I’M A DESIGNER, SO WHY *RESEARCH*? CULTIVATING A VALUE-SENSITIVE DESIGN PRACTICE THROUGH RESEARCH

DISSERTATION
Peter Sörries
Burg Giebichenstein University of Art and Design Halle

I'M A DESIGNER, SO WHY RESEARCH?
CULTIVATING A VALUE-SENSITIVE DESIGN PRACTICE THROUGH RESEARCH

Dissertation for the degree of Doctor of Philosophy (Dr. phil.)
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Burg Giebichenstein University of Art and Design Halle by
Peter Sörries born on 27.10.1984 in Friedrichshafen (Lake Constance)

SUPERVISION

Prof. Dr. Pablo Abend
Department of Design & Design Studies
Burg Giebichenstein University of Art and Design Halle

Prof. Dr. Claudia Müller-Birn
Human-Centered Computing Research Group
Institute for Computer Science, Freie Universität Berlin

DECLARATION

I hereby declare that this dissertation is my own work, which I have written independently. All sources, references, and bibliographies used or cited in the preparation of this work have been properly indicated and listed with full details of the respective sources.

Peter Sörries

AUTHOR'S NOTE

This dissertation is structured so that each chapter builds upon and informs the others. During the writing process, I published scientific articles, including conference papers, journal articles, and workshop volumes, listed in the chapter *Publications*. These publications are referenced throughout this dissertation. The research foundations in Chapter 5, the method for participatory value elicitation in Chapter 6, and the results of Sörries et al. (2024) in Chapter 7.1 and Sörries et al. (2023a) in Chapter 7.2 originated from the writing of this dissertation. Therefore, these chapters are neither replicated nor comparable to the published articles, as I sought to maintain the independence of this dissertation. Additionally, the data analyses presented in the two chapters, Chapter 7.1 and Chapter 7.2, were conducted exclusively for this work, leading to a novel contribution to design practice, namely the *be part* toolkit described in Chapter 8, which has not been previously published. Through these efforts, this dissertation extends beyond the articles and establishes itself as an independent body of work, contributing to a cohesive research outcome.

ACKNOWLEDGEMENTS

This dissertation would not have been possible without the support and encouragement of many people, to whom I would like to express my deepest gratitude.

First, I thank Pablo Abend from the Burg Giebichenstein University of Art and Design Halle. Without his commitment and support, I would not have been able to pursue my doctorate at the Burg.

Obtaining a doctoral degree in design still presents a significant and exhausting challenge, as I have experienced. In Germany, designers are often deemed incapable of conducting research since design is usually considered purely artistic. This results in many universities being unsuitable to pursue a doctorate in design. The few institutions that offer doctoral programs in design often ruled themselves out in my case because of my dissertation topic. For some, my topic and background were considered too computational or too distant from design. In one instance, I was even told that doctoral candidates in design were not particularly welcome, despite this institution being one of the largest German universities in design. I sincerely hope that this situation in Germany improves for future doctoral candidates with a design background. Given these circumstances, I am grateful to Burg Giebichenstein University of Art and Design Halle for the opportunity to pursue my doctorate. At the Burg, I received valuable appreciation and constructive criticism through consultations with Pablo Abend and from design students who reflected on my research during my lecture in the “Mitgestalten” series. Their feedback helped me strengthen my work and encouraged me to move forward.

I would also like to extend my special thanks to Claudia Müller-Birn, head of the Human-Centered Computing Research Group at the Institute of Computer Science of Freie Universität Berlin. At the beginning of my work as a researcher in her group, I had almost given up on pursuing a doctoral degree due to the aforementioned challenges. Beyond that, I was uncertain whether I could conduct research with the necessary academic rigor. It seemed to me that I lacked the required knowledge. However, she encouraged me to continue on this path. For example, she consistently supported me in enhancing my academic research practices, provided opportunities to deliver self-responsible lectures or to participate in conferences aligned with my research interests, and dedicated herself to securing my position so that I could further develop my skills—and, finally, achieve my doctorate. In a spur-of-the-moment conversation, I remember her saying: "You're going to be a good researcher."

Another special thanks goes to Carola Zwick, who supported and guided me throughout my studies at the Weißensee School of Art and Design Berlin. Her engagement led to my position in the Human-Centered Computing Research Group, which somehow made my doctoral studies possible.

Moreover, I would like to thank my family and friends, especially Lars Sörries-Vorberger, who always encouraged me and made time to discuss my dissertation and, with a sense of urgency imposed by me, even read through every single word of this dissertation, and Tom Lange, who always encouraged me by saying cheekily, "You can do this research thing." I would also like to express my gratitude to everyone else, including those not mentioned by name, who accompanied me throughout this journey.

Finally, I thank Studio von Fuchs for realizing the visual design of the *be part* toolkit.

PREFACE

This dissertation, titled "I'm a Designer, So Why Research? Cultivating a Value-Sensitive Design Practice Through Research" investigates how research methods can be blended into design practice to preserve the strengths of both research and design and yet complement each other. Situated at the intersection of design studies, human-computer interaction, and design practice, this work focuses on integrating participatory value elicitation into design processes.

The overarching approach is research through design, in which I defined, developed, investigated, and refined a method for participatory value elicitation. Grounded in the theoretical foundations of value sensitive design and participatory design, expanded through value-led participatory design and related approaches, this method encompasses a structured workshop concept and a tailored analysis procedure. I explored the feasibility of this method in two real-world contexts, revealing how values can influence design resolutions and furthering the method based on these insights.

This iterative process culminated in the *be part* toolkit, a resource that enables designers to systematically elicit values in their practice and augment their design processes through values. This dissertation demonstrates how research through design can sustain a value-sensitive design practice by bridging design and research methods to offer a compelling means for inquiry in design processes.

ZUSAMMENFASSUNG

Die vorliegende Dissertation mit dem Titel „I'm a Designer, So Why Research? Cultivating a Value-Sensitive Design Practice Through Research" untersucht, wie Forschungsmethoden in den Designprozess eingebettet werden können, um die Stärken beider Bereiche zu bewahren und sich gegenseitig zu ergänzen. Angesiedelt an der Schnittstelle von Designwissenschaften, Mensch-Computer-Interaktion und Designpraxis, konzentriert sich diese Arbeit auf die partizipative Ermittlung und Einbindung von Werten in Designprozessen.

Mittels des übergeordneten Ansatzes „Research through Design" (Forschung durch Design) habe ich eine Methode zur partizipativen Ermittlung von Werten definiert, entwickelt, erprobt und ausgearbeitet. Diese Methode basiert auf theoretischer Forschung zu Value Sensitive Designs, Participatory Designs und Value-Led Participatory Designs sowie auf begleitenden Ansätzen und umfasst ein Workshop-Konzept sowie ein darauf abgestimmtes Analyseverfahren. Ich habe die Anwendbarkeit dieser Methode in zwei realen Kontexten untersucht, wodurch ich aufzeige, wie Werte Designentscheidungen beeinflussen können, und auf dieser Grundlage die Methode weiter ausgearbeitet.

Dieser iterative Prozess mündete in das *be part* Toolkit, einer Ressource, die es Gestalter:innen ermöglichen soll, Werte in ihrer Designpraxis systematisch zu erheben und für Designprozesse nachnutzbar zu machen. Diese Dissertation zeigt, wie Untersuchungen des „Research through Design" eine werteorientierte Designpraxis fördern können, indem sich Design- und Forschungsmethoden komplementär ergänzen und schließlich eine vielversprechende Synergie für die Designpraxis bieten.

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"As designers, we are left to wonder:
what values, attitudes, and ways of looking at the world
are we unconsciously building into our technology,
and what are their effects?"
—Sengers et al. (2005, p. 49)

Under the title "I'm a Designer, So Why Research? Cultivating a Value-Sensitive Design Practice Through Research," I investigate how research methods can be embedded into practices of designers[1]. I assume that both research methods and design practices can drive design processes, especially when individual values and participation are considered catalysts.

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[1] In this dissertation, I refer to the definition of Zimmerman et al. (2007) when using the term "designer." The authors defined designers as individuals who dispose of trained or practical experience in a specific discipline (e.g., architecture, product design, or interaction design).

Hence, essential to this work is establishing a value-sensitive approach[2], but most likely to make it tangible for design practice. In doing so, I adopt a research through design (RtD) approach to synthesize the knowledge gained throughout this work. This process unfolds in four stages to establish a method for participatory value elicitation. This method, primarily informed by a research lens, culminates in the *be part* toolkit, a thoughtfully designed, adaptable, and practical resource for design practice that acknowledges and augments designers' skill sets.

During my education in product and interaction design, I learned to recognize the critical role and expertise of designers. Designers bring skills to the table, such as developing concepts and designs that span artifacts, including products, objects, and software, skills that can only be acquired through dedicated education. I understood that designers' uniqueness lies in their ability to reflect critically on their work within iterative design processes. Later, I had the opportunity to broaden my research focus to human-computer interaction (HCI). I thought the skills I had acquired during my design education would enable me to master new interaction designs from a research perspective. However, I struggled with research methods that were more systematic than design methods used in design practice. Specifically, my presumed methodological skills were insufficient for the research discourse in which I increasingly presented my methods and findings. Despite these challenges, I recognized the contribution I could make as a designer to research and vice

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[2] Throughout this dissertation, I use the term "value-sensitive" rather than "value-centered," "value-based," or "value-oriented" since this work aims to engage directly with stakeholders to unfold their values within the design process. For example, a value-sensitive approach ensures that design processes actively consider the negotiation of people's values, needs, and concerns. While a value-centered or value-based approach can override the design process with overarching values (Friedman & Hendry, 2019) that may not reflect the lived experiences of the people it is intended to serve. These overarching values could stem from broader institutional tenets, such as efficiency or profit, which may not align with individual values.

versa. A hallmark of designers is their continual development of prototypes, creating something tangible while remaining open to moving from initial, less promising ideas to more sophisticated ones—or even discarding them entirely and starting anew. These characteristics differentiate the dynamics of design practice from the slower pace of research processes, which, for example, involve qualitative studies that must be planned, conducted, analyzed, and documented with utmost care. Consequently, I wondered how research could augment design practice without altering uniqueness. I realized that designers' focus and resources are not solely dedicated to the artifact being designed, but also to the act of designing throughout the design process. In my current position, I primarily use qualitative research methods, such as workshops and user studies with people affected by a given context, to synthesize their insights into novel interaction design concepts. This experience has taught me to appreciate the role of research in design practice. Reflecting on my background as a researcher, designer, and lecturer motivated me to contribute insights gained over the past years to designers' practice.

What designers might not be aware of, but what I have learned as a researcher, is that they can influence a design process through their values or those associated with a project (Iversen & Leong, 2012b). I assume that it might not be entirely possible through methods used in design practice, such as personas or user journeys, to reflect on values—expecting designers to specify design processes from a more methodological research lens when considering values in their work practices (Frauenberger et al., 2015). In other words, considering designers' and people's values would emphasize an appropriate method. Although various methods for working with values exist, they do not necessarily engage designers' skills, especially for those who work exclusively in a practice-oriented manner, without any reference to research. Yet there are currents in research that make methods more adaptable for designers, such as the theoretically grounded approach of value sensitive design (VSD), which provides several methods for considering and critically analyzing values before, during, and after the design process (Friedman & Hendry, 2019). Although VSD offers a wide range of methods for investigating values (Friedman et al., 2017), there is a lack of consensus on how values can be elicited and analyzed without merely identifying them (Parvin et al., 2015). Hence, it is not only a question of methods for capturing individual values but also of how to work with values in design processes through participation (Iversen & Leong, 2012b; Iversen et al., 2010, 2012a; Leong & Iversen, 2015).

When *participation* is mentioned in this work, I associate it with the Scandinavian approach of participatory design (PD). In its tradition, PD is motivated by the idea of democracy, i.e., "[p]eople who are affected by a decision or event should have an opportunity to influence it" (Schuler & Namioka, 1993, p. xii). Therefore, PD requires active participation, which should be established through social interaction, such as between designers and individuals affected by a design. Thus, participation is a necessary precondition, but also essential for "good design" (Schuler & Namioka, 1993, p. xii). Fundamentally, PD is about the process, not a product or solution, for exploring alternatives and supporting mutual learning (Bødker et al., 2022). However, PD emerged in workplace settings to design alternative processes and products. In the meantime, PD has emancipated itself from this origin and is applied in different contexts beyond workplace settings that strive for democracy (Bødker et al., 2022). To sustain this democracy, PD can help reveal people’s values, concerns, and even related tensions among other stakeholders (Bødker et al., 2022).

Toward eliciting values through participation, designers may sometimes find themselves at a crossroads, namely balancing engagement with people and contextual factors, such as organizational structures that might affect participation in design processes, with emphasizing creative practices over empirical methods (McCarthy & Wright, 2015). Furthermore, approaches for determining values have attracted more interest in the research community than in real-world design practice. One reason might be that designers assume that methods for value elicitation are already part of their work practice and, therefore, there is no need for research methods to consider values (Rotondo & Freier, 2010).

Reflecting on this, I found inspiration in my roots as a designer. I attempted to plan a design process by using artifacts such as storyboards and user diaries to envision a potential design space from the perspectives of the stakeholders I needed to consider. To this end, I created a toolkit of these artifacts that I used at specific stages of the design process. Such toolkits in design practice are more than collections of artifacts; they are carefully crafted and curated instruments that aim to integrate promising practices for investigating contexts (Mattern, 2021). Those who develop a toolkit determine how the embedded artifacts can be used meaningfully to integrate theoretical assumptions into design practice, thereby generating new knowledge (Petterson et al., 2023). To make the strands of research methods for value elicitation and participation accessible to design practice, I consider a toolkit that embodies a method for participatory value elicitation as promising. Emerging from this dissertation, I will present the *be part* toolkit, which is intended to enable designers to foster critical engagement with values through participation and to integrate insights gained into their design work. At this point, I want to emphasize that I intend not to alter how designers should work from a research perspective. My concern is to give designers the freedom to expand their practices while maintaining their expertise and creativity within an iterative design process.

To define, develop, investigate, and refine the method for participatory value elicitation within the *be part* toolkit, I use an RtD approach, which enables me to assess the method's suitability throughout this dissertation. At its core, RtD strives to generate knowledge (Zimmerman & Forlizzi, 2014) and relies primarily on the strength of artifact-making (Rittel & Webber, 1973). However, other forms of knowledge can also be created through RtD, such as new processes, methods, and empirical evaluations (Zimmerman & Forlizzi, 2008)—these justify RtD as an approach for realizing my work and its contributions.

Before introducing the research questions in Chapter 4 and how they are addressed in this thesis through RtD, I clarify the specific foci I have pursued in this introduction. In Chapter 2, I further support my work by considering the use of methods in design practices. Notably, the perspectives of design students on engaging with research and design methods in their projects emerged from my lectures. Building on these observations, I examine deliberations on research and design practice in Chapter 3 to clarify why research can be crucial to enhancing design practice. By outlining the underlying origins and premises, I will provide an overview that helps establish a common stance for RtD and how research (methods) can enrich design processes.

2

Method Use in Design Practice

In his quote, Gaver (2012, p. 938) fittingly clarified how designers work: "Whenever practitioners describe their influences, discuss the rationales for design decisions, and articulate their assessment of what they have made and its importance, they engage in a form of implicit conceptual work by highlighting important issues, dimensions of similarity, and criteria for choices and success." This process of reflection and articulation is central to a designer's work. As designers progress through the iterative phases of the design process, they confront challenges and ambiguities within the given context, continually refining their understanding of the problem and its requirements. This process helps shape ideas that evolve into tangible or intangible outcomes, whether in the form of physical objects, user interfaces, or software solutions.

Not without hurdles, Sanders & Stappers (2008) highlighted that the

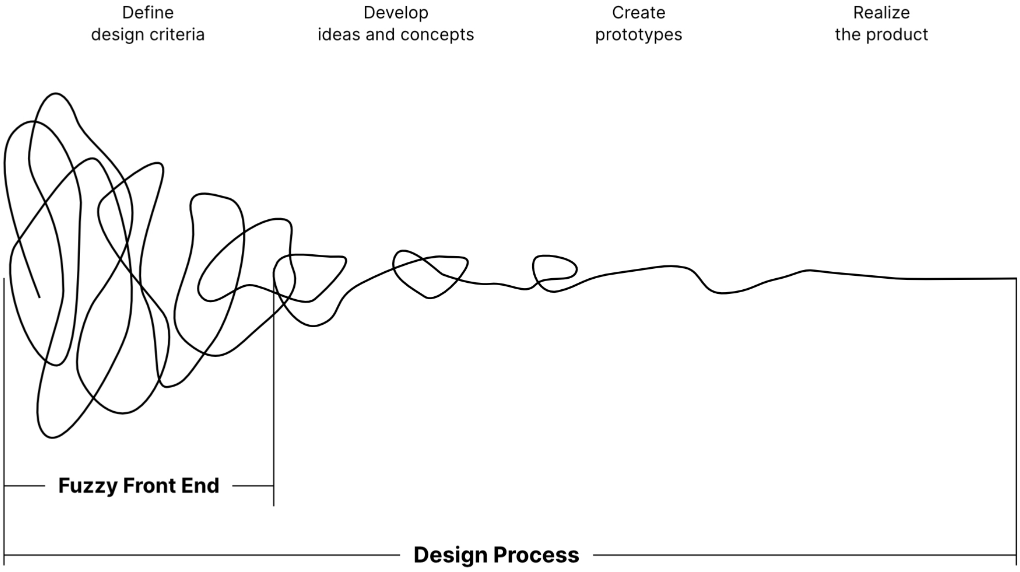

Figure 1: Sequence of a design process, outlining design criteria in the “fuzzy front end,” idea development, prototyping, and product realization; own representation adapted from Sanders & Stappers (2008, p. 6).

design process typically begins with the “fuzzy front end,” a phase characterized by ambiguity and uncertainty, as shown in Figure 1. For example, this phase involves exploring a design challenge in which designers engage with issues, requiring them to balance conflicting requirements, expectations, and perspectives. The challenge lies in navigating the unknown, such as understanding individual user needs, defining the problem scope, and determining the appropriate design approach. Here, the role of co-design, or designing through participation, becomes critical (I revisit co-design in the context of participatory design (PD) in Chapter 5.2). However, it is essential to note that the initial fuzziness of a design process presents an opportunity to adopt a more reflective, methodical approach. Involving users at this early stage can significantly enhance alignment between the design and their needs, increasing the likelihood that the final product will be meaningful to them.

In this fuzzy phase, a typical design method is to use personas, i.e., fictional characters representing potential users. These personas enable designers to envision how their products might be used in a given context, thereby providing an opportunity to incorporate user values into design (Pruitt & Grudin, 2003). Personas can therefore help represent user needs and behaviors without the time and cost of recruiting *real* people. In my design education, I have observed that design processes can be fast-paced, iterative, and resource-intensive, making personas useful while maintaining design objectives.

Based on my experiences as a researcher, designer, and lecturer, design methods such as personas, scenarios, and user journeys may sometimes reflect the designer's values and goals more than those of actual users. As mentioned, such methods can be time-saving and efficient; however, relying on generalizations derived from them may lead to missed opportunities to develop better understandings of actual users' needs and concerns (Zimmerman et al., 2007). This is not to say that design methods are inherently flawed, but rather that they may lack the critical, reflective engagement with people that could be achieved by integrating more research-driven methods into the design process (Zimmerman, 2003). In line with this, McCarthy & Wright (2015) argued that addressing these challenges of engagement in design requires more than creativity and aesthetic sensibility; it necessitates strong analytical skills, including critical thinking and problem-solving. From my background as both a design student and now as a lecturer, I have observed that design education emphasizes creative and constructive work, which is rightly the core of design. Still, as a researcher, I think designers would also benefit from placing greater emphasis on cultivating analytical skills that deepen their understanding of people's lived experiences.

To substantiate these discussions on how methods can contribute to designers' practice, I draw insights from teaching in the interdisciplinary course "Coding Interaction and Design (IxD)"[3]. This course provides an experimental space in which computer science and product design students collaborate to design functional objects that respond to socially relevant contexts (Sörries et al., 2022). Building on research through design (RtD), the course integrates design and research methods, such as mind mapping, to explore contexts and shadow users in real-world settings. These methods encourage students to approach design from both creative and empirical perspectives, fostering an awareness of the broader implications of their work.

