventions are well-targeted but also that they lead to sustainable improvements that benefit all stakeholders involved.

Four Domains of Design

Understanding the four design domains is crucial for addressing the varying levels of complexity within design projects. Jones and Van Ael (2022) categorize these domains as Identity & Artefacts (1.0), Products, Services & Platforms (2.0), Organizations & Processes (3.0), and Systems & Policies (4.0). Each domain represents a different layer of complexity and requires unique approaches. Identity & Artefacts focus on creating tangible objects and visual communications, emphasizing aesthetics and direct user interaction. Products, Services & Platforms integrate multiple artifacts into cohesive user experiences, considering broader user journeys. Organizations & Processes involve designing within and for organizations, improving internal workflows and structures. This domain requires a holistic view of efficiency and organizational culture. Systems & Policies represent the highest complexity, designing large-scale systems and policies that impact societal structures. Each domain builds upon the previous one, with increasing complexity and broader impact, ensuring interventions are appropriately scoped and targeted.

The scope and goals of this project align well with the principles of Domain 4.0. As Nobles (2021) articulates, the systems mindset fundamentally differs from the reductionist mindset. The reductionist mindset focuses on interventions targeting specific elements of the system in isolation or aims to instigate change at the individual level rather than addressing populations and systems as a whole. Figure 2.2a shows how these factors apply to different design domains.

Purpose and Focus of Actions
In systemic design, actions aim to influence the entire system holistically rather than isolated elements. These actions emphasize patterns, structures, and drivers rather than specific causal factors. Furthermore, systemic actions are highly context- and time-specific, acknowledging that systems evolve over time and might require interventions in various areas. In contrast, the reductionist mindset assumes that systems remain static over time, focusing on fixed solutions.
Relationship between stakeholders
The relationship between stakeholders in a systems approach is inherently more collaborative rather than transactional. This collaborative approach fosters a deeper understanding and cooperation among stakeholders, which is essential for addressing complex systemic issues.

Evidence Base
The evidence base for systems change is often more limited and the research on these approaches is still emerging. Consequently, evidence in systemic design tends to be more hypothetical and theoretical compared to the well-established findings of reductionist research. This nascent evidence base requires a flexible and adaptive approach to designing and implementing interventions.

Evaluating Actions
Evaluating the impact of systemic actions is challenging, as it often focuses on proxy measures of success due to the lack of tangible indicators. This complexity necessitates the development of innovative evaluation methods that can capture the broader effects of systemic interventions.

Balancing Mindsets
It is important to note that adopting a systems mindset does not mean abandoning the reductionist mindset entirely. Instead, it is crucial to view these mindsets as existing along a spectrum. Each design step must be positioned appropriately along this spectrum to achieve optimal results. Balancing both mindsets allows for a more comprehensive and effective approach to addressing complex issues.
By embracing these principles, the project aims to create sustainable and impactful changes within the healthcare data exchange system. The systemic design approach provides a robust framework for understanding and addressing the multifaceted challenges inherent in this domain.

Appendix Y: Quantifying meaningful use

7.5 Quantifying Effects of Flaws in Meaningful Use

The failure to achieve meaningful use in health data exchange systems has significant practical consequences, affecting the quality of healthcare, the efficiency of healthcare delivery, and the well-being of healthcare professionals. This section explores various dimensions of these effects, illustrating the importance of balancing usability with technical and organizational requirements.

Impact on Healthcare Quality

When usability issues are not adequately addressed, they can directly impact the quality of patient care. A study analyzing 9,000 patient safety reports from three different healthcare institutions on paediatricians found that 36% of the reports had usability issues contributing to medication events, and nearly 19% of these issues potentially resulted in patient harm, for a total of around 6% (Ratwani et al., 2018)(figure 7.5a). These findings underscore the critical need for user-friendly systems to prevent such errors and enhance patient safety.

Burnout of Healthcare Professionals

The burden of inefficient electronic health record (EHR) systems significantly contributes to physician burnout. The American Medical Association (AMA) has identified burdensome EHR systems as a leading factor in the physician burnout crisis, demanding urgent action to address these issues (AMA, 2023). Healthcare professionals often find themselves spending more time navigating complex interfaces and performing redundant administrative tasks, which detracts from their primary role of patient care and increases job dissatisfaction.

Workflows Matching

Another critical issue is the mismatch between EHR workflows and the actual workflows of healthcare professionals. According to the AMA (2023), *"The EHR workflow is not supported due to a mismatch between the EHR and the end user's intent."* This misalignment can lead to inefficiencies, errors, and frustration among healthcare providers. For example, a system that requires excessive clicks to perform routine tasks or that does not integrate well with other systems can significantly hinder a provider's ability to deliver timely and effective care.

