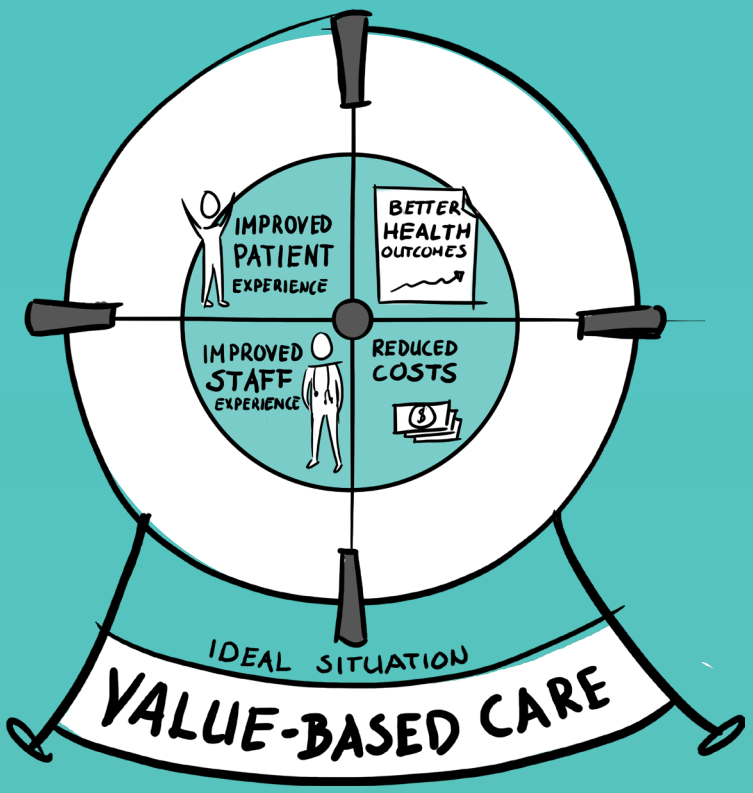
PHILIPS

TU Delft



A TOOLKIT FOR PHILIPS TO SUPPORT

TRANSFORMATION TO VALUE-BASED CARE IN LIVING LABS

Natalie Brik

November 2019

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TRANSFORMATION TO VALUE-BASED CARE IN LIVING LABS

MASTER THESIS

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FIRSTLY

THANK YOU

FOR YOUR INTEREST!

The past few months I have been diving into a totally new field and with handing in this report this project has come to an end. I have learned a lot from the complexities in the field of healthcare. I thought it was difficult and fascinating to take a helicopter perspective and to think on an abstract level about really big challenges. This has been difficult, because not so many people really understand the problem I try to solve. However, it was also fascinating, because I believe that the result I delivered is new and useful for the intended context of use. I am happy to contribute to a relevant issue and to hope the outcomes are going to be used. It was a valuable learning journey, with a lot of freedom to make my own decisions.

Finding and concluding this project was possible thanks to my supervisory team. I want to thank Maaike for the critical but really helpful feedback at all important moments. I also want to thank Marina for the flexibility and investment of time to help me with any question. I want to thank Geert for providing me with the opportunity to work with Philips and get practical feedback. Also from Philips, Stephanie, you were a great help by providing a fresh perspective on my thesis in the last months.

The participants in the interviews were important to understand the topic and to feel the relevance of the topics I chose. I also want to thank many fellow students and friends that helped me by giving feedback, reading the report or having a talk over a cup of coffee. Lastly, I want to thank my family and friends for the positive support from the first till the last weeks. Especially Roel, you were always there to support and cheer me. Thanks!

Natalie Brik

CONTENTS

SUMMARY

Healthcare systems in developed countries are under extreme pressure due to multiple factors. The challenge is to deliver high quality of care while dealing with limited budgets. An ageing population and in increase in chronic diseases leads to an growing demand for care. This growing demand leads to an increase in costs in the system, but the required budgets are not available. The rapid rise of costs makes healthcare systems unsustainable, a transformation is needed.

Not only the costs, also other signs show that healthcare systems need drastic change. Patients are not satisfied, healthcare staff is dealing with burnouts and health outcomes are not as good as is desired. These different signs together show that the healthcare deals with a systemic problem. To address a system problem, the different factors should not be seen in isolation, the interlinked effect of factors should be considered.

What is needed is a transformation towards value-based care (VBC). Theory proposed by Porter and Teisberg (2006) explains that the basis of healthcare systems need to shift from delivering volume to delivering value. From their perspecitveg value in healthcare means to improve relevant health outcomes while reducing the costs.

The transformation to value-based care can be guided by the quadruple aim. The quadruple aim is a framework developed by Spinelli (2013) and used by Philips to show the different dimensions that need to be addressed in transformation: 1) improving health outcomes, 2) improving patient experience, 3) reducing costs and 4) improving staff experience.

The quadruple aim is a suitable approach to guide transformation to VBC as it is widely used across the health system. The quadruple aim is seen as most complete overview compared to other frameworks, because all important dimensions of a healthcare system are included in the quadruple aim.

However, the theory on VBC and the quadruple aim is general and needs a translation into a specific context. In other words, the global strategy of VBC needs to be made specific to guide local action.

In this thesis, living labs are the context for defining local action. Philips wants to set up living labs with multiple stakeholders and learn how to initiate living labs for transformation to VBC. A key element in the initiation of a living lab is the construction of a common vision, because based on this vision actions need to be defined.

This thesis results in a toolkit to supports the definition of a vision for a living lab and translate the vision into action. The toolkit can be used in co-created sessions with partners in the living lab. The toolkit provides tools to define purpose, partners and objectives in a local setting. The purpose for the living lab is defined first. An overview of the global challenge, vision and enablers in VBC is presented visually. Following the step-by-step approach will support the lab partners in defining a local challenge, vision and enablers. Based on the identified local vision, the partners and objectives for the living lab can be systematically discussed using tools.

To support the co-creation sessions, the toolkit consists of four elements:

1. A global purpose visualization.
2. Work sheets that need to be printed and filled in during the sessions.
3. A slidedeck to use during workshops.
4. Facilitator instructions to support the facilitator in explaining the process.

The toolkit has been tested within Philips and determined valuable for their business. Based on a test session suggestions for improvements are identified and included in the report. It is recommended to further test the toolkit in real-life settings.

The toolkit shows to be relevant by providing a integrated overview of theory on VBC in a visual way. Besides, by outlining the process of initiating a living lab, this thesis is a foundation to develop more tools that can be used in living labs.

KEY WORDS EXPLAINED

Living lab

A method of open innovation, together with multiple stakeholders, in a real-life environment and involving users in co-creation process.

Value-based care (VBC)

A strategy for healthcare systems to emphasize the focus on delivering value. This is contradicting current healthcare systems that are organized to deliver volume.

Triple aim

Framework proposed for transformation in healthcare. This includes the pursue of three aims: improved health outcomes, improved patient experience and reduced costs.

Quadruple aim

Framework proposed for transformation in healthcare, as improved version of the triple aim. This includes the pursue of four aims: improved health outcomes, improved patient experience, reduced costs and improved staff experience.

Global

Used in the context of a global ‘strategy’, ‘issue’ or ‘purpose’. This means the general situation that applies internationally.

Local

The opposite of global. With the local context, the context of a living lab is meant in this thesis.

Transformation

Drastically changing the way things are currently organized.

GOOD TO KNOW BEFORE DIVING INTO THE REPORT

READER'S GUIDE

This report should be enjoyable and easy to read to anyone interested in the topic of VBC, living labs or toolkit design. Guiding the reader is done with colours and dedicated text blocks that cover key findings, personal reflections and details.

The key findings provide a quick overview of the main insights in this report. These key findings are the starting point for the design chapter, the insights are clustered and lead to design guidelines.

The report is divided in 5 sections, A to E, as shown on page 2. Each section contain multiple chapters. For section A till E a summary of this part is included at the end of each section.

Key finding

This text box shows a key finding based on the information given on this page. Numbers are given to the findings to make it easier to trace back and reference findings.

Personal reflection

This text box shows an important reflective thought. In some cases these are hard to underline with sources. However, they are considered to be relevant to mention and therefore explained in more detail.

GREY BOXES

It is possible to read these sections, but not necessary to follow the main story line. In these grey boxes examples, illustrations or more in depth discussions are presented.

INTRODUCTION

This report is the result of my master thesis, the final project of the master Strategic Product Design. This project is executed in collaboration with Philips Design in Eindhoven. Therefore, the delivered design needs to be valuable for the company. This project aims to contribute to a complex societal challenge: the challenge of achieving the required transformation in healthcare.

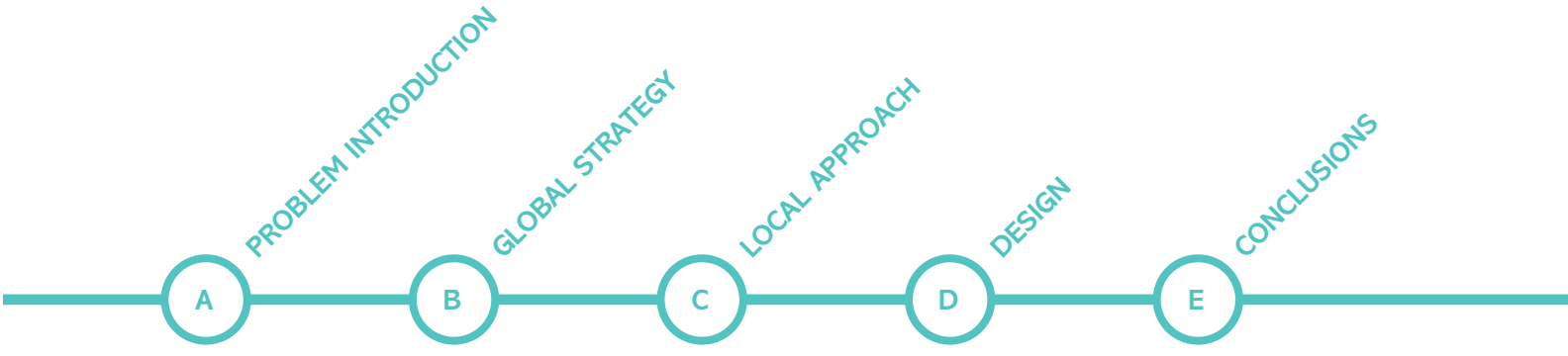
In the first section, 'Problem introduction', the need for transformation and the required approach for transformation in healthcare is explained. This leads to the identification of a scope and a research question for this thesis. Next, the approach to this problem is explained.

In the following section, 'Global strategy', the concept of value-based care is explained. This is a strategy that is promising to solve the problems of current healthcare systems.

In the section on 'Local approach', more insights on how to translate a global strategy into a local approach are presented. In this thesis the local approach is envisioned in living labs. Both a theoretical and a practical perspective on living labs is taken in this chapter.

In the 'Design' section a synthesis of findings from the previous chapters is discussed. Design guidelines and a design vision is presented. This leads to the outline of a toolkit to support Philips. The first element of the toolkit is a visual representation of the global issue, based on section B. Other elements of the toolkit help to translate the global situation into the context of a living lab.

In the last section of the report, Conclusions, an evaluation of the design, the relevance of the results and recommendations for future research are presented.



A. PROBLEM INTRODUCTION

DEFINING A FOCUS FOR THIS THESIS

This section is an elaboration on the problem that is identified for this thesis. The required transformation in healthcare is the main topic in this section. Through the following chapters it becomes clear why transformation is needed and how this can be approached (A.1-A.4). This leads to the definition of a scope (A.5, A.6) and results in a research question (A.7) and approach of this thesis (A.8).

A.1 HEALTHCARE SYSTEM NEEDS TRANSFORMATION

The life expectancy in wealthy countries has nearly doubled since around 1900, technology has advanced which now allows us to treat complicated diseases and access to healthcare in developed countries is considered good (World Economic Forum & BCG, 2017). These are aspects that show a promising future for healthcare, but at the other hand the healthcare sector currently deals with big challenges. The main challenge is the unsustainable rise of costs; the growth rate of healthcare costs is roughly double the rate of growth in gross domestic product (World Economic Forum & BCG, 2017). This results in current healthcare systems being under extreme pressure (Philips, 2019).

COSTS AND QUALITY OF CARE UNDER PRESSURE BECAUSE OF INCREASING DEMAND FOR CARE

The pressure on the health system can be explained by multiple factors. First, the demand of care is increasing because of an ageing population. According to UN rojections on world population, the number of older people (60+ yrs) will be doubled in 2050 compared to 2017 (United Nations, 2017). Chronic diseases are becoming more significant, which also increases the demand for care (WHO, 2014). This puts pressure on the system: the system needs to deliver good quality while the demand is increasing and budgets are limited.

A variation in quality of care delivered across different providers is observed, a lot of these variance in outcomes is unexplained (Philips, 2019). The quality of care is not always considered systematically (World Economic Forum & BCG, 2017). Defining the right measured for quality and outcomes appears to be difficult.

Another aspect that makes the sector costly is the high level of waste in the system – around 30% of money (Health Affairs, 2012) – is wasted on unnecessary or inevitable treatments.

STAFF IS DISSATISFIED WITH THEIR WORK BECAUSE OF HIGH PRESSURE

Healthcare staff dissatisfaction is a burning issue in developed countries. The staff is not satisfied with the quality of care they can provide (Friedberg et al., 2014) and has to deal with high work pressure. A healthcare report of Bain (2018) stated that between 20% and 35% of physicians in Germany, the UK and Italy would not recommend their hospitals as a place to receive care. The high work pressure on physicians results in high burnout rates and intent to leave their job. Burnout rates range from 30 to 65% across different expertise, the highest numbers found for staff working at the front line of care (Bodenheimer & Sinsky, 2014; Pedrazza, Berlanda, Trifiletti, & Bressan, 2016). Physicians dealing with (signs of) burnouts are a major problem, because this can lead to reduced quality of care, less empathy with patients and a rise in costs.

THE SYSTEM CANNOT PROVIDE THE SERVICE PATIENTS REQUIRE

Trends from other industries influence the demands and expectations users have from the healthcare system (Moberly, 2014). Other industries are becoming more and more user-centred, for example any type of good can be delivered within a few hours. A focus on the user experience results in a better integration of online an offline services. However, the healthcare system can often not meet those expectations, which leads to an increase in number of complaints and claims by patients. What patients primarily look for is to become better, but they also want this in a timely fashion and with empathy from clinicians in a positive relationship (Detsky, 2011).

Key insight 1

The problems in healthcare make the system unsustainable and therefore the system needs transformation.

A.2 QUADRUPLE AIM TO GUIDE TRANSFORMATION

The signals presented in the previous section show the complexity of the problems and the need for transformation. Literature provides a strategy to deal with this problem, this strategy is called: value-based care (VBC). This strategy was first introduced by Porter and Teisberg (2006) and later on adopted by multiple organizations.

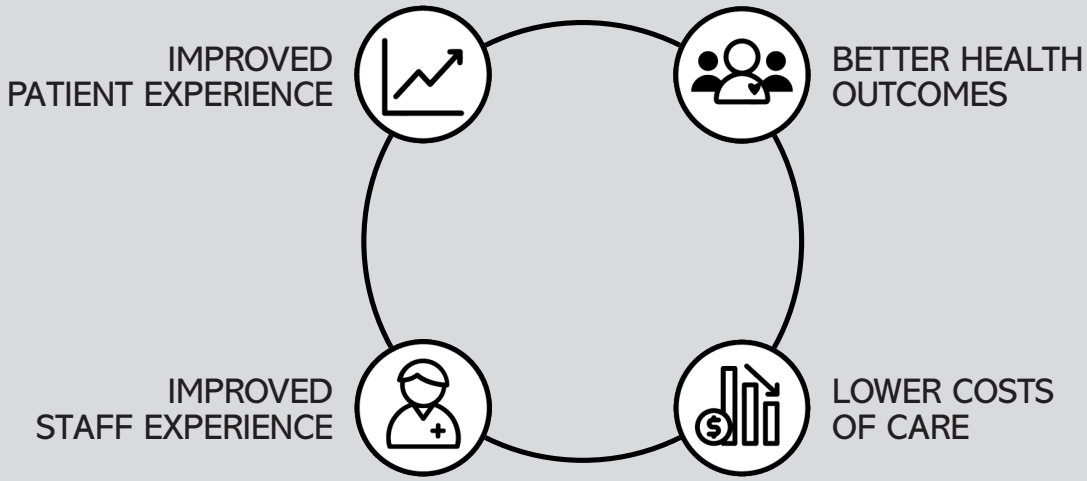
The quadruple aim is a framework to address the transformation to value-based care. The four aims of the quadruple aim are: 1) enhancing the patient experience 2) improving health outcomes 3) lowering the cost of care and 4) improving the work life of care providers (Spinelli, 2013). The fourth aim could also be explained as 'improved staff experience'.

The quadruple aim is a suitable framework to address the problems of the healthcare system. The framework is well recognized by health systems internationally (World Health Organization, International Health Institute, Philips). By including four dimensions of the quadruple aim, this framework is evaluated most comprehensive compared to other frameworks. The problems presented in the previous chapter are in line with the four aims. Other frameworks often ignore one of the aims, for example staff experience.

More about value-based care, the quadruple aim and a comparison of frameworks can be found in section B.

Key insight 2

Quadruple aim is a suitable framework to guide the transformation to value-based care.



A.3 WHAT DOES TRANSFORMATION MEAN

In order to tackle the challenges in the complex system many sources agree that a fundamental transformation is needed (Pfannstiel & Rasche, 2019; Porter, 2008). Not incremental changes in today's system, but a more disruptive change in the current healthcare system is required (Hwang & Christensen, 2007; Porter, 2008; World Economic Forum & BCG, 2017). Transformation is more than an accumulation of incremental changes (de Haan & Rotmans, 2011). For real transformation the socio-technical system needs to be addressed, technological innovations alone are not enough (von Wirth, Fuenfschilling, Frantzeskaki, & Coenen, 2019). The approach that is required is a systemic approach, that deals with the complexity of the business, technology, people and links between those goals (Berwick, Nolan, & Whittington, 2008; Goodwin, 2016).

In the paper of Adams et al. (2016) the systemic view is put on an axis, with the opposite of systemic defined as insular (figure 1). The axis origins from the literature on sustainability transition. Over time, the innovation focus has moved from "doing the same things better" to "doing good by doing things with others" (Adams et al., 2016, p. 185). Ceshin & Gaziulusoy (2016) adapted this view and categorized four levels of innovations on the insular-systemic axis, from product level to socio-technical system level. With an increasing possible impact if innovations target levels that go beyond product level innovation. Definitions on those levels can be found in appendix A.

Key insight 3

To achieve the transformation that is required, there is a need to target more than only product level innovation.

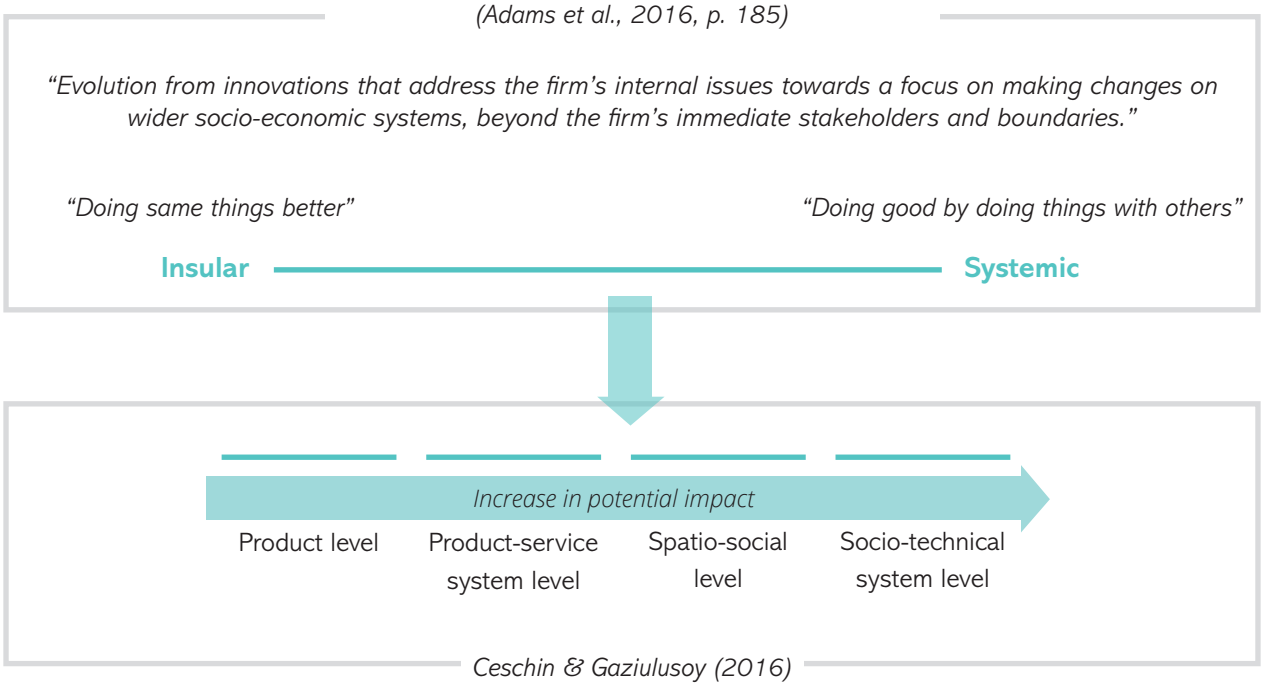


Figure 1 Literature overview on systemic view

Based on existing definitions in literature it is possible to clarify what is meant with 'healthcare system transformation'. From the definitions presented at the right we learn that a system is a network, that fulfils a need. In the case of healthcare the general need is well-being. Transformation means a fundamental change. That the change needs to be fundamental, we already saw on the previous page.