While design students may not possess the extensive practical experience of professionals, their perspectives are particularly valuable. In my lectures, I found that design students are at a unique juncture in their education, actively learning and refining their understanding of design processes. This state of learning makes them open to exploring new approaches, including research and design methods that may not yet be deeply ingrained in their practice. In contrast, professionals may rely on established routines or intuitions in design processes honed through years of experience. Design students' willingness to experiment and engage critically with various methods offered me valuable insights, particularly those that intersect with user values and participation. These insights make design students' viewpoints a vital lens through which I can gain a broader perspective on the methods used in design practices.

To this end, I engaged in the weekly reflection task (WRT) to better understand how students use research and design methods. As shown

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[3] https://codingixd.mi.fu-berlin.de/

Table 1: Overview of the weekly reflection task, deployed in Coding IxD, to understand design students' reflections on using methods in their design practice.

No.	Questions
1	What is the most important thing you learned since the last session?
2	How did your learnings influence your understanding or work practice?
3	Have you already applied the method of this assignment? And if so, in which contexts?
4	How did the method help you to realize the assignment?

in Table 1 (p. 11), the WRT invites students to critically reflect on their experiences after completing an assignment. Assignments are methodologically structured tasks that students complete throughout the course using a specific method. By reflecting on how these methods influence their design process, students gain a deeper understanding of how to integrate, for example, user perspectives into their design. We, three lecturers of Coding IxD, developed the WRT in 2022 by drawing on the research of Moon (2013) on reflection in learning. The goal is to help students assess whether the methodologically guided course has supported them in their design practice. To prevent repetitive responses, the questions are slightly reworded after the fifth assignment, yet they still focus on students' experiences applying specific methods. I reflect on WRTs from ten design students.[4] In doing so, I aim to provide reasoning that methods, especially from research, can enhance design practice and support designers in considering values.

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[4] This includes seven WRTs from the winter term 2022/23 and three from 2023/24. The design students were informed about the research objectives and provided consent forms, ensuring transparency in data handling and their right to withdraw from participation at any time (Niksirat et al., 2023).

Design Students’ Viewpoints on Research and Design Methods

Design students have reflected on how methods, whether derived from design or research, contribute to their practice and reshape their attitudes toward design practice. One design student highlighted the unique value of research in the design process, explaining that “[methods] helped to understand the benefit of research in design; however, [designers] might be able to bring skills to the table that science and other research practices miss.” This student further emphasized that “[methods] offer new potential and possible directions to strive as a designer.”

Generally, design students acknowledged that incorporating research methods into their design practice could deepen their understanding of users’ values, needs, and concerns. As one design student pointed out, “[research methods] helped to explain the idea and concept in more depth.” Yet, they also stressed that research methods should be integrated into the design process without suppressing creativity. Additionally, design students often struggle to translate their initial creative impulses into clear, actionable design ideas for specific user groups. While ideation is frequently seen as an exciting part of the design process, it can also become overwhelming. For example, one design student described the challenge of refining ideas during the ideation phase: “[In an ideation phase] I had to structure my thoughts,” adding that “sometimes design ideas don’t need to solve a huge societal question but might respond to a small group [of individuals].”

The difficulty, however, of narrowing down broad ideas into concrete design criteria is a recurring challenge. As one student observed, “[h]onestly, it’s hard to narrow down the ideas into one good idea, especially with the outlook of a [design concept]." In my view, this sentiment showed the need to evaluate and compare ideas throughout a design process. Despite these challenges, design students recognized the importance of research methods in refining and deepening their understanding of design concepts. One student remarked, "I still feel that there's much more to clarify [regarding design process outcomes], but research methods helped a lot." Most design students also reflected on the difficulty of fully understanding users' values and needs during the design process. Some mentioned the usefulness of design methods, such as personas and scenarios, in illustrating user values and concerns. Building on the discussion from the previous chapter, design students acknowledged these methods. One student noted: "Defining a persona and agreeing on a scenario helped us a lot in concretizing a [design concept]." Nevertheless, design students generally recognized understanding user values and needs as challenging. Interestingly, one design student reflected, "I always have to think about my personal biases" when imagining users. Another design student shared, "I am gradually trying to deepen my knowledge [to understand user needs], which is still quite superficial [...]."

During the course, the experience of engaging directly with users through methods like interviews or observations was informative for many design students. As one design student explained, "[these methods] helped me better understand for whom we want to design [...]." Another design student described how, through such methods, "we [might discover] problems, on the one hand, and interesting points on the other, that we had not considered before." Similarly, another design student emphasized that "[involving users] might help me to understand more how much the design should be based on the needs and wishes of a specific group to really get to the bottom of a problem.”

In summary, the design students’ reflections revealed that incorporating research methods into design practice can support the investigation and addressing of values embedded in specific contexts. Such methods, in design education and beyond, might open new ways for designers to engage with the realities of the people they aim to serve. Hence, the challenges design students faced in refining broad ideas, overcoming personal biases, and integrating user engagement emphasize the need for approaches that balance both the exploratory and creative aspects of research and design. Despite the flattering reflections from design students, I observed that many struggled to apply and prepare specific research methods, such as interview studies, within the course. While the design students appreciated research methods, they often found it challenging to translate theoretical research approaches into practical applications. For example, some design students did not engage deeply with the provided teaching materials or research articles and, in some cases, even rejected the idea of using research literature. This resistance posed a challenge in fostering a comprehensive understanding of research methods. Nonetheless, I noticed a shift in later courses when we, the lecturers, restructured methods, particularly those derived from research articles, into step-by-step worksheets. These sheets helped design students bridge the gap between theory and practice, making methods more accessible and easier to understand. By breaking down research methods, design students were motivated to engage more actively with these methods and to adapt them to their design processes.

Building on these observations, I will deepen my understanding of the intersection between research and design practice toward RtD.

3

Delineating Research and Design Practice to Understand Research through Design

The essence of research[5] is to systematically conduct and analyze to gain knowledge and share it in a research community (Redström, 2021). Accordingly, research methods are analytical and aim to solve problems to discover what exists. Stolterman (2008) elaborated that research relies on patterns and regularities with the perspective to transform them into knowledge or even to form theories with general validity. This general validity is challenged by design practice, which involves creating something unique that serves a specific purpose in a specific situation for a particular individual or group (Gregory, 1966).

Interestingly, according to Cross (2001), design methods originate in

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[5] In literature, I noticed that the terms "research" and "science" are often used equally, such as in Redström (2021). By prospecting deeper into these terms, the Oxford Learner's Dictionaries defined research as "a careful study of a subject, especially to discover new facts or information about it" (Oxford Learner's Dictionaries, 2023c) and science as "knowledge about the structure and behaviour of the natural and physical world, based on facts that you can prove, for example, by experiments" (Oxford Learner's Dictionaries, 2023d).

research. Looking back at the origins of research methods in design, concerns emerged in the 1920s about the need to conduct careful research when designing products. By the 1960s, efforts emerged to rationalize research methods in design practice, including the development of structured, standardized processes to integrate research rigor into design. Le Corbusier in Cross (2001) considered making research knowledge visible through design practice.

Furthering this consideration of research in design, Archer (1981) discussed the term "design research," which he described as covering a broad range of activities and topics of both disciplines. Archer (1981, p. 31) proposed two possible definitions: The first encompasses nearly everything human-made, namely "Design Research is systematic enquiry whose goal is knowledge of, or in, the area of human experience, skill and understanding that reflects man's concern with the enhancement of order, utility, value and meaning in his habitat." The second focuses exclusively on the design process, explaining, "Design Research is systematic enquiry whose goal is knowledge of, or in, the embodiment of configuration, composition, structure, purpose, value and meaning in man-made things and systems." Deeming both definitions somewhat incomplete, Archer (1981, p. 31) brought up a third definition, stating, "Design Research is systematic enquiry into the nature of design activity." Recapitulating this definition, he felt it was too limited in substance. Simon (1996, p. 68 ff.) later argued that design research should be "a body of intellectually tough, analytic, partly formalizable, partly empirical, teachable doctrine about the design process."

I believe efforts to establish a universal definition of design research risk narrowing the scope of design by systematizing it. The latter may, in particular, overlook the iterative and dynamic nature of design practices, potentially excluding practical considerations, such as the cultural, social, and environmental contexts in which design occurs and interacts with the world. For example, Schön (1984) emphasized the need to integrate research, design, and methods within a reflective design practice. This approach can encourage designers to evaluate their actions throughout the design process critically, thereby enhancing their methods. Echoing this, I agree more with the term "research" (rather than "design research") in this dissertation, as it still conveys a stronger connection to design.

This interplay between research and design also laid the groundwork for research through design (RtD)—a paradigm that seeks to bridge the gap by treating design practice as a method of inquiry (Zimmerman et al., 2010). Over the past three decades, RtD has evolved into an approach that has enhanced understanding of research and design, particularly in fields like human-computer interaction (HCI) (Basballe & Halskov, 2012; Gaver, 2012; Stappers & Giaccardi, 2017; Zimmerman et al., 2007, 2010). Already in 1994, in his seminal work, Frayling (1993) distinguished three approaches embracing research and design, as shown in Figure 2 (p. 18): first, *research into design*, i.e., material research through research on the human activities of design; second, *research for design*, i.e., activities[6] to advancing design practice through research; and finally, *research through design*, i.e., action research[7] through empathetic engagement with people

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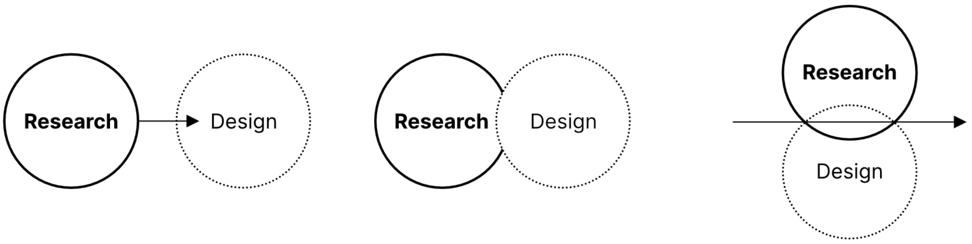
[6] Activities are actions that people perform to achieve specific goals or objectives and that are often influenced by social and cultural contexts, for example. Activities are a creative act of making that serves the "construction and transformation of meaning," which involves all people involved (Sanders & Stappers, 2014, p. 6).

[7] Action research was coined by Lewin (1946), who introduced the term in the 1940s and described a process that considers the conditions and effects of social action, for example, by discussing problems before an individual or a group make a decision. At its core, it involves the active participation of those affected by a decision. Action research anticipates and identifies these people and their needs. In addition, such research requires that decisions and potential consequences be documented and continually reviewed; for example, if a plan is exhausted by an individual or group decision that leads to new problems, these can be discussed again among them.



Research into Design
research on the human activities of design

Research for Design
advancing design practice through research

Research through Design
action research through emphatic engagement with people for novelty

Figure 2: Three approaches to research and design with distinct objectives; own representation adapted from descriptions of Frayling (1993, p. 5).

in a problematic situation, striving to create novel solutions—a core concern underpinning my approach in this work.

Following Frayling (1993), Archer (1995) emphasized that RtD arises from practical activity. Similarly, Findeli et al. (2008) argued that RtD should be understood as research essential for a design process. However, Basballe & Halskov (2012) highlighted the lack of a concrete definition of what constitutes RtD, particularly regarding its contribution to research (Zimmerman et al., 2007). Berger et al. (2017) proposed that design resolutions should be seen as equal to research outcomes, asserting that a well-conceived design concept is as valuable as pursuing truth in traditional research.

At its core, RtD has enabled designers to tackle “wicked problems” (Zimmerman et al., 2010, p. 310)—complex social issues that cannot be resolved through merely user-friendly design solutions. Instead, these problems must be contextualized by narrowing the potential solutions within a design space[8] and by developing a deeper understanding of the specific context in which a problem exists (Berger et al., 2017; Petruschat,

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[8] Berger et al. (2017) defined a design space as the connection between the issues to be explored, designers’ beliefs, values, judgments, and potential solutions.

2019). Furthermore, Gaver (2012) articulated that research can arise from design practice. In RtD, contexts are embodied through design activities, such as participatory approaches like design probes or workbooks (Gaver & Sengers, 2020), reflecting designers' judgments about how to address challenging contexts. These activities, in turn, enable critical reflection through the lens of design.

Through this discourse, I encountered different perspectives on how to contribute to an RtD approach. Zimmerman et al. (2007) noted that RtD emerged to integrate research methods into design practice, alleviating the tension between research and design. They identified two key contributions of RtD, namely reflective practice during the design process and envisioning the future to understand what might benefit society. Expanding on this, Gaver (2012, p. 940) described RtD as generative, aiming to create the "right thing" and to shape meaningful solutions. Godin & Zahedi (2014) further emphasized that RtD contributes to objective knowledge rather than being confined to artifacts produced during the process. Dalsgaard & Halskov (2012) underscored the importance of tools and routines that facilitate reflection, such as defining roles and responsibilities or analyzing empirical data. Building on this, Schön (1984) argued that designers should reflect on insights to guide subsequent steps in the design process.

While RtD is often associated with creating artifacts, its contributions extend to concepts and theories (Gaver, 2012). Redström (2021) argued that RtD results should evolve from specific instances to generalizable outcomes, such as new processes or methods. Similar to Archer (1995), he also stressed the importance of ensuring that RtD activities are systematic and repeatable, noting that answers from design practice should be acknowledged as valid research contributions.

A recurring issue is how to implement an RtD approach practically. Gaver (2012) viewed the pursuit of generalization in RtD as a potential hindrance and instead advocated for using RtD as a means to stimulate reflection through making. Likewise, Jonas (2014) countered that research could guide an RtD process to generate knowledge. Godin & Zahedi (2014) emphasized that understanding knowledge should be seen as objective and not merely as an artifact arising from RtD. In a later work, Jonas (2015) noted that RtD aims to support inquiries in which people actively participate.

Extending RtD inquiries, various approaches have been discussed to orchestrate RtD, though they offer varying degrees of explicit direction. For example, Markussen (2017) emphasized the extension, framing, and fusion of theories through design to gain knowledge. Rodríguez Ramírez (2017) relied on a model that first places research in the context of design by making the research tangible through experiments, examining the experiments, and finally searching for contributions to knowledge through them. Similarly, Herriott (2019) elaborated on a three-step approach that first defines the research question, then develops an object, and finally formulates and strengthens a theory from this knowledge. Krogh & Koskinen (2021) shifted their focus to the research activities formalized in RtD first through hypothesis formation, then experimentation, and finally evaluation to gain new knowledge. Prochner & Godin (2022) suggested indicators such as replicability, validity, and transferability that should be considered to strengthen an RtD process. Unlike linear research methods, such as structured, sequential approaches, RtD requires a more detailed process for curating research activities, as Redström (2021) explained. Koskinen et al. (2011) also suggested revisiting the same context repeatedly could improve RtD outcomes.

Among these approaches, DiSalvo et al. (2004) offered, in my view, the most promising direction within a model for design practice, consisting of six stages, which was later discussed in Zimmerman & Forlizzi (2008) with greater emphasis on RtD. During the first stage, *define*, designers investigate the problem space and frame their objective. In the second stage, *discovery*, fieldwork is conducted to explore a context by analyzing and understanding people's needs. In the stage *synthesis*, the knowledge from the previous stage is used to identify gaps, serving as design opportunities. In the following stages, *construct or generate* and *refine* involve iteratively creating and testing design concepts with people, yielding both specific and generalizable knowledge. Finally, in the *reflect* stage, designers evaluate the design process and potential improvements. This model illustrates how knowledge is acquired and applied repeatedly at each stage to achieve a comprehensive understanding throughout the RtD process.

Zimmerman et al. (2010) later reflected that more examples of how RtD can be deployed are needed. As noted, examples of RtD exist; they merely follow a similar approach, which is reasonable given iterative design processes. Despite this, Zimmerman et al. (2010) argued that RtD examples are necessary to make work reproducible, extendable, and thus validatable within design practice and beyond. They deemed that RtD researchers need to be more empathetic in their design practice. In addition, Basballe & Halskov (2012) and Dalsgaard et al. (2008) emphasized that the focus should be on the design process rather than the design of ready-to-use products. In a later work, Zimmerman et al. (2007) provided further guidance on critically framing and evaluating a design process through four criteria of RtD. The first criterion focuses on the *process*, particularly the documentation of contributions. In other words, the process must be documented and justified by explaining the rationale for the specific methods used. *Invention*, as the second criterion, addresses the meaning of the contribution and its location in a research area. A particular focus is on conducting a literature review to demonstrate how a contribution can advance research. Furthermore, it is crucial to explain how these findings advance technology. The third criterion, *relevance*, focuses on validity. In addition to locating the contribution in a real-world context, it is necessary to justify which condition is to be achieved and how to consider this. It should be motivated in detail by the relevance of the contribution to a context under investigation. Finally, *extensibility* foregrounds the resulting outcome. An outcome can yield in two directions: on the one hand, by applying the process to other contexts; on the other hand, by the knowledge gained from the resulting artifact. Accordingly, the contribution must be documented so that others (e.g., researchers or designers) can adopt either the process or the knowledge gained.

Despite the various viewpoints on RtD, research still struggles to establish common ground regarding RtD processes (Höök & Löwgren, 2012; Swann, 2002; Zimmerman et al., 2010). Nonetheless, Zimmerman et al. (2010) equalized these discussions, arguing that thorough documentation of the entire design process, including how theories from other disciplines inform design outcomes, can provide direction. Without adequate documentation, they reasoned that the comparability and evaluation of RtD outcomes might be compromised.

In summary, I consider, with reference to Chapter 2, integrating research methods into design practice valuable, as they can enrich the designer's ability to engage more critically with their design processes—especially regarding people's values and participation. In this regard, RtD stands out as an approach that enables the iterative development of novel artifacts and methods while fostering a more profound, empathetic connection with designers' and people's values (Berger et al., 2017; Petruschat, 2019). Through RtD, design resolutions can be explored to address the broader social and cultural contexts in which design practice is situated (Gaver, 2012; Zimmerman et al., 2010). Furthermore, one of RtD's strengths lies in translating participatory activities into insights that support critical reflection on their outcomes. This, in turn, provides orientation to the fact that activities are deeply rooted in the lived experiences of those they aim to serve (Frayling, 1993; Koskinen et al., 2011). By tying these insights together, providing detailed accounts of an RtD process and its outcomes can bridge the gap between the specific insights gained through design and the generalizable knowledge sought by research (Redström, 2021; Zimmerman et al., 2007). In doing so, I recall Chivukula et al. (2019) who emphasized the importance of ethical considerations that can be achieved when designers actively account for values within design processes.

In the next chapter, I present my research questions, which are grounded in the experiences described in Chapter 2, and addressed through RtD as the overarching approach to defining, developing, investigating, and refining a method for participatory value elicitation from the perspective of design practice.

4

Research Questions and Framing the Research-through-Design Process

Drawing on the motivation established in the previous chapters, this dissertation investigates how research methods can meaningfully inform and enhance design practice, particularly within value-sensitive and participatory approaches. As discussed, designers do not work in isolation; their processes are influenced not only by their expertise and creativity but also by the values they hold, or even the values embedded in a project, and the perspectives of the people affected by their designs. While design methods such as personas, scenarios, or user journeys offer practical ways to structure and imagine user contexts, they may not sufficiently support designers in eliciting and reflecting on individual or societal values.

This tension between design intuition and methodical inquiry motivated the central focus of my work, namely, to develop a method that is both research-informed and practice-oriented, capable of integrating participatory value elicitation into design processes. Against this background, my dissertation addresses two interrelated methodological questions:

> *How can a method rooted in research be realized for design practice to explore and analyze values of a specific context?*
>
> *How can a method for participatory value elicitation be embedded and contribute to design practice?*

The first research question focuses on developing a method for participatory value elicitation that is informed by relevant theoretical insights. In particular, I draw on the theoretical foundations of value sensitive design (VSD) to support my understanding of working with values, and on participatory design (PD) that extends VSD by ensuring meaningful engagement with the people affected by design outcomes. Using these foundations, I examine how values can be elicited, analyzed, and represented in ways that are accessible to designers without compromising the rigor of research principles. The second research question extends the previous one by examining the integration of the method in real-world design practice. I explore how designers can incorporate a method for participatory value elicitation into iterative design processes, how it can foster critical engagement with values, and how it can support designers in translating insights into design decisions or directions without diminishing their creativity.