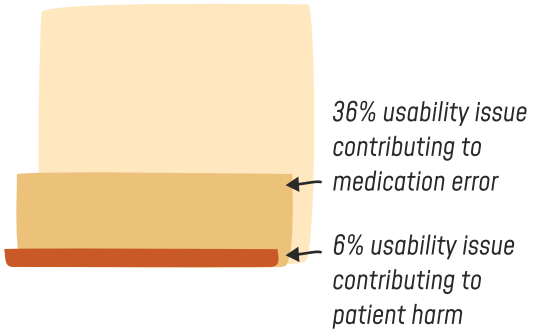
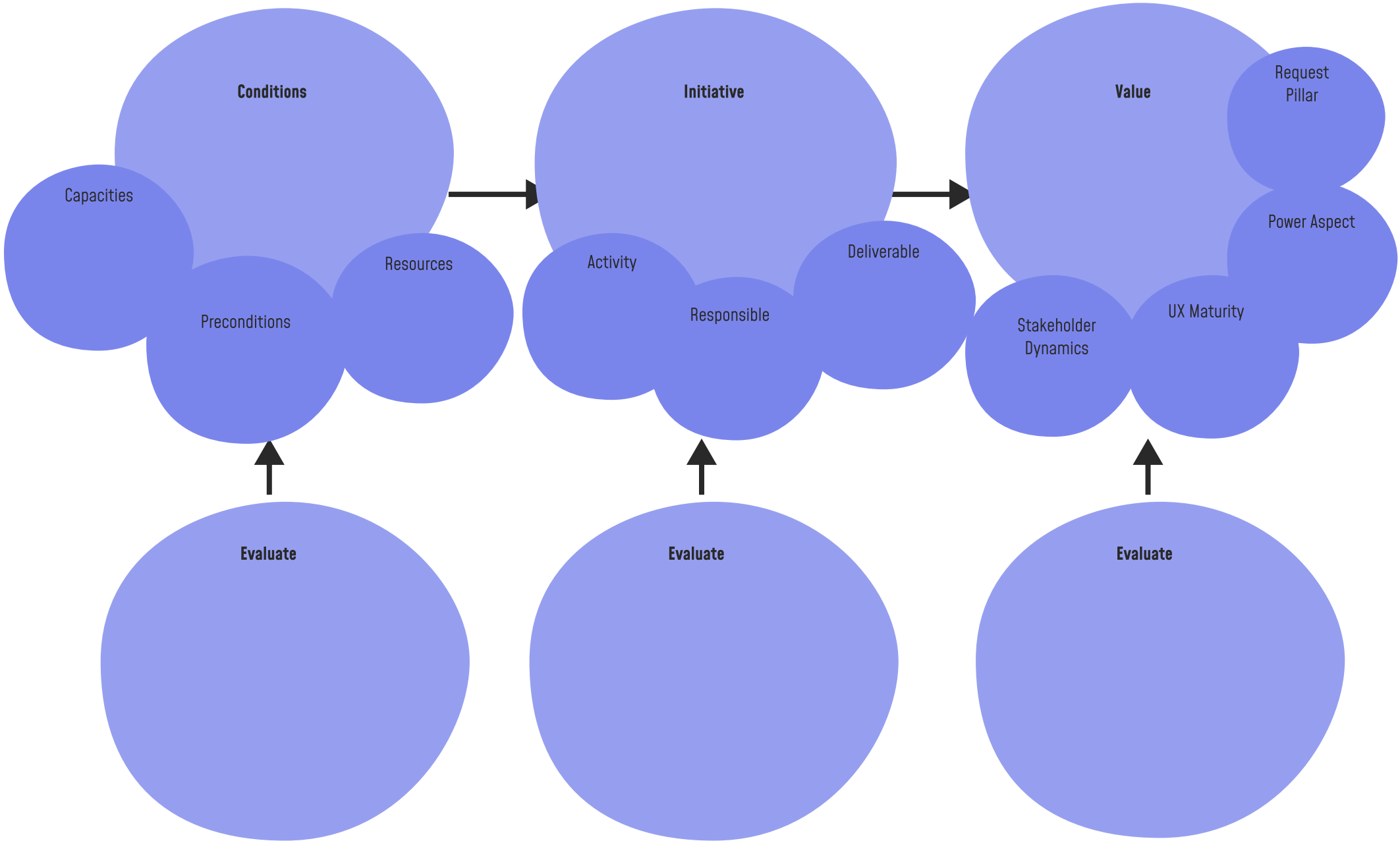
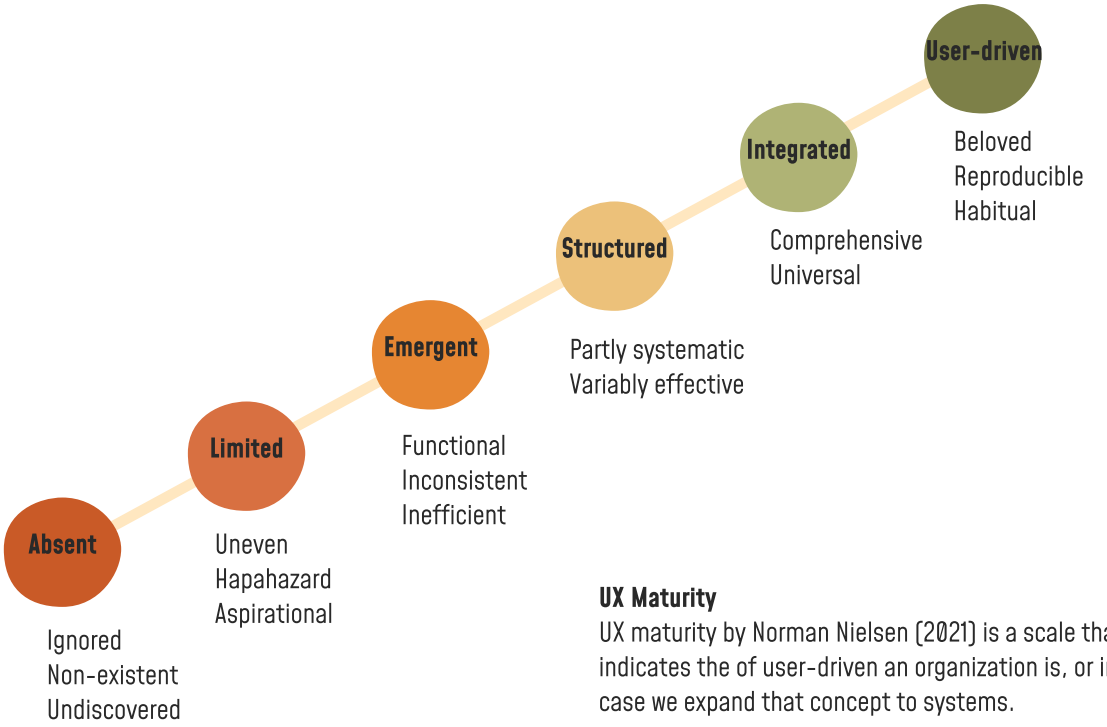