In the definition from Best et al. (2012) on healthcare system transformation, three out of the four aims from the quadruple aim are mentioned. To optimise this definition, the missing aim (staff experience) is added, which results in a working definition for healthcare system transformation below.

System

A system is something that fulfils a societal need and therefore has a functioning (de Haan & Rotmans, 2011)

A system can be defined as an emergent or designed network of interconnected functions that fulfil an intended unit of satisfaction (Jones, 2014, p. 94).

Transformation

Fundamental change in the structures, cultures and practices of a societal system (de Haan & Rotmans, 2011, p. 92).

Healthcare system transformation

Large-system transformations in health care are interventions aimed at coordinated, system-wide change affecting multiple organizations and care providers, with the goal of significant improvements in the efficiency of health care delivery, the quality of patient care, and population-level patient outcomes (Best et al., 2012, p. 422)

Working definition healthcare system transformation

System transformation in healthcare is an intervention aimed at coordinated, system-wide change affecting multiple organizations and care providers, with the goal of significant improvements in patient experience, health outcome, staff experience and reduced costs.

Considered to be part of this system are a set of stakeholders, which includes care providers, payors, suppliers, policy makers, patients and families. An overview of key stakeholders and the relationships is shown in figure 2. In reality, more stakeholders are playing a role in the healthcare system. For a transformation multiple stakeholders need to be involved. The way the system is structured needs to change, this means the relationships between stakeholders need to be defined in a new way. For example the way care is provided or care is financed are relationships that are considered in the theory about value-based care (section B).

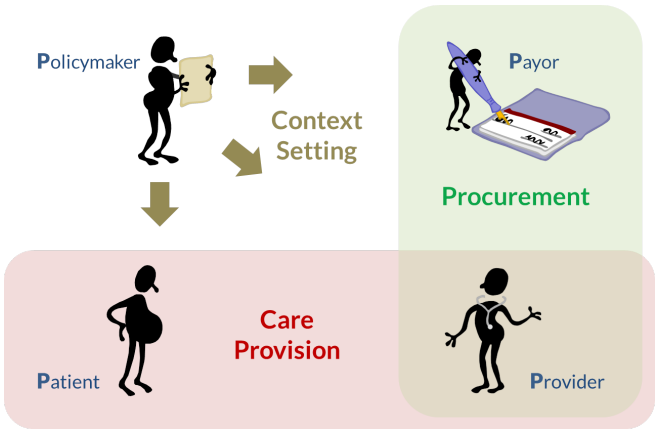


Figure 2 Key stakeholders in healthcare and relationships

PROBLEM INTRODUCTION

A.4 APPROACH TO TRANSFORMATION

For the healthcare transformation, a transformation mindset is required. We learn about the different paradigms from the past and the future in a Philips Design paper from Brand and Rocchi (2011). They defined four different paradigms: the industrial, experience, knowledge and transformation paradigm. For the project it is most important to understand and learn about the transformation paradigm, but in order to understand how this paradigm emerged, all four paradigms are introduced. A summary of each paradigm is based on three readings: the book of den Ouden (2012), the paper of Brand and Rocchi (2011) and an article from Deckers et al. (2018). Keywords for each paradigm are helpful to recognize paradigms.

INDUSTRIAL PARADIGM

The industrial paradigm started in 1920 and was at peak between 1950 and 1980. The Industrial Revolution made it possible to produce large number of products. This led to an economy where profit margins and efficiencies are important for defining success. The principles behind the industrial paradigm still play a big role nowadays.

Keywords

Supply chain
Mass production
Profit
Technology
Consumption
Quality improvement
Cost-cutting
Urbanization
Competition
Efficiency

EXPERIENCE PARADIGM

From the 1980's till now the experience paradigm is present. Products became commodities and companies needed to distinguish themselves in new ways, with experiences. Brands became more important and buyers used these brands to express their identity. The experience paradigm is still a basis for many organizations.

Keywords

Lifestyle
Distinguish
Express
Brands
Identity
Target
Disposable society
Media
Services
Intangibility
Personal

KNOWLEDGE PARADIGM

From 2000 and onwards the impact of the internet became significant, this triggered a new economy, the knowledge paradigm. This allowed almost anyone to generate value on the web and participate in communities and social media. Companies shift from being the creator to becoming the enabler of experiences, providing a platform and ecosystem within which users can add their own personal touch. This paradigm is unfolding.

Keywords

Internet
Social media
Share
Participation
Open
Creativity
Information
Tracking
Communities

TRANSFORMATION PARADIGM

The last paradigm, is also unfolding and seen as a future paradigm. This is triggered by the increasing complexity of problems. In life and in jobs, people want to give meaning to work and life and are more conscious of environmental challenges. The complex challenges need to be addressed in collaboration with different disciplines. In figure 3 the original picture from the paper is shown, this shows how global complex challenges ask for a local approach. The global challenge needs to be translated into context-specific propositions that can be addressed with local stakeholders. Successfulness in both the knowledge and transformation paradigm require continuous experimentation.

Keywords

Global problems
Context-specific
Transparency
Complex problems
Multi-stakeholder
Meaningful
Ethical
Value sharing
Environmental
Dynamic
Fundamental

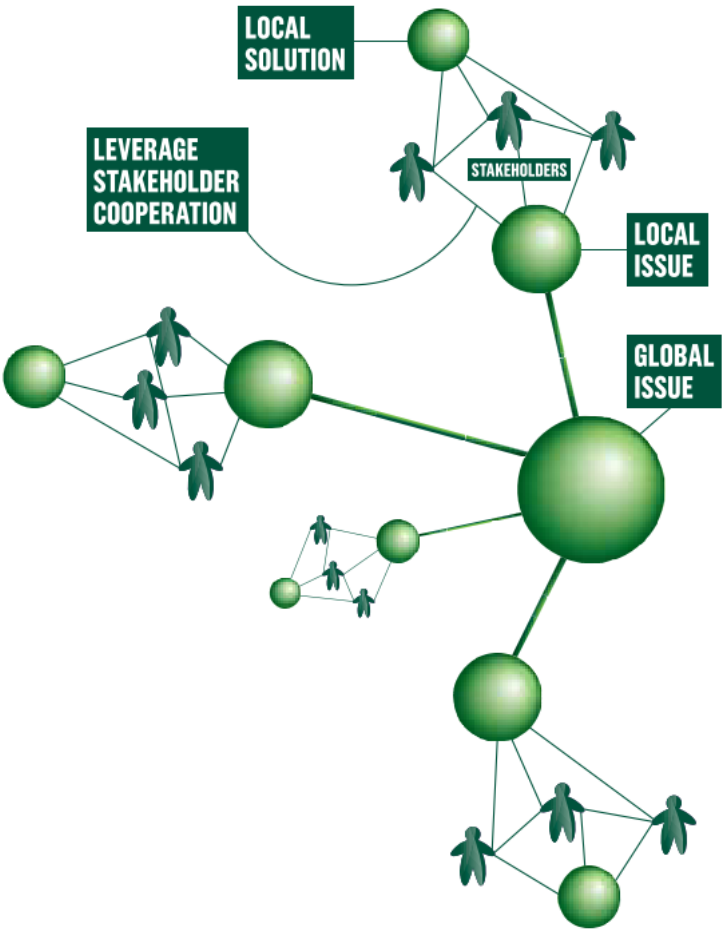


Figure 3 Visualisation of the transformation paradigm (Brand & Rocchi, 2011)

Literature on the transformation paradigm provides an understanding of the approach that is needed for transformations. The transformation theory is summarized in five aspects. These aspects are discussed and enriched by other literature from healthcare studies if available.

1. CONTEXT-SPECIFIC APPROACH OF GLOBAL ISSUE

The importance of the local context is mentioned in the paper of Philips Design (Brand & Rocchi, 2011). Context-specific translations of value-based care are necessary, because every country has its own legal and financial structure that are part of the context of healthcare. The type of problems and importance of problems vary between different contexts. Also the ability to solve problems vary between context. This can be the consequence of absence or presence of local stakeholders. In this thesis the definition of local is the context of a living lab.

2. EXPERIMENTAL APPROACH

Brand and Rocchi (2011) recommend a continuous experimental approach, because it helps to pilot the collaboration ventures. In transformations problems are often ill-defined and little is known on the optimal solution, therefore experiments and short feedback loops are required to make transformations successful (Best et al., 2012).This is in line with von Wirth et al. (2019), who explicitly name the role of experimentation in addressing grand societal challenges.

3. EXTENDED VIEW ON VALUE

The traditional way to express value is in financial terms, but profit as main goal is based in the industrial paradigm. A more extended view on value is needed to understand innovation in transformation. Joyner & Payne (2002) argue that financial measures, in isolation, fail to capture the essence of the business overall successfulness. Emerson (2003) proposes a blended value proposition that integrates social, environmental and economic value levels. In the knowledge and transformation paradigm, the attention for intangible values becomes more important. Examples of intangible value are knowledge, reputation, attention, experiences and well-being (den Ouden, 2012). Allee (2000, p. 37) said that "the intangible value exchange is the real reason for engaging in the activity". The quadruple aim can be used to provide this extended view on value.

4. MULTIDISCIPLINARY COLLABORATION NETWORKS

Because a system includes multiple stakeholders, and the system needs to transform, this also means that multiple stakeholders need to work together to achieve the transformation. The perspective from one firm is too limited in its view to deal with a transformation (Lindgren, Taran & Boer, 2010). Multiple stakeholders can together create a richer understanding on the problem than a single stakeholder (Costa, Diehl, & Snelders, 2019). This is important in cases where the problem is ill-defined. Besides, one company does not have the expertise to cover all aspects, therefore collaborations networks should be build on complementary expertise (Brand & Rocchi, 2011). Philips (2019) gives an example of a set of stakeholders that could be involved: management, care providers, clinicians, payors, patients, government and pharma (Philips, 2019).

5. INVOLVE USERS IN CO-CREATION

To achieve better staff experience and patient experience, the engagement of those user groups is crucial (Best et al., 2012; Pfannstiel & Rasche, 2019). Co-creation with users helps to understand their perspectives and to address the needs and values. Users in this case are both care receivers (patients) and care givers (staff).

Key insight 4: Five aspects to approach transformation

1	2	3	4	5
Context-specific approach of a global issue	Experimental approach	Extended view on value	Multidisciplinary collaboration networks	Involve users in co-creation

A.5 ROLE OF PHILIPS IN TRANSFORMATION

Within the healthcare field, Philips is one of the important stakeholders with innovation expertise and access to the network. This graduation is done in collaboration with Philips Design, so the perspective and relevance to the company need to be taken into consideration throughout the project. Philips wants to take a leading role in initiating collaboration networks in the field. Philips wants to gain knowledge on how to initiate collaboration networks using an experimental approach.

COLLABORATIONS IN LIVING LABS

Philips has translated the vision of collaboration with stakeholders into the concept of living labs. A living lab is a co-created approach of innovation in a real-life environment (Westerlund & Leminen, 2011). The concept of living labs is in line with the insights on approaching transformation, because living labs give room to co-creation in multidisciplinary teams. A living lab is also a place for continuous experimentation. Living labs are positioned in a real-life environment, so it offers the possibility to create context-specific interventions. More literature and empirical research on living labs is presented in section C.

CURRENT STATUS OF LABS

The first lab from Philips with the aim to experiment on transformation started last year in Veldhoven, together with Technical University of Eindhoven, Maxima Medisch Centrum (MMC). This MMC lab is concentrated on one topic: perinatal care. The idea is that Philips' employees work in the hospital on projects in the field of value-based care. Together with the partners of the lab projects are selected and carried out. More conversations about new collaborations in living labs are currently ongoing. In this stage it is useful for Philips to gain a better understanding of how to set up living labs in the field. The goal is to develop tools that can be used to structure the process of initiating living labs. So, this thesis focuses on the development of tools for the lab and not for projects that run within the lab.

PHILIPS

Philips is positioned as a leading health technology solutions company. But this has not been the proposition from the beginning, it has shifted over time. Royal Philips is founded in 1891 by Frederik Philips. It is headquartered in the Netherlands and has 77,000 employees across the globe. The company started as a producer of light bulbs. In the next decades, Philips has produced radios, televisions, shavers, TV's, CDs and DVDs. But the focus has changed drastically over more than 100 years, from the 21st century the strategic focus shifted from being a producer of single products towards a company that delivers solutions. The focus became more and more on the healthcare industry, therefore the light division of Philips is now separated into a new company: Signify. The health technology company is now focused on improving people's health. The slogan in the annual report of 2018 was 'transforming healthcare through innovation'. This slogan shows the focus of Philips is moving towards transformation.

PHILIPS DESIGN

Philips Design is a department within Philips dedicated to provide design services to all business divisions within Philips and to external clients. Philips design expertises lies in the field of user experience design, design strategy and insights, product design and brand communications design.

"We believe in creating products, services and solutions that go beyond the users' expectations to enrich the quality of their lives. Philips Design creates innovative, people-focused designs, which are recognized for excellence within the industry and beyond." (Philips Design, 2019)

A.6 DESIGN SCOPE

To understand how this project can be of most value for Philips Design, the outcome of this project should fit with the capabilities of Philips Design (further referred to as Philips). A small research on the topic of strategic design capabilities is conducted. First two strategic design capabilities are discussed which leads to a scope for this project.

Strategic design capabilities

DEAL WITH COMPLEX PROBLEMS

Design has strong capabilities to deal with the challenges in transformation. Designers can deal with complex problems by embracing uncertainty and taking a human-centered approach (Lin, Hughes, Katica, Dining-Zuber, & Plsek, 2011). Complex societal challenges are often ill-defined, the capability of designers to deal with these problems with a solution-focused strategy is really helpful (Cross, 2011).

Designers are used to communicate and model the problem and solution in a nonverbal, but visual way (Cross, 2011; Simonse, 2014). Using a visual design approach is helpful in social contexts, to balance the technologically possible and the socially desirable (Morelli, 2007). Visualizations of complex issues help to synthesise knowledge, communicate better and build shared understanding (Costa et al., 2019).

FACILITATE CO-CREATION WITH TOOLS

A core capability of strategic designers is to facilitate co-creation sessions (Canales Durón, Simonse, & Kleinsmann, 2019). Designers can do this by orchestrating the knowledge of different actors and facilitate shared understanding. The networked setting of transformation, is not so much an activity of an individual designer, but a cooperative effort, it requires a broader skill set from the network (Simonse, 2014). These co-creation activities can be guided by tools. Design has moved from providing matching solutions for problems towards providing innovation tools and capacities to organisations (Sangiorgi, 2011).

Scope

MAKING VISIONS ACTIONABLE BY TOOLS

All these aspects together make strategic designers good at constructing future visions and making the vision actionable by the use of visual tools (Canales Durón et al., 2019). A future vision gives orientation and should allow to discover solutions in a constructive way (Canales Durón et al., 2019). In this project the vision is the envisioned transformation to VBC and can be approached by the quadruple aim. The approach of a global issue in a context-specific way is the common thread for this project. This leads to the question how to make the global transformation challenge actionable in a local, living lab, setting together with stakeholders using visual tools.

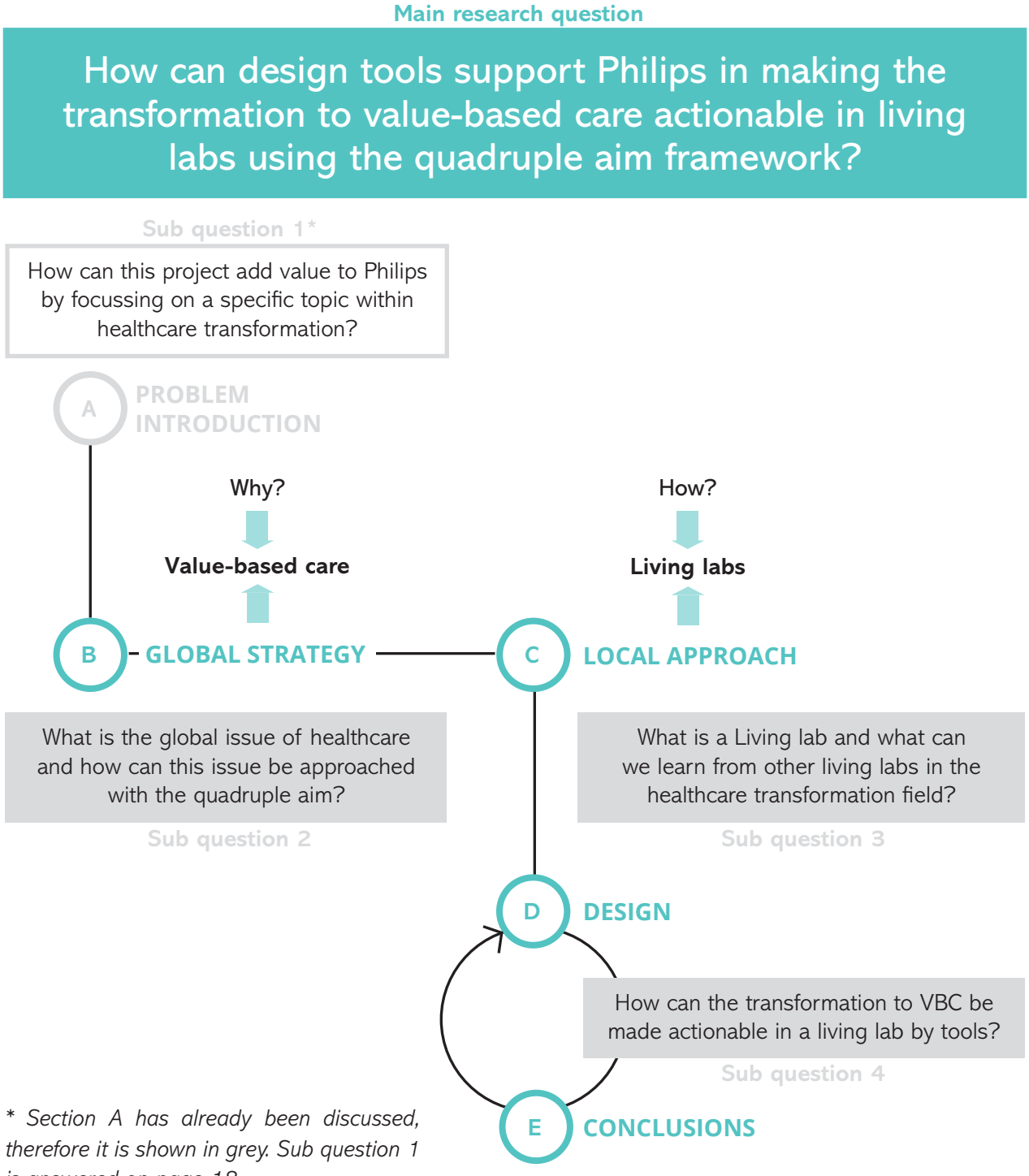
FOCUS ON VISIONING IN INITIATION PHASE

No handbook or timeline on how to approach a living lab is found in the healthcare field. However, for urban living labs the Amsterdam Institute for Metropolitan Solutions (AMS) recently published a living lab handbook (Palgan, McCormick, & Evans, 2018). From this handbook an 8 step timeline can also be useful for the healthcare living labs. The first step of this timeline is the initiation phase. In the initiation defining a problem and a vision for the lab is needed. This shows that for initiating a lab having a purpose and defining the problem you want to solve is an important first thing to consider in the lab, even before finding partners.

A.7 RESEARCH QUESTION

From the identified scope a research question can be constructed. The main research question is build up from elements discussed already. This includes the result (design tools), the company (Philips), the challenge (transformation to VBC), the context (living labs) and the decision to use the quadruple aim framework.

The main question is approached in steps, by first diving into the global issue and next into the local approach. The flow of this report is shown in the visual below. The different sections A to E address different sub-questions in order to cover all aspects of the main research question.



** Section A has already been discussed, therefore it is shown in grey. Sub question 1 is answered on page 18.*

A.8 APPROACH

B. GLOBAL STRATEGY

Literature VBC *Explorative interviews*

The main method to gain a better understanding of VBC is read what is written on this topic. A review on the systemic problem of healthcare is executed. This leads to the strategy proposed by Porter: value-based care competition. Next the triple aim and quadruple aim are studied. This leads to a comparison of Porter's perspective and the quadruple aim perspective. Explorative interviews with stakeholders in the field of VBC are conducted as well. By reflecting on the interviews it is possible to highlight key insights that needs to be considered in the design phase. With the information from both theory and the interviews a comprehensive understanding on the global topic can be constructed.

C. LOCAL APPROACH

Literature living labs *Living lab interviews*

To understand how VBC can be approached in a local context a combination of literature and interviews is used as method. First theory on how implement the quadruple aim is studied. Furthermore, the literature on living labs and 'a living lab way of working' is discussed. To better understand how living labs approach transformation in a lab setting, several labs in the field of healthcare are selected for interviews. In these interviews several topics are addressed: the mission of those labs, the partners, the projects and the outcomes. These interviews have resulted in best practices and challenges that help to define which tools are needed in the design phase. Synthesizing the findings into a high-level approach for living labs is based an theory and practice.

D. DESIGN

Synthesis *Design*

Design guidelines are constructed based on clusters of key insights from previous chapters. These guidelines lead to a design vision, that helps to structure the tools in the toolkit. The designed toolkit consists of three parts. The first part is a visual representation of the global strategy using the quadruple aim framework. This can be designed based on the knowledge from section B and guidelines. The second part of the toolkit consists of work sheets that need to be filled in during co-creation sessions within the living lab. The sheets are also based on the quadruple aim. The sessions are facilitated by someone from Philips. The facilitation is supported by the design of a slidedeck that includes all steps (part 3). Discussing the total design with people from Philips provides insights in the practical application of the toolkit. The toolkit is evaluated and improvements are suggested.

E. CONCLUSIONS

Lastly, relevance, limitations and future recommendations for the report and the toolkit are discussed.