Together, these research questions frame a methodological inquiry at the intersection of research and design: the first emphasizes the creation and adaptation of a research-informed design method, while the second focuses on its practical embedding. The answers to these questions culminate in the design and refinement of the *be part* toolkit, a resource intended to make participatory value elicitation both tangible and actionable for designers. Through this dual focus on method development and practical integration, my dissertation aims to demonstrate how research can augment design practice and foster more reflective and value-sensitive design processes.

To address these questions, I adopt a RtD approach informed by the theoretical insights outlined in Chapter 3. Drawing on the research (DiSalvo et al., 2004; Gaver, 2012; Koskinen et al., 2011; Redström, 2021; Zimmerman & Forlizzi, 2008), this work has two primary objectives: to carefully document the development of a method for participatory value elicitation through RtD and to critically reflect on this method to enhance its accessibility and applicability in design practice.

As depicted in Figure 3 on the previous page, the RtD approach unfolds through the four successive stages, *defining*, *developing*, *investigating*, and *refining*, which guide both the inquiry into participatory value elicitation and the structure of this dissertation. Following the canon of knowledge acquisition and synthesis, these stages are designed to build on one another, with insights from each informing subsequent stages.

The first stage, *defining*, establishes the theoretical foundation in Chapter 5 for understanding how people's values, needs, and concerns can be unfolded through participation in design processes. This stage expands on the principles of VSD, exploring its methodology and associated methods. It also delves into PD, examining its historical development, intrinsic values, and epistemological underpinnings to better understand how to create opportunities for participation in the sense of PD. I conclude this stage by critically reflecting on VSD and PD as approaches to participatory value elicitation. In doing so, I expand on the theoretical insights I

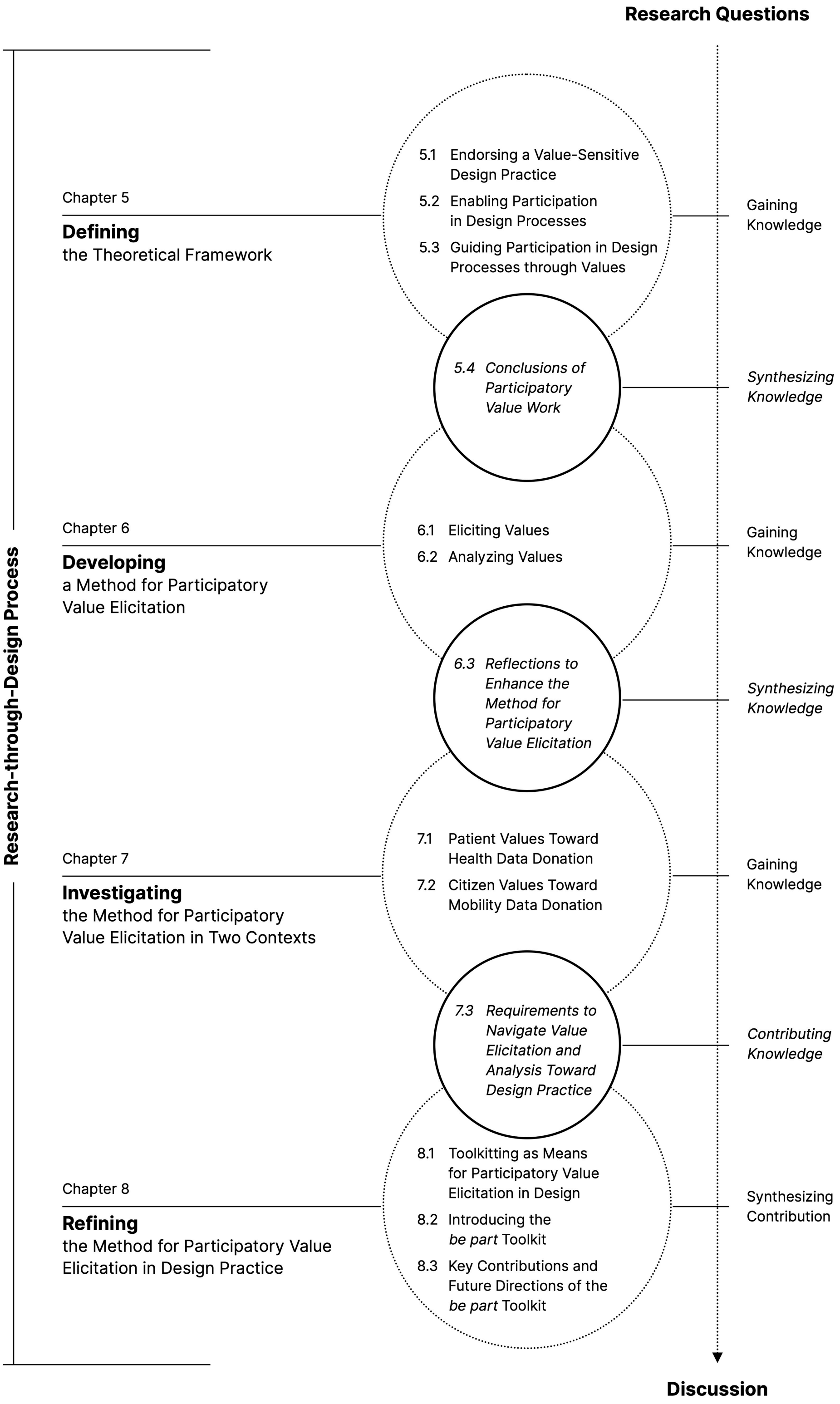

Figure 3: Proposed research through design approach consisting of four successive stages, namely defining, developing, investigating, and refining; own representation adapted from DiSalvo et al. (2004, p. 11) and Zimmerman & Forlizzi (2008, p. 43).

have gained through research in value-led PD and related approaches, namely experience-centered design.

The second stage, *developing*, builds on these theoretical insights to propose a method for participatory value elicitation in Chapter 6, which answers the first research question. This method includes a workshop concept to elicit participants' values and an analysis procedure to examine and make use of the values collected. I conclude this stage by discussing the insights gained from a pilot study and reflecting on the use of the method.

The third stage, *investigating*, evaluates the developed method by applying it in real-world contexts in Chapter 7. Through six workshops conducted in two distinct contexts of health and mobility data donation, this stage demonstrates how systematic value elicitation and analysis can generate actionable insights for design practice. The findings highlight the method's potential to yield value-sensitive suggestions[9] informing specific contexts. By distilling the lessons learned and challenges encountered during this stage, I discuss the method's practicality for design practice.

The final stage, *refining*, synthesizes the insights from the earlier stages to critically examine and justify the method for participatory value elicitation as a meaningful contribution to design practice in Chapter 8. To answer the second research question, this stage introduces the *be part* toolkit, which embodies the method for participatory value elicitation. The toolkit is designed to be integrated into various phases of a design

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[9] Inspired by the work of Friedman & Hendry (2019), I use the term "value-sensitive suggestions" to refer to design resolutions, recommendations, requirements, or proposals that take into account and align with the values, ethics, and preferences of individuals or groups. In design practice, these suggestions consider the social, cultural, and moral implications of decisions and actions, ensuring that they resonate deeply with the values of the individuals or groups involved.

process, enabling the elicitation of values from people affected by the context. It also includes an analog analysis procedure tailored to designers' practices, demonstrating how qualitative research methods can be used adaptively in design.

In Chapter 9, I critically reflect on my RtD process. This reflection is informed by and reflects the knowledge gained throughout my work. Furthermore, I discuss my experiences facilitating participatory approaches and working with values in distinct contexts.

5

Defining the Theoretical Framework

The tension between research and design in participatory value elicitation is a defining characteristic of this dissertation, which I delved into through the research through design (RtD) approach. In this context, value sensitive design (VSD) offers a way to thoroughly determine values throughout a design process and consider them in the design. This supports the idea that values are not an afterthought but embedded throughout the design process. Conversely, participatory design (PD) highlights the importance of engaging stakeholders in the design process to reflect their needs, concerns, and aspirations. By actively involving individuals and communities, PD ensures that design outcomes are more inclusive and responsive to the people they aim to serve. Building on this, value-led PD and related approaches offer insights into how participation driven by values can be incorporated into design processes.

As RtD evolves, it might challenge designers to consider the more profound ethical, social, and cultural implications of design (Redström, 2021; Zimmerman et al., 2010). Hence, the theoretical framework discussed in this chapter enables me to review, compare, and integrate approaches and methodologies that enhance designers' reflective practice and critically examine the values embedded in their design work.

Drawing on insights from the RtD discourse, as outlined in Chapter 3, I aim to explore how this framework can support me in navigating between research and design practice, particularly when eliciting values through participation in design processes. For this, I deepen the discussion by detailing the notion of values and introducing VSD in Chapter 5.1 and PD in Chapter 5.2 expanded with value-led PD and related approaches in Chapter 5.3. I will then summarize my findings in Chapter 5.4, which will serve as the basis for my methodological considerations for eliciting and analyzing values through a participatory approach in Chapter 6.

5.1 Endorsing a Value-Sensitive Design Practice

Design influences how we use and interact with technology, making it essential to encounter our values meaningfully. Thoughtful design in technology, such as user-friendly interfaces and inclusive accessibility features, considers how technology aligns with values such as privacy, fairness, and sustainability. In the field of human-computer interaction (HCI), Friedman & Hendry (2019) stated that designing with (human) values might lead to technologies incorporating ethical and moral aspects that enhance the quality of life for individuals and groups.

With the rise of the World Wide Web and the increasing presence of personal computers in individuals' lives, Friedman and colleagues perceived a lack of clarity regarding how values are incorporated into these technological efforts (Friedman & Nissenbaum, 1996). At that time, for example, research on computer-supported cooperative work focused on collaboration in work environments—a similar tendency discussed in the early traces of PD. However, with an exclusive focus on values in technology design, Friedman and colleagues developed the theoretically founded approach of VSD, emphasizing the responsibility to integrate values and technology during the 1990s. In doing so, they referred to Winograd & Flores (1986, p. xi) who stated that "in designing tools we are designing ways of being."

Friedman and colleagues, furthermore, incorporated psychological research by Turiel (1983), which delineates broader considerations of values regarding moral and conventional aspects, and points to individual judgments and beliefs in life. VSD encompasses the complexity of social life by incorporating moral values, i.e., people consider good or bad (Friedman et al., 2006). For example, things of value to individuals or groups based on life circumstances. Based on these considerations, Friedman & Hendry (2019, p. 24) derived their working definition of values in 2006, namely "what is important to people in their lives, with a focus on ethics and morality."

To be more precise on what a value can be, Friedman & Kahn (2002a, p. 1187 ff.) defined twelve universal values with ethical import that can be considered in a design process such as "privacy," i.e., individuals' right to decide what information is communicated to third parties, "autonomy," i.e., individuals' ability to achieve their goals, or "identity," i.e., individuals' understanding of themselves over time. In a later article, the twelve universal values were extended to 13, including "courtesy," i.e., treating individuals with consideration and reason (Friedman et al., 2006, p. 17 ff.).

Friedman and colleagues argued that this list of universal values does not claim to be exhaustive; moreover, these values may be more or less interdependent. They explained the interdependency of certain values that sometimes conflict in a specific context. For example, the value "privacy" might relate to values such as "trust" and "autonomy" connected with "identity" (Friedman & Hendry, 2019, p. 44).

Such values may be in tension due to individual or group beliefs. In this regard, examining value tensions can help to align conflicting values. For example, Friedman et al. (2017) explained that disclosing value tensions can narrow the design space by reducing the set of design options. Specifically, (technological) solutions can be examined in design options and whether people reject them due to value tensions. Through this examination, the essential design options emerge. Investigating value tensions can provide unforeseen directions for novel technology design approaches.

Building on the principles of VSD, which emphasize integrating ethical and moral values into technology design, I considered it necessary to examine the concept of values in greater depth. While VSD suggests universal values such as privacy, autonomy, and identity within design practices, understanding more broadly what constitutes a value provides me with a more thorough theoretical grounding for this dissertation. Hence, in the following, I outline how values are defined, how they guide behavior, and how they are socially and individually constructed across different disciplines, before returning to the methodology and methods of VSD. This sets the stage for a more detailed discussion of values in relation to VSD. In particular, the conceptualizations of values, their roles in guiding action, and their interrelations.

Defining Values and How They Define Us

Values shape how we act and judge, influencing what we consider desirable or essential. Values such as security and benevolence guide our actions toward achieving goals (Schwartz, 2012) and help gain a broader, more versatile perspective in specific circumstances (Fleischmann, 2013). Values, therefore, represent our interests, preferences, duties, and moral obligations (Williams in Rokeach, 1973), which we prioritize based on lived experiences and that form the foundation of our moral beliefs, including principles that help us distinguish right from wrong. Ethics, the study of the moral principles, systematically applies these beliefs to guide our behavior in specific contexts. In this way, values influence morality, governing our actions.

In linguistics, Kuße (2012) referred to Najder (1975), who declared value as something good, and von Heydebrand & Winko (1996) distinguished between axiological and attribute values. Axiological values are standards that make, for example, an object and its characteristics appear valuable, such as justice that expects a fair judgment of a person (Kuße, 2007; Woldt, 2010). Attributive values guide action and are regarded as evaluation standards (von Heydebrand & Winko, 1996). These values help us to evaluate situations and justify actions. In other words, attributive values are indispensable for a decision to act (Lenk, 1994). However, values are dynamic and may vary across contexts, individuals, and societies. As a result, a value that one person holds might be unimportant to another (Schwartz, 2012).

Over many years, various disciplines have studied values and their effects on individuals' self and behavior. For example, social sciences argued that values motivate and explain individual decision-making (Schwartz, 2007). Similarly, research in psychology has found that values are intertwined with an individual's personality type (Schwartz, 2007). Hence, several definitions of values have emerged, including implications about conceptualizing values and what constitutes and matures individual values. Kluckhohn (1951, p. 395) defined a value as "a conception, explicit or implicit, distinctive of an individual, or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action." Guth & Tagiuri (1965, p. 124 ff.) described a value as "a conception, explicit or implicit, of what an individual or a group regards as desirable, and in terms of which he or they select, from among alternative available modes, the means and ends of action." Hutcheon (1972, p. 84) stated that "values are not the same as ideals, norms, desired objects, or espoused beliefs about the 'good,' but are, instead, operating criteria for action." Rokeach (1973, p. 5) defined a value as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence." Similarly, Schwartz (1994, p. 20) explicated values as "a belief pertaining to desirable end states or modes of conduct that transcends specific situations; guides selection or evaluation of behavior, people, and events; and is ordered by the importance relative to other values to form a system of value priorities." Informed by the research of Kluckhohn (1951) and Rokeach (1973), Braithwaite & Blamey

(1998, p. 364) later argued that values "are principles for action encompassing abstract goals in life and modes of conduct that an individual or a collective considers preferable across contexts and situations."

By reviewing and comparing these definitions, Cheng & Fleischmann (2010) found that Kluckhohn (1951) and Guth & Tagiuri (1965) emphasized values as conception. Rokeach (1973) and Schwartz (1994) referred to values as enduring belief. Braithwaite & Blamey (1998) see values as principles. By further analyzing these definitions, Cheng & Fleischmann (2010, p. 3) synthesized a comprehensive understanding of values. From this comparison, they derived a more adaptable definition: values "serve as guiding principles of what people consider important in life," a definition that is mirrored in the VSD's value definition (Friedman & Hendry, 2019). Similar to VSD, Cheng & Fleischmann (2010) intended to capture the essential role of values in shaping individuals' priorities and actions.

Reflecting on these definitions of values, the problem remains that, across disciplines, the term "value(s)" is used and conceptualized in varying ways in research (Cheng & Fleischmann, 2010). In this regard, I refer to the work of Rokeach (1973), which distinguishes between values and behavior and provides a theoretical understanding of values, for example, by mitigating terminological inconsistencies. Rokeach (1973, p. 2), who drew on, for example, Williams Jr. (1967, 1968), explained that values serve as standards or criteria that guide both judgment and evaluation. Echoing Murray (1938), Rokeach (1973, p. 2) further described values as "cognitive representations of 'internal needs'[10]" caused by external con-

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[10] Research in values often adds the term "need." Nevertheless, no distinction is made between values and needs, or needs that are even part of the description of values. For clarification, Oxford Learner's Dictionaries (2023a) defined a need as "a situation when something is necessary or must be done," such as a person's need for treatment, emphasizing the improvement of social conditions or care.

straints. For example, to decide whether to argue something, convince others of something, or believe in something (Rokeach, 1973). In addition, values are considered as norms[11] to justify processes consciously and unconsciously and better rationalize thoughts, judgments, and actions. Rokeach (1973) concluded that self-definition and awareness, or gaining knowledge, can lead to changes in values that occur naturally and result from individual needs due to the demands and goals of society.

In reflection, these definitions describe values as guiding principles for decisions, actions, and priorities that influence both the moral and behavioral aspects of decision-making. Regarding the latter, it is crucial to recognize that values are not formed in isolation but are inherently social constructs. Values emerge through interactions within cultural, institutional, and community contexts, reflecting both shared norms and collective experiences (Braithwaite & Blamey, 1998; Schwartz, 2007). With a more social import, I recall Rokeach (1973, p. 210), who assumed that improved awareness of one's values and the values of others is achievable. By considering the social import of values, one can better understand their situatedness and influence on individual positionality. This perspective emphasizes that personal preferences, beliefs, and moral judgments are entwined with broader social influences, including historical, economic, or political conditions. Consequently, understanding values requires examining the interplay between personal dispositions and socially medi-

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[11] The Oxford Learner's Dictionaries (2023b) delineated between, first, "the norm," i.e., "a situation or a pattern of behaviour that is usual or expected," such as "a departure from the norm," that is also a synonym to "rule." Second, "norms" including social and cultural norms, i.e., "standards of behavior that are typical of or accepted within a particular group or society," such as "[s]he considered people to be products of the values and norms of the society they lived in." Third, "a required or agreed standard, amount, etc.," such as "[t]he government claims that background radioactivity is well below international norms." In this context, Rokeach (1973, p. 15) reflected on "normative orientations" of values that may be complex and vary from society to society. The elements of such normative orientations include norms, such as obligatory demands, expectations, rules, and values, that constitute "criteria of desirability."

ated expectations, rather than treating values solely as internalized guides for action. I found that integrating this social aspect of values, which vary from person to person, provides a more comprehensive foundation, enabling both the elicitation of values and critical reflection on how our own assumptions shape the interpretation and consideration of these values in research or practice.

Building on this understanding, I turn to the VSD methodology in the following. Here, I discuss the underlying theory and relevant methods in light of eliciting values.

Methodology of Value Sensitive Design

In this section, I distinguish between the theoretical foundations of VSD and the methodological approaches employed within it. This separation allows a clearer understanding of the theoretical rationale behind VSD and its methods.

According to Friedman & Hendry (2019), values can significantly influence the design of technology. Hence, the underlying theory of VSD is grounded in the premise that technologies are not neutral artifacts; they embed the values of designers, users, and society. Friedman & Kahn (2002a) also posited that designers might implicitly influence the design process by embedding their values in technology and proposed the tripartite methodology of VSD (Friedman et al., 2017) to address these influences in technology design. This methodology comprises three consecutive investigations, namely *conceptual*, *empirical*, and *technical*.

First, *conceptual* investigations involve exploring a context through analyses. These investigations enable designers to understand better the concerns or responsibilities involved within a context (e.g., a project) and to make essential assumptions about specific values and align them among stakeholders[12] affected, for example, through interdisciplinary discourses.

Second, *empirical* investigations include quantitative and qualitative methods commonly used in social science research, such as interviews, surveys, and observations. The aim is to examine which values are considered necessary in the socio-technical context[13] by stakeholders and what value tensions might arise. In these investigations, designers determine which methodological approach (potentially incorporating multiple methods) is appropriate and when to use it.