Figure 7.5a *Example case of patient harm due to usability*

Appendix Z: Adapted Collaboration Model Template



Appendix AZ: UX maturity Scale



UX Maturity
UX maturity by Norman Nielsen (2021) is a scale that indicates the of user-driven an organization is, or in our case we expand that concept to systems.

Appendix AB: Imaginary BgZ Designathon Chats

BgZ Implementation Chat
Tap here for more info...

VWS
Hi! We want interoperability and continuity of care through digital healthcare exchange. Here is the Wegiz which legislates this.

Healthcare Institution
We are not going to ask our software supplier to build something that is not mandatory, we have other priorities.

VWS
Understandable. We will pay you to ask your supplier to develop software for you!

Healthcare Professional
This software does not support my clinical process, I'm not going to be using that...

FMS has entered the chat

FMS
We have heard concerns about the usability of the new software pilots. We will not be signing the Kwaliteitsstandaard

VWS
What? Without that we can't start legislating the Wegiz. What do we have to do to fix it?

Nictiz
I have an idea! Let's do a project where we ask CMIO's and software suppliers to sit in a room and we'll make a list of requirements to make the system usable! We'll call it a Designathon.

FMS
Great idea. This should give us enough trust that the software that will be legislated is nog going to be harmful to our healthcare professionals!

Software Supplier
Sure, I guess. Let's see what we get!

Designathon Letsgoooo
Tap here for more info...

Nictiz
So, what did we think of the first few Designathons?

CMIO
It was hard in the beginning to understand each other on technical and system stuff, but it really helped we sit together!

Facilitator
I think we are doing great work, but it's not really a Designathon yet, more like talking sessions. I'm also hoping the individual healthcare institutions will actually be using our BgZ requirements.

Software Supplier
Yeah it's crucial that we sit together. I'm not convinced by the requirements yet, many of them are already possible, or address things that are way too specific. Also they are often generic and we need to know in what scenario and context they count, and which not.

Software Supplier
Ah also, we need to understand prioritization between use cases and requirements. Choices will have to be made.

Bringing Healthcare Professionals to the Policy Table

Engaging Healthcare Professionals in Creating Data Exchange Systems to Support Meaningful Use

The Dutch healthcare system is under pressure. Standardizing digital data exchange is one of the strategies to improve quality and reduce costs. The BgZ will be the first standardized exchange implemented.

The Ministry of Health, Welfare, and Sport (VWS), healthcare institutions, Nictiz, and other stakeholders are collaborating to facilitate this standardization. However, they are struggling to deliver a truly usable system. Why is this?

My leverage analysis indicates that balancing power is the most crucial way to guide the system. Balancing power is inherent in almost all relationships, as different interests vie for influence on decisions and priorities.

The most critical relationship where power needs to be balanced is that between the healthcare professional and their software supplier. System actors with power apply it to prioritize technical and societal developments. Healthcare professionals need to be empowered to push the system to create software solutions that provide meaningful use in healthcare context.

The key deliverables of my research are:
A new research process of request articulation which is able to accurately represent and support the perspectives of healthcare professionals.

An interaction design that allows regular healthcare professionals to express their knowledge in a structured and accessible way.

A strategy to achieving the future vision by articulating 4 phases, and insights on specific actions and capacities to build to get there.

Peter van Oost
2024