DESIGN RESULT

SUMMARY
PROBLEM INTRODUCTION

Current systems are under high pressure and need a transformation to value-based care.

Transformation to value-based care can be addressed by the four aims of the quadruple aim: enhancing the patient experience, improving health outcomes, lowering the cost of care, and improving the work life of care providers.

The transformation that is needed is more than the development of new products or services, innovation for transformation should target the socio-technical system level.

The literature on the transformation paradigm leads to five key aspects on approaching a transformation: context-specific approach, experimental approach, extended view on value, multidisciplinary collaboration networks and co-creation with users.

Sub question 1: How can this project add value to Philips by focussing on a specific topic within healthcare transformation?

Philips wants to use living labs as a method to approach the value-based care transformation together with stakeholders, in an experimental way and in a local context.

Strategic designers have valuable capabilities to deal with the complexity of the value-based care transformation.

The focus of this thesis is on the initiation phase of a living lab that aims for healthcare systems transformation, because little is known about how to initiate those type of labs.

This leads to the design of tools that can be used by Philips for initiating living labs that aim to make transformation to VBC actionable.

B. GLOBAL STRATEGY

TRANSFORMATION TO VALUE-BASED CARE

In the first chapter B.1, the structural malfunctioning of the system is explained. Subsequently, the strategy that is needed to fix this system is explained. The perspective of Porter is introduced first in B.2, he wrote about value-based competition on results. Afterwards, the VBC strategy and definitions are extended to the triple aim and later on to the quadruple aim (B.3). These frameworks are then compared in B.4. Besides theory, explorative interviews are used as method to gain a broader understanding on the topic of VBC (B.5). With the knowledge gained from both literature and interviews it is possible to create a summarized understanding on the topic including the problem, the goal, the way to get there and the main challenges of VBC.

B.1 FROM VOLUME TO VALUE-BASED CARE

As already discussed in chapter A.1, there are multiple signs that the system of healthcare is not sustainable anymore. An increase in chronic diseases leads to higher expenses in healthcare, chronic conditions currently account for three-quarter of the health expenditure worldwide (Tsiachristas, 2016). The ageing population also adds to the increase of costs. This pressure on healthcare systems makes it more difficult to guarantee the quality and access to care. Besides, low satisfaction under staff and patients is a clear sign that there is something fundamentally wrong in current systems. Literature provides a better understanding about what is wrong with the current system fundamentals. The main problem is that current systems are based on delivering volume and not value. The following four topics illustrate what this means (figure 4).

1. FROM SILOS TO AN INTEGRATED SYSTEM

The direction that is needed is an integrated perspective that unites the actors of the system around a common purpose (Porter & Teisberg, 2006). A problem identified is providers do now work independently in silos and the integration between providers is weak (Clarke et al., 2016). The solution should therefore address the full system and not only one actor.

2. FROM PROVIDER TO PATIENT-CENTRED

The system is currently build around the provider and not around the patient (Berwick et al., 2008; Putera, 2017). The patient will become a partner instead of only a user, which needs a bigger change of thinking in the system. This means that the patient should be seen as a person with needs and values and not only as a disease that needs treatment. An example on how services could be organized more patient-centred and less provider-centred is to plan hospital visits not only according to schedule of physicians or devices, but also is comfortable to patients. If the patient has to go to three different departments it is more comfortable and efficient to plan these activities on one day, instead having three appointments on three different days.

3. FROM QUANTITY TO HEALTH OUTCOMES

The current system gives incentives to healthcare professionals and providers to conduct more procedures because they get paid for quantities (Porter & Teisberg, 2006). Fee for service (currenlty a widely used payment structure) is a system that rewards providers to do more, no matter the outcome of the procedure (Porter & Teisberg, 2006). In the current market hospitals are rewarded if beds are filled (Berwick et al., 2008). But in a value-based situation hospitals should be rewarded for healthier patients, which means less beds filled.

4. FROM CURE TO PREVENTION

More beds stay empty if hospitals move towards prevention and proactive care. The focus on prevention rather than curing is promising and could lead a total reduction in costs (Ryan, Brown, Glazier, & Hutchison, 2016).

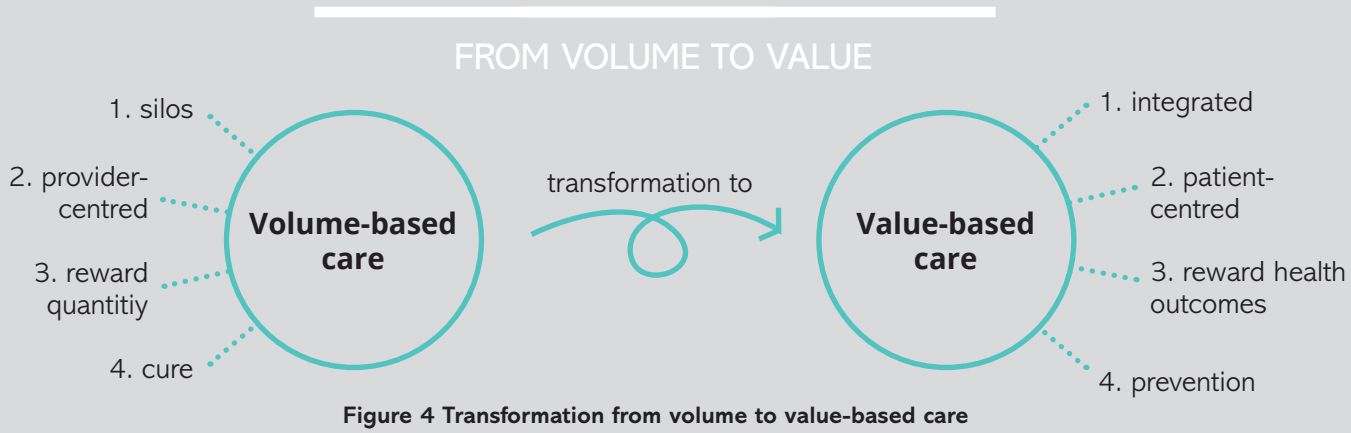


Figure 4 Transformation from volume to value-based care

B.2 VALUE-BASED COMPETITION PORTER

Besides explaining the problems with current healthcare systems, Porter also introduced a strategy to solve the problems. Porter and Teisberg (2006) identifed the lack of a strategic framework and proposed the strategy that is needed for improving healthcare: value-based competition on results.

DEFINITION OF VALUE

Value is defined as "the health outcomes achieved per dollar spent" (Porter & Teisberg, 2006, p. 4). This equation is the basis for the VBC theory from Porter (figure 5).

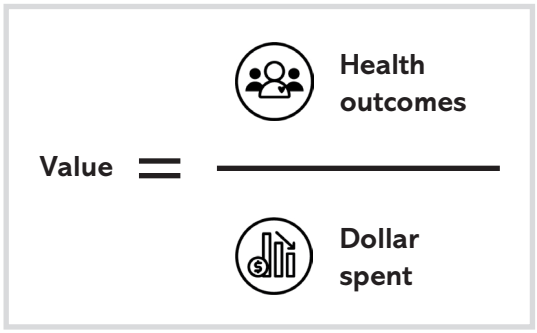


Figure 5 Definition of value in health from Porter & Teisberg (2006)

THE US MARKET PERSPECTIVE

The strategy Porter and Teisberg proposed is originally designed for the US health system. Although the systematic problems are evident in all countries, the issue is most burning in the US. The costs for healthcare are higher for the US compared to other developed countries (Porter & Teisberg, 2006). As can be seen in figure 6, the costs of the US are the highest of all countries and the health outcomes (life expectancy) are quite low.

COMPETITION ON RESULTS

The key driver to create better value in the health system is creating competition on health outcomes. In other markets competition has lead improvement in quality and costs, so this logic should also work for healthcare (Porter & Teisberg, 2006). More strongly, Porter believes that "competition is the only way to truly reform health care" (Porter & Teisberg, 2006, p. 4). The main challenge is to create competition on the right aspects. That means, not competing of following procedures, but competing of outcomes that matters to the patient. Competition needs to be organized on value instead of volume.

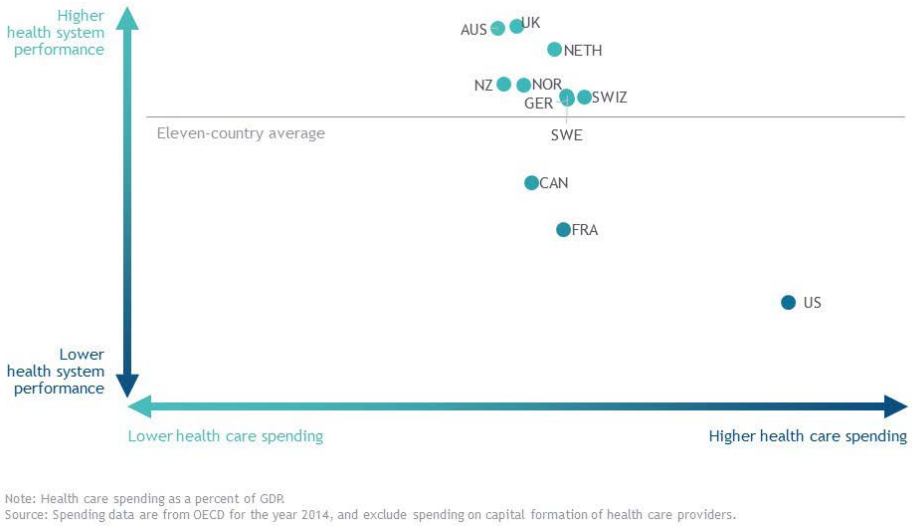


Figure 6 Healthcare performance compared to spending (Schneider, Sarnak, Squires, Shah & Doty, 2017)

DEFINING OUTCOMES THAT MATTER

In the current system actors tend to only measure irrelevant outcomes, for example measuring if processes are compliant with guidelines (Putera, 2017). This needs to change to systemically measure relevant outcomes. Having more insights in relevant health outcomes within and across organizations allows to better understand which treatments are successful and which are not. If organizations start to measure outcomes and compare outcomes, the organizations that perform worse will be motivated and enabled to change their way of working and learn from better performing organizations.

A BROAD DEFINITION OF RELEVANT HEALTH OUTCOMES

Porter shows that only treatment outcomes and mortality rates are not sufficient to cover the relevant outcomes. Health should be considered not only during diagnosis and treatment, but considered over the full cycle of care. Which also includes healthy living, prevention and home care. The full cycle of care is adopted by many organizations including Philips, and is often visualized as seen in figure 7. Besides, health is more than only physical health, it includes several dimensions that all need to be considered (Putera, 2017). Following the definition from the World Health Organization (WHO) health covers several aspects: physical, mental and social health.

OUTCOME HIERARCHY

To give a framework for this broad definition of health Porter introduced an outcome hierarchy (figure 8) that includes three tiers (Porter, 2010). The three tiers of health considered are 1) health status achieved, 2) process of recovery and 3) sustainability of health. Examples of outcome measures for different diseases are included in the work of Porter (2010).

FOUNDING ICHOM

Besides contributing to theory, Porter also took action in measuring outcomes. Porter was one of the founders of the international consortium for health outcomes measurement (ICHOM) a consortium dedicated to health outcome measurement.

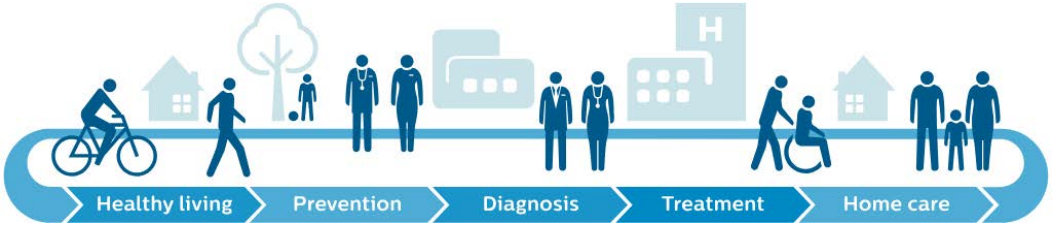


Figure 7 Cycle of care (Philips, n.d.)

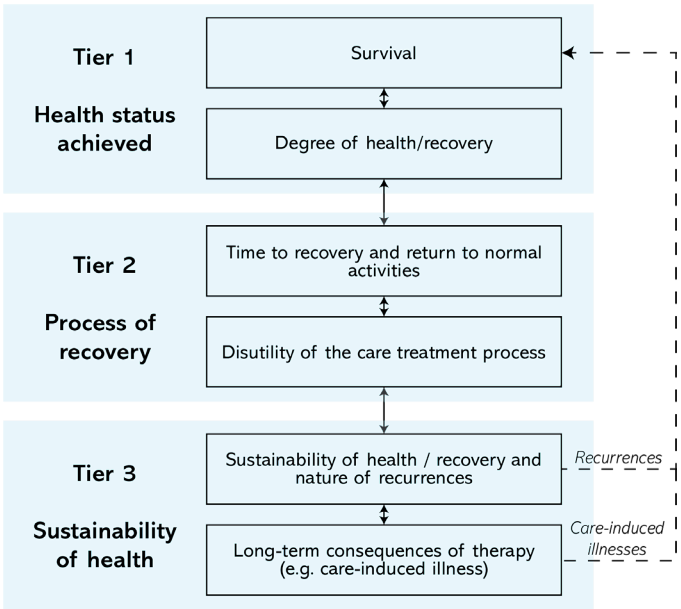


Figure 8 Health outcome hierarchy (Porter, 2010)

STRATEGIC AGENDA

A more strategic article of Porter, written together with Lee, is 'The strategy that will fix healthcare' (Porter & Lee, 2013). They point out a strategic agenda with six topics to explain how healthcare should be organized (figure 9). In the article on these topics more background is provided about why and how these topics need to be considered.

What we learn from this strategic agenda is that in topic 2 and 6 the importance of measuring outcomes is also reflected. In topic 1 it is illustrated how integrated care should look like, care organized in integrated practice units (IPUs). An IPU is "a dedicated team made up of both clinical and non-clinical personnel who provide the full care cycle for the patient's condition" (Gentry & Badrinath, 2017, p. 4). In topic 3 the issue to better align value with financial incentives is addressed. In this agenda it is translated into bundled payments for care cycles. What is meant with financial incentives are rewards or penalization to motivate providers to move forward toward desired outcomes (Putera, 2017).

Strategic agenda value-based care

1. Organize into Integrated Practice Units (IPUs)
2. Measure Outcomes and Costs for Every Patient
3. Move to Bundled Payments for Care Cycles
4. Integrate Care Delivery Systems
5. Expand Geographic Reach
6. Build an Enabling Information Technology Platform

Figure 9 Strategic agenda for value in healthcare (Porter & Lee, 2013)

Key insight 5

Only looking at treatment and health status achieved is limited, health needs to be considered over the full cycle of care.

Key insight 6

To reduce costs financial incentives need to be restructured to enable health providers to deliver good health outcomes.

THE INTERNATIONAL CONSORTIUM FOR HEALTH OUTCOMES MEASUREMENT ICHOM

ICHOM is an independent non-profit organization and brings together world leaders, clinicians and patients with the aim to define harmonized sets of outcomes metrics. These metrics are specified for different conditions, diseases and populations. By defining global standard sets ICHOM aims to unlock the potential of VBC (ICHOM, n.d.). If provider organisations are going to adopt these sets and start reporting these measure, more value can be created for all stakeholders. Besides defining standard sets ICHOM also organizes activities and workshops for implementation and conferences that bring together leaders around the topic of VBC.

B.3 QUADRUPLE AIM

Besides the strategic framework of Porter, the quadruple aim is another prevalent framework for VBC. Initially the triple aim was introduced and is later adapted to the quadruple aim.

TRIPLE AIM

The Institute for Healthcare Improvement (IHI) introduced the triple aim, a framework that should help to focus improvements on different goals. Berwick et al. (2008) found that current efforts are often focussed on single aspects, and what is needed is to pursue improvements in the broader system of linked goals. The framework guides to pursue three goals simultaneously: improving the individual experience of care, improving the health of populations, and reducing the cost of care (figure 10). Considering all aspects together makes the triple aim an exercise of balance (Berwick et al., 2008). What is most new in this framework is the recognition of population as a specific concern for defining health outcomes and costs.

QUADRUPLE AIM

Spinelli (2013) saw a missing perspective in the triple aim and did a contribution to the framework, he added the staff experience as a fourth aim in the framework (figure 11). The overall aim is to improve health of populations, the interaction between staff experience and health outcomes is significant. Doctors, nurses and other staff are crucial for good health outcomes, because they are the service providers of care to patients. So, staff satisfaction directly influences population health , the main goal of the triple aim (Bodenheimer & Sinsky, 2014). The other way around, staff satisfaction is also influenced by the quality of care they can provide, if physicians are not able to provide quality care this will negatively influence their satisfaction (Friedberg et al., 2014). This shows that pursuing staff satisfaction is highly important to achieve good health outcomes for populations, a good reason to add this aim to the triple aim. But not only does the staff experience influences health outcomes, it also influences the patient experience and costs. A more in depth illustration on the relationships between the four aims can be found on page 26.

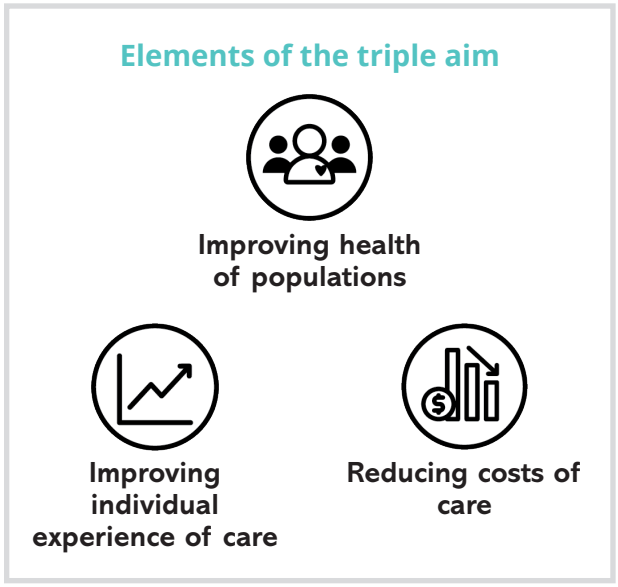


Figure 10 Elements of the triple aim (Berwick et al., 2008)

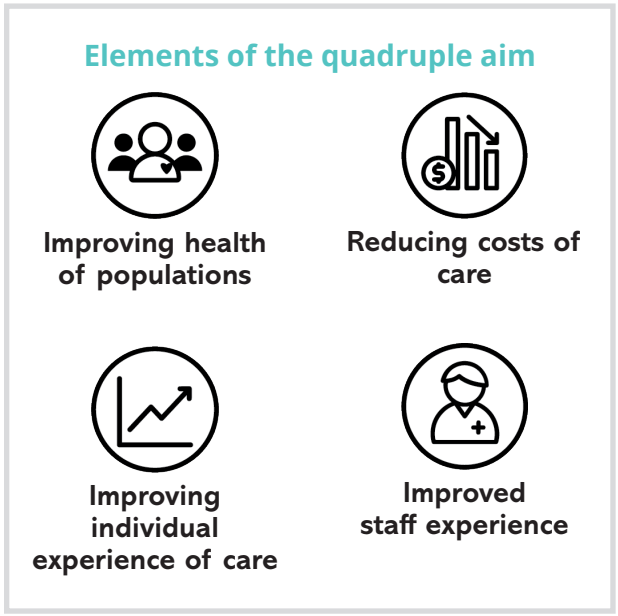


Figure 11 Elements of the quadruple aim (Spinelli, 2013)

Key insight 7

Improved staff experience is a crucial driver for improving health outcomes and should therefore be considered separately in VBC.

The existence of relationships between the aims show it is important to see the "parts of larger systems as intertwined components rather than independent entities" (Costa, Patrício, Morelli, & Magee, 2018, p. 6). To use the framework of the quadruple aim as intended it works best if all aims are considered and the relationships between the aims are also incorporated. The main challenge is not improve one aim at the expense of another aim, but to search for improving all aims.

Key insight 8

The dimensions of the quadruple aim should not be seen in isolation, the influence of one aim on another should be taken into account.

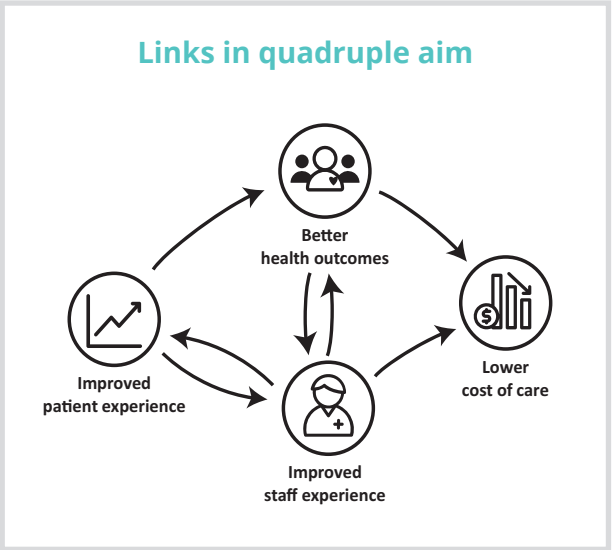


Figure 12 Relationships between four aims

RELATIONSHIPS BETWEEN THE FOUR AIMS

"Changes pursuing any one goal can affect the other, sometimes negatively and sometimes positively" (Berwick et al., 2008, p. 760). Costs can raise and individual care can improve if new, more effective but costly technologies are implemented. Both reduced costs and improved outcomes can be achieved by eliminating overuse or misuse of therapies. A main complexity in reducing the total costs of care are time delays among the effects of changes. Moving towards preventive care may take years to yield returns in cost or population health.