Third, *technical* investigations help assess a technology's suitability with respect to the values it supports. These investigations examine how technological properties and design choices shape these values, and whether a user interface or system's functionality and algorithms align with ethical considerations. For example, system operations, user interactions, or automated decisions might be performed more meaningfully by prioritizing a specific value. Such an investigation can be retrospective or prospective, engaging designers to analyze new opportunities for technology design while evaluating how different design choices support or hinder particular values. Prototyping and testing potential solutions are often part of this process for embedding values in technology.

To blend VSD's theory into practice and to support investigations of

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[12] Stakeholders encompass individuals or entities (e.g., organizations, companies, or regulators) significantly affected or potentially affected by a technology (Friedman & Hendry, 2019). Stakeholders differ from users in that they do not focus exclusively on the individual interacting with technology. VSD therefore distinguishes between direct and indirect stakeholders: those who interact directly with technology and those who interact indirectly with it (rarely or never) but are nevertheless significantly affected by it; for example, systems in the medical field used directly by medical staff and indirectly affecting patients' health outcomes.

[13] Socio-technical refers to the interaction and interdependence between social systems (e.g., people, organizations, and communities) and technical systems (e.g., tools, technologies, and processes) in the design, implementation, and evaluation of systems (Suchman, 2012).

the tripartite methodology, Friedman et al. (2017) introduced 14 methods, which were later expanded to 17 (Friedman & Hendry, 2019). Notably, VSD methods can be considered both design and research methods: as design methods, they guide the creation of technologies that embody values, and as research methods, they systematically investigate values, stakeholders, and the relationship between technology and society. This dual role bridges practical design efforts and theoretical inquiry. Friedman & Hendry (2019) described this theoretical engagement as a dialogic process in which method and theory inform each other. Friedman et al. (2017) did not specify how these 17 methods are applied within the tripartite methodology. Still, they point out that the methods are used iteratively and in accordance with the context being examined. Additionally, they emphasized the descriptive nature of the methods, which serve as a guide to help designers focus on problematic or critical situations and to generate, compare, and validate new outcomes.

Given the plethora of VSD methods listed in Friedman et al. (2017), I will focus on the most relevant methods for my research, as they facilitate a more designerly practice and align with the objective of my work. By focusing on the following VSD methods that support iterative, hands-on stakeholder engagement, values can be explored in a way grounded in design practice rather than purely through theoretical analysis.

The *stakeholder analysis* considers stakeholders such as individuals, groups of individuals, society as a whole, or even institutions. This analysis helps to identify stakeholders and the extent to which they are affected by a context under investigation. The goal is to document the results, for example, through a stakeholder list that specifies their roles. Nathan et al. (2008) presented an approach to envisioning long-term systemic effects, i.e., the broader, long-term, and often unintended consequences that arise from the design and implementation of a system, based on four specific criteria, namely *stakeholders*, *time*, *values*, and *pervasiveness*.[14] These criteria are explored through questions and tasks to support design practices. The authors emphasized that considering these criteria promotes a broader process of envisioning, revealing both the positive and negative impacts of technology design. Furthermore, this approach may help broaden the focus beyond a technology's functionality to encompass social, ethical, and cultural aspects.

The *value source analysis* examines the implicit values that designers bring to a project and assesses whether the project's overall values are compatible with those of the researchers, designers, and other stakeholders. However, this analysis also serves as a form of awareness-raising, meaning that not all values researchers or designers behold are necessarily relevant to a project. Examining these potentially divergent values can prompt reflection on value tensions. Borning et al. (2005) investigated how a technology incorporating citizens' concerns and needs could facilitate public decision-making, for example, measures for structural changes to districts as part of urban planning. They emphasized that investigating technologies helps to reconcile the diverging values of citizens and project managers. The authors concluded that analyzing stakeholders' values and expectations can sometimes clarify substantial value tensions.

The *value scenario* builds on the scenario-based design method by Carrol (1999), which is widely recognized as essential to design processes.

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[14] Stakeholders and values follow the aforementioned definitions of VSD (Friedman & Hendry, 2019). According to Nathan et al. (2008), time refers to the consideration of both short-term and long-term effects that a system's design and use can have on individuals and society. Pervasiveness describes the extent to which interactive systems are integrated into and influence various aspects of daily life and society.

Scenarios are narratives that focus on human actions when interacting with, for example, a technology, allowing for interpretations and reflections on (specific) use cases. Scenarios consider the five elements of scenario-based design, namely *setting*, which captures the environment, such as place, time, people, and objects; *actors*, involving the people and technologies participating in actions; *goals*, pursued by the actors through interaction; *events*, leading to changes in interaction; and *changes*, which can influence the goals of the actors. Value scenarios extend scenario-based design by incorporating components that enable a socio-technical perspective on technology use (Nathan et al., 2007). These components include *direct and indirect stakeholders* (the individuals or groups directly or indirectly affected by technology), *critical values* (fundamental principles such as privacy, fairness, or transparency that guide design), *indirect impacts* (unintended consequences or side effects of technology use), *widespread use* (the extent to which technology becomes universally adopted or integrated into society), and *systemic effects* (the long-term, broad impacts that technology may have on societal, environmental, or economic structures). Czeskis et al. (2010) demonstrated that applying this method to explore the design space and value tensions in the context of mobile technologies for parental tracking of teenagers. The authors argued that, based on the components of value scenarios, parents and teenagers designed scenarios that revealed new insights into the conceptual design of tracking technologies, extending beyond functionality to include parental closeness and trust in their child.

The *value sketch* is a representation that can be understood as a visualized textual scenario using techniques such as sketching for storytelling. Such sketches aim to direct attention to the critical aspects of a technology design. Friedman et al. (2002b) engaged participants to illustrate the security of web browsers through value sketches. The authors found that this approach enabled participants to express their security needs regarding information exchange and the transmission of browser data. They suggested that such a method can benefit technology design by exploring new forms of expression and articulating thoughts creatively.

The *value-oriented coding manual* enables the analysis of qualitative data (e.g., from a *value source analysis*, *value scenarios*, or *value sketches*) to capture the social aspects of a specific context. Friedman et al. (2008) investigated in interviews the values and judgments of participants regarding surveillance in public spaces and direct or indirect stakeholders involved. Based on the interview data, the authors developed an empirically grounded coding manual that includes coding rules and categories derived from the participants' values, with definitions and examples (Hagman et al., 2005). They concluded that such a coding manual can improve understanding of individuals' conceptions of values in a given context.

In addition, Friedman & Hendry (2019) emphasized that VSD methods can be enriched with additional social science methods, such as ethnographic field studies, surveys, or focus groups, as well as participatory approaches, such as co-design workshops (e.g., Yoo et al. (2013)), to reflect on how theory-driven values can be grounded in empirical and design practice.

Overall, the theoretical rationale of VSD clarifies why specific values should be prioritized to highlight potential ethical concerns in technology design. The methods offered, individually curated within the tripartite methodology, can help to investigate values and possible tensions. Notably, the iterative engagement between theory and methods to anticipate value conflicts and iteratively define and refine design ideas or solutions with stakeholders enhances the thinking about ethical concerns and how they are considered throughout the design process.

Critiques on Value Sensitive Design

Research has shown that VSD can be a promising approach for investigating technologies with respect to values (Le Dantec et al., 2009). Friedman & Hendry (2019) noted that although values are generally understood as principles that individuals consider necessary in their lives, it is essential for designers to investigate and interpret these values within the specific context of their projects.

As previously noted, VSD provides 13 universal values; however, applying this list as a heuristic across projects can lead to overlooking individuals' intrinsic values. Le Dantec et al. (2009) indicated that using universal values could result in individuals' rejection of context-specific values. Borning & Muller (2012) questioned the idea of generalizing values by creating a fixed list, highlighting concerns about the consistent application of such universal values across various contexts, especially in technology design. They pointed out that this approach might lead to problems such as decontextualization or difficulties ensuring accurate applicability when translating values, thereby affecting their meaning. Parvin et al. (2015) argued that incorporating universal values into the design process results merely in identification and application logic. Such logic would miss the idea that values should be uncovered in a design process. Referring to Flanagan et al. (2008), Parvin et al. (2015, p. 97) explained, "[v]alues are not applied to situations; rather, values serve situations as hypotheses."

I believe that designers should be conscious of their values, which they may develop consciously or unconsciously in their work on a project or context, by actively engaging in dialogue with people affected by the same (Davis & Nathan, 2015). Such a stance thus helps to distinguish from prevailing moral values (Albrechtslund, 2007; Manders-Huits, 2011; van de Poel, 2009). In other words, by determining these values, designers might make their own assumptions explicit and externalize them to foster a more reflective design practice. In this regard, Flanagan et al. (2008) highlighted that designers may face challenges in translating values into design, despite carefully selecting and applying methods. They suggested deriving suggestions from the decision about necessities (which values are mandatory or even innovative) and suitability (which values can be reliably embodied in a design). These decisions are intellectually demanding, emphasizing exploration throughout the design process of how and whether values can be successfully mirrored in a design.

Turning to the methodology and methods of VSD, Le Dantec et al. (2009) challenged the proposed sequence, starting with *conceptual*, followed by *empirical*, and finally *technical* investigations. They argued research should instead follow an iterative approach, meaning by responding to the context under investigation, any of the three investigations can be initiated (Borning & Muller, 2012). Le Dantec et al. (2009) also noted the lack of a uniform approach to determining which empirical methods are most effective for investigating values. This lack of consistency presents a problem, as it limits the discovery of new values, primarily because conceptual investigation is often prioritized over empirical methods. As a result, the exploration of values in real-world contexts is restricted, preventing engagement with unforeseen values that could offer valuable insights.

Even if designers' decisions have systematically captured and evaluated values, how are they applied to a design, such as a technology?

Reflecting on this question, I realized that although methods for determining values exist, there are few applicable approaches and tools for evaluating values to inform design practice. Here, Shilton et al. (2013) offered another perspective, emphasizing the need to facilitate value-sensitive methods. They argued that designers should detail their methodological approach for eliciting values and understanding its limitations. On the one hand, Shilton et al. (2013) suggested that deductive approaches, which involve testing existing theories through empirical research, should be applied. These approaches are beneficial for assessing the relevance of stakeholder values to a project. On the other hand, inductive approaches, in which theories are developed from research such as observations or text analysis, can be valuable for exploring collective stakeholder values. As a synthesis of these critiques, Borning & Muller (2012) proposed measures to strengthen VSD that withstand societal changes driven by technological advancement and amplify stakeholders' voices in design processes. One approach could be to embed VSD methods into cooperative practices in the tradition of PD, ensuring that stakeholder values are not neglected (Shilton, 2018). This cooperation can dismantle power asymmetries between the diverse stakeholder views and concerns, such as the workshop of Ballard et al. (2019), combining VSD and design fiction[15] to foster dilemmas.

By consolidating these insights on VSD, I will consider PD as an

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[15] Design fiction, as coined by science fiction author Sterling (2005) and later extensively expanded by the technologist Bleecker (2009), is a practice that uses speculative storytelling to explore and prototype possible futures, as demonstrated by Dunne & Raby (2013). It blends elements of science fiction, design, and technology to provoke discussion. These speculative explorations help designers and technologists anticipate societal shifts and challenge conventional assumptions about technology's role in shaping the future.

epistemic-driven approach in the following.

5.2 Enabling Participation in Design Processes

As an approach to action research, PD emerged during World War II. This foundational period is exemplified by the efforts of the Tavistock Institute in London, which labored to improve the working conditions of coal industry workers in the United Kingdom (Trist & Bamforth, 1951). These early endeavors focused on the joint optimization of processes, balancing worker productivity with their needs and requirements, marking an early recognition of humans as integral to systemic and industrial design.

In the 1970s, design and research practices developed further, leading to what became known as the Scandinavian approach, more commonly referred to as cooperative design (Bødker & Kyng, 2018, p. 3). This approach was distinct in its emphasis on fostering active collaboration among researchers, designers, people, and other stakeholders throughout a project. It thus advocated for participatory processes that engaged workers and stakeholders directly in shaping their tools and systems. One notable example of these practices is the work of the researcher Kristen Nygaard, who collaborated closely with Norwegian trade unions (Nygaard & Bergo, 1975). Nygaard developed the DELTA programming language (Norwegian for *participate*), a specific object-oriented programming language designed to empower workers by improving their quality of work (Bannon & Ehn, 2012). Alongside this, other collaborative projects during the 1970s and early 1980s, such as the Demos project in Sweden and the DUE project in Denmark, emphasized the development of democratic system design methods (Schuler & Namioka, 1993).

Perhaps the most prominent initiative from this era, the UTOPIA project exemplified these participatory ideals (Sundblad, 2011). Over several years, UTOPIA emphasized the development of design methods that included users at every stage of the design process. This effort focused on creating tools, such as novel input devices and layout programs, to enhance graphic designers' skills. To facilitate participation, the project actively promoted exchanges among diverse stakeholders, including graphic designers, computer scientists, and social scientists. Activities included study trips to institutions such as Xerox PARC, the development of requirements for newspaper layout systems, the piloting of tools for graphic work, and the distribution of manufactured tools to the graphic design industry. By highlighting graphic designers' individual skills and considering factors such as work organization, collaboration formats, work environment, and skill development, UTOPIA pioneered new ways to conduct design exercises for prototype development. Moreover, it created opportunities for cooperative learning by forming "communities of practice" (Sundblad, 2011, p. 7). This project demonstrated the importance of creating spaces in which diverse stakeholders could actively engage in the design process, thereby setting a precedent for participatory approaches in subsequent decades (Halskov & Hansen, 2015). The international interest in such collaborative activities, particularly in North America, led to the emergence of the term "Participatory Design" during the 1980s.

Recently, Bødker et al. (2022) stressed the matter of gaining a deeper understanding of what sets PD apart from other design paradigms, such as user-centered or human-centered design[16], emphasizing that PD is fundamentally concerned with the design process rather than the final product (Bødker et al., 2022). To provide a clearer understanding of the challenges and evolution of PD, Bødker et al. (2022) outlined four distinct eras.

First Era (1970–1985). This period marked the transition from designers acting as external observers to becoming activist researchers actively engaging with workers. Notable projects during this era included UTOPIA and the Florence Project in Norway. The latter examined nurses' work practices to explore how information technology could support their tasks. Despite emphasizing worker agency, this era lacked established methods and insights for designing cooperative workplace systems.

Second Era (1985–1992). PD gained traction as international interest grew. Unlike in the first era, individuals were often perceived as passive entities to be studied through systematic tests. Bannon (1992) later characterized this shift as moving from a focus on human factors to human actors, recognizing people as active participants in technology development. This shift laid the groundwork for various human-centered approaches in HCI, such as contextual design (Beyer & Holtzblatt, 1997), co-design or co-creation (Sanders & Stappers, 2008), and VSD (Friedman & Hendry, 2019).

Third Era (1992–2013). This era witnessed a broad expansion of participatory methods, moving beyond the workplace to other contexts such

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[16] User-centered design focuses specifically on optimizing usability and functionality for users, involving them primarily through feedback and testing rather than co-creation (Sanders & Stappers, 2008). Human-centered design, in contrast, takes a broad approach to design (technological) solutions that consider users' needs, behaviors, and experiences, often addressing social and contextual factors beyond usability (Kling & Star, 1998). Like in PD, where people are treated as active collaborators to foster agency, control, and empowerment throughout the design process (Bødker et al., 2022).

as architecture and engineering. Politically motivated research became a significant focus, with PD methods applied to engage citizens in public initiatives, such as the development of education strategies (Binder et al., 2002). However, Bødker et al. (2022) noted the critical disengagement from political perspectives within PD, which limited its potential to achieve participatory democracy.

Fourth Era (2014–Present). This ongoing era reflects the increasing complexity of PD, with a growing emphasis on developing new methods to address democratic challenges, enhance critical reflection on values, and explore new forms of work (Smith et al., 2017). In an era dominated by companies such as Alphabet and Meta, where data has become a ubiquitous currency, Bødker et al. (2022) argued that PD retains the potential to drive meaningful change. For instance, PD can still facilitate the development of innovative technologies that address complex challenges arising from political agendas and the growing influence of corporate structures, but the prospects for success remain uncertain.

Through these evolving eras, PD has consistently sought to center human agency and democratic participation in design processes, demonstrating its enduring relevance and adaptability in addressing societal and technological challenges.

Facets of Participation

As mentioned, in recent years, the question of methods has increasingly emerged, seeking to reflect PD as a primary concern. Regarding the latter, Halskov & Hansen (2015) assumed that participation can be generally defined as an implicit process that seeks to engage with people's perspectives, resulting in mutual learning. To address this general definition and to set the stage for PD, the authors examined the diversity of PD through a systematic literature analysis. As a result, Halskov & Hansen (2015) proposed five fundamental aspects to situate practices in PD. First, *politics*, to create opportunities for people to participate in decision-making processes actively. Second, *people*, as they have expertise about their lives. Third, *context* must be clearly defined for any design process. Fourth, *methods* for enabling people to influence design processes, and finally, *product*, which improves people's quality of life by designing alternatives to the status quo.

While these aspects provide valuable guidance for establishing PD, it is essential to consider how they can be implemented methodologically. However, Bødker et al. (2022) noted that a clearly defined catalog was not possible due to the sheer number of approaches to PD. To create practices that align with PD, nonetheless, Bødker et al. (2022) distinguished five design activities, allowing methods to be subsumed within them and providing guidance for PD practitioners.

The first design activity, *field studies*, examines contexts, people, and other relevant stakeholders. Field studies in PD are not understood as observations or interviews, as in user-centered design, but rather as a mutual exchange with people that enables critical reflection on their environments and activities. For example, Blomberg & Karasti (2012) suggested that qualitative research, such as ethnography, contributes to a deeper understanding of sociality by observing the behavior and interactions of a specific group of individuals. The authors emphasized that ethnographic field research can provide important insights for deriving design implications from collaboration with people. This deeper collaborative engagement with contexts and people affected can serve as a basis for the following four design activities.

The second design activity, *workshops*, focuses on collaboration among researchers, designers, participants, and context-relevant stakeholders. Workshops are considered the most central activity in PD, supporting mutual learning and reflection on concerns, knowledge, skills, and needs among participants, such as designers. The goal is to explore future alternatives and foster a shared vision. Workshops in PD are also firmly committed to democracy and empowerment. Muller & Druin (2002) noted that it is essential to conceptualize processes that enable participants to move beyond their experiential perspectives, thereby creating spaces for negotiation. A necessary part of this conception is strategies to promote participants' creativity, for example, by providing tools and techniques that can be flexibly combined, as proposed by Sanders et al. (2010, p. 197). These tools are delineated as "making tangible things" (e.g., creating collages or 3D artifacts), "talking, telling and explaining" (e.g., using cards or visual maps to organize and prioritize ideas), and "acting, enacting and playing" (e.g., through role-playing or improvisation). Although Sanders et al. (2010) offered a theoretical framework to facilitate the selection of tools and techniques for PD, the usability and application for design practice and research remain open.

A more practical approach is offered by the well-established method of future workshops, developed by Jungk & Müllert (1997) and later applied by Kensing & Madsen (2020). Future workshops enable participants to develop new visions and solutions to societal problems (e.g., in urban areas, such as overcrowding, or in healthcare, addressing rising healthcare costs). Four phases are fundamental to implementing future workshops: First, *preparation phase* to deploy methods outlining the workshop's process; second, *critique phase* to examine a problematic situation; third, *fantasy phase* to develop a future vision or solution by participants; and finally, *implementation phase* to discuss the suitability of a solution. Jungk & Müllert (1997, p. 12) stated, "[t]he affected parties always come too late," and they can only react, if at all, when a decision has already been made. In other words, designers in such investigations act as anchors for participants, supporting and motivating them. They empower participants by addressing their questions and uncertainties, ultimately fostering a trusting environment where unexpected insights can emerge. Overall, it is vital to make the context concrete, make activities accessible, and allocate sufficient time for participants to discuss activity outcomes with facilitators.

The third design activity, *collaborative prototyping*, is increasingly used in interaction design processes to test and explore design ideas (e.g., prototypes or products). It involves finding ways for potential users to contribute their skills and analyze designs to understand the impact of design proposals. This includes concrete resolutions and open questions that require further reflection on a design. Grønbæk et al. (2017) explained that pursuing high-quality products and processes should drive new technologies. The authors advocated for a stronger emphasis on collaboration between practitioners and users in design processes. They concluded that neglecting collaboration in design processes results in technologies that are not designed for those who will ultimately use them. For instance, a lack of user involvement in the development of healthcare technologies, such as telemedicine platforms, can result in complex systems for patients to navigate or in a failure to meet their specific needs. Similarly, designing innovative city technologies without engaging residents in urban planning might result in solutions that overlook local concerns, such as data privacy and accessibility.

The fourth design activity, *infrastructuring*, emphasizes three essential components: social, organizational, and technical infrastructures. Infrastructuring refers to the creation of physical and digital systems on the one hand, and, on the other, to the continuous shaping and maintenance of relationships, norms, and routines that allow a community or organization to function over time. For instance, in a community project, infrastructuring might involve establishing collaborative digital platforms, organizing recurring workshops, and defining formal roles that ensure that knowledge and decision-making processes are shared and sustained beyond the project's duration. The goal is to create a sustainable, enduring repository of insights and experiences arising from, for example, a project that benefits people. Dindler & Iversen (2014) emphasized that PD practitioners should carefully build and sustain relationships with participants, stakeholders, and organizations, attending to social and organizational infrastructures even after a project's completion. This continuity requires dedicated expertise, allocated resources, and mechanisms for long-term engagement, such as community networks or events. However, a lack of concrete, widely recognized methods for infrastructuring remains, resulting in scarce systematic guidance for practitioners.

In this context, Arnstein (1969) proposed the "Ladder of Citizen Participation." This ladder can serve as a conceptual lens for understanding how infrastructuring might be enabled to foster genuine empowerment. While Arnstein did not explicitly focus on PD, her model highlights the difference between symbolic and meaningful participation. Hence, this ladder can pave the way for infrastructuring (e.g., organizational routines, access to resources, communication channels) that enable citizens to ascend from the lower rungs of manipulation or tokenism toward the higher rungs of partnership, delegated power, and citizen control. The ladder consists of eight rungs (typologies), representing increasing levels of citizen control: non-participation (*manipulation, therapy*); tokenism (*information, consultation, placation*); and genuine participation (*partnership, delegated power, citizen control*). Arnstein (1969) argued that true empowerment requires the redistribution of power so that previously excluded citizens can actively shape political, social, or economic agendas—a goal that mirrors the idea of infrastructuring to maintain sustained engagement and access to decision-making mechanisms.[17]

The last design activity, *evaluation*, emphasizes the assessment of results and the quality of a design process, which can be material, such as a product, or immaterial, such as newly acquired knowledge. However, evaluations conducted in PD are often opaque or difficult to follow due to their informal or exploratory character or insufficient documentation. Kensing et al. (1998) emphasized the necessity of a coherent, systematic evaluation to achieve sustainable and understandable insights. Similarly, Frauenberger et al. (2015) argued that accuracy should be considered despite the diversity of practices, activities, and methods in PD. According to the authors, this involves creating conditions that enable designers and

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[17] I want to note that this model is not without limitations. In her critical reflection on the rung-by-rung participation model, Arnstein (1969) argued that it fails to capture the complex stratification and inconsistent power dynamics in genuine participatory situations. She also pointed out that there are circumstances where it is appropriate to inform citizens about decisions that have already been made or to withhold control from them, particularly when they lack the specialized skills or knowledge necessary for specific tasks, such as managing public funds. Nonetheless, the model outlines a critical approach to achieving genuine participation. At its core, this ladder aims to prevent the separation of power between citizens and decision-makers. Arnstein (1969) assumed that groups comprising citizens or an institution can encompass divergent viewpoints, interests, and skills that need to be co-opted for. Jungk & Müllert (1997) similarly emphasized long-term participation and stressed that infrastructuring should not only produce immediate outputs but also cultivate enduring capacities, networks, and practices, enabling communities to shape infrastructures over time.

researchers to establish a common language, thereby informing decisions and generating actionable insights. Realizing these conditions will lead to structured and critical reflection on the results from the perspective of validating and qualifying PD practices.

Remaining Challenges for Participatory Design

PD accounts for democratizing design processes and intervening in conflict situations by enabling the participation of individuals affected by the conflict. However, participation in PD is increasingly synonymous with user-centered design and may have lost clarity and identity (Bannon et al., 2018). Although the effort to revise PD is underway, emphasizing empowering individuals to influence significant societal issues (Bødker & Kyng, 2018), fundamental concepts such as conflict and power, central to PD, are mostly neglected; for example, leading to increasingly opaque computing or information processes in technology, as previously mentioned in the fourth era.

As a result, tension persists between the rigor of research and the quality of interventions in PD projects, leading to broader challenges in research and design endeavors (Bannon et al., 2018). Hornecker et al. (2006) underscored the challenges of engaging with stakeholder values in PD. Similarly to Bødker (2006), who questioned the limited influence individuals have in shaping technologies and emphasized the need for greater democratic control. Furthermore, PD is still influenced by values that guide the design process, such as those of a project. These values can sometimes constrain the likelihood of generating new insights (Iversen et al., 2010). Bannon et al. (2018) argued that the imposition of researchers' and designers' values on people partaking in PD requires an ongoing, iterative process expecting dialogue, collaboration, and adapting PD methods in diverse contexts. Bødker & Kyng (2018) assumed redefining relationships between researchers, designers, and people might have a lasting impact on increasing the influence of marginalized groups in areas of importance to them. Building on these aspects, Bødker et al. (2022) emphasized the need for a better understanding of what is being evaluated in PD, as evaluation in PD has historically played a modest role. They further added that achieving desired PD outcomes necessitates rigorous evaluation and reflection on the effectiveness of PD interventions.

In the following, I will expand on these insights regarding research that integrates VSD and PD into a value-led approach throughout design processes.

5.3 Guiding Participation in Design Processes through Values

In Chapter 5.1, I explained how values can be investigated in a design process through the theoretically grounded approach of VSD. In this context, Frauenberger et al. (2015) argued that designers must be conscious of which methods they choose and how they use them when working with stakeholders' different values. In Chapter 5.2, I have outlined how active participation can be realized within the PD tradition and the challenges that arise in upholding values through stakeholder involvement. Research (e.g., Bannon, 1992; Muller & Kuhn, 1993; Schuler & Namioka, 1993) emphasized that researchers, designers, people, and other stakeholders should negotiate their values and contribute equally to (technology) design. However, clarifying values through PD can challenge designers to reconsider the relationship between methods and participation (Iversen et al., 2010). Based on insights from the previous chapters, VSD and PD show weaknesses, reflected first in a lack of structured approaches to eliciting and evaluating values and second in the dilution of participation. Research on value-led PD and related approaches has aimed to address these weaknesses. I will reflect on the insights of this research strand below.

Value-led PD emerged from the work of Iversen et al. (2010), which examined how values should be encountered in a design process. This approach uses values as driving forces for PD activities. As discussed in Chapter 5.1, Iversen et al. (2010) assumed that values can be partially indefinable or interdependent. Hence, emphasizing values in PD requires rethinking how methods are selected for working with and using values. While values can, in turn, drive PD activities through dynamic and dialogical encounters. Therefore, the approach to addressing values in PD requires a more detailed explanation of how to proceed in design practice. Participation appears appropriate, yet Iversen et al. (2010) explained that participation alone is not necessarily sufficient to be understood as PD—more is needed, namely, opportunities for negotiating individual values. Critical of the search for suitable methods to elicit values, Iversen et al. (2010, p. 91) emphasized that the focus should be on how methods can work with values in design processes to achieve “a core engagement with values.” Consequently, values should be negotiated dynamically and dialogically in a value-led PD endeavor to promote the *emergence*, *development*, and *grounding* of values in iterative design processes (Iversen et al., 2010).

In the first phase of *emergence*, the focus is on identifying and understanding the values that should guide the design process. In the second phase of *development*, the identified values are integrated into a dialogical process, i.e., a collaborative approach for mutual learning and exchange between researchers, designers, and other stakeholders. The aim is to develop further, refine, and concretize values by incorporating them into the design process. In the final phase of *grounding*, the generated values serve as guidelines for decisions and actions in the design process, ensuring that decisions align with and reflect the collective values of researchers, designers, and stakeholders.

To solidify the approach of value-led PD, Leong & Iversen (2015) expanded on their work (Iversen & Leong, 2012b; Iversen et al., 2010, 2012a) to reveal alternatives, i.e., outcomes, through value-led PD that enable novel value-sensitive design concepts. Alternatives can take two forms: first, material, i.e., as a designed artifact, such as a product or service; and second, immaterial, i.e., ways of thinking that provide insights into stakeholders' values, for example, regarding the use of technology. Leong & Iversen (2015) concluded that designers should pay attention to values throughout a design process to respond to changing values or possible value conflicts. For instance, participatory activities can be deployed to promote the emergence of values in design. The authors also distanced themselves from the universal values of VSD (Friedman et al., 2006), arguing that values are not fixed and, therefore, not generalizable; hence, values must be explored continuously, dialogically, and dynamically. In addition, to mitigate the influence of researchers' and designers' values, they emphasized that value-led PD efforts can help carefully align project expectations with people's values.

A broader review of the field of value-led PD highlighted the knowledge that can be generated through participation in values. For example, van der Velden & Mörtberg (2015) assumed that values can arise implicitly and explicitly through co-creation activities. They further underscored the benefit of co-creation methods in design practice, enabling participants to materialize values and negotiate value conflicts. A more practical example is provided by Grönvall et al. (2016), which highlights the continuous negotiation of values through a community-based PD approach. In agonistic spaces[18], participants negotiate their understanding of values through the activity of "thinging," i.e., the formation of values through collaborative negotiation (Grönvall et al., 2016, p. 41). They underscored that these spaces enable collective analysis of values by fostering mutual learning among different stakeholders. Peer (2022) also emphasized that activities enable participants to critically reflect on their values, for example, regarding data literacy. Activities such as creating two-dimensional data story sketches or three-dimensional data sculptures, facilitated in workshops, can reveal new insights into local communities' personal and collective values toward data. He indicated that such activities support researchers and designers in gaining a deeper understanding and interpretation of community values.

Engaging in the Voice of People

Following on from the previous section, in HCI, the integration of values and ethics into design processes has been the subject of extensive research. For example, Shilton (2018) offered a comprehensive review of over three decades of scholarship in this domain. She examined the

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[18] Agnostic spaces can be understood as environments designed to support activities without being dedicated to a single or fixed objective or purpose (Grönvall et al., 2016).

controversies surrounding the application of ethical principles in design, including challenges in defining and measuring values and in determining which values should be considered in the design process. Moreover, Shilton (2018) discussed various frameworks for incorporating values into everyday design practices, emphasizing the need for designers to engage critically with the ethical implications of their work. Her analysis underscored the importance of reflexivity and the recognition of power dynamics in design decisions, advocating for more inclusive and ethically aware approaches.

Building on these insights, I learned the importance of creating spaces that facilitate dialogue among researchers, designers, people, and other stakeholders. To deepen these considerations of dialogical encounters, I draw on research from experience-centered design (ECD), a HCI perspective that intersects with value-led PD. While ECD itself does not inherently require reflection on researchers' or designers' personal values, it enriches my understanding of how to explore people's lived experiences and perspectives, which resonate with the principles of value-led PD. ECD emphasizes the lived experiences of individuals and communities as central to the design process, prioritizing their values, emotions, and cultural contexts. By attending to the ethical and experiential aspects of design, ECD can complement and facilitate VSD and PD.

ECD focuses on creating products, services, or technologies by actively involving people (McCarthy & Wright, 2015; Wright & McCarthy, 2022). ECD is particularly valuable because it foregrounds users' subjective and emotional aspects, ensuring designs resonate with them personally. By centering real-world experiences, ECD fosters solutions that are not only functional but also ethically and experientially grounded. Unlike VSD, PD, and value-led PD, ECD places primary importance on understanding users' emotional characteristics rather than merely meeting values. ECD, therefore, can complement these approaches by offering an understanding of users' lived experiences and by responding to them.

McCarthy & Wright (2015) emphasized that by considering ECD inquiries, spaces can be created that foster vibrant, meaningful, and relational community activities in dialogue (Sullivan & McCarthy, 2005). Such dialogic practice enables the exploration of various outcomes that can be reflected upon within a design space. McCarthy & Wright (2015, p. 20) refer to this as "reflexive awareness," i.e., the impact of one's own experiences on others, which in turn helps recognize the voice of the individual (McCarthy & Wright, 2004; Wright & McCarthy, 2022). It is not merely about the individual having something to say, but about committing to their perspective, perceiving differences, and openly articulating them. Similar to value-led PD, Shorter (2000) assumed that participants in ECD are encouraged to realize themselves through dialogue and, in turn, to go further, for example by acknowledging others' perspectives, reflecting on their self-image, developing self-confidence, and being empowered to embrace new values.

Considering dialogical relationships, Rancière (1991) emphasized that participants' equality is an essential prerequisite. McCarthy & Wright (2015) further added that the characteristics of participants, expressed through emotions and experiences, should be recognized. Helping designers to develop sensitivity to encountering these characteristics before a person speaks, for example, through their habitus or demeanor. In other words, ECD aims to capture the individual's subjectivity through dialogic negotiation. It is about recognizing the voices of people who otherwise fade into the background or cannot express themselves verbally (Benhabib, 2020). Hence, embodying participants' experiences and insights through their voices is vital, as these manifest meaning and value that open new design spaces. For example, by deploying ECD, Jonas & Hanrahan (2022) examined how value conflicts can be reconciled among stakeholders, including researchers, designers, and stakeholders in a given context. They focused on reflexivity, especially the designers' role, and argued that designers should deepen their understanding of contexts through critical self-reflection, particularly when involving marginalized groups in design processes. In HCI, Sengers et al. (2005) similarly argued that designers must critically examine the values, attitudes, and perspectives they unconsciously embed in the technologies they create.

As an objective, Jonas & Hanrahan (2022) called for deliberate efforts to uncover and address blind spots in design processes, enabling more informed and reflective decision-making that could enhance the quality of life for diverse stakeholders. They suggested that all stakeholders' values in the design process should be equally acknowledged in a design that shares different values. For this, commonalities in values must be evaluated, as in VSD's "value tensions" (Friedman et al., 2017, p. 99), and, finally, these values must be reflected upon. The authors concluded that this approach enables designers' entrenched values, carried through a project, to be excluded in favor of incorporating shared values and responding early to value conflicts. In another example Foley et al. (2019) focused on the social interactions of vulnerable groups, such as dementia patients, by investigating shared experiences through participatory activities. Their research addressed a critical gap in dementia care by emphasizing the need to empower people to make positive social contributions in care homes, thereby enhancing their sense of agency and autonomy. To explore this, they designed and deployed receipt-based print media devices (small printers) to encourage social contributions and agency in care homes. The authors identified the importance of participation and agency among nursing home residents through two years of ethnographic research. In various ways, they facilitated participation, including direct engagement with technology, shared experiences, and co-constructive, meaningful interactions among residents. Foley et al. (2019) argued that such inclusive and integrative design practices contribute to the care of designers who can support the everyday lives of vulnerable groups. They emphasized that these practices foster reflection on individual and collective experiences through cooperative, meaningful activities. They concluded that designers can promote engagement among marginalized and vulnerable groups, thereby strengthening their agency in design processes.

5.4 Conclusions of Participatory Value Work

In this chapter, I introduced the theoretical foundations of my work, including value-sensitive and participatory approaches, which provided valuable insights into value work.

To recall, VSD has created rich opportunities to stimulate reflection on values in design processes and has established a methodology and accompanying methods to support the investigation of values in HCI and beyond. However, research pointed to certain limitations of VSD, for example, including vague guidance on developing empirical tools to elicit, assess, critically examine, and categorize these values (Le Dantec et al., 2009) or shifting the focus from solely identifying and applying values (Parvin et al., 2015) to more participatory practices that better capture individual values of the people.

This is where PD becomes essential. PD has evolved over the years, establishing foundational activities that enable participation, as introduced in Chapter 5.2. Reflecting on the insights of Bødker et al. (2022), it is evident that PD aims to involve people in designing desirable futures by acknowledging their capabilities, concerns, and values; in contrast to VSD, where diverse, context-specific values may rely on a predefined list of universal values proposed by VSD (e.g., privacy, transparency, or fairness) without genuine deliberation. Here, PD can serve as a counterbalance to this limitation of VSD by actively negotiating people's values through field studies, workshops, or collaborative sessions, making power relations and potential value conflicts visible. Through such negotiations, PD reduces the risk that values are treated merely as a technocratic checklist, instead fostering context-sensitive discussions that are responsive to the actual concerns and priorities of the people affected.[19] PD thus helps to establish a space for stakeholders to contribute their values actively and enables their unfolding throughout the design process, instead of treating them as universal principles, as in the case of VSD (Borning & Muller, 2012).

As highlighted in Chapter 5.1, values are not merely internalized guides to action; they emerge through social interactions within cultural, institutional, and community contexts, reflecting shared norms or collec-

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[19] This goal also aligns with the principles of RtD, as described in Chapter 3, which similarly seeks to engage people in envisioning and shaping future possibilities by using design as a method of inquiry.

tive experiences. This means also that understanding values cannot be separated from the positionality of both stakeholders and designers. In practice, designers cannot simply bracket their own values to achieve neutrality; rather, employing a suitable methodological repertoire enables a reflexive stance in which designers actively consider their positionality and the situational embeddedness of a design project. PD can enable this stance by structuring interactions that foreground stakeholders' values while encouraging designers to reflect on how their own assumptions and social positioning shape their interpretations of those values. This relational perspective shows how PD can address certain limitations of VSD. Rather than merely identifying and applying predefined or universal values (Parvin et al., 2015), PD situates value exploration within context-sensitive engagements that consider the diversity of stakeholder perspectives and foster critical reflection on the interplay between personal dispositions, project-specific constraints, and broader socio-cultural influences.

Despite its promise, however, PD becomes increasingly diluted or superficially deployed, as evidenced by people's minimal influence on decision-making, often reduced to a tokenistic gesture rather than a genuine participatory effort. Other challenges remain in providing robust evaluations that support reflection on values. In this context, I nonetheless learned that the approaches of VSD and PD might complement and inform one another, with VSD offering methodological approaches to value consideration and PD providing participatory means to ground values in people's lived experiences.

Insights from value-led PD and ECD provided complementary perspectives on how designers can work with values in design processes.

Value-led PD explicitly foregrounds reflection on designers' own values, while ECD further supports the ethical and experiential aspects of individual and societal engagement. Accompanying research helped me to reflect on my attitudes and responsibilities as a researcher and designer, and on how I can foster dialogic encounters (e.g., McCarthy & Wright, 2004, 2015; Wright & McCarthy, 2022). This involves promoting ongoing negotiation of values among participants through activities such as participatory or co-creation workshops, and determining how participants can play a significant role in these negotiations (e.g., Iversen & Leong, 2012b; Iversen et al., 2010, 2012a; Leong & Iversen, 2015). Especially for vulnerable or stigmatized groups, participation should acknowledge individuals' perspectives, concerns, and feelings to foster their agency and inclusion (Foley et al., 2019). In design practice, therefore, spaces should be created that encourage reflection through meaningful dialogic encounters, as also reflected in PD.

Although there is a shared ambition to integrate values into design through value-sensitive and participatory approaches, I found that there remains a need for structured methods to elicit and consider values within design processes (Winkler & Spiekermann, 2021). Furthermore, methods for assessing the usefulness of such approaches in real-world projects remain scarce (Le Dantec et al., 2009). Hence, designers might continue to face the challenge of engaging with values reflectively and deliberately, ensuring that values genuinely inform their design decisions. In my view, addressing these challenges requires developing and validating methods or practical tools that make values tangible for design processes, while also supporting designers in cultivating ethical and reflexive design practices in their work (Shilton, 2018).

In the following, I will combine the insights from this chapter to illustrate how participatory value work can be cultivated within design processes.