Staff experience - Patient experience

Burnout among the health care workforce threatens the patient experience (Bodenheimer & Sinsky, 2014). This real-life relationship between staff and patient has been proven to be important. Haas et al. (2000) found that professionals satisfaction influences patient satisfaction. Less satisfied staff show less empathy, this leads to decrease in patient experience (Hojat et al., 2011). Also the patient safety is affected by a heavy workload put on nurses at work (McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011).

Staff experience - costs

Maylett & Wride (2017) link an increase in staff experience to happier customers and an increase in revenue. This increase in revenue can be significant for some companies, it can be three times higher per employee (Morgan, 2017). Bodenheimer and Sinsky (2014) give a good overview of how costs can increase with bad staff experiences. Healthcare professionals dealing with a burnout contribute to the overuse of resources and in this way increase the costs of care. Physicians that are unhappy do also more often prescribe wrong medicine for their patients and leads to a higher chance on complications (Williams & Skinner, 2003). These complications lead to higher costs per capita. In moving towards value-based care programs health and wellness of their employees increases, the productivity increases and absenteeism decreases, and this off course saves money (Araujo, 2019).

Patient experience – health outcomes

Patient satisfaction also influences health outcomes, less satisfied patients show worse health outcomes, especially worse mental health results (Chen et al., 2019). But this relationship is not studied so much yet, Kaye et al (2017) found a positive influence of patient satisfaction on short-term health outcomes like mortality rates, but the magnitude of this relationship is find modest.

These examples show how one aspect can influence another aspect in both positive and negative ways (figure 12).

B.4 COMPARING PORTER AND QUADRUPLE AIM

	Value-based competition	Quadruple Aim
Similarities	Reason: under performing and costly US health system Need for integration Measuring outcomes as enabler of improving health outcomes Patient-centred approach	
Differences	Goal: *1. Improve health outcomes* *2. Reduce costs* Stronger focus on competition	Goal: *1. Improve health outcomes* *2. Reduce costs* *3. Improve patient experience* *4. Improve staff experience* Less focus on competition, more on collaboration

The framework from Porter and the quadruple aim framework are the oldest ones in VBC literature and most widely used. More VBC frameworks have been found, but not considered in this comparison. Putting the two frameworks besides each other gives insight in the similarities, differences and possibilities to combine the two. This comparison is summarized above.

SIMILARITIES

The reason behind the two frameworks is similar: the US healthcare system is drastically under performing and costs are rising. Both saw a need for integration, call for a patient-centred approach and considering the full cycle of care for measuring outcomes. To summarize, two aims are considered in both framework goals: the costs and health outcomes.

DIFFERENCES

The main difference is the addition of two aims in the quadruple aim that are not explicitly mentioned from the view of Porter, staff and patient experience. A difference in the importance of competition as a mechanism for change is observed. Porter argues competition as the key principle to achieve better value, this is stated weaker in the quadruple aim. Berwick et al. (2008) see the need of competitive dynamics to realize other behaviour, but also argue to focus on collaboration to realize transformation.

CHOSEN FRAMEWORK

The quadruple aim is chosen as most suitable framework to address the transformation to VBC. Adding two more dimensions to the framework of Porter is considered to result in a more comprehensive view on the total system. Patient and staff experience are crucial to achieve the overall aim of improved health outcomes. Only looking at the ratio of health outcomes and costs show similarities with the industrial paradigm, a focus on efficiency and tangibles (figure 13). Adding staff and patient experience is considered to be more in line with the transformation paradigm, it balances the different values (figure 14).

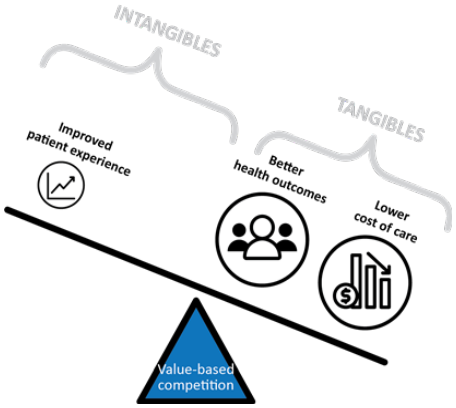


Figure 13 Value-based competition Porter unbalanced

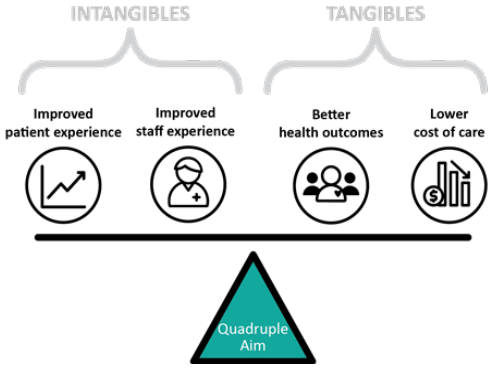


Figure 14 Quadruple aim in balance

B.5 EXPLORATIVE INTERVIEWS

Besides the theoretical side of value-based care, it is interesting to look at the practical side as well. Explorative interviews with experts in VBC are set up to understand the topic of value-based care from different perspectives. Several stakeholders from different backgrounds are interviewed about their perspective and work on value-based care.

SET-UP

The main goal of these interviews is to get a more in depth view of value-based care. The theory of the previous chapters sketches an ideal scenario for the health system, but learning how to apply value-based care in work is not studied yet. Therefore questions on the view on VBC and VBC in their work were asked. The interview questions can be found in appendix B.

SELECTION

The interviewees are purposively selected based on heterogeneous aspects. Stakeholders from the Netherlands are selected, because this makes it possible to meet in person, which is preferable.

First the view of Philips is relevant to consider, to see the differences and similarities in understanding on the topic compared to other stakeholders. Next, three other interviewees are selected based on their possible role and expert position on the topic.

Two interviewees are selected based on their possible role in the living lab. In the MMC lab the university, Philips and hospital are already established partners, and political or payor partners would be possible new partners for the MMC lab. This has lead to an interview with someone from an insurance company and someone in a political position.

The last interviewee is selected based on his expertise in the field. To get a heterogeneous perspective on the topic, a general industry perspective is of added value and is not reflected in the other three interviewees yet.

INTERVIEWS

In the boxes, the different stakeholders are introduced, with quotes and explanation to support their perspectives. This leads to new insights and discussion. In the interviews, interviewees mentioned additional documents on VBC, these have been considered as well.

The interviews are recorded and notes are taken. The analysis is focussed on the topics that were unknown before the interviews.

1. GLOBAL DIRECTOR MARKET ACCESS - PHILIPS

From the point of Philips, VBC is translated into the quadruple aim.

"What I think the trap can be, is that many people try to translate the book, somehow, back to other countries, which it was really not designed for."

He said that the book of Porter is less useful than the quadruple aim, because it is only written for a specific country and difficult to apply to other countries.

"We map our products against the quadruple aim, which we are using as a tool to demonstrate to our customers, how products can be used in a value-based way."

The quadruple aim is used to determine external value created for customers.

"Put the patient in the middle. And that's why we call it also patient centric care. And that's a lot what value-based care is about, it's about patient-centricness."

The main aspects in the value-based care theory that he pointed to were patient-centricity and the need to reform the financial model. To better understand the financial aspects he pointed to Philips' white paper on value-based care (Philips, 2018).

2. MANAGER STRATEGY & BUSINESS DEVELOPMENT - ZILVEREN KRUIS

"There are two extremes, VBC as a kind of holy grail. And people think we are going for VBC and the world is immediately different. But that is not true. Between the one extreme, here, and the other extreme of having an integrated budget, there are many smaller steps in between."

Value-based care is seen as financial structure that would be ideal, but is not realistic. He visualises a scale of current payment models (fee for service) at the one side and value-based models at the other side.

"Actually, value-based care is quite far from our system, it is not possible in our system if everyone is insured"

VBC is designed for the US, not for the Netherlands. This is a problem, since the system works quite different here, everyone is insured and there is less competition.

3. SR POLICY ADVISOR - MINISTRY HEALTH, WELFARE & SPORTS

Value based care is quite a big topic within the Ministry of health welfare & sports. A separate program, with multiple fte working on the topic, is running. The topics discussed during the interview were supported by a booklet (VWS, 2018).

"It depends on how you colour (Dutch: 'inkleuren') the management literature"

This quote illustrates that the management literature (from Porter) can be interpreted in different ways. Value-based care within VWS is translated into outcome-based care, with four main directions to guide action.

"Within the program we focus on the patient and what matters to them, we focus less on the costs"

These actions are centred around the patient. The main goals written down in the booklet are: improve quality of life for the patient and improve job satisfaction and quality of the healthcare professional.

"We work together with umbrella organizations, to be able to quickly scale from one to other hospitals if something proves to be successful."

Ministry of VWS defines its own role as bringing organizations together and make it possible to scale from one to more organizations.

4. SERVICE DESIGNER - DELOITTE DIGITAL

"I have to admit that VBC is a kind of ideal system, a system for the future. Our clients are far from there."

"I do understand VBC on a theoretical basis, but practically I see a lot of barriers. I never had a project for a client on the implementation of VBC."

VBC is a topic that is not a key issue for clients in the healthcare field. VBC is not reality yet, it is a utopian. It is more a theoretical concept and not directly applicable in practice.

"I like the ideas presented in VBC, BUT (...)"

"If we talk about change, all parties are going to point to another party. The physician is pointing at the payors, because they don't give the money they need. The patient is pointing at the hospital or the government, because the healthcare allowance is raising again."

A lot of barriers in the current system exist that will make it really difficult to implement VBC. The main complexity are the actors that are currently not aligned.

INSIGHTS

In the interviews the main challenge that I identified in the problem introduction, was recognized. The fact that the global theory that exist is not directly applicable in practice. It needs to be "translated into a context", or "coloured". On a "theoretical level" it is nice, but in practice deals with barriers.

From the interviews I found that only Philips uses the quadruple aim as framework for VBC. The others mention topics that are more in line with the theory from Porter (interview 2, 4) or are referring to a self-constructed framework (interview 3).

The VBC theory is broad in the sense that it covers several aspects: problem, solution, strategy and challenges. But in the interviews it is observed that they tend to highlight one aspect of value-based care and not the full range of aspects. For example only focus on the outcomes (interview 3), focus on VBC financial models (interview 2), or zooming into the patient-centricness of VBC (interview 1). In interview 2, the costs are intentionally left out of scope. This insight is summarized in key insight 9.

Key insight 9

Tendency to focus on one aspect of value-based care and forgetting other crucial parts.

DISCUSSION

It is difficult to give a good representation of VBC and not focus on one aspect only. In the quadruple aim perspective, this means addressing all aims and not focussing on one aim only. Seven years after the triple aim was introduced, Whittington et al. (2015) evaluated the impact of the triple aim and found that is challenging to pursue all three components simultaneously. It is not only a challenge to understand all aspects of VBC (insight 9), but also to cover all aspects in the implementation of value-based care (Whittington et al., 2015).

Key insight 10

In practice it is challenging to pursue all aims simultaneously.

Another challenge identified related to the lack of a shared understanding on VBC is explained in a paper on the triple aim from Mery, Majumber, Brown & Dobrow (2017). This research observes how the triple aim has been adapted and used in several projects. They found that the components of the triple and quadruple aim have been changed a lot and this is a problem, because it results in redundancies in the framework. However, the fact that the triple aim has changed is also logical, because using the original US model in other jurisdictions requires context specific adaptations. This does not mean one of the main aims changes, but rather a slight change in the aim definition. One of the reasons for the variety in understanding on the quadruple aim is the simplicity of the model, this simplicity has led to widespread popularity in the healthcare industry (Mery et al., 2017). But the simplicity of the model is not only a benefit, it is also a risk for misinterpretation.

Key insight 11

The definitions of the four aims can be adapted to reflect local context needs and priorities.

SUMMARY GLOBAL STRATEGY

Based on the theory read and the interviews conducted it is possible to summarize the key aspects of value-based care. This includes the problem, the ideal situation, the way to get there and the main challenges identified. This answers sub question 2: *What is the global issue of healthcare and how can this issue be approached with the quadruple aim?.*

The problem

The problem are healthcare systems that are not sustainable, this is visible by multiple signs: increasing costs, quality of care under pressure, unsatisfied staff and patients. The main problem of the system are misaligned incentives. Current financial structures do not promote to deliver value, but incentivizes the delivery of volume.

The ideal situation

The ideal situation is a system that is based on value, it rewards good health outcomes and reduces total costs. The goal is to pursue the quadruple aim: improve patient experience, improve health outcomes, improve the staff experience and reduce costs of care. It is key to pursue all aims simultaneously and balance the aims, to make sure to not improve one aim at the expense of another

The way to get there

It is important to move from working in silos towards better integration of the system. This will lead to reduced costs and better patient experience.

The driver to improve health outcomes is to measure relevant health outcomes and to act based on the outcomes. Outcomes should be considered over the full cycle of care.

Another key element in promoting better outcomes is to align financial incentives with value. This means changing from fee for service structures to value-based payment structures.

The main challenges

One of the challenges identified is to balance all aims of the quadruple aim and to pursue all aims simultaneously. There is a tendency to focus on one of the aims and not consider other aims.

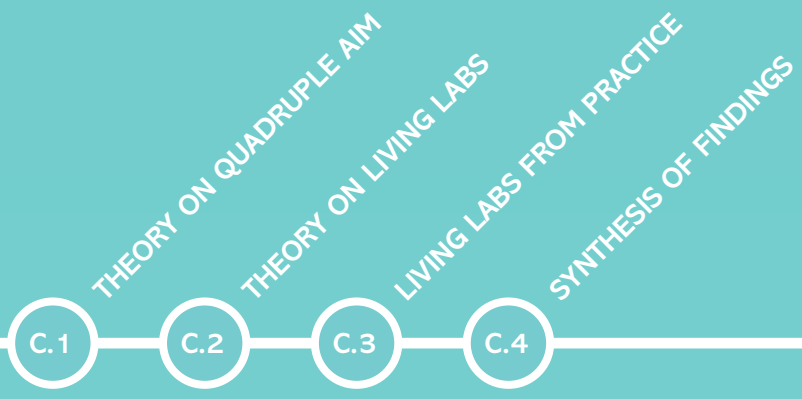
The definitions of aims in the quadruple aim can be adapted to be suitable for the local context needs and priorities.

C. LOCAL APPROACH

LIVING LABS AS A PLACE FOR INNOVATION

Whereas the previous chapter introduces the transformation to value-based care and explains why it is needed at global scale, this chapter elaborates on the way VBC can be approached in a local setting. After this chapter all elements of the sub question are covered: “What is a living lab and what can we learn from other living labs in the healthcare transformation field?”

By taking three different angles a high-level approach to initiate living labs can be created (C.4). First a review on theory from the triple and quadruple aim is done (C.1), next literature on living labs results in an approach to initiate living labs (C.2). Finally, a perspective from practice by interviewing six different labs that aim for healthcare transformation gives a more in depth understanding on the topics from literature(C.3).



C.1 THEORY ON QUADRUPLE AIM

The IHI has laid the foundations for the triple aim and described why this framework was needed, this is described in chapter B. But the IHI also wrote about how to implement the framework. In an article by Whittington et al. (2015) lessons learned from organizations that used the triple aim framework between 2008 and 2015 are described. This leads to guidelines explained in this chapter, it is assumed that the guidelines for the triple aim also holds for the quadruple aim.

DEFINE FOCUS

A central focus of the quadruple aim framework is to define a population. Populations can be defined in many different ways either as enrolled or as geographic populations. What needs to be considered is that all aims need to be relevant for the defined population (Whittington et al., 2015).

Segmenting the population into sub populations according to peoples needs helps to further focus. Populations can be segmented into groups from healthy people to those with complex needs (Whittington et al., 2015).

Having those sub populations helps to investigate and act based on the needs of those people. Projects can be set up to address the needs of a sub population, while covering all aims of the quadruple aim. These projects together create a portfolio of projects on a specific topic (Whittington et al., 2015).

Key insight 12

Segmenting a population in sub populations helps to focus on specific needs of people and define projects around those needs.

ROLES AND STAKEHOLDERS

In the initial publication on the triple aim Berwick et al. (2008) identified the need of an integrator role. The integrator should be responsible to oversee the work, establish a purpose and build learning capacity to achieve the triple aim (Whittington et al., 2015). Besides having a high-level integrator responsible for the full portfolio of projects, the IHI recommends to designate a project leader to each project that has the time and resources to oversee the project (Whittington et al., 2015).

The role of an integrator includes the responsibility to define a broader collaboration network of stakeholders to achieve the quadruple aim. Four considerations that help to identify which stakeholders need to be involved are explained by Whittington et al. (2015, p. 270)

(1) those who would benefit if the health, healthcare, and per capita costs improved for the population;

(2) those who could directly or indirectly influence the necessary changes;

(3) those who would champion the spread of successful changes;

(4) those who had access to the data and measures that would drive Triple Aim results.

Covering all these aspects is a challenging task. The process of setting up the stakeholder network can take as long as 18 to 24 months (Whittington et al., 2015).

Key insight 13

Include those who benefit, those who influence, those who would spread successful changes and those with important data.

DEFINING PURPOSE AND PRIORITIES

Another responsibility of the integrator is to define a purpose around the quadruple aim. This means providing specific meaning to the quadruple in the local setting (Whittington et al., 2015). It is needed to define "what we are trying to accomplish and why" (Whittington et al., 2015, p. 272). Porter & Lee (2013) have mentioned a similar issue, they said that clarity about the goal is crucial to become successful.

An example of a purpose statement is: "Improve the health of the population while maintaining or improving experience of care and lowering costs. We will begin by focusing on high-risk and high-

cost members of the population whose care often adversely influences health care revenues." (Whittington et al., 2015).
In this purpose statement the relative importance of aims and populations can be articulated. For a specific context it can be more important to improve patient experience and less important to reduce costs. This can result in the objective to not directly lower costs, but first focus on improving patient experience while maintaining costs.

Key insight 14

Defining a purpose around the quadruple aim can be done by defining priorities in the quadruple aim.

MEANING OF QUADRUPLE AIM

To support good collaboration it is necessary to describe in more in detail the meaning of the quadruple aim in a certain context. If the meaning of value has not been communicated clearly this will become a core problem in achieving the quadruple aim (Pendleton, 2018). Having a better understanding on the definitions of the quadruple aim also helps to discuss who is responsible for achieving specific value characteristics (Pendleton, 2018). Defining measures for all aims help to evaluate progress on the aims (Whittington et al., 2015).

Key insight 15

Discussion on the meaning of the values in the quadruple aim is needed to prevent misalignment of stakeholders.

LOCAL LEARNING APPROACH

Whittington et al. (2015) also found that transformation requires continuous learning. Starting with experiments rather than immediately moving to full-scale implementation is preferred (Whittington et al., 2015), this is in line with key insight 4.

The theory on how to approach VBC according to quadruple aim theory is summarized in the figure 15. A similar type of visual is made in the next section. In synthesizing the findings is done in section C.4) these models will be combined.

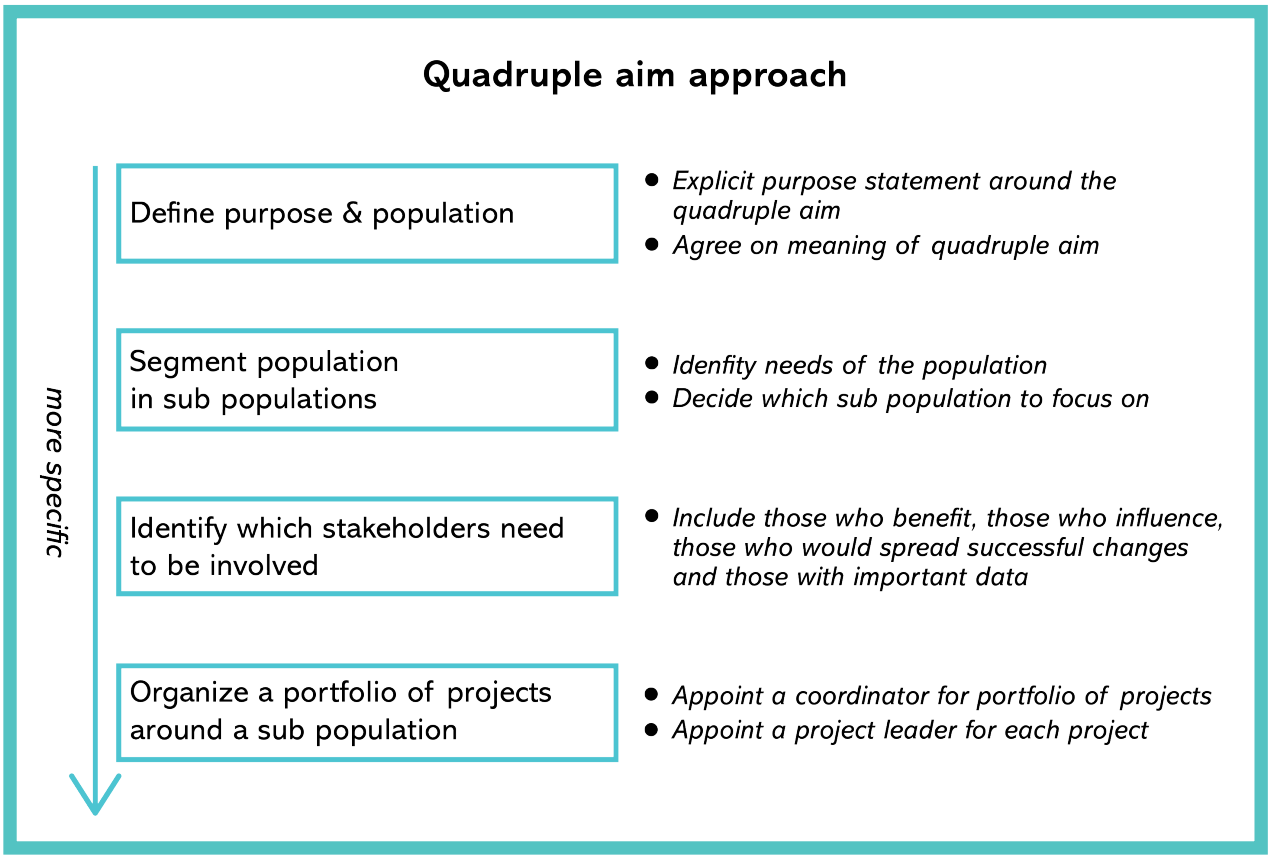


Figure 15 Summary of approaching quadruple aim

C.2 THEORY ON LIVING LABS

Philips has envisioned the local experimental approach in living labs. Maas et al. (2017) also found that living labs are promising to tackle societal problems. Examples of societal challenges are, besides healthcare, sustainability and urban development. Most examples of living labs are found in these three areas (Maas, Van den Broek, & Deuten, 2017). This section will dive into the literature of living labs from a general perspective, not only living labs for healthcare.