6

Developing a Method for Participatory Value Elicitation

In this chapter, I introduce a method for participatory value elicitation to address the first research question: *How can a method for participatory value elicitation, rooted in research, be realized for design practice to explore and analyze values of a specific context?* The method is delineated in a four-phase workshop concept to elicit values and an analysis procedure to examine the values gathered.

When developing this method, I faced the challenge of synthesizing extensive knowledge to enable meaningful participation and the variety of methods for determining values. However, I found no suitable method for analyzing the values, thereby underscoring the relevance of my work. I briefly recall further challenges and insights below.

Research in value sensitive design (VSD) offered various methods to account for values in a design process (e.g., Borning et al., 2005; Czeskis et al., 2010; Friedman et al., 2002b). As described in Chapter 5.1, there is criticism that these methods can systematically capture prevailing or conflicting values within a specific context, such as in *value source analysis* (Friedman & Hendry, 2019), which identifies the values of direct and indirect stakeholders. Furthermore, it is not clearly described how this method can be applied in practice. To address this, Le Dantec et al. (2009) introduced the value-discovery approach, namely that values should be examined and continuously reflected upon in context.

In Chapter 5.2, participatory design (PD) has deepened the understanding of participation as an essential means in design practice. For instance, activities facilitated in workshops can help people affected by a decision or situation under investigation to articulate their concerns, needs, and values, thereby strengthening democratic decision-making (Bannon, 1992; Bødker et al., 2022; Schuler & Namioka, 1993). Nevertheless, a designer applying PD might hold their values differently across projects, potentially influencing people's values.

As discussed in Chapter 5.3, I found further guidance in research on value-led PD, which I extended through the lens of experience-centered design to understand better how values can guide participation. Iversen et al. (2010) argued that thinking about eliciting and evaluating values rather than the methods themselves is more important. In other words, designers need to take systematic steps to elicit and assess values.

In this chapter, I present, in detail, the method for participatory value elicitation. This method consists of two essential parts. First, in Chapter 6.1, a workshop concept comprising four consecutive phases, namely (1) *explore*, (2) *contextualize*, (3) *translate*, and (4) *reflect*, and second, in Chapter 6.2, an analysis procedure to contextualize the data, i.e., values, collected in the workshop and to derive value-sensitive suggestions, for example, values blended into requirements and resolutions, informing a context under investigation.

In the following sections, I describe the two parts of the method and conclude with insights from a pilot study on its deployment.

6.1 Eliciting Values

The overall objective of a participatory workshop to elicit values is to situate individual values within social contexts and to consider them in design practice.

In conceptualizing the workshop, I decided on approximately 2.5 hours (excluding breaks). At least two facilitators are expected to conduct the workshop, each fulfilling specific roles and responsibilities. The first facilitator introduces the workshop context, procedures, and associated activities, and addresses any questions or concerns that participants may have. The second facilitator manages the timing of each activity to ensure the workshop's progress. In discussion rounds, such as those on activity outcomes, facilitators should promote dialogue to enhance participants' engagement and reflection. Overall, the facilitators need to foster a positive, supportive, and appreciative environment. In doing so, they should motivate participants to engage in activities that are tailored to their abilities. It's essential to emphasize that there is no right or wrong when engaging in these activities. Facilitators should provide one-to-one assistance to those who may struggle to understand the instructions. Moreover, facilitators must inform participants about their rights to sustain their agency at the beginning of a workshop.

Figure 4: Material box utilized during the workshop activities, containing a workshop leaflet, color-coded sticky notes, i.e., yellow for values, pink for stakeholders, and writing and drawing utensils.

In addition to providing this information, which I will describe as a preliminary measure in Chapter 7, the goal is to convey the value of participants partaking in a workshop. In this regard, explaining the research ethics, motivation, workshop goals, and procedures at the beginning of the workshop is essential. This provides participants sufficient time to decide whether to continue. Additionally, facilitators should maintain contact with participants even after a project is completed. This ongoing communication can include updates on the project's progress, such as publications, which help acknowledge and appreciate participants' contributions and the valuable time they dedicate to the project.

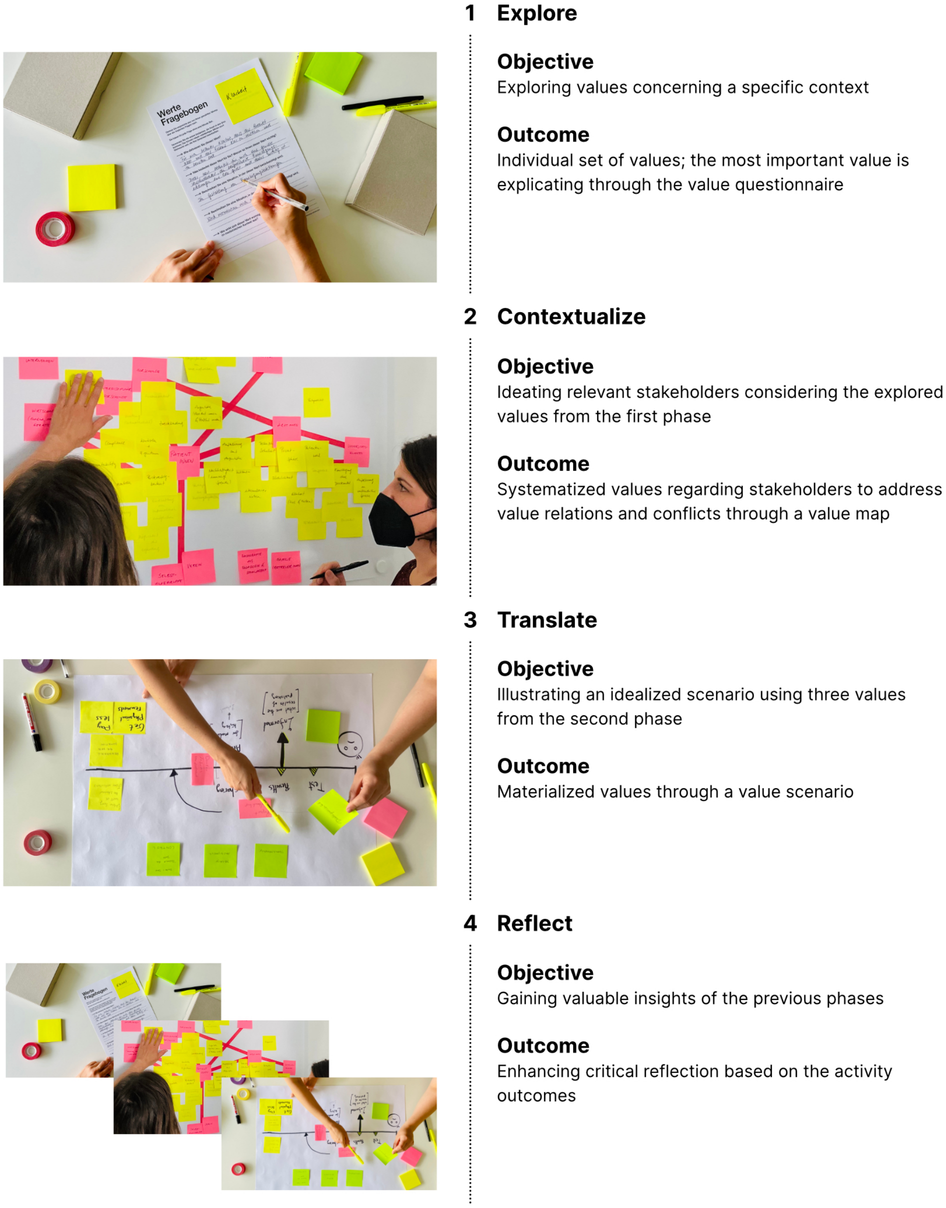
After this briefing, participants are introduced to the workshop context through a brief presentation that defines the values, explains how they are described, and suggests what values might exist in contexts beyond the workshop. The introduction concludes with a brief discussion round to allow participants to express uncertainties or clarify open questions. Each participant then receives a material box, as shown in Figure 4, which is used during the workshop activities. The material box contains a workshop leaflet with information about the study, the facilitators' contact details, and the workshop agenda, as well as writing and drawing utensils and sticky notes. The sticky notes are color-coded by workshop phase: yellow for values, pink for stakeholders, and green for value conflicts or stakeholder relationships.

Below, I explain the four consecutive phases of the workshop. Afterward, I propose an analysis procedure for the empirical data (values) collected and conclude with reflections on the method from a pilot study.

Workshop Phases

The following four workshop phases, along with descriptions and exemplary images of activity outcomes, are illustrated in Figure 5 (p. 74).

The first phase, *explore*, aims to discover participants' values regarding a specific (project) context, serving as a workshop objective. This phase aims to identify which values participants consider particularly important, based on their lived experiences. This phase is vital for establishing a foundational understanding of participants' moral and experiential orientations before engaging in subsequent activities. In alignment with value-led PD, an initial exploration of individual values enables a grounded elicitation process that considers values rather than pre-imposed theoretical constructs to guide subsequent phases. According to Alshehri et al. (2020), values are often represented by broad or generalized terms (e.g., privacy or trust). To avoid this generalization, participants should be encouraged to find keywords or descriptions to articulate the values important to them. First, participants write their most important values on



1 Explore

Objective
Exploring values concerning a specific context

Outcome
Individual set of values; the most important value is explicating through the value questionnaire

2 Contextualize

Objective
Ideating relevant stakeholders considering the explored values from the first phase

Outcome
Systematized values regarding stakeholders to address value relations and conflicts through a value map

3 Translate

Objective
Illustrating an idealized scenario using three values from the second phase

Outcome
Materialized values through a value scenario

4 Reflect

Objective
Gaining valuable insights of the previous phases

Outcome
Enhancing critical reflection based on the activity outcomes

Figure 5: Workshop concept showcases the four consecutive phases, explore, contextualize, translate, and reflect.

yellow sticky notes to compile a set of values. This approach draws on Flanagan et al. (2008), Le Dantec et al. (2009), and Shilton (2018) to discover and compile individual values within a specific context. Second, participants explore the advantages and disadvantages, as well as the individual and societal impacts, of values for subsequent activities. For this purpose, participants select the most important value from their set. They are then given a value questionnaire comprising a set of questions and prompts, which allows them to concretize and externalize their values. Based on an iterative process, I developed this questionnaire with my research group colleagues, resulting in the following questions: First, *How do you define this value?* Second, *What does this value mean to you, and why is this value important to you?* Third, *Describe a situation in which this value is given importance.* Fourth, *Describe a situation where this value is not considered.* Finally, *How does this value possibly affect the workshop context?* After completing the value questionnaire, each participant briefly presents their answers to the group. Through this, participants are encouraged to alter value similarities or differences within the group (Iversen et al., 2010).

The second phase, *contextualize*, aims to situate the values explored in the first phase within the workshop context. This contextualization is achieved through a value map, which enables participants to identify direct and indirect stakeholders responsible for specific values and to establish relationships among stakeholders based on those values. Seminal in this regard, this phase helps translate individual value articulations into a relational structure that exposes interdependencies and potential conflicts among stakeholders. By embedding values within stakeholder constellations, this phase clarifies individual value abstractions by negotiating their social implications. For example, two or more stakeholders may share similar values or exhibit value conflicts. I argue that assigning values to a value map helps participants understand values in context. For instance, participants can examine the values on a value map and reflect on their importance and how they can be applied in that context. A value map facilitates discussion of values relevant to the situation by showing how they relate to one another, what they have in common, and where they might conflict. Below, I explain how a value map is created.

The first facilitator supports the development of a value map by moderating rather than influencing participants' actions. Adapted from the method of *direct and indirect stakeholder analysis* (Friedman & Hendry, 2019), participants are first asked to identify direct and indirect stakeholders in the context of a workshop. Stakeholders are noted on a pink sticky note and placed on a value map. Second, participants assign the values they explored in the first phase to the stakeholders. Participants are then asked to examine and articulate potential value relationships, i.e., commonalities or value conflicts between two or more stakeholders. The resulting value relationships are marked with tape and green sticky notes, which define a brief, precise justification for a commonality or value conflict. These subsequent steps can be applied recursively; participants may return to any of them. For example, participants might raise concerns about stakeholders or how values are assigned, requiring further negotiation and repositioning of stakeholders or values. Once participants acknowledge that a value map is complete, the phase ends with a discussion. The whole group is encouraged to reflect on the value map by negotiating the revealed value relationships.

The third phase, *translate*, aims to materialize values in an idealized scenario. Participants are engaged in envisioning an ideal state grounded in values. This phase was deliberately chosen to support the shift of value constructs into material representations or imaginaries. Drawing on VSD and value-led PD, translating values into value scenarios makes implicit ethical assumptions explicit, enabling participants to externalize and critically examine how values could shape, or be shaped by, practice. As a conceptual foundation for value scenarios, I drew on the *value sce-*

nario proposed by Nathan et al. (2007) to consider both direct and indirect stakeholders. In addition to stakeholders, the long-term impact and cultural aspects of societal values are considered, for example, by examining the positive effects of values on technology use. Since textual elaboration of a scenario may not be within the abilities and competencies of all participants, the value of scenarios in the method presented here can be expanded or even replaced by a visual component. For this purpose, I considered the *value sketches* by Friedman & Hendry (2019), which serve as visual narratives consisting of, for example, drawings or collages that I, in addition, extended in this phase to three-dimensional representations, i.e., physical models that include several objects, making processes more tangible (Peer, 2022). First, participants receive a prompt to stimulate their imagination for an idealized scenario. For instance, the facilitator read aloud the following prompt for the first context on health data donation, as used in Chapter 7.1: "Please describe an ideal value scenario for a health data donation process from the patient's perspective. Select three values you would like to realize within the value scenario. There is no right or wrong in creating the value scenario. The scenario can relate to a real or fictional situation." The idea of the prompt is based on Merrill (2020), who drew on speculative practices in research to spark a glimpse into the future (Dunne & Raby, 2013). Second, participants are divided into subgroups of two to four people. They are then asked to select at least three values of the value map from the second phase that they consider essential to their idealized scenario. To unleash their creativity, participants are equipped with large-format blank paper, drawing materials, and prototyping materials such as styrofoam and cardboard. Upon completing this activity, all subgroups are asked to present their value scenarios. The other subgroups can provide feedback by identifying similarities to other value scenarios or by questioning ambiguities, such as how values are materialized within a value scenario.

The fourth phase, *reflect*, adopts a reflexive stance on applying values to the workshop objective. This phase closes the iterative cycle of value inquiry by enabling participants to reflect. Building on value-led PD and ECD, this phase helps participants reflect on their values and critically interrogate their reasoning, thereby deepening the understanding of value tensions and potential trade-offs between their value propositions and those of other participants. This phase, in turn, reveals how prior phases might have influenced participants' perspectives, thereby fulfilling a key principle of value-led PD: continuous reflection on both process and outcome. To accomplish this, the first facilitator encourages critical reflection by summarizing and recapitulating the activity outcomes of the first three phases. According to Sengers et al. (2005), I see critical reflection as a vehicle for making participants' rationales tangible; for example, how they realized an activity outcome, leading to a more profound awareness on the part of the designer of participants' attitudes, values, and concerns, mirroring the broader society. Thus, reflection can help envision social implications, for example, for technology design and how it can support human life. Participants can then be encouraged to think about how a value scenario could improve a situation by resolving stakeholder conflicts. They can also consider whether applying values to a scenario that accounts for other stakeholders' values has changed their attitudes toward specific values.

Tailored to the workshop concept, I detail the analysis procedure next.

6.2 Analyzing Values

To systematically analyze the data (values) gathered in a workshop, I first focused on the method of *value-oriented coding manuals*, such as those developed by Friedman et al. (2008) and Hagman et al. (2005). These manuals provide a structured approach to categorizing data based on underlying values, offering a foundation for identifying and organizing patterns within qualitative datasets. However, these manuals are context-specific, making it difficult to adapt or modify them across contexts. For example, I reflected on how I could use the coding manual by Hagman et al. (2005) in the context of the method introduced in this work. Yet I realized that the categories presented in this coding manual are narrowly focused on values from surveillance-related investigations, which would have required a comprehensive restructuring (e.g., by detaching them from their original category and subcategory structure) to be valuable for this work. This consideration led me to assume that adopting such *value-oriented coding manuals* in other contexts might not be feasible; however, during this in-depth exploration, I gained valuable insights into structuring and categorizing values that go beyond merely identifying and applying them, as argued by Parvin et al. (2015).

To develop a more generalizable analysis procedure, I revisited the activities of the workshop phases. I found that two activity outcomes provide a preliminary categorization of values. Namely, first, the value map from the second phase, *contextualize*, which clusters value regarding specific stakeholders; and second, the value scenarios from the third phase, *translate*, which demonstrate which values in a context are of concern (e.g., of an individual or group of individuals) and how these values might be considered within context.

Reflecting on these observations, I considered the work of Mayring (2014) for qualitative content analysis. Qualitative content analysis consists of two procedures that can be combined depending on the research question or hypothesis. First, an inductive approach involves conducting original research to generate new theories based on empirical findings. This process begins with observations and data collection, from which patterns or concepts emerge, ultimately leading to the development of a theory. In contrast, a deductive approach starts with an existing theory, derived from prior research or established frameworks. This approach tests the theory through empirical evidence to confirm or refine its validity in a new context. For qualitative analysis, this means that categories of codes can be developed inductively from the material (e.g., transcripts or protocols) and deductively assigned to the material based on a theory (Mayring, 2014). Thus, in inductive coding, categories can remain open, systematically refined, and expanded step by step. Whereas the deductive approach should follow a (self-)developed coding guidelines, the material is reduced, categories are precisely defined, and examples are added, such as quotes from the transcript, to make the analysis results, i.e., the categories, understandable, explainable, and conceivable.

As various inductive and deductive approaches exist, Mayring (2014) explained that data analysis can be conducted using inductive and deductive content analysis methods. For example, open coding, thematic analysis, or grounded theory can be employed in inductive content analysis to identify patterns and generate new insights from data. These methods enable the development of theories directly from the data itself, starting with a minimal predefined structure. In contrast, deductive content analysis often utilizes pre-existing theories, categories, or frameworks to analyze data. Techniques such as hypothesis testing can be used to assess the extent to which the data support or contradict established theories or themes. These methods enable the application of an existing theoretical lens to new data, thereby confirming or refining existing theoretical understandings. However, inductive and deductive content analysis requires a pre-analysis to provide methodological validity (Mayring, 2014).[20]

Based on this inquiry into qualitative coding strategies, I observed differing views on how methodological analysis should be conducted and the number of coders required to achieve the reliability of the results. For example, McDonald et al. (2019) posited that inter-rater reliability or inter-rater agreement of two or more raters, i.e., the agreement among different raters' assessments as termed in empirical social research, may be unnecessary for qualitative analysis procedures. However, they argued that it is crucial to understand the analysis and its results by detailing the analytical process and providing insights into how empirical research is conducted. Similarly, Braun & Clarke (2006) argued that the way qualitative analyses are often conducted is opaque and leads to inconsistent replication of analysis methods. In addition to advocating more consistent methods, they also called for recognition of the analyst's reflexivity, achieved through thorough engagement with the material. Mayring (2014, p. 30) further reinforced this as a relationship between one analyst

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[20] A pre-analysis refers to the preliminary phase in content analysis, where researchers prepare and organize the material before applying the analysis methods. This step is crucial for ensuring validity, as it involves clarifying the research questions, defining the scope of the material to be analyzed, and establishing the framework or coding structure that will guide the analysis. The pre-analysis helps ensure that the content analysis is systematic and grounded in a clear understanding of the data and the theoretical approach used, whether inductive or deductive. It structures the analysis process, ensuring rigor, and helps identify potential biases or gaps in the data before detailed coding or interpretation begins. In Chapter 7, I will consider the exploration of the method for participatory value elicitation as the pre-analysis emphasized by Mayring (2014).

and the material as meaningful, stating that "qualitative content analysis remains interpretation. The central step of relying upon categories and parts of the text material is not an automatic technique but a reflective act of interpreting meanings [...]."

By consolidating these insights, I present the two-step analysis procedure tailored to the workshop phases below.

Analysis Procedure

As previously mentioned, I suggest examining two aspects of the workshop to foster reflexivity. First, participants' remarks on creating and discussing a value map, i.e., the second phase *contextualize*, which includes the first phase *explore*, for inductive analysis. Second, participants' reflection on their value scenarios, i.e., the third phase *translate* and the fourth phase *reflect* for deductive analysis. These two parts can be viewed as a general analysis procedure that builds on one another and serves as a guide for evaluating values related to various workshop objectives or contexts. For further clarity, Figure 6 (p. 83) delineates the analysis goals by first investigating participants' contextualized understanding of values and, in the second step, how they idealized them. I note that such an analysis can be quite complex due to the volume of empirical data gathered (e.g., verbatim transcriptions of audio recordings). Therefore, I used the software MAXQDA [21] for qualitative coding.

Before the analysis, the collected material, such as value questionnaires, value maps, value scenarios, and personal notes, must be reviewed. This review helps better understand transcripts that might not explicitly reveal participants' expressions but reflect them in activity out-

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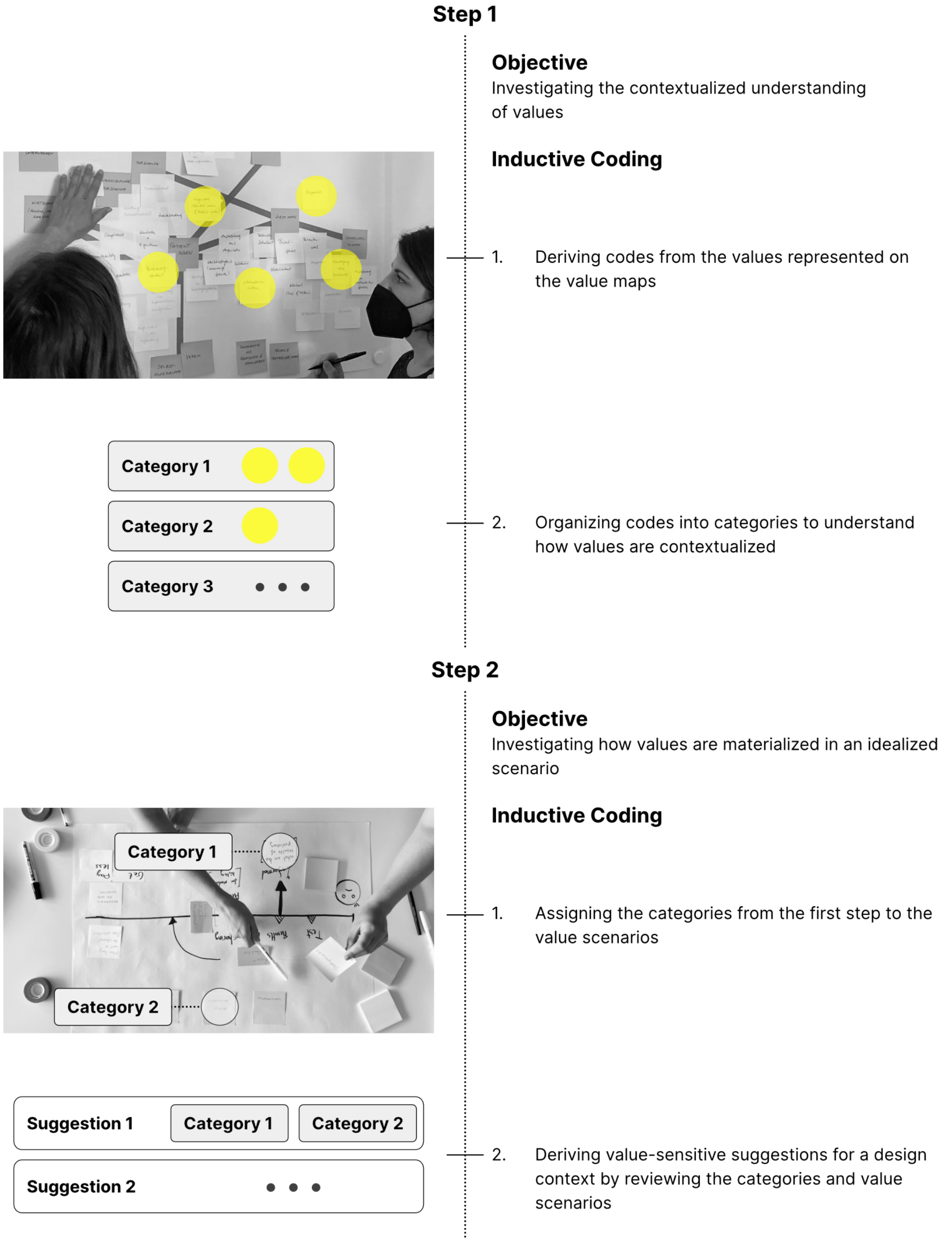
[21] https://www.maxqda.com/



Step 1

Objective
Investigating the contextualized understanding of values

Inductive Coding

1. Deriving codes from the values represented on the value maps
2. Organizing codes into categories to understand how values are contextualized

Step 2

Objective
Investigating how values are materialized in an idealized scenario

Inductive Coding

1. Assigning the categories from the first step to the value scenarios
2. Deriving value-sensitive suggestions for a design context by reviewing the categories and value scenarios

Figure 6: Analysis procedure consists of two steps to investigate first, inductively, the contextualized understanding of values and second, deductively, how values materialize in an idealized scenario.

comes or individual notes.

The first step, i.e., inductive coding, involves extracting values from a value map and assigning them as codes, words, or descriptions that explicitly represent a single value. I argue that value maps can serve as a coding scheme, since they are already the result of a negotiation process among participants, in which they have systematized their values within a given context and among direct or indirect stakeholders. In this process, it is essential to account for values that carry the same meaning but are described differently by participants. For instance, values such as *purpose*, *good purpose*, and *goal* should be grouped under a single code to reflect their shared meaning. Additionally, values not explicitly addressed in the value scenarios are not of concern to the participants and can therefore be excluded from further analysis. The resulting codes are then assigned to the parts of the transcripts by coding individual text passages in which the value maps, i.e., creation and outcome in the second phase *contextualize*, are discussed. Based on the coded text passages, the codes are gradually organized into categories, i.e., phrases summarizing groups of codes. At this stage, facilitators who also conducted a workshop may be consulted to recap their thoughts and contribute to category refinement. In these consultations, categories can be reflected upon, carefully restructured, or merged if necessary. This analysis step is required to establish the rationale for the second step by deepening the understanding of how values are contextualized.

In the second step, i.e., deductive coding, the categories from the first step serve as a basis. They are assigned deductively to the value scenarios themselves, on the one hand, and to the part of the transcripts where participants present their value scenarios, i.e., the third phase *translate*, on the other. For example, in the context of health data donation, the value scenarios revealed favored values (e.g., *time* or *explanation of consequences*) that might enhance patients' reflective decision-making, as detailed in Chapter 7.1. Generally, I consider these favored values as suggestions, representing broader or overarching ideas that can serve as design hypotheses or as a mindset to trigger novel perspectives and discussions within a given context (Parvin et al., 2015). I recommend reviewing the resulting value-sensitive suggestions with the participant's reflections in the transcripts, i.e., the fourth phase *reflect*. This review eliminates ambiguities and inconsistencies, thereby refining the suggestions. I note that value scenarios, in their physical form, may provide limited description; therefore, aligning the suggestions with participants' reflections may be valuable to avoid misinterpretation of how values materialized in the value scenarios. For example, a value such as *user-friendliness* in a value scenario might initially indicate accessibility. Still, further implications, such as simple vocabulary, structured content, or visual elements (e.g., symbols or icons) in a user interface design, might also be revealed in comparison within the transcript. Similar to the first analysis step, this step can be completed by discussing the resulting suggestions with other facilitators who conducted a workshop to reach consensus on their meaningfulness and to strengthen participant-centeredness in the analysis results.

In the following chapter, I will critically reflect on the method for participatory value elicitation through a pilot study.

6.3 Reflections to Enhance the Method for Participatory Value Elicitation

Based on a pilot study, I conclude by critically reflecting on the method's suitability, particularly with respect to the workshop concept.

Thabane et al. (2010) suggested that methods should be tested in a pilot study. Hence, in May 2022, two of my colleagues from the Human-Centered Computing Research Group at Freie Universität Berlin and I conducted a participatory workshop for value elicitation with six participants. The participants, with academic backgrounds, included two students in computer science and product design, and four associated researchers in interaction design, research, and human-computer interaction. We separated our roles into two facilitators (one of whom was me) and one observer who documented the workshop proceedings, including our (facilitators') presentations and the activities undertaken by the participants. These observations helped refine the workshop concept and identify shortcomings, such as participants' lack of understanding of the activity descriptions or uncertainty about how to engage with the activities. With a duration of 2.5 hours, the pilot study took place in the facilities of the Cluster of Excellence "Matter of Activity. Image Space Material"[22] at Humboldt-Universität zu Berlin. The workshop addressed the context of health data donation that emerged from the main study, as presented in Chapter 7.1. This choice was made because my research focus at the

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[22] The Cluster of Excellence "Matters of Activity. Image Space Material" is a research initiative dedicated to interdisciplinary studies that examine the interplay between materiality, visual representation, and spatial contexts. It brings together experts from various fields, including design, architecture, and the humanities, to explore how materials and images influence each other and impact cultural and scientific practices.

time was on patient-centered decision-making in healthcare.

As described in Chapter 6.1, participants were introduced to the context through a brief presentation at the beginning of the workshop that highlighted values related to consent for data donation in healthcare. Subsequently, participants were guided through four consecutive workshop phases, culminating in a discussion.

Through this pilot study, I learned that the carefully prepared presentation in the first phase, *explore*, influenced and eventually shaped participants. For example, I focused on the project, identified weaknesses in the health data donation process, and shared my thoughts. Furthermore, I observed that the participants engaged with the examples and descriptions of values, such as data protection and accountability, and applied them precisely in their activities. I realized that, as a facilitator, one must tread a fine line in supporting participants' exploration of values without steering them in a specific direction. Consequently, I refined the presentation to focus solely on the overarching context. Additionally, I removed the presentation's examples of values to prevent participants from being influenced by predefined terms or descriptions. Instead, I opted for a combination of the value definitions from Friedman & Hendry (2019) and Cheng & Fleischmann (2010), as these provided an approximate reference point for what values might mean to individuals and for their moral and ethical implications.

Based on the observation protocols, I further reflected on the facilitators' responsibilities and roles. The pilot study showed that we (two facilitators) intervened in participants' activities. For example, we provided overly specific answers to participants' questions, diverting them from their viewpoints or leaving them uncertain. Additionally, when introducing the descriptions of the activities, i.e., how they should be carried out, we tended to be too specific, unintentionally limiting participants' mental space or leading them to doubt their ability to present their activity outcomes in discussion. As a result, I contemplated the role of a facilitator more carefully by revisiting the research of McCarthy & Wright (2015) and Wright & McCarthy (2022), leading to the following reflections: First, a facilitator should adopt a more reserved position, for example, supporting but not influencing participants' decision-making process on realizing an activity through intervening based on the facilitator's perspective. Second, a facilitator should encourage mutual exchange among participants, serving as a source of encouragement and support to create a trusting and caring atmosphere throughout a workshop. Welcoming each participant personally at the start of a workshop will reduce barriers to conversation and foster a deeper appreciation of participants. Third, a facilitator should structure activities to avoid pressured completion, for example, by accommodating participants' varying levels of knowledge and by providing introverted participants with a space for their voices. In other words, it is crucial to describe the goal of an activity rather than to over-detail its scope, resolution, and outcome to preserve participants' autonomy and creativity. Then, participants might feel less pressured when a facilitator clearly states that there are no right or wrong answers and that every outcome from the activities is valuable to the workshop's objectives.

I found that the four consecutive phases helped participants elicit their values. For example, ambiguities of values in the first phase *explore* were reflected upon among the participants in the second phase *contextualize*. Furthermore, in the third phase *translate*, I determined that participants were encouraged to unleash novel ideas to materialize values as idealized scenarios based on the previous phases. One subgroup demonstrated, through role-play, how a value scenario highlighted weaknesses in the health data donation process. This subgroup creatively embodied three values they deemed necessary from the value map. While they didn't provide explicit suggestions, their actions sparked ideas within the workshop group. This process opened up new perspectives on marginalized and vulnerable individuals facing specific challenges, such as the fear of losing their profession if their employer learns about their rare health condition. This representation of a value scenario encouraged participants to discuss ethical concerns grounded in values and the societal significance of values in sensitive life circumstances.

In summary, the pilot study has led to valuable considerations for improvement, namely, the development and provision of a method for eliciting values and reflecting on them in dialogic encounters. Expanding on these reflections, I investigate the method for participatory value elicitation in the next chapter and explore its versatility across two contexts.

7

Investigating the Method for Participatory Value Elicitation in Two Contexts

In this chapter, I investigate the method for participatory value elicitation by deploying it in two distinct contexts: patient values related to health data donation in Chapter 7.1 and citizen values regarding mobility data donation in Chapter 7.2.[23] These contexts were derived from my ongoing research at the Human-Centered Computing Research Group at the Freie Universität Berlin.[24]

The structure of the subsequent two chapters follows the same outline. First, in *Encountering Participants*, I describe participants' backgrounds and roles within each study context. In doing so, I aim to establish why engaging with their perspectives is valuable to my work and ensure the

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[23] At this point, I emphasize that the data analyses of the two contexts were conducted exclusively for this dissertation and do not originate from the articles Sörries et al. (2023, 2024). While the findings of both analyses reveal thematic overlaps, this is instead a result of the method's reproducibility for participatory value elicitation, demonstrating its suitability.

[24] The research group investigates and designs socially responsible interaction concepts by examining the relationship between data and humans in relevant contexts, intending to foster sustainable human-AI collaboration.

Table 2: Overview of the workshop agenda deployed in the contexts.

Activity	Objective	Duration
Introduction	Facilitators explain their research ethics and educate participants about the (workshop) context and objective.	10 min
Phase 1: Explore		
Step 1	Participants arrive at an individual set of values regarding the context.	5 min
Step 2	Participants define the most important value using the value questionnaire.	10 min
Step 3	Participants articulate their most important value in a brief presentation within the group.	15 min
Phase 2: Contextualize		
Step 4	Contextualizing values from the first phase toward stakeholders of a workshop context to arrive at a value map, highlighting value conflicts among stakeholders.	30 min
Phase 3: Translate		
Step 5	Participants are prompted to create a value scenario.	5 min
Step 6	Participants develop a value scenario, i.e., an idealized scenario based on their values of the first phase.	30 min
Phase 4: Reflect		
Step 7	Participants critically reflect on the value scenario within the group by questioning how the value scenario might have improved the context.	15 min

relevance of their contributions to the context under investigation. I also provide the agenda, which outlines the planning and conduct of the workshops in Table 2, which is almost identical across both contexts.

In the concluding chapter, *Contextualizing Participants' Values*, I analyze the data collected using the proposed procedure to examine how participants' values relate to the specific context. This is essential for interpreting participants' values and situating them within their respective social, cultural, and technological contexts.

After contextualizing values, in the *Findings*, I demonstrate how participants' values can contribute to design processes, for example, by considering that technology design aligns with the participants' values. Accordingly, I distill and reflect my empirical findings within each context in *Summary*.

Finally, in Chapter 7.3, I outline the method's refinements based on the knowledge and experiences gained in the two contexts. By identifying areas for improvement, I discuss requirements for participatory value elicitation toward design practice.

7.1 Patient Values toward Health Data Donation

In Germany, debates on data-driven healthcare alternate between concerns about individual data protection and international competitiveness of the German healthcare system. The Federal Ministry of Health initiated the development of the "Digitalisation Strategy for Health and Care" in 2023, with the aim of involving stakeholders, including healthcare experts and the broader public, in its implementation (Federal Ministry of Health, 2023). However, while the digitization strategy encourages people to share their health data through digital applications, further questions arise regarding their health literacy, such as understanding the extent of data use and the potential risks of re-identification (Orak, 2023). For example, implementing electronic health records promises to streamline care delivery to enhance the quality of medical research. Yet these efforts might fail to capture patient concerns about how their data will be used. From the tedious, opaque process of opting into the terms of digital consent forms, the experience for patients can feel impersonal and coercive, much like the ubiquitous cookie banners that flood our online experiences (Machuletz & Böhme, 2020). Although legally compliant, these digital practices often result in unwilling consent—a consequence of patients simply clicking through forms without fully understanding the implications. Nevertheless, data-driven health technologies are promising for Germany's digitization strategy and could improve personalized medicine (Jungkunz et al., 2022).

One essential requirement for making health data accessible is enabling the secondary use of routinely collected patient data by repurposing information from existing sources, such as electronic health records, hospital databases, or insurance claims (Shilo et al., 2020). To allow the secondary use of patient data, a standard form or document, namely the broad consent, compliant with the General Data Protection Regulation (GDPR), was approved for use in all German university hospitals by the Datenschutzkonferenz (DSK) in April 2020 (Zenker et al., 2022). By consenting, i.e., signing the broad consent form, patients agree to the secondary use of their data across all participating university hospitals for purposes other than a predefined medical research purpose. In an iterative consultation process, the specifications (e.g., scope of data use and duration of consent) for the broad consent form were established in collaboration with all 52 German ethics committees for medical research and all 18 German data protection authorities at the federal and state levels (Zenker et al., 2022, 2024). Surprisingly, there was only one consultation group with patient representatives from the Federal Joint Committee.

Despite the involvement of relevant interest groups and authorities, the acceptance of broad consent remains contentious, given patient concerns about informed consent for data processing, which may heighten individual privacy concerns (Maus et al., 2020; Nunes Vilaza et al., 2020). Furthermore, the consultation process for specifying the broad consent form in Germany appears to be characterized by asymmetries of engagement and influence among interest groups. Research, therefore, suggested that selecting among the requirements of multiple interest groups with differing objectives and values may be biased by factors such as profession, social status, or eloquence (Dahl & Sharma, 2022).

I hypothesize that power asymmetries within the consultation process may have led to the bypassing of patients' values, particularly with respect to their autonomy and the risk of privacy violations. Power asymmetries are imbalances in authority, control, or influence between stakeholders, often resulting in one party having more influence over decisions, actions, or outcomes than the other (Dahl & Svanæs, 2020). In healthcare settings, these imbalances are frequently observed between healthcare professionals and patients, with medical practitioners holding greater expertise, knowledge, and authority, while patients may feel pressured or inadequately informed. For example, in critical cases, when a physician dominates the conversation, the patient's concerns or preferences regarding treatment options might be overlooked. Furthermore, implementing medical technologies without adequate patient consent may raise privacy concerns, including the risk of unauthorized access to sensitive health data. Such power imbalances, therefore, can undermine patient autonomy, that is, the right of individuals to make informed decisions about their medical care. Additionally, these imbalances may inadvertently expose patients to privacy risks due to insufficient protections or transparency in how their data is handled (Dietrich & Riemer-Hommel, 2012; Hofmann, 2009). Especially in healthcare, large-scale data collection requires special attention, as patients may belong to vulnerable or stigmatized groups (McDonald & Forte, 2020; Walker et al., 2019). Although regulatory measures like the GDPR set strict requirements for consent to data disclosure, such as information on the purpose and use of data, research indicated that digital practices often interpret regulations vaguely, leading to the design of, for example, consent user interfaces such as cookie banners that induce unwilling consent (Machuletz & Böhme, 2020). Healthcare, furthermore, often lacks clear guidance on designing innovative health solutions to digitize paper-based consent forms, including the broad consent. Kassam et al. (2023) further discussed the challenges in creating digital consent solutions that comply with legal and ethical standards while ensuring patient understanding and engagement.

This situation described originates from my research in the project "WerteRadar – Donating Health Data with Sovereignty"[25] funded by the Federal Ministry of Education and Research (grant number 16SV8463) running from July 2020 to December 2023. The primary goal of this interdisciplinary project was to design a process for health data sharing by conceptualizing a user interface that enables patients to donate their data in an informed and thoughtful manner, while also addressing their privacy needs, concerns, and values. For example, consent forms comply with regulatory requirements but do not fully incorporate patients' viewpoints into the consent process. Although consent forms are legally regulated with respect to content such as data sharing, processing, and storage, their practical implementation in the digital environment, which must also address patients' values and concerns, remains unclear. Thus,

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[25] https://www.werteradar.org

questions arise about how paper-based consent forms should be digitized in the future to accommodate patients' values regarding data privacy and security.