BACKGROUND LIVING LABS

The living laboratory concept came up in the 1990s, Bajger et al. (1991) wrote a paper about real-world student projects executed in an inner-city neighbourhood. Others say the living lab concept is originally from William Mitchell of MIT, he explained the living lab as a user-centric research methodology for sensing, prototyping, validating and refining complex solutions (Eriksson, Niitamo, Kulkki, & Hribernik, 2016). The first initiatives for living labs were in the area of studying smart/future homes. The concept of living lab has been adopted by companies, living labs could be seen as a specific type of open innovation (Westerlund & Leminen, 2011).

Over the past 20 to 30 years the number of living labs has increased drastically. The Enoll (European Network of Living Labs) has labeled over 440 around the world (Enoll, 2019). In the Netherlands, the Rathenau Institute did a quick scan and found over 90 living labs in 2017 (Maas et al., 2017).

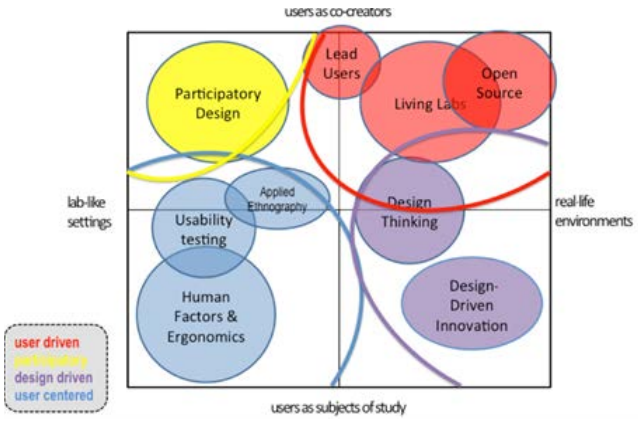


Figure 16 Overview of user-innovation methodologies, (Almirall, Lee & Wareham, 2012)

SIMILARITIES

Living labs are a methodology of user-innovation, in the figure 16 Almirall, Lee & Wareham (2012) positioned living labs as user-driven innovation. User-driven means involving users as co-creators and positioned in a real-life environment.In the appendix an overview of later definitions of living labs is shown. Although there are differences in the definitions, all sources agree on the fact that 1) users are co-creators, 2) living labs are placed in a real-world context and 3) multiple stakeholders are involved.

1) Users as co-creators

Involving users in the innovation process helps to capture market and domain-based knowledge (Almirall et al., 2012). Involving users in the full innovation process is challenging, a lot of labs only involve users in certain aspects of the innovation process, for example only setting up requirements and testing of prototypes (Palgan et al., 2017; Westerlund & Leminen, 2011).

2) Real-world context

Within living labs the fit to a specific context is important (Almirall et al., 2012). Living labs often have a physical space, this makes the innovation focused on a specific region (Eriksson et al., 2016). The real-life environment is not only realistic context for validating proposals, it creates opportunities for the emergence of new meanings, capturing tacit knowledge and validation of the whole ecosystem (Almirall et al., 2012).

3) Multiple stakeholders

Another agreed aspects is the fact that multiple stakeholders are involved in the process. The key challenge for successful collaboration with multiple stakeholders is to create sustainable value for all stakeholders (Ståhlbröst & Holst, 2016).

Key insight 16

It is important but challenging to involve users in the full innovation process.

DIFFERENCES

In the field of living labs a lot of different types exist. Besides the similarities are explained, differences in key objective, stakeholders and activities are found among different labs (Herrera & Portnoy, 2019). The most differentiating factor is the goal of the lab, this goal influences which stakeholders need to be involved and which activities need to be organized (Herrera & Portnoy, 2019). Four distinct types of living labs have been found in literature: co-creation, acceleration, transformation and culture change. Definitions of these types can be found in appendix A.

LIVING LAB WAY OF WORKING

Key insight 17

Be aware that living lab is a broad term. Having a clearly defined goal for the lab is important, because it influences stakeholders and activities in the lab.

In literature, little practical guidelines on how to define stakeholders and activities based on a higher goal are found. However, one recent handbook is quite explicit in introducing the living lab way of working for urban living labs (Palgan et al., 2017). The first three steps from this handbook are explained.

Define a problem

A lab needs to be initiated with the ambition to solve a certain problem. This problem needs to be made explicit to find partners that agree with the relevance of solving this problem in a lab.

Find partners

Next step is to get in touch with potential partners in four domains: users, public actors, knowledge institutes and private actors. The aim is to build partnerships that together are able to set up a project. It is important to persuade potential partners and have a clear idea about the problem.

Define a project

After having a specific problem and partners, it is necessary to translate this abstract aspiration in a concrete project. In this project all interest of partners need to be considered in a way that everyone is able to contribute to the problem.

Insights on the approach are summarized in figure 17.

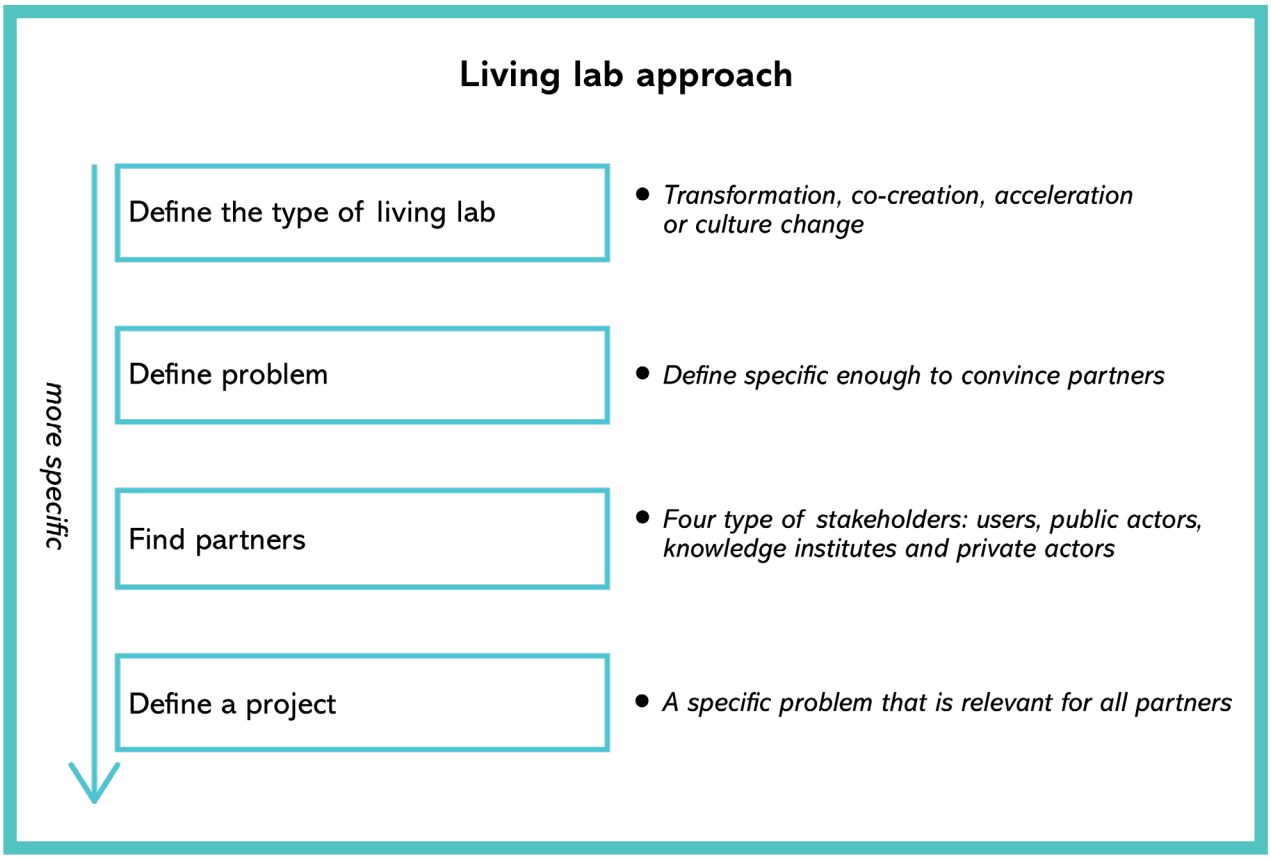


Figure 17 Summary of approaching living labs

C.3 LIVING LABS FROM PRACTICE

Theory has shown which steps are needed to initiate a living lab for transformation. From practice it is useful to get a more in depth understanding and see which of these steps are challenging. A selection of living labs in the field of healthcare was made and interviews were conducted. The method is explained and the lessons learned from the interviews are presented under results.

METHOD INTERVIEWS

Ten labs were approached and six labs participated in this research. Labs were selected based on the available information provided online. Labs that appear to be dedicated to transformation of care or value-based care were of interest for this study. Besides the ten approached labs, no other labs dedicated to healthcare transformation have been found. A reflection if the labs could be seen as a lab for transformation is included in the results section.

A summary of the labs that were interviewed, including their mission, the location, the organization and the starting year can be found in appendix C. The main goal of the interviews was to understand labs defined a mission, and how this mission is reflected in projects, partners and outcomes. An interview guide is made and used during the semi-structured interviews (appendix B). The four topics (figure 18) are also an anchor for the analysis of the interviews. These topics are chosen because they are in line with the research scope: translating a vision into action. By requesting examples it is possible to learn from specific situations that went well or were difficult in those labs. The result of the analysis is a list of best practices and key challenges categorized under the four topics. Besides, a few general insights are explained under results.

Figure 18 Topics addressed in interviews

Personal reflection

A lot of living labs do not identify themselves as living labs. Many other names do exist which makes it difficult to find labs of interest. However, based on what I learned about the way of working in the labs I could label them as 'living labs'. Other names that are used include: Innovation lab, field lab, centre for innovation, design lab etc. It is not clear what are the differences between those labs, but it could lead to a whole new discussion on defining a good name. This discussion is seen as valuable, but out of the scope for this thesis.

Because of the high number of insights, not all insights can be seen as key insights. The insights that are most relevant in initiating a living lab have been considered as key insights. Those insights are used in the formulation of design guidelines.

The interviews were planned for one hour and conducted via Skype, because the labs were not based in the Netherlands.

RESULTS

Mission

General insight 1

4 out of 6 labs are aim for transformation

From the interviews a better understanding on the mission of each lab is gained. This makes it possible to reflect if the labs take a transformation approach. Based on the four different types of labs found in living lab literature it is possible to evaluate which labs are which types. One lab is found to be mostly focused on changing culture: "To be focussed on creating awareness". One other lab better fits the definition of co-creation "Use people centred design approach to (...) service & products". The other four labs show enough characteristics of taking a transformation approach to be seen as a 'living lab for transformation'. The

key characteristic of a lab for transformation are: it address the system, which means it focuses on more then only product or service level innovation (page 9).

General insight 2
Mission can evolve over time
Interestingly the focus of its mission can evolve over time, for example one lab evolved from "medtech products" to "patient experience" and is now looking at "digital health" "behavioural change" and using "data". For one other lab, they were currently questioning how they want to be repositioned. So having defined a mission when starting a living lab, does not mean this mission will stay the same. "We question ourselves what focus we want to take".
This insight is interesting but not seen as key insight. It is more important in the later stages of a lab, not the initiation phase.

Challenge 1
Addressing all aims of the quadruple aim
Only one of the labs used the quadruple aim as a framework for their mission. The quadruple aim is possibly unknown to other labs .In table 1, the aims addressed in each lab are categorized. This overview shows that patient experience and improved health outcomes are addressed most in the labs, those aims are potentially easier to be addressed in labs. Staff experience and costs are mentioned less and appear to be more difficult to address within a lab.
Challenge 1 is not a new key insight, this is also described in key insight 10.

Partners

Challenge 2 (key insight 18)
Difficult to involve a variety of stakeholders
In the answers interviewees explained which stakeholders were involved at the start of the lab and which stakeholders are involved at this moment. Hospitals were the main stakeholder in the lab for each living lab, 5 out of 6 labs were also positioned within a hospital. From previous chapters I learned that a big variety of stakeholders is required for transformation: policy makers, payors, users and providers. However, none of the labs worked close together with a payor and only two labs are working together with political organization. Industry partners are often not the core of the lab organization. They are mentioned as important players for implementation and scaling up innovations, but not so often in the initial phase of projects. These examples show how difficult it can be to involve a variety of stakeholders at the core of a living lab. However, a best practice is seen in one of the labs to involve a variety of stakeholders.

Best practice 1
Be open to a variety of stakeholders
Start the initiative in an open way and allow stakeholders to be involved. One lab started with an event where they pitched their idea and problem and started conversations with stakeholders that were interested in joining. "We invited around

Personal reflection

The collaborations that are needed for transformation are challenging, the gap between disciplines is big. For example healthcare professionals and designers have been teached a different mindset. Designers prefer quick action and dream about the future, while healthcare is used to rigor in testing new things. Health care professional have to deal with everyday problems which makes it difficult to dream about the far future. Big differences in background need to be taken into account, new collaboration does not happen automatically but need time and effort to become successful.

Table 1. Quadruple aim in living labs

	Lab 1*	Lab 2	Lab 3	Lab 4	Lab 5**	Lab 6***
Patient experience	x	x	x	x	x	
Health outcomes		x	x	x	x	
Staff experience	x			x	x	
Costs		x	x			

* Lab 1 is seen as a culture change lab
** Lab 5 is seen as a co-creation lab
*** Lab 6 is a relatively new lab and the answers remained abstract, which made it difficult to identify the aims

40 people. We invited the major players from university, we invited people from industry that we knew. We needed to have industry partners as well. We invited people from the government." This has resulted in a big variety of stakeholders involved in the projects that run in this lab.

Projects

General insight 3

Project approach varies between labs

Under the topic of projects a lot of diversity is observed. Some labs have a fixed timeline and a structured approach. "Where we have a call for proposal every year and anyone can apply to. We select a couple of projects. In the first phase we try to get early anecdotal evidence we are moving the right direction. That is around 6 months. This is the first phase." Others have developed a project execution toolkit that should help to structure the project approach, this was seen in 2 labs.

Having the project execution clear is often not something that was defined up front. It is something that becomes better defined through time. That this process takes long was mentioned by 2 labs: "Taking a lot longer than we were hoping, because it take time to convince that there's a better way to do things." "But that actually took a couple of years to materialize how to define the projects."

Project selection and structuring is not considered a main insight, because this research focuses on the lab level, not on project level. Besides, project selection was the focus of research done by Jia (2019).

Best practice 3 (key insight 19)
Organize a lab around topics

What is seen in 3 labs, is a structure in the organization of projects in dedicated portfolios. These 3 labs were all considered labs for transformation. Portfolio of projects were mentioned as "research themes" "units" or "focus areas". Structuring around these topics helps to appoint leaders to these topics. It also helps to not only address product development, but to dedicate effort to more challenging innovations that address the systems level. For example "Digital health" "Innovative infrastructure" or "Healthy living" are examples of topics that take a systems perspective on innovation. Which topics are addressed in labs can also be seen in appendix C.

Outcomes

Challenge 3 (key insight 20)
Defining outcome measures for transformation

It is important to deliver outcomes, because making impact is key, but it is difficult to define the right outcome measures for a living lab. "It becomes very important for us to evaluate and document the impact our solutions have. Because otherwise there is no argument." One reason given for making it difficult to define outcome measures is the uncertainty of the process "Innovation does not always lead to concrete outcomes". "If you take the innovation approach into a new topic, you have to accept that failure could be a possible outcome".

Outcomes are measured in several ways, and one could doubt if these outcome measures are in line with transformation. Outcomes mentioned in three labs are in the field of research output, this could be "number of PhD" "number of publications". Outcome measures that were mentioned once are "ROI", "having a scaled intervention" or "annual report".

Challenge 4 (key insight 21)
Defining what is expected upfront

Expectations on outcomes are not always made explicit at the beginning of a lab or a project. This leads to frustrations and misalignment between stakeholders. It would be beneficial to spend more time upfront to define expected outcomes. This point is mentioned in one of the quotes "They have not really defined clearly what they expect. But of course they expect something." And next, the interviewee explains how this has led to problems. In one lab the interviewee said "You need to be just really clear about what this thing is that you're doing, for us this was a big mistake, because everybody thought it was clear." And it appeared not the be clear. So he advices to spend more time upfront in defining expectations. The challenge of defining expectations is seen as main challenge of all challenges they encountered for 2 labs.

C.4 SYNTHESIS OF FINDINGS ON LIVING APPROACH

HIGH-LEVEL APPROACH

The previous three chapters show similarities in the approach that can be taken to initiate a living lab. By combining the knowledge from theory and practice it is possible to draft a high level approach for initiating successful living labs in healthcare (figure 19). The steps show a logical order, but should not essentially be interpreted as a linear process. It could be possible to follow another order or make iterations.

1. Agree on the type of the lab

Is the goal of the lab transformation and taking a systemic view, or is it just co-creation, acceleration or culture change.

2. Define a specific topic

A specific topic in the case of healthcare could be defined around a (sub) population that has specific needs.

3. Define common purpose

Within the selected topic the problem and the vision, representing the desired situation need to be clear to act as a common purpose.

4. Find partners

Partners that are important in solving the identified problems need to be found and convinced to join.

5. Make objectives specific

Make the vision more specific by defining objectives and what outcomes are expected.

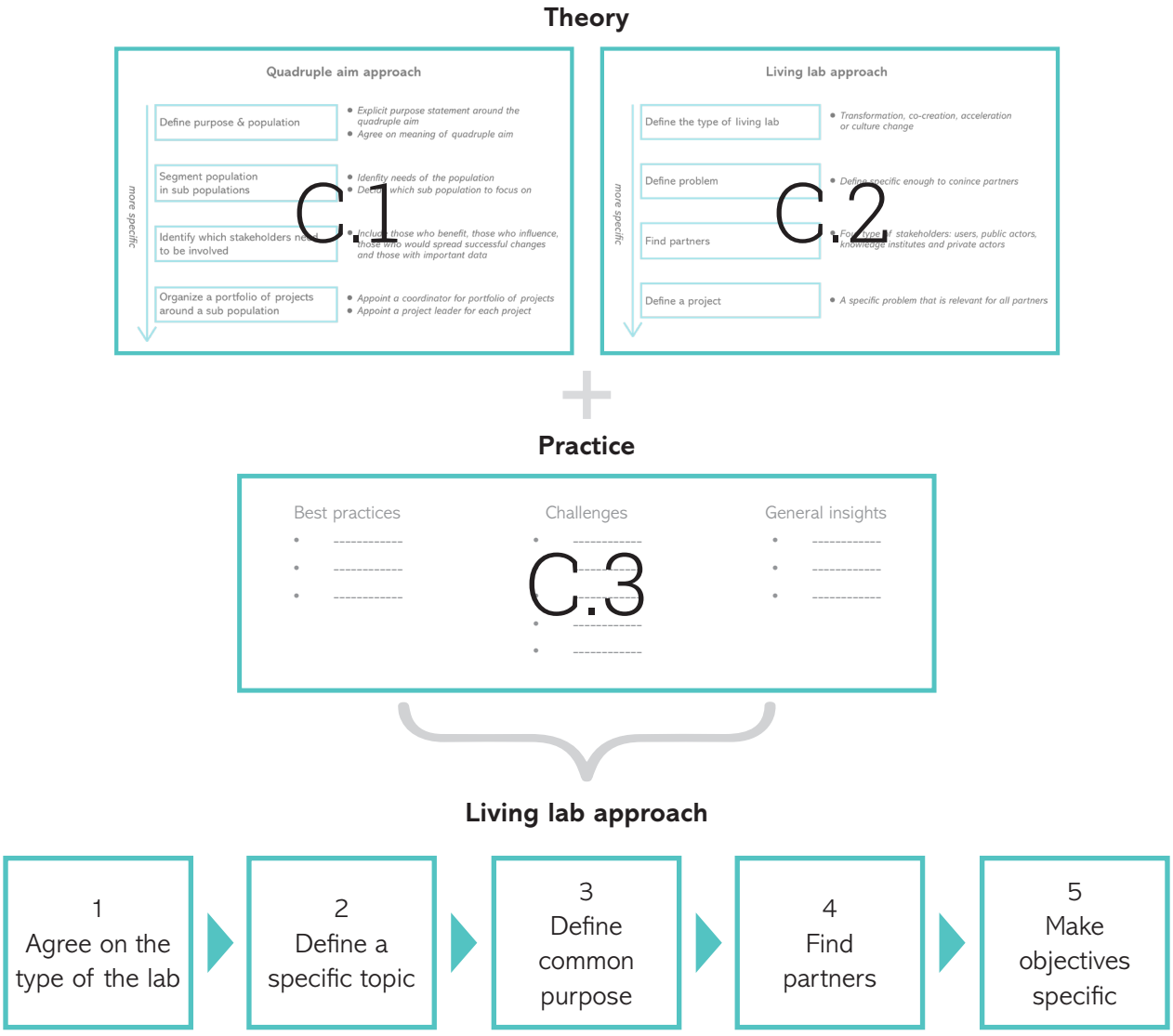


Figure 19 Combining theory and practice into a high-level approach

SUMMARY
LOCAL APPROACH

Sub question 3: What is a living lab and what can we learn from other living labs in the healthcare transformation field?

A living lab is a type of open innovation, which is executed in collaboration with multiple stakeholders, including users, and positioned in a real-life context.

Living labs are organized around a central topic that matters to all contributing partners. Complex societal challenges are often addressed in living labs.

Five steps have been identified that need to be followed when initiating a living lab for healthcare transformation.

1) Agree on the type of lab
2) Define a specific topic
3) Define common purpose
4) Find partners
5) Make objectives specific

The theory provides an understanding on possible challenges that are related to the identified steps:

- Involving users in the full innovation process, not only validation
- Holding different interpretations on the meaning of the quadruple aim. This should be solved to prevent misalignment on the goal and responsibilities around the quadruple aim.
- Understanding the type of lab (co-creation, acceleration, culture change or transformation) because this influences partners and activities

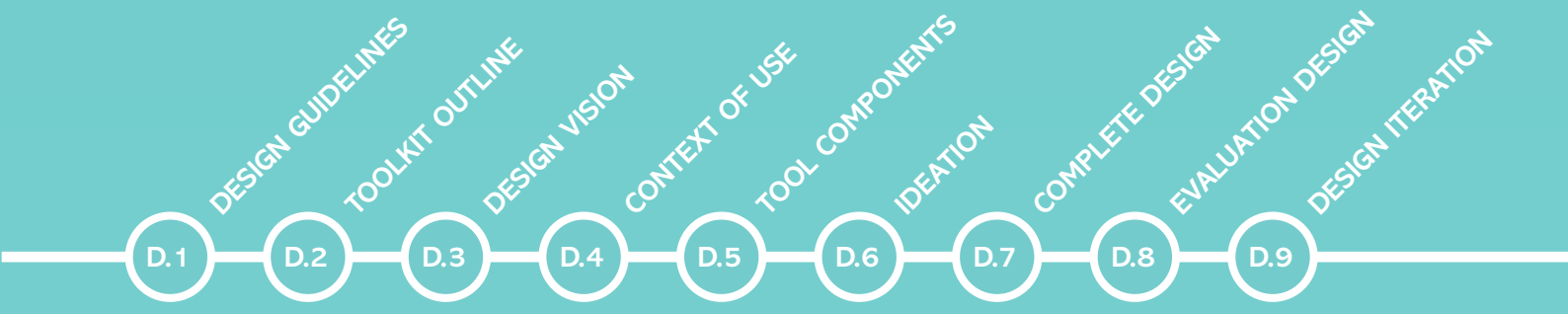
Insights from practice identified multiple challenges to carry out the five steps as well:

- Involving multiple partners at the lab level
- Managing expectations should be done systematically
- Defining outcome measures in line with transformation

D. DESIGN

TOOLKIT FOR PHILIPS

With the knowledge on the global strategy and local approach, the next step is to apply this in a design. This section covers multiple steps to reach a final design proposal. In the first chapter design guidelines are constructed (D.1). Based on the guidelines an outline of the toolkit is presented (D.2). This leads to a focus on three tools for further iterations and a design vision for those tools (D.3). Next, the context of use (D.4) and tool components (D.5) are introduced. Chapter D.6 summarizes the design process, which leads to a complete design (D.7). Furthermore, an evaluation of the design (D.8) is presented based on a test session, which results in a design iteration (D.9).



DESIGN

D.1 DESIGN GUIDELINES

It it possible to create an overview of the design challenge by clustering the 21 insights from the previous chapters. The insights are clustered in eight design guidelines. These guidelines help to define focus and formulate a vision for the design of the toolkit. The guidelines are formulated in a way such that it provides direction: "The toolkit should (...)".
The guidelines utilise the synthesis and findings from chapter C.4, and therefore show some overlap with this chapter. Defining the guidelines in this chapter is more elaborate, it provides an in-depth and complete overview of insights from all previous chapters.

GUIDELINE 1: THE TOOLKIT SHOULD USE THE QUADRUPLE AIM FRAMEWORK

The problems with current healthcare systems are complex and have multiple dimensions. Therefore the four dimensions of the quadruple aim are a helpful framework to address the complexity of the systemic problem.

Underlying insights

Key insight 1

The problems in healthcare make the system unsustainable and therefore the system needs transformation.

Key insight 2

Quadruple aim is a suitable framework to guide the transformation to value-based care.

Key insight 7

Improved staff experience is a crucial driver for improving health outcomes and should therefore be considered separately in VBC.

GUIDELINE 2: THE TOOLKIT SHOULD SUPPORT IN PURSUING ALL ASPECTS OF THE QUADRUPLE AIM

It is a challenge to simultaneously pursue all aims. But it is key to cover all aims and to not focus on one aim at the expense of another aim. The toolkit should provide a way to improve the total of all aims and deal with the fact that aims are interlinked. This could for example be done by prioritizing aims. This means that initial effort can be focussed on less than four aims, while not neglecting the other aims.

Underlying insights

Key insight 8

The dimensions of the quadruple aim should not be seen in isolation, the influence of one aim on another should be taken into account.

Key insight 9

Tendency to focus on one aspect of value-based care and forgetting other crucial parts.

Key insight 10

In practice it is challenging to pursue all aims simultaneously.

Key insight 14

Defining a purpose around the quadruple aim can be done by defining priorities in the quadruple aim.

GUIDELINE 3: THE TOOLKIT SHOULD HELP TO ADDRESS THE GLOBAL ISSUE IN A CONTEXT-SPECIFIC WAY

The global issue of value in healthcare need to be addressed from local initiatives. However, the theory about value-based care is not directly applicable in a local setting but needs to be interpreted in the context. The toolkit should provide an understanding about the global issue to direct local action.

Underlying insights

Key insight 4.1

Transformation aspect:
Context-specific approach of a global issue.

Key insight 11

The definitions of the four aims can be adapted to reflect local context needs and priorities.

GUIDELINE 4: THE TOOLKIT SHOULD FACILITATE THE DISCUSSION ON THE TYPE OF THE LAB

Not all living labs have the same key objective. A transformation lab is different from a co-creation lab. Therefore partners in the lab should make clear what type of lab they want to initiate. The four type of labs that are identified are: acceleration, co-creation, culture change and transformation. The main difference is the level of innovation that is targeted. Innovations can target product-level only, but also product-service system level or socio-technical systems level. The socio-technical systems level fits best with the aim of transformation.

Underlying insights

Key insight 3

To achieve the transformation that is required there is a need to target more than only product level innovation.

Key insight 17

Be aware that living lab is quite a broad term, and that having a clearly defined goal for the lab is important, because it influences stakeholders and activities in the lab.

GUIDELINE 5: THE TOOLKIT SHOULD SUPPORT STAKEHOLDERS TO DEFINE A RELEVANT TOPIC

A topic in a lab can be organized around a specific population. Identifying the needs of a population can act as an anchor point for defining the problem, possible projects and desired outcomes. A population should be defined in a way that all aims of the quadruple aim are relevant to this group. Defining sub populations is not the only way to formulate a topic, it is also possible to identify a 'higher trend' or 'infrastructure' problem as a topic. The level that is preferred by Philips to define topics is for example 'perinatal care' or 'cardiovascular diseases'.
Note: In a lab, it is not needed to only address one topic, several topics can be chosen.

Underlying insights

Key insight 12

Segmenting a population in sub populations helps to focus on specific needs of people and define projects around those needs.

Key insight 19

Best practice:
Organize a lab around topics.

GUIDELINE 6: THE TOOLKIT SHOULD SUPPORT FINDING AND INVOLVING MULTIDISCIPLINARY PARTNERS IN THE LAB

Multidisciplinary partners are needed in the living lab. This includes partners that would benefit, influence, spread successful changes or possess relevant data. The main stakeholders that benefit and influence are patients and care providers (staff). The stakeholders that have a lot of influence are payors, policy makers and knowledge institutes. Besides, industry partners can play a role in scaling successful changes. Thus, the network in a living lab should consist of a combination of users, public actors, private actors and knowledge institutes.

Underlying insights

Key insight 4.4
Transformation aspect: Multidisciplinary collaboration networks.

Key insight 4.5
Transformation aspect: Involve users in co-creation.

Key insight 13

Include those who benefit, those who influence, those who would spread successful changes and those with important data.

Key insight 16

It is important but challenging to involve users in the full innovation process.

Key insight 18

Challenge:
Difficult to involve a variety of stakeholders.

GUIDELINE 7: THE TOOLKIT SHOULD FACILITATE SHARED UNDERSTANDING ON THE MEANING OF QUADRUPLE AIM

The quadruple aim can remain an abstract framework and should be made more explicit by adapting it to a local context. This is needed to keep stakeholders aligned on the meaning of the quadruple aim. This prevents different expectations on the goal and outcomes of projects. Example questions that need to be considered are “what relevant health outcomes?” (insight 5) and “what is meant with financial structures in value-based care ?” (insight 6).

Underlying insights

Key insight 15

Discussion on the meaning of the values in the quadruple aim is needed to prevent misalignment of stakeholders.

Key insight 21

Challenge:
Defining what is expected up front.

Key insight 5

Only looking at treatment and health status achieved is limited, health needs to be considered over the full cycle of care.

Key insight 6

To reduce costs financial incentives need to be restructured to enable health providers to strive for good health outcomes.

GUIDELINE 8: THE TOOLKIT SHOULD INCLUDE GUIDELINES TO DEFINE OUTCOME MEASURES THAT ARE IN LINE WITH TRANSFORMATION

Defining good outcome measures in living labs is difficult but very important. Outcomes of the lab should not only be focussed on monetary values, but should include outcome measures that are in line with the transformation. The quadruple aim could potentially guide in the definition of outcome measures.

Underlying insights

Key insight 4.3

Transformation aspect:
Extended view on value.

Key insight 20

Challenge:
Defining outcome measures for transformation.

D.2 TOOLKIT OUTLINE

The formulation of design guidelines for the toolkit, gives an overview of the diversity and size of the design challenge. Addressing all aspects in the design phase is considered too much to cover in one thesis.

TOOLS

The design guidelines are used to identify the design tools needed in a toolkit. The tools are conceptualized using the 5 step approach from chapter C.4. From there I have prioritized and focused the design iteration process on three tools. The selection of tools is explained in chapter D.3.

GUIDELINES

The connection between the design guidelines and the tools is shown in figure 20. Some of the guidelines are relevant in one of the tools, others cover the toolkit.

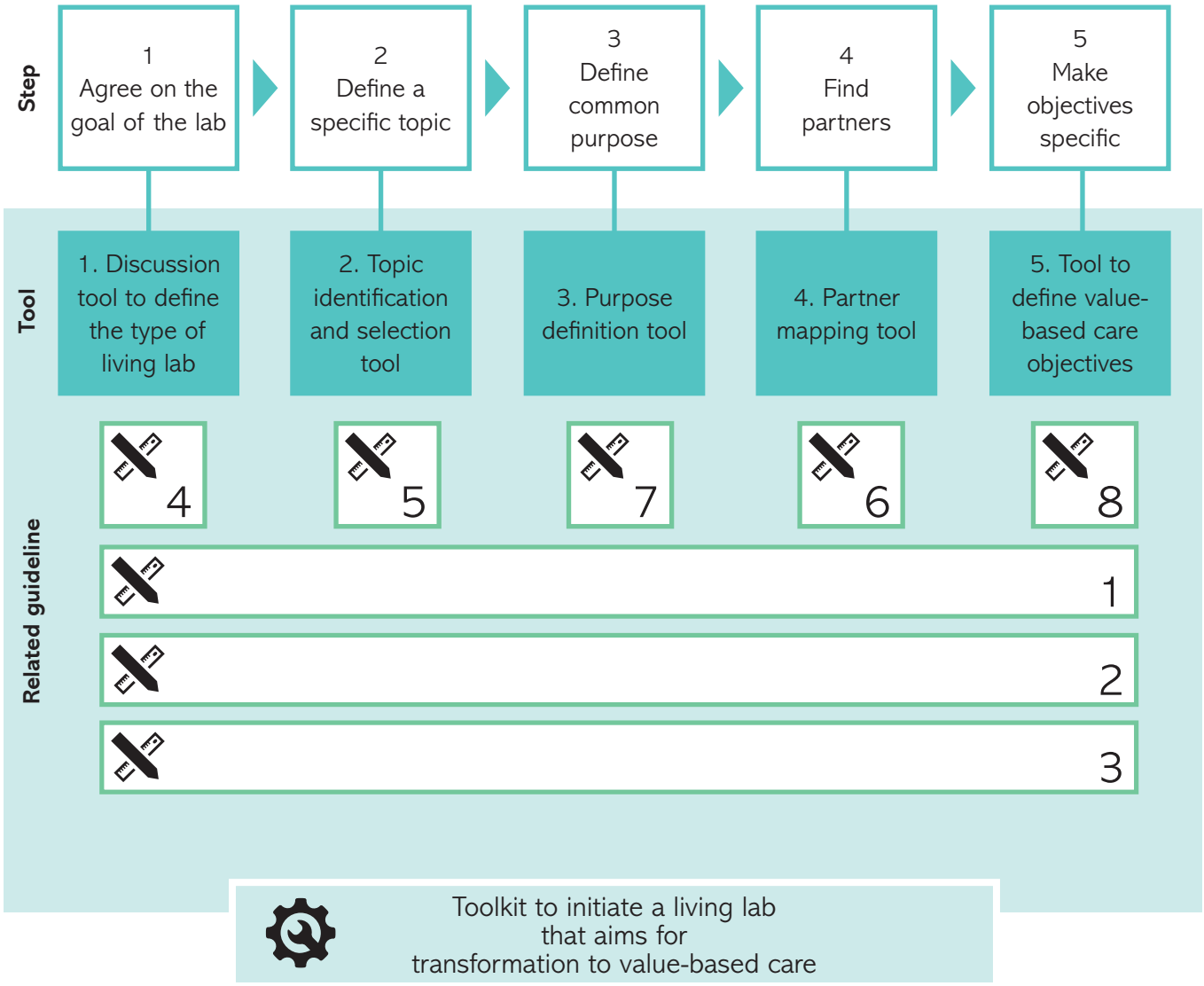


Figure 20 toolkit outline

D.3 DESIGN VISION

Philips perspective does not help to prioritize what tools to conceptualize as they value all tools as equally important. Therefore, this section uses other methods to select the three tools for the design phase.

OUT OF SCOPE

1. Discussion tool to define the type of living lab

2. Topic identification and selection tool

The first step 'defining which type of lab' is considered to be crucial by Philips in the initiation of a living lab. However, this tool is least in line with the initial research question. However, initial ideation on this topic was part of this thesis*. The 'topic selection tool' shows overlap with an already existing project selection tool, proposed by Jia (2019). Consequently, there is less urgency to design these two phases as an initial start is already made. Future research should further develop these first two tools.

IN SCOPE

3. Purpose definition tool

4. Partner mapping tool

5. Tool to define value-based care objectives

The initial scope was to use the quadruple aim as a framework to translate the vision of value-based care into a local action. Therefore it is chosen to focus on the last three steps defining a purpose, and based on this purpose find partners and define objectives.
It is better to not focus on one tool, but to design more than one because problem, partner and objectives are connected topics that influence each other. It is not possible to define partners or objectives without the formulation of a problem.

Focussing on the last three tools in the design phase makes design guidelines 4 and 5 (see page 44 & 46) less relevant. The remaining six guidelines are guiding the design phase. From these six guidelines a design vision is formulated.

DESIGN VISION

Making value-based care actionable by using the quadruple aim framework to define the local purpose, partners and objectives that are in line with and contribute to the global issue.

Design guidelines

1. (...) use the quadruple aim framework

2. (...) targeting all aspects of the quadruple aim

3. (...) address the global issue in a context-specific way

6. (...) involving multiple types of partners

7. (...) facilitate understanding on the meaning of quadruple aim

8. (...) define outcome measures in line with transformation

** An ideation to investigate in which ways visual overviews can support defining the type of living lab was part of the project, but is not included in the main report. The initial ideas can be found in the appendix (D) and guide other designers to improve the proposition.*

D.4 CONTEXT OF USE

Before moving into the ideation phase, the context of use of these tools needs to be considered. As already explained, employees from Philips Design will bring those tools forward and facilitate the process in which multiple stakeholders are involved.

TIMELINE

The tools need to be useful in either a first conversation or one of the follow-up converstaions between the potential partners of a new lab. It is useful for Philips to understand the timeline of the initiation phase and to know which tools need to be used at what time. A possible timeline is visualised in figure 21. The purpose (tool 3), partner (tool 4) and objectives (tool 5) tool will be relevant after the initial conversation with a new partner.

The timeline is sketeched to provide an overview of the process. In practice, steps can be taken in different order and iterations might be required. It is acknowledged that many smaller steps are missing, for example practical steps (arrange a location) and legal steps (sign contracts). These steps were not part of the research, a more detailed overview could include these smaller steps as well.

PRACTICAL CONSIDERATIONS

The toolkit should be used by a facilitator, therefore the responsibilities and actions required from the facilitator need to be explained. This is done in a supporting instruction booklet for the facilitator.

A practically relevant factor to consider is the fact that healthcare staff has limited time to participate in long workshops. Therefore, the length of the workshops should ideally not exceed one hour.

It should be possible for Philips to adjust parts of the content if changes appear to be necessary through time. This could be for example adding example outcomes of tools to act as inspiration. But changes can also be required because of a changing context. The challenges, enablers and factors of the vision that are considered relevant now, and therefore are included in the current design, could possibly change.

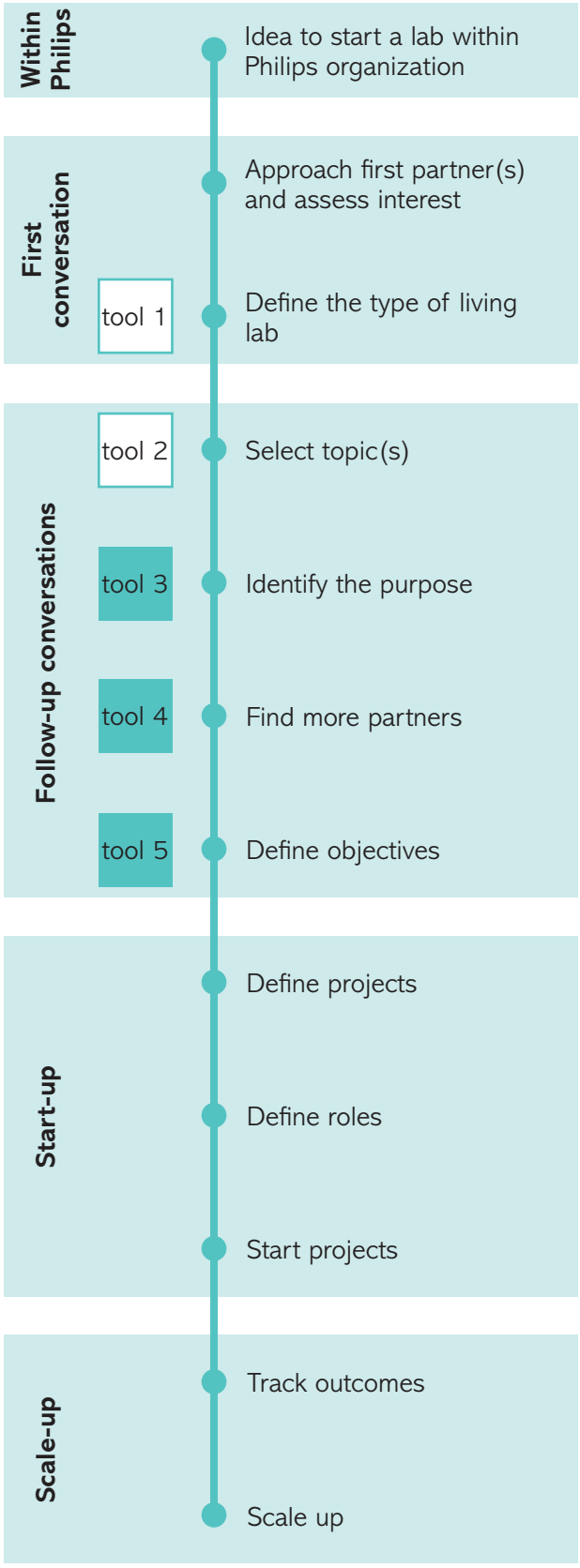


Figure 21 Timeline for living labs

DESIGN

D.5 TOOL COMPONENTS

In chapter A.6, strategic design capabilities are discussed and it is shown that visualization skills are one of the core capabilities of strategic designers. In the tools visualization is a core ingredient for constructive discussions. In this chapter the added value of visualization is explained. Next, the structure of the toolkit is outlined.

VISUALIZATION

The idea to sketch the global issue and in this way support the local issue framing is seen as a valuable way to address the design of the tools. The importance of showing a visual that represents a vision are made clear by Ink Strategy (Inkstrategy, n.d.). They believe that a shared vision to guide and fuel the change is key for a successful transition. They name the following benefits:

- Showing the vision provides direction (fig. 22)
- Showing the vision identifies why the transformation is important (fig. 23)
- Showing the vision practically helps new parties to understand the vision without using business jargon or vague concepts
- Having a visual enables constructive discussions

Figure 22 Provide direction (Inkstrategy, n.d.)

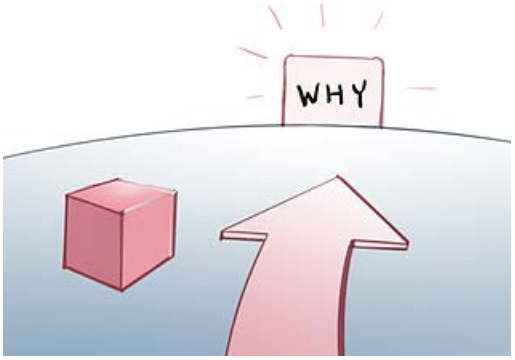


Figure 23 Showing why (Inkstrategy, n.d.)

STRUCTURE OF THE TOOLKIT

A global purpose visualization is part of the toolkit, the content is based on the findings from section B. But, as this vision is not directly applicable in the local setting, the local vision needs to be co-created by the local partners. Involving the partners in the co-creation of the local vision leads to ownership of the vision. The global purpose visualization acts as a starting point for the toolkit. In the purpose tool steps to turn this global purpose into local actions need to be included. These steps are guided by a slide deck. To support the steps work sheets are designed that should by used in the step-by-step approach.

The structure of the tools is visualized in figure 24. The purpose tool needs to be used first. The outcomes of this tool are needed as input for defining partners and objectives.

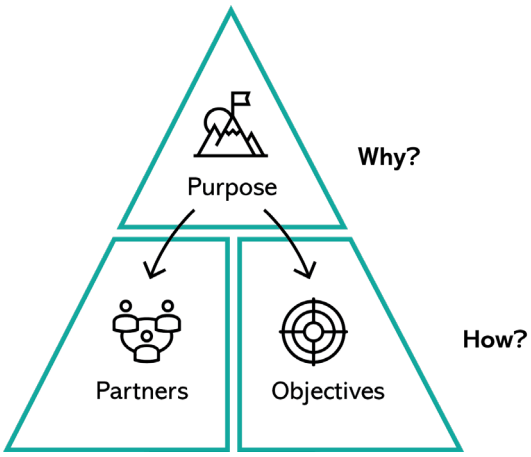


Figure 24 Structure of the toolkit

D.6 IDEATION

Global purpose visualization	Work sheets to define local action	Slidedeck to use during co-creation session	Facilitator instructions to lead sessions

Figure 25 Overview of parts in the toolkit

The four elements of the toolkit that need to be designed are shown in figure 25.

METHOD

Ideation

First, the global purpose visualization is designed following several iterations (figure 26). The content and structure of the visualizations have been discussed continuously.

Both the templates and the slide deck for the co-creation sessions have been designed in parallel. Therefore, the flow of the sessions needed to be set out in detail. The design guidelines are helpful in defining the step-by-step approach. The initial designs of the templates and slidedeck are discussed in regular coach meetings.

The facilitator instructions have been worked out as the last part of the toolkit, but with little iterations.

Additional research

In order to create a better understanding on the meaning of the quadruple aim (guideline 7), additional research is done. The aspects of the quadruple aim are elaborated in appendix E and used in the toolkit.

Testing

Based on the initial feedback, a complete version of all four parts of the toolkit is designed. This has led to the 'complete toolkit' in chapter D.7. This toolkit is tested in a session where I was the facilitator and we went, step-by-step, through the toolkit with multiple employees from Philips. This session has led to evaluation and points of improvement, this is summarized in D.8 and elaborated in appendix F.

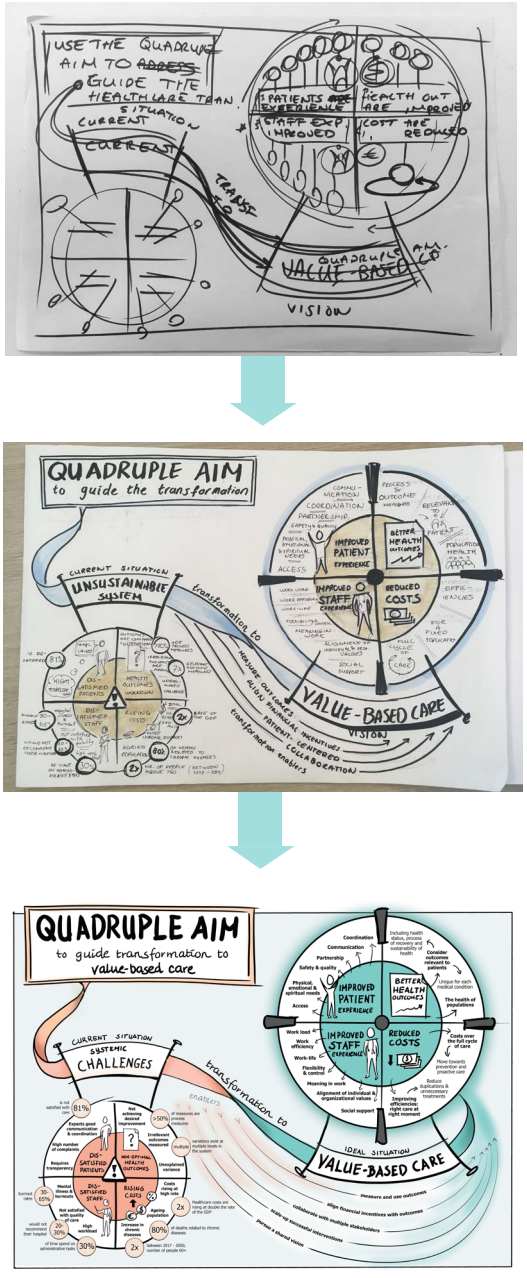


Figure 26 Visualization steps in design process

D.7 COMPLETE DESIGN

DESIGN FLOW

The structure of the tools shown in figure 18 is elaborated into a step-by-step approach. The flow of the steps is shown in figure 27. The purpose needs to be discussed first, the order of partners and objectives is not important. But considering the fact that having the right partners at the table is required to define good objectives, the preferred order is 1) purpose 2) partners 3) objectives.

DESIGN ELEMENTS

Visual guidelines

A tracker that shows the current step of the process is included in both the facilitator slidedeck and the main slidedeck. The steps in the tracker are in line with the design flow of figure 27.

Placeholders

Some specific details could not be filled in already, they need to be filled in by the facilitator. These are covered as 'placeholders'. This includes for example specific dates and people. Placeholders for content developed during earlier sessions that need to be used in later sessions are also considered.

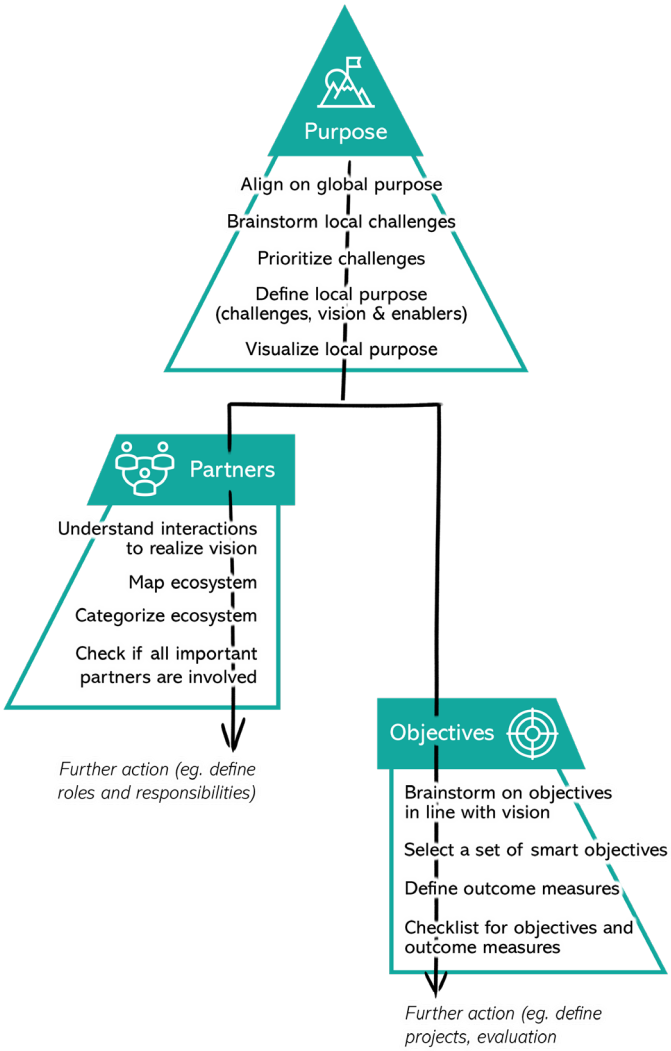


Figure 27 Flow of steps in the toolkit

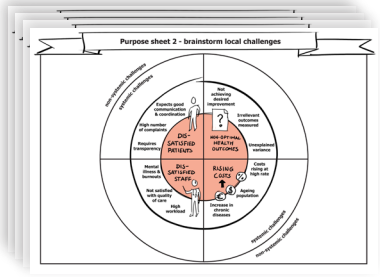
FINAL TOOLKIT DESIGN

The full versions of the slides and work sheets can be found in appendix F. On this page a visual summary of elements in the toolkit is given.

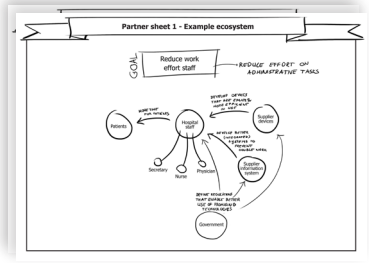
Global purpose visualization - PDF

The final design is shown on the next page.
The content is based section B and additional research in from appendix E.

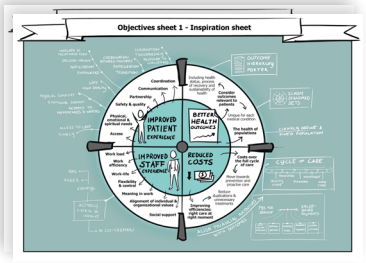
Work sheets to define local action - PDF



4 sheets for purpose



2 sheets for partners



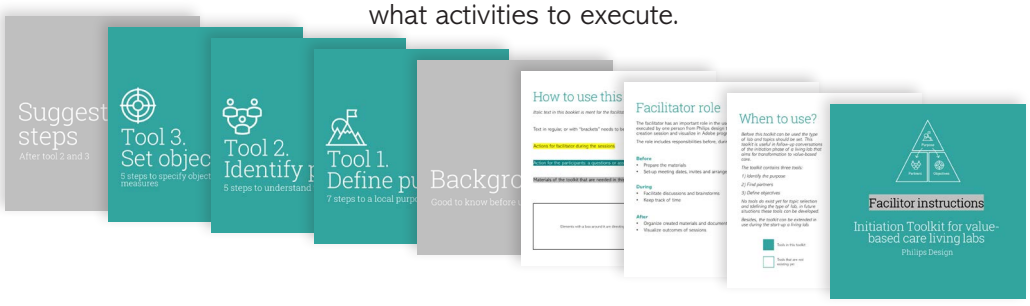
2 sheets for objectives

Slidedeck to use during co-creation session - PPT

The main slidedeck includes the three tools, complemented with slides on 'background' and 'suggested next step'. Resulting in one slide deck with 44 slides.

Facilitator instructions to lead sessions - PPT

The facilitator instructions sollow the same steps as in the main slide deck but with extra instructions up front and during the sessions. This includes which materials to bring, which questions to ask and what activities to execute.



QUADRUPLE AIM

to guide transformation to **value-based care**

CURRENT SITUATION

SYSTEMIC CHALLENGES

transformation to

enablers

IDEAL SITUATION

VALUE-BASED CARE

DIS-SATISFIED PATIENTS

- 81% of patients is not satisfied with care
- Expects good communication & coordination
- High number of complaints
- Requires transparency

NON-OPTIMAL HEALTH OUTCOMES

- Not achieving desired improvement
- >50% of measures are process measures
- Irrellevant outcomes measured
- multiple variations exist at multiple levels in the system
- Unexplained variance

DIS-SATISFIED STAFF

- 30-65% staff burnout rates
- Mental illness & burnouts
- Not satisfied with quality of care
- 20-30% would not recommend their hospital
- High workload
- 30% of time spend on administrative tasks

RISING COSTS

- Costs rising at high rate
- 2x Healthcare costs are rising at double the rate of the GDP
- Increase in chronic diseases
- 3/4 of health expenses related to chronic diseases
- Ageing population
- 2x number of people 60+ between 2017 - 2050

IMPROVED PATIENT EXPERIENCE

- Coordination
- Communication
- Partnership
- Safety & quality
- Physical, emotional & spiritual needs
- Access

BETTER HEALTH OUTCOMES

- Including health status, process of recovery and sustainability of health
- Consider outcomes relevant to patients
- Unique for each medical condition
- The health of populations

IMPROVED STAFF EXPERIENCE

- Work load
- Work efficiency
- Work-life
- Flexibility & control
- Meaning in work
- Alignment of individual & organizational values
- Social support

REDUCED COSTS

- Costs over the full cycle of care
- Move towards prevention and proactve care
- Reduce duplications & unnecessary treatments
- Improving efficiencies: right care at right moment

- measure and use outcomes
- align financial incentives with outcomes
- collaborate with multiple stakeholders
- scale-up successful interventions
- pursue a shared vision

DESIGN

D.8 EVALUATION DESIGN

The design of the toolkit has been tested in a two hour session with three colleagues from Philips Design.

GOAL TEST SESSION

The goal of the session was to test the flow and activities that are included in the design. Going through all the steps elicits which steps or visuals are unclear and need to be improved. The employees from Philips Design have experience with facilitating and participating in similar sessions and can bring valuable insights from a practical perspective. In the two hours, all slides were presented and discussed. This resulted in a list of suggestions for improvements, these suggestions are divided into two groups. The first group focuses on feedback on the structure of the toolkit and is discussed in this chapter. The next group of suggestions is considered as detailed suggestions for improvement. Those suggestions are presented in orange blocks in appendix F.

OVERALL STRUCTURE CONSIDERED GOOD

The main approach and flow of the tools was considered good and valuable for Philips. With some small changes, the tools are ready to be used in real living labs.

SUGGESTED IMPROVEMENT - MORE CONTEXT

One of the concerns around the current design is the lack of an elaborate context explanation. The goal of using the tools and the possible outcome should be clear to the participants. The sessions require a decent amount of effort from the participants to be successful. Participants are more likely to be willing to do this if the expected outcome is clear for them. Also, including more information on which stakeholders need to be involved at which step is recommended.

SUGGESTED IMPROVEMENT - QUADRUPLE AIM

A valuable discussion on the use of the quadruple aim framework shows the complexity of correctly using the framework. At the one hand, the quadruple aim can not be seen as separate elements, because in systemic challenges the interrelation of challenges is important. But at the other hand, it is practically not possible to address all dimensions of the quadruple aim at the same time. With limited time and resources it is better to focus on one area. This challenge of a linked system versus a focussed view around the quadruple aim is also reflected in design guideline 1 and 2.

GOAL AND OUTCOMES OF TOOLKIT

The overall goal of the tool is to structure a good discussion on the purpose, partners and objectives to address in a living lab for transformation to value-based care. The outcome is a set of three visual overviews that present local purpose, partner ecosystem and smart objectives.

The objective of tool 1
Identify an opportunity area for projects that is considered relevant by participant, can create impact and is possible to address in a living lab with current stakeholders.

The objective of tool 2
Understand the relationships between the stakeholders around the table and evaluate on completeness of represented lab partners.

The objective of tool 3
Specify the vision and agree on shared objectives and outcome measures.

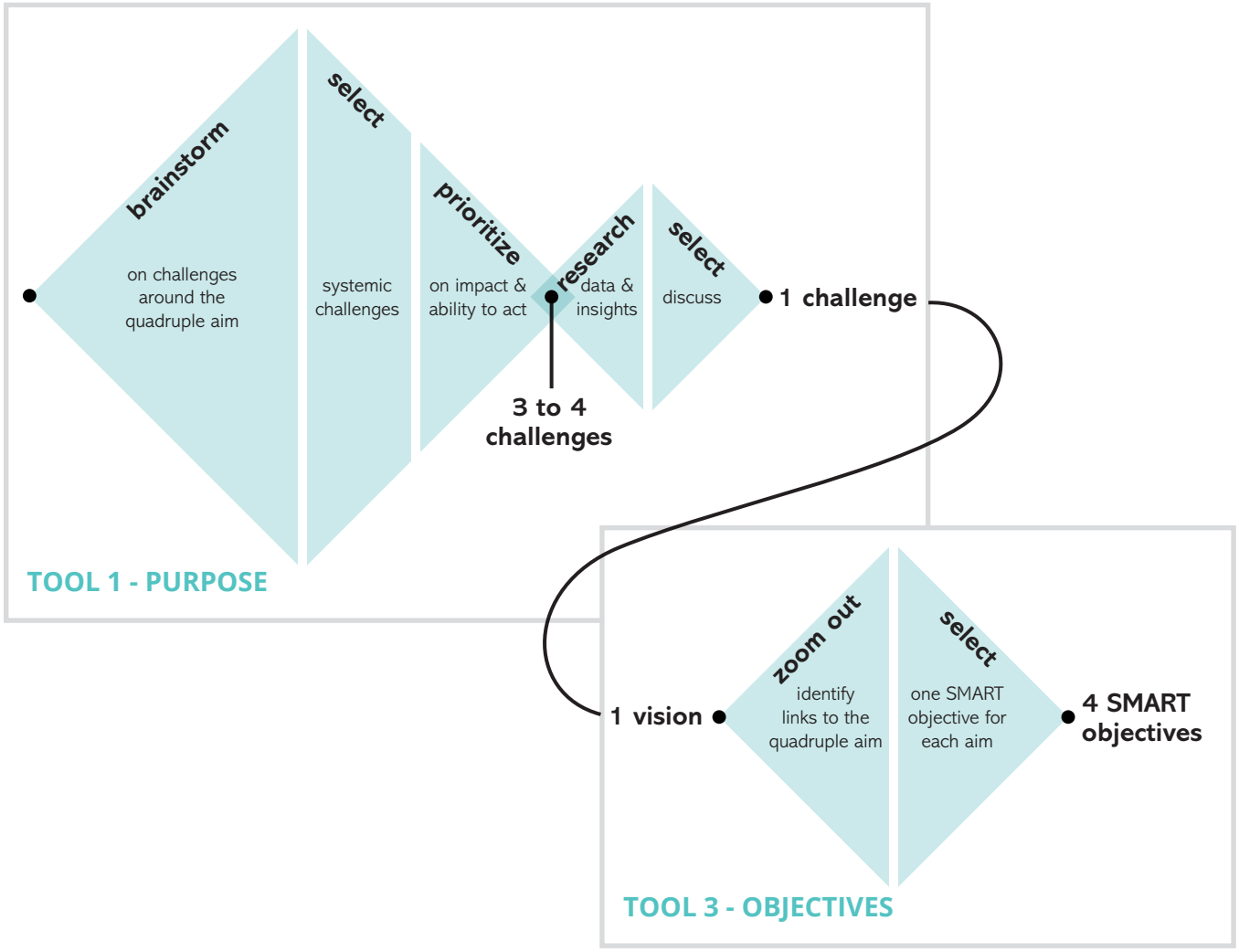


Figure 28 diverging and selection stages in tool 1 & 3

During the session an approach is developed to balance both the systemic and the focussed view. This is shown in figure 28.

In the first tool, defining a purpose the objective is to define one challenge that has the highest priority. This is done by first brainstorm on challenges around the quadruple aim, and step-by-step prioritizing challenges. So in this tool, the focus is not so much on understanding the connection between the dimensions of the quadruple aim. In the third tool, defining objective, the first step is to zoom out on the identified challenge and to figure out the connection between the challenge and all four aims. In this tool a SMART objective for all of the four aims need to be constructed.

SUGGESTED IMPROVEMENT - ADDITIONAL ELEMENTS

The current toolkit consists of four different elements. It is suggested to add additional elements to make it more complete.

Pre-read on value-based care

A pre-read on the topic of value-based care and quadruple aim should be created. Sending this reading material to the participants before the first session creates a more equal starting point on knowledge among participants.

Illustrator

The involvement of an illustrator in the second part of the purpose tool could be a good way to capture the energy of the participants. The illustrator will visualize the local purpose in a co-created session and allow participants to immediately give feedback and contribute to the visualization.

Make work sheets self-sufficient

The work sheets do currently not include instructions, the instructions are presented by the facilitator and included in the slide deck. To make the job of the facilitator easier the instructions must be available from different sources. This could be done by including instructions on the work sheets.

D.8 DESIGN ITERATION

Based on the suggested improvements one iteration of the design is done. For this iteration, the design flow is improved first (figure 29). A few steps are added and a few of them have changed.

Based on the suggestions from D.8 it is chosen not to improve all four elements of the toolkit, but focus on the most important one. The work sheets are chosen for iteration. By including instructions on the steps in the sheets the sheets could also be used without the slide deck. Therefore, the work sheets, in combination with the purpose visualization are seen as core of the toolkit design.

In the final design (figure 30) the steps are included in small boxes on the sheets. Besides, legends and explanation of words are included in the work sheets. A bigger version of the sheets can be found in appendix G.

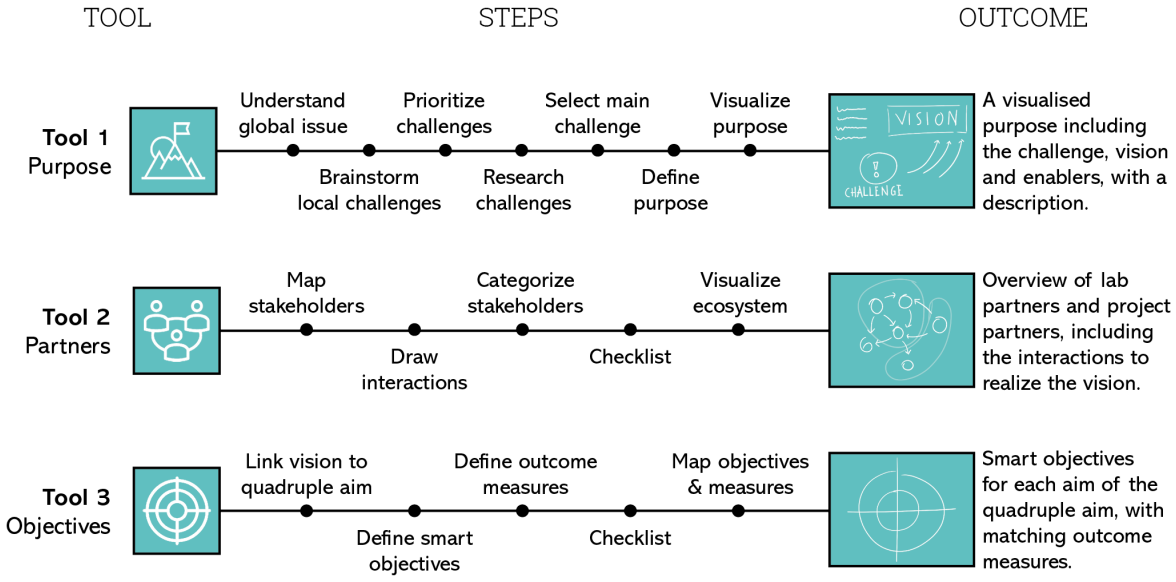
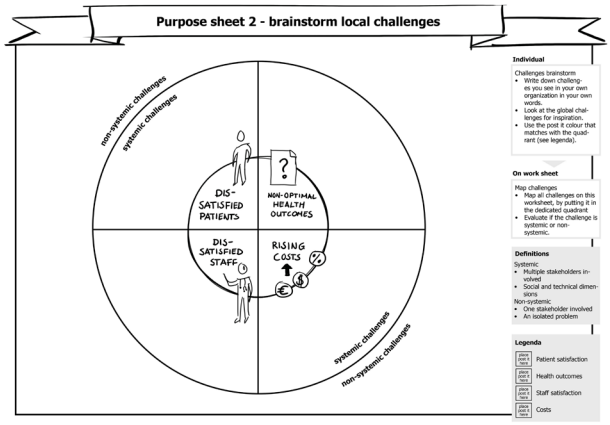
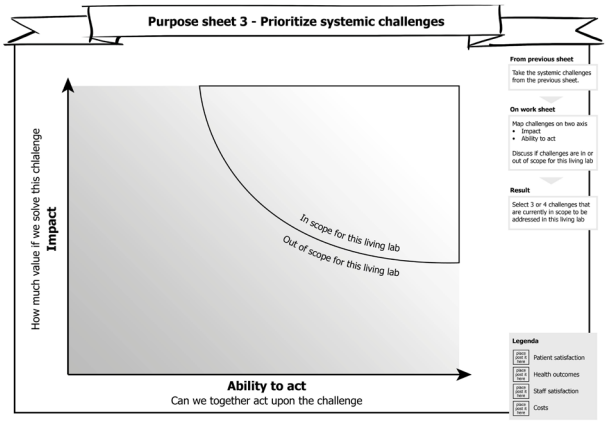
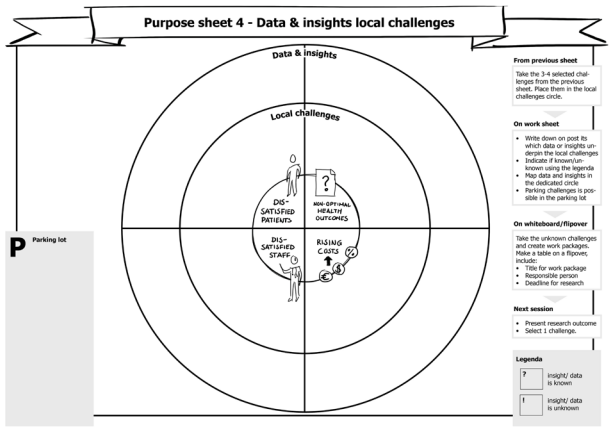
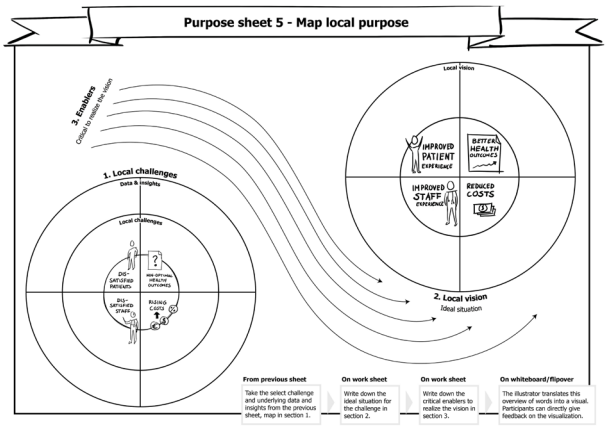


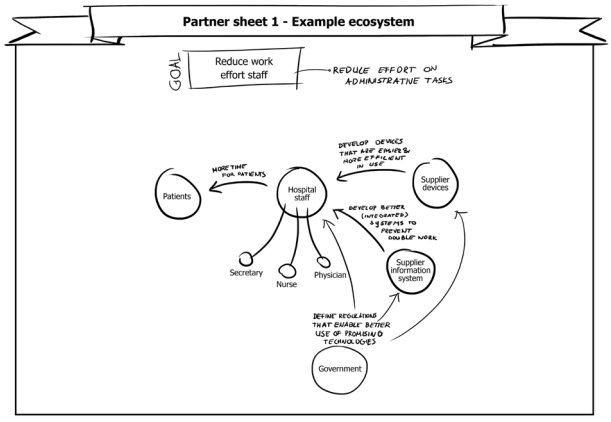
Figure 29 Iteration on design flow

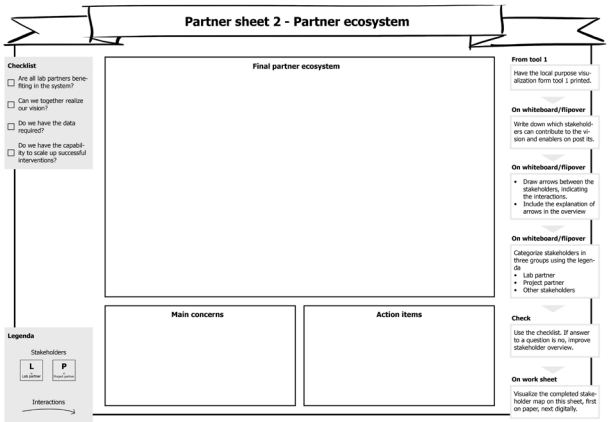


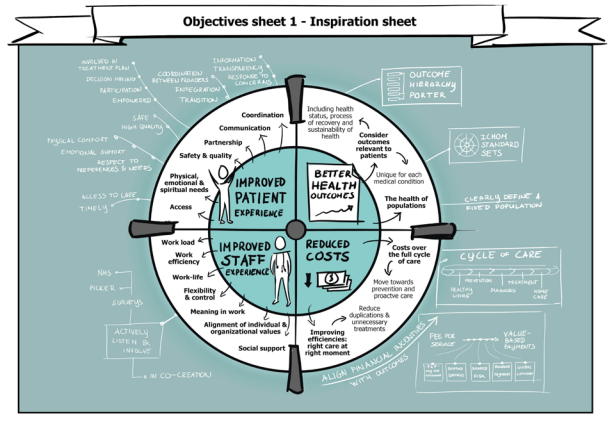












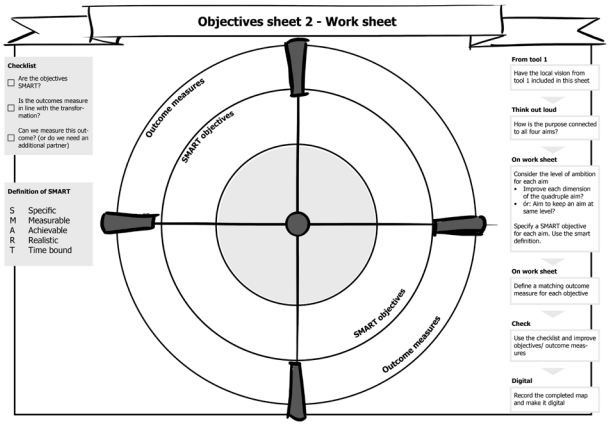


Figure 30 Improved work sheets

SUMMARY DESIGN

Sub question 4: How can the transformation to VBC be made actionable in a living lab by tools?

The transformation challenge and vision can be framed using the quadruple aim framework. This can be done on a global and a local level.

For each of the five steps (from section C) a tool is required to structure a discussion. From those five tools, three tools have been designed. Starting with definition of the purpose, which leads to the identification of partners and objectives.

The global purpose is visualized, this includes global challenges, vision and enablers. A visual way of representing the challenge and solutions facilitates constructive discussions and clearly visualize the 'why'.

Based on the global picture a local purpose can be constructed using a step-by-step approach. This results in a visual that represents the local purpose and is created collaborative. This visual and supporting description can act as a common ground and creates ownerships for the participants of the session.

Based on the definition of a local vision partners and their relations can be mapped. This helps to understand the ecosystem and check if all relevant partners are involved.

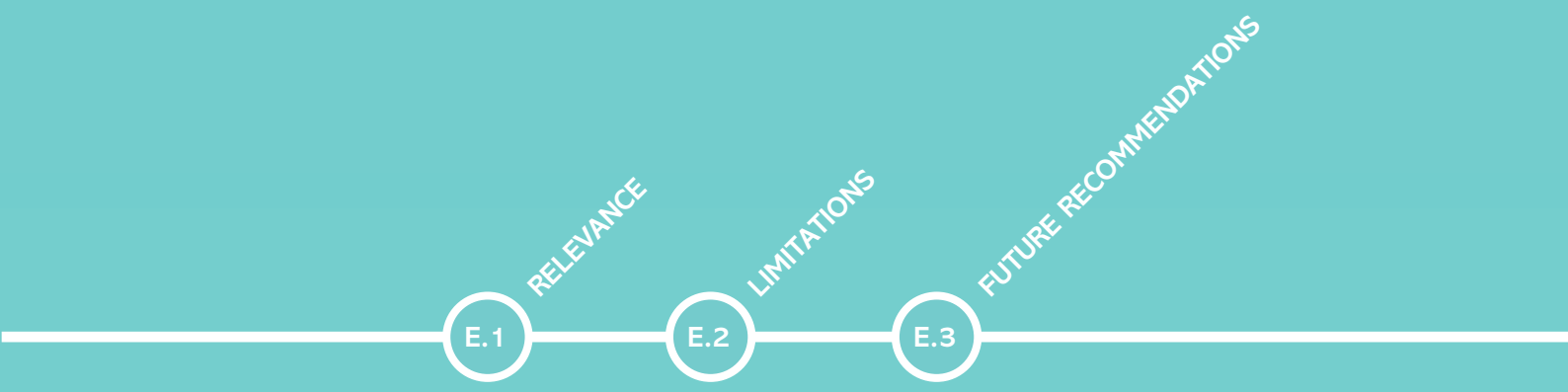
Based on the local vision, objectives and outcome measures can be constructed. This is done by asking 'how can this be realized?' and using SMART principles.

The outcomes of all tools is a solid foundation for future steps. In this way activities in a living lab are structured and alignment with the higher goal of transformation is considered. The outcomes create a common ground to further specify roles, responsibilities, projects and evaluation cycles.

E. CONCLUSIONS

REFLECTING ON THE DESIGN

The added value of the design to Philips and academic relevance is described in 'Relevance' (E.1). The limitations in the method of this study and the limitations of the outcomes is discussed next (E.2). The last part of the report describes future recommendations (E.3).



EVALUATION

E.1 RELEVANCE

The relevance is explained by answering the main research question, considering the academic relevance and explaining the business value.

MAIN RESEARCH QUESTION

By answering the sub questions in the summary of each section, answering the main research question is possible. The question was: *How can design tools support Philips in making the transformation to value-based care actionable in living labs using the quadruple aim framework?*

The answer to this question could be given after an investigation of the topic from several angles. This includes the theoretical perspective and an empirical perspective, supported by the view of Philips. Combining those angles gives a new view on the use of design tools for transformation to VBC. Design tools support Philips to initiate living labs by proposing a structured approach to create the transformation mindset that is needed for VBC. What is not realized with the tools are specific actions for transformation. The process of translating a vision into action is elaborate. This toolkit only lays the foundation for action, but this foundation is important to steer the actions in the living lab in the direction of transformation to VBC.

ACADEMIC RELEVANCE

Creating a visual overview on VBC

This research contributes to existing literature by creating an overview of available knowledge on the topic of value-based care. Theory from different authors is compared and integrated, based on this integration, a visual overview of the global challenge, vision and the enablers of VBC is created. In this way, the topic of VBC becomes easier to understand and use in practice for those new to the field.

Explain the suitability of the quadruple aim framework and use in practice

In this thesis the suitability of the quadruple aim framework to address the transformation to VBC is made explicit. Besides, it also shows how the framework can be used to structure actions in line with this framework.

Global-local approach to a complex societal challenge

This research is relevant by proposing a way of approaching a complex societal problem. The problem is first framed in the global perspective, which leads to a step-by-step approach to define the local situation. This approach is applicable to healthcare transformation, but can also be relevant for other complex societal challenges.

BUSINESS VALUE

Tools to define purpose, partners and objectives for living labs that aims for transformation to VBC

From the evaluation of the design the value of the toolkit for Philips became evident. If suggested improvements are implemented, the tools are ready to be used in living labs for transformation to VBC.

Foundation for more tools for living labs

Not only the three designed tool, also the outline of possible new tools is of added value. It lays the foundation for a more complete toolkit for the initiation and start-up of a living lab for value-based care. This is explained in E.3, future recommendations.

Structured approach to set up living labs

Philips wants to set up living labs together with multiple stakeholders, therefore it is of value for the company to gain knowledge how to structure the initiation of such a lab. This research has contributed to structuring this process by the identification of five steps from literature and interviews (C.4) and showing these steps on a timeline for Philips (D.4). Having a structured and successful process to initiate living labs makes it easier for Philips to scale up to multiple living labs.

Usefulness of toolkit beyond living labs

The complete toolset can be used in the context of a living lab. However, it is also possible to use elements of the toolkit in other settings. For example the global purpose visualization or the partner mapping approach could be used in other Philips activities as well.

E.2 LIMITATIONS

Limitations in the method used and missing considerations are explained in this chapter.

LIMITATIONS IN THEORETICAL STUDY

In the theoretical study only two main frameworks for value-based care are described and compared. Those are chosen, as those are the original and most used ones in the industry. However, several new frameworks for value-based care do exist as well. Those are often adaptations of the original frameworks. Including more frameworks into the comparison could have led to a better argued decision on a chosen framework. Examples of new frameworks are developed by the World Economic Forum & BCG (2017) and by VWS (2018).

LIMITATIONS EXPLORATIVE INTERVIEWS

Explorative interviews have been conducted at the start of this thesis. The goal was to get a broad understanding about the stakeholders and their viewpoint on VBC. Having only interviewed four people in depth shows a limitation in sample size. The field of healthcare and the number of stakeholders is much bigger. A higher number of interviews would have lead to a better understanding on the width of perspectives of the field.

Having the view of clinical people would have been beneficial, as the role of healthcare staff is often mentioned in this research. However, with limited time from clinicians, this has turned out not to be possible during this thesis.

LIMITATIONS LIVING LAB INTERVIEWS

Living labs were interviewed to get a more in depth understanding on the first steps of initiating a living lab and the particular challenges in this process. Six living labs that seemed to be working in the field of transformation of healthcare are interviewed. However, it turned out that for two of those labs the core activity was not transformation, but co-creation or culture change. Considering the big variety between labs around the world, more labs would have given a more comprehensive overview of the field. This could be the basis for a more in depth analysis of findings.

Besides, for this research only one person from every lab was interviewed. This could lead to subjective answers, that include the viewpoint of the interviewee's expertise. Including more people with different roles from one lab would give a more accurate overview of the labs, less dependent on the interviewee.

The insights from the living lab interviews were selected by one researcher. To counteract biased decisions on the importance of selected insights, comparing views from multiple researches would be preferable.

VALIDITY OF TOOLKIT

Because of the complexity of the topic and the limitations in time it was not possible to validate the toolkit in a real living lab. The toolkit should be used in a real-life case, in preferable a new living lab, to validate the usability.

The part of the toolkit that has been tested least are the facilitator instructions. Reviewing and testing these would contribute to a toolkit that could be picked up by anyone.

CONTENT OF THE REPORT

The structure that was chosen to address the healthcare transformation is a global-local approach. The focus of this thesis is on the translation from global to local. However, to make the research more complete, the relation from local to global needs to be addressed as well. Having a better understanding on scaling up local action to other local contexts is seen as a valuable way to address a global challenge (figure 30).

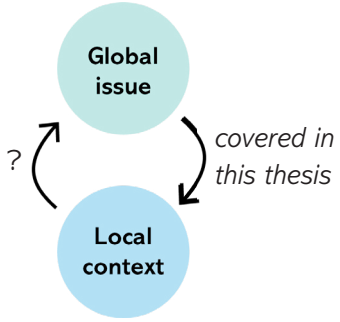


Figure 30 Global-local connection

E.3 FUTURE RECOMMENDATIONS

IMPROVEMENTS TOOLKIT

Based on the evaluation session within Philips, improvement directions are presented (D.8). The main contributions to improve the content are to

- Add more context at the start of the toolkit. To make the objective and possible outcome of the tools clear to participants.
- To deal with the balance of systemic versus isolated perspective on the quadruple aim.
- To add additional elements to the toolkit.

Suggestions for improvement on details and smaller steps are presented in appendix F. It is recommended to implement those improvements in the next iteration of the tools. It is suggested to follow this order in iterating on the toolkit 1) global visualization 2) work sheets 3) main slidedeck 4) facilitator instructions.

Besides, the tools need to be tested in a real-life setting in order to test desirability and feasibility. Based on real-life sessions better examples can be developed and included in the toolkit to better facilitate new sessions.

Although the challenge of involving healthcare staff and patients is observed, this challenge is not addressed. In testing the tools the social sides of involving patients and getting time from clinical people should get more attention.

NEW TOOLS

In figure 31, an extended version of the toolkit is outlined. Tool 3, 4 and 5 have been proposed already. An additional number of 6 tools can be designed in the future within Philips.

Tool 1: Tool to facilitate discussion on type of lab.
Tool 2: A structured approach to topic selection.
Tool 6: Convince new partners and onboard them.
Tool 7: Define roles and responsibilities.
Tool 8: Define projects around objectives.
Tool 9: Track progress in projects, measured against set objectives.

IMPROVING THE TIMELINE

The timeline for Philips presented in D.4 and included in the facilitator instructions. Improving this timeline is suggested for future actions. This could include adding a layer of which stakeholders need to be involved when. Another improvement on the timeline could be to highlight iterations in the process. Currently the process is sketched linear, but in practice a step of reflection on the defined purpose, objectives and partners will be useful at some point in time.

It could also be valuable to sketch possibly different tracks in the timeline for relationships that do already exist and for new relationships.

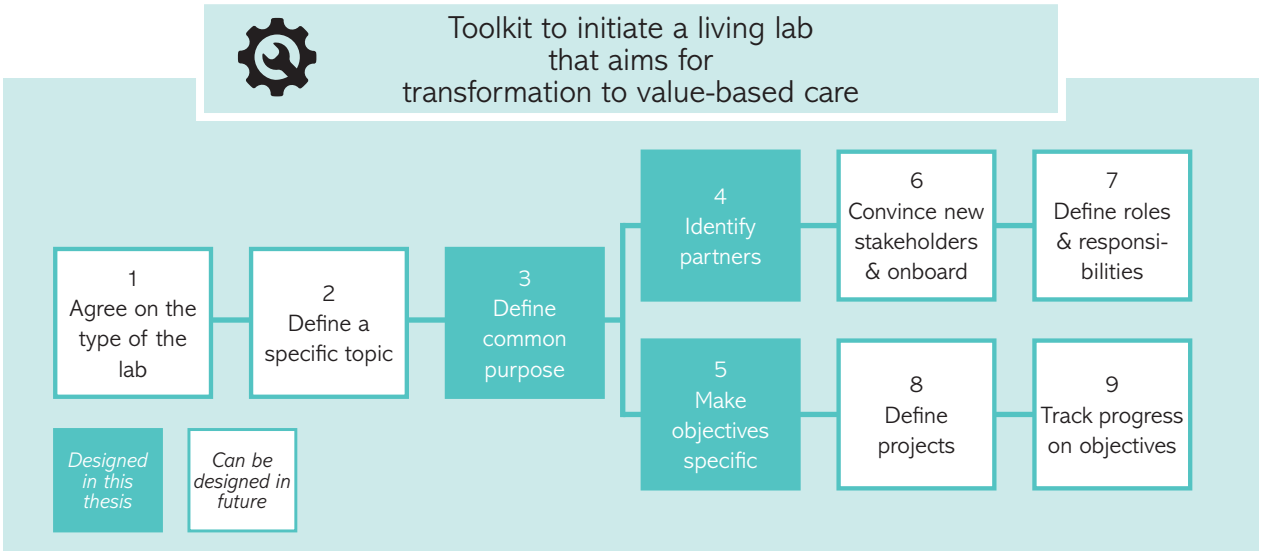


Figure 31 Improved toolkit outline including future recommendations

FUTURE PROJECTS

The main focus of this thesis was on the global to local connection. A next step is to better understand and facilitate the step in scaling local to global.

The global-local structure that is followed for the healthcare transformation challenge can also be applied to other complex societal challenges. The high level approach, the step-by-step approach and outline of the toolkit are considered relevant beyond the field of healthcare transformation. The validity of the approach taken in this thesis needs to be tested, but could be a good starting point to tackle complex societal challenges in other industries.

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