In collaboration with physicians, medical ethicists, and patients, I realized that considering patients' values is essential to the design of socially responsible healthcare technologies. Therefore, measures should be taken to better understand individuals' varying competencies, such as through direct communication and involvement of stakeholders like patients and clinical staff, to continuously learn from their respective experiences and enhance healthcare (Cantner et al., 2023).

Encountering Participants

I conducted three workshops with 16 participants: one with five patient representatives in May 2022 and two with eleven patients in clinical care at the psychosomatic department of Charité – Universitätsmedizin Berlin in September and October 2022. All workshops were held during the ongoing COVID-19 pandemic, which required strict adherence to Charité's hygiene protocols. Below, I detail the preliminary measures for the workshops with patient representatives and patients in clinical care.

The first workshop with patient representatives from vulnerable and marginalized groups, such as people with visual impairments or vascular malformations, was held in facilities provided by a partner institution, the Cluster of Excellence "Matters of Activity. Image Space Material" at Humboldt-Universität zu Berlin. As this workshop was the first after the pilot study, I assumed it would take longer to conduct. Changes were made to the workshop phases and accompanying activities since participants had no prior experience with participatory workshops. This resulted in a longer duration, ranging from 2.5 to 4.5 hours, excluding breaks.

Recruitment of patient representatives was achieved through a press article we (Human-Centered Computing Research Group) published in the Tagespiegel (Müller-Birn, 2021). One participant, a patient representative, approached us and expressed interest in and support for our research project "WerteRadar – Donating Health Data with Sovereignty." Their interest arose from personal experiences with a chronic illness, which has necessitated numerous visits to medical facilities and the completion of extensive consent forms for treatment. Moreover, they are committed to advocating for people with similar conditions to enhance patient rights and promote changes that improve individual healthcare.

Following initial contact, we arranged regular meetings that culminated in a proposal to conduct workshops with patient representatives. These meetings lasted over six months to build mutual understanding and a respectful relationship, eventually leading this contact person to support recruiting additional participants through their network, who are also involved in associations for people with rare diseases. We assumed patient representatives would provide valuable expertise, advising patients in emotionally challenging situations related to rare diseases. Furthermore, they actively mediate between patients, clinical institutions, and society to amplify patient voices and advance societal awareness of these diseases. Additionally, patient representatives were affected by demanding health conditions through their own or their close family members' medical history (e.g., emotionally taxing hospital stays or inpatient treatments). Given these characteristics and circumstances, I consider patient representatives to be patients as well; however, they enriched discussions by sharing their in-depth expertise on health data donation and exhibiting a critical perspective toward medical institutions.

The subsequent two workshops were held in an art therapy room within the psychosomatic clinic at Charité. The second workshop involved six participants (patients in clinical care), and the third involved five. In contrast to the workshop with patient representatives, I was unable to participate in recruitment because Charité's data protection regulations stipulated that our research partner (a physician and medical researcher in the psychosomatic department) would conduct the recruitment. Hence, my two colleagues from the Human-Centered Computing Research Group, who joined me as facilitators, and I prepared for the workshops by gaining insights into the patients' characteristics and circumstances through preliminary discussions with our research partner. The research partner also clarified that patients suffering from psychosomatic disorders, such as stress, anxiety, or depression, experience rapid, acute exhaustion. Furthermore, these disorders can lead to reduced visual and cognitive performance, barriers, and fear of failure, necessitating a profoundly respectful and empathetic approach to this cohort. For example, even dealing with a simple consent form can be mentally challenging for these patients, which might lead to resignation or unwilling decisions. Given these circumstances, I shortened the workshop to 3 hours, excluding breaks. However, I expected that we (facilitators) would need to provide more intensive patient support, such as one-on-one supervision. Furthermore, our research partner was present in a nearby room to respond to potential emergencies requiring medical assistance.

Three facilitators, including me, facilitated all workshops. To ensure voluntary participation, participants in the three workshops did not receive monetary compensation. However, patient representatives were reimbursed for their travel expenses and provided with on-site catering, which was also offered to the patients. We also provided participants with sufficient time to consent to participate in the workshop.[26]

In the following chapter, I will present the findings of the workshops.

Contextualizing Participants' Values

In total, I collected nine hours of audio material in three workshops: one with patient representatives and two with patients in clinical care. I transcribed the audio material verbatim. In addition to the transcripts, I included the activity outcomes, i.e., 16 value questionnaires, three value maps, and six value scenarios across the three workshop phases in the analysis.

To initiate the analysis, I first familiarized myself with the transcripts. In places where the transcript did not provide a clear indication of, for example, a value placed on a stakeholder on the value map but was hinted at and not explicitly mentioned by participants, I referred to the activity outcomes (e.g., value map or value questionnaires) to understand better which value was at stake and which other values might be associated with it. Additionally, I continuously compared the prevailing values revealed by the workshop cohorts with the value scenarios to understand how val-

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[26] Freie Universität Berlin does not have an institutional review board (IRB) for research projects. However, our research group has developed internal guidelines reflecting the values we prioritize in our research activities, including consent procedures. These guidelines, shaped through an iterative process, are designed to protect participants' autonomy and identity while fostering socially responsible collaboration between researchers and participants (Pimple, 2002). I used the ethical principles of our research group to draft the consent forms for the participatory workshops. These forms included essential details such as the research group's information, contact details, and background on the study. In response to the ethics committee's feedback, the forms also outlined how the collected data would be processed and stored. For example, transcripts are stored on a password-protected server, and audio recordings are deleted at the end of the project. Additionally, the consent form incorporated legal requirements, including participants' rights under the General Data Protection Regulation (GDPR) (European Union, 2018). Before being used, the form was reviewed and approved by the data protection officer at Freie Universität Berlin.

ues were translated within them.

This preliminary process enabled me to empathize, reflect, and interpret the participants' perspectives, laying the foundation for a meaningful interpretation of the materials (Mayring, 2014; Segal & Suri, 1997). To derive the subsequent findings, I followed two analysis steps: first, contextualization (based on the value maps) and, second, materialization of values (based on the value scenarios), as introduced in Chapter 6.2. To begin the first analysis step, the activity outcome of the second phase, *contextualize*, resulted in three value maps, discussed below and developed step by step during a moderated session by participants.

I found that the participants indirectly defined their values in the context of health data donation, i.e., they told a story or provided an example for each value drawn from their personal health history or that of a close family member. I realized that describing a value conveyed more meaning than attempting to achieve a universal definition (Le Dantec et al., 2009; Parvin et al., 2015).

All participants in the three workshops collaboratively developed a value map. I engaged participants in freely structuring and orchestrating a value map aligned with their needs and viewpoints. To support participants, I placed only the main stakeholders *patients*. I loosely assigned three predefined stakeholders, i.e., *medical researchers*, *physicians*, and *university hospitals*, to the patients on pink sticky notes. Initially, I asked each workshop cohort to rearrange the three stakeholders (excluding patients) if necessary, but no one did so in any workshop. Afterward, I explained that participants should add and place additional stakeholders in appropriate locations. All cohorts mentioned similar stakeholder groups such as *justice*, *data protection officers*, or *health insurance companies*. Only the first cohort, i.e., the patient representatives, identified noticeably more stakeholders than the other two cohorts, i.e., patients in clinical care. I assume this difference was due to the patient representatives' expertise in healthcare data practices, as they mentioned more granular stakeholders, such as *self-help groups* and *pedagogues*.

Furthermore, I noticed that especially the value map of the patient representatives (see Figure 7, p. 102) differed in the density of values and stakeholders from those of the patients in clinical care (see Figure 8 and Figure 9, p. 102). It was also noticeable how the values were distributed among the stakeholders responsible for implementing them. Specific stakeholders, such as *media*, *pharmacy*, or *authorities*, were defined using a pink sticky note. Yet they were not further considered when assigning stakeholder values. In this regard, all cohorts increasingly focused on the patients and the stakeholders closest to them. This led specific stakeholders to play no significant role or exert no influence on patients when donating health data.

Upon closer examination of the three value maps in consultation with the transcripts, I noticed the level of detail with which the patient representatives captured values in the context of health data donation. I attribute this to the workshop duration with the patient representatives, as I had planned more time. This workshop was the first one after the pilot study. I assumed that more time for facilitation was necessary, as the participants were inexperienced with participatory workshops, unlike the pilot study cohort, to which I invited designers. Furthermore, the two workshops with patients in clinical care had to be significantly shortened from 4.5 to 3 hours. As mentioned earlier, this shortened duration was justified and necessary to prevent potential exhaustion among

Figure 7: Value map 1 of the first workshop with patient representatives shows an obvious density of values assigned to different stakeholders, leading to several relationships or value conflicts.

Figure 8: Value map 2 from the second workshop with patients in clinical care depicts fewer stakeholders compared to the workshop with patient representatives, yet a comparable number of values are assigned across the stakeholders, comprising three relationships or value conflicts.

Figure 9: Value Map 3 from the third workshop with patients in clinical care reveals that most values are attributed to two stakeholders, i.e., physicians and patients, showcasing three relationships or value conflicts.

this cohort. This led me to suspect that engagement in and completion of the activities, particularly the development of a value map, were affected. For example, the patient representatives identified over five stakeholder relationships (in contrast to patients in clinical care, who identified only two to three). They also identified precise notions that attempt to capture or summarize several identical values. In contrast, patients in clinical care almost avoided committing to a value notion, using short sentences or keywords. I assume that the patient representatives' ability to articulate and define their thoughts concretely stems from their daily work, as they continually communicate with medical organizations and institutions through their professional and voluntary activities. During the workshop, I observed their profound knowledge of consent forms and practices in healthcare, which might facilitate their expression of values.

Although this approach to capturing the values of both cohorts initially appeared contradictory, upon further examination, I found that the values of the patient representatives and the patients in clinical care were similar.

I detail these findings from the first analysis step and synthesize them in the second step. In Table 3 (p. 105), the prevailing values are sorted into categories and are listed based on their appearance in the workshops. Each category reflects the overarching concern of the values. The values are followed by a description of how they should be considered in healthcare from the patient's perspective. The categories are structured as follows: First, *ethical considerations in healthcare*; second, *enhancing decision-making for patients*; third, *preserving patient autonomy*; and finally, *promoting patients' health sovereignty*.

I will describe and elaborate on the values assigned to these categories, using participant quotes (P1 to P16) to illustrate how these values were represented in the workshops and to provide the basis for the findings of the second analysis step.

Table 3: Overview of values uncovered using the first analysis step. Each value is accompanied by a description to address the patient's perspective.

Value	Description
Category 1: Ethical Considerations in Healthcare	
Integrity	Medical institutions ensure that patients' data is used only for the study for which patients consented to provide their data.
Purpose	Medical institutions ask patients if their data can be used for other medical studies.
Accountability	Medical institutions are responsible for protecting patient data and potential misuse.
Sustainability	Patients give one-time consent to use their data for medical research.
Autonomy	Patients are enhanced to reflect on their preferences and concerns when deciding, i.e., consent to a data donation.
Category 2: Enhancing Decision-Making for Patients	
Comprehensibility	Patients with limited reading ability receive information about using their medical data in an understandable form.
Awareness	Patients are informed about privacy policies and the importance of data protection.
Competence	Patients can review a decision regarding their previous consent to use their data for other research purposes.
Category 3: Preserving Patient Autonomy	
Voluntariness	Patients voluntarily agree that their medical data be used for research purposes.
Transparency	Patients are informed about what data is being collected and how it is used in their privacy policy.
Data Protection	Medical institutions protect patients' data from unauthorized access.
Withholding	Patients can withhold personal information they deem irrelevant for data donation.
Category 4: Promoting Patients' Health Sovereignty	
Data Sovereignty	Patients' data are treated confidentially and are only used for specified medical research purposes.
Anonymity	Medical researchers exclusively use anonymized data to protect patient privacy.
Equality	Measures for barrier-free assessment for non-native patients to understand the context of a data donation.

First, *ethical considerations in healthcare*. Participants across all workshops emphasized the importance of ethical considerations to achieve fairness and inclusivity in health data practices. For example, proactive measures to reduce bias and to prioritize the needs of vulnerable groups are the responsibility of medical institutions that collect and share data with third parties, thereby promoting social justice and collective wellbeing. I found that this was reflected in an alliance of values, including *integrity*, *transparency*, *purpose*, *accountability*, *sustainability*, and *autonomy*. Considering this, participants reflected on how equitable access to health data practices can be promoted to enhance medical research, for example, by addressing disparities in the availability and distribution of patient data among medical institutions. Additionally, participants enforced the fair treatment of patients throughout the entire data-sharing process.

Regarding this, I found that participants in this process repeatedly referred to the *integrity* of medical institutions, such as physicians and medical researchers, as the first point of contact for, for example, a treatment. It was essential for the participants that patients be treated with respect and dignity, taking into account their health histories, rather than merely as study subjects donating data. One participant (P8) linked *integrity* to a commitment by medical institutions to sincerity in selecting patient data, i.e., not collecting vast amounts of data but only those necessary for a medical study. This participant further elaborated that *integrity* of medical institutions entails a responsibility to foster patients' confidence in donating health data, for example, by ensuring that data use is transparent and serves a meaningful objective.

> *"[Patients] don't appear as individuals; then [third parties] can certainly release data somewhere, then [medical institutions] should, of course, be serious*

[...]" — P8

I found that *transparency* was a concern among participants regarding the collection, use, and sharing of health data, which may ultimately support informed consent for health data donation. The participants' core concern regarding *transparency* in data use was not merely compliance with regulations, but instead fostering a culture of respect, including *accountability* and *purpose*, in which health data practices align with ethical principles and uphold patients' rights. Essential here, for example, was clear communication in paper-based consent forms, such as how data are anonymized or processed, as highlighted by one participant (P3).

> *"So, clarity about the scope of data usage. Objective, purpose, and transparency within the process and subsequent usage. So, that's what I understand transparency to mean."* — P3

In this discussion, I found a recurring demand for meaningful *purpose*, i.e., purposeful data usage. In conjunction with *transparency*, one participant (P3) added that data collection should serve a specific purpose that aligns with patients' data security needs.

> *"Important, because we all need security and control, which can thus also [be achieved through a specific purpose]."* — P3

Overall, I observed that participants, to uphold *transparency* and *purpose*, regarded medical institutions as responsible for ensuring *accountability* in the responsible use of patient data. I found that such *accountability* entails preserving patients' values and needs. One participant (P2) described a balance between the need for data and the *sustainability* of consent. For example, patients with chronic illnesses may change medical facilities and frequently request data from different physicians or medical researchers. This means that *sustainability* eliminates the need for renewed consent, as the patient has already provided it.

> *"[With sustainability], I want to give data once and not be asked [repeatedly]."* — P2

The participants, in particular patient representatives, discussed how *sustainability* can be provided by medical institutions. However, in the growing discussion, they questioned whether sustainable health data donation would benefit physicians and medical researchers who rely on abundant, up-to-date patient data. One promising suggestion was *autonomy* to reconsider, revoke, or modify consent to data sharing over time, i.e., after a health data donation has been made. For example, participants advocated for mechanisms that allow patients to withdraw their consent or adjust their privacy preferences, such as with whom data is shared and for what purposes. One participant (P1) emphasized the importance of mechanisms that enhance *autonomy*, enabling patients to review and amend their privacy preferences.

> *"[Autonomy], so, the expiry of the period for which I provide it; also the revocation."* — P1

In summary, participants demonstrated deep concern for *integrity*, *transparency*, *purpose*, *accountability*, *sustainability*, and *autonomy* in the donation of health data. They emphasized the need for medical institutions to be accountable for maintaining sustainable data practices and protecting patient rights for ethical import. For example, approaches should be considered to allow patients to reflect on a past or upcoming data donation in light of their privacy preferences.

Second, *enhancing decision-making for patients*. Building on the previous category, I found that participants discussed measures in health data practices to enhance the *comprehensibility*, *awareness*, and *impact* of data sharing, eventually favoring *competence* in consent. To sustain *comprehensibility*, one participant (P3) mentioned measures addressing formal aspects of paper-based consent forms, such as context-specific information:

> *"No citizen ever understands the content through the paragraphs. And actually, the paragraphs should be removed. I mean, you have to understand [the paragraphs]. And then you always have to google: What do they mean by that, yes? Paragraph so and so. What do they mean by that? I mean, 70% of citizens don't understand that."* — P3

Similarly, another participant (P 11) emphasized that data donation situations should be established that do not involve pressure and that accompany or even support the comprehension of consent forms.

> *"Yes, because I have a problem with reading. And when I read something, I forget what I read before. And I need an explanation and impulses in the middle of it. And it would be good if there was someone who [supports] me."* — P11

I noted that measures of *comprehensibility* significantly affect participants' *awareness* of health data donation. Discussions during the workshops revealed that only when *comprehensibility* is achieved can *awareness* of data donation be attained, and that patients are only willing to share their data when they are confident that their data will be protected. One participant (P2) reflected accordingly:

> *"Yes, definitely, only when patients are confident that their data will be handled securely, processed, collected, etc. Where [the data] are, who has access to the data."* — P2

Overall, I observed that participants' thoughts on *comprehensibility* and *awareness* centered on *competence*, specifically ensuring that all patients have equal opportunities to make informed decisions that account for their individual needs. One participant (P15) emphasized support not necessarily from a medical institution but from family members who already accompany patients in their care and provide ongoing support, including for new treatment measures and for obtaining new consent for data donation. Institutions should instead create spaces that separate consent from stressful admission situations.

> *"[...] often there is no time to understand [consent forms]. And what is important here, as was repeated, is that you can take it home and have time to discuss it with someone who can explain it to you. So, it was mainly about having someone explain it to you, so [...], that you don't just get it and have to sign it immediately, but have the opportunity to reflect on it and think about it."* — P15

In summary, I found that the values of *comprehensibility*, *awareness*, and *impact* of data sharing have a crucial influence on decision-making regarding health data donation. Participants emphasized the importance of ensuring *comprehensibility* and *awareness* among patients about data donation to facilitate informed consent decisions. For example, participants suggested more precise, context-specific information in consent forms to raise *awareness* of the implications of data sharing. Additionally, creating a supportive environment, involving family members, and separating consent from admission situations were identified as ways to support patients' decisions.

Third, *preserving patient autonomy*. As indicated by the two previous categories, I found that participants in the workshops aimed to improve *voluntariness* of data donations, *data protection* of patient data, and *withholding* of data sharing that might not be in the best interest of patients, such as providing no added value to their healthcare. Participants further emphasized the importance of patients retaining ownership and control of their data even after data donation. However, the question of the *voluntariness* of data donation consistently arose in discussions following the potential disclosure of health data, for example, to third parties such as health insurance companies. One participant (P9) stated that consent to data use should be free of coercion to maintain the *voluntariness* of health data donation. Especially for acute treatment, patients should not be pressured to consent. Instead, the decision should be in the patient's best interest, free from influence by, for example, physicians or medical researchers.

> *"[...] I had in mind this situation where you usually sign, which often happens when you have acute problems and call a physician's office and then sign various consents, which is more like a door-to-door deal."* — P9

In line with *voluntariness*, participants viewed *data protection* as essential, emphasizing that data still belong to patients even after donation and should not be treated as a donation. Participants again questioned data ownership and third-party use. I found that this discussion highlighted a tension between the need for medical research for more data and patients' need for control over their information to uphold *data protection*.

> *"I wrote [data protection]. The data belongs to the patient. This is a donation. What does that actually mean? [...] Yes, on the one hand, they want to use our data completely, but as far as I remember, it's not that simple. They can't just say they're using it, but it's theirs. So, the question is: When do I completely get rid of my data? Is that even possible? Who is allowed to use the data?' Can someone profit from it without considering the donor?"* — P1

Although all participants expressed distrust and concern about the secondary use of patient data, some felt compelled to donate health data, such as for their own treatment or that of a close family member. However, participants expressed distrust and concern about opaque health data processing, including the potential for third parties to use patient data. One participant (P9) reflected on patients' personal motives and explained, based on the motives, why *withholding* data might become relevant at some point, such as due to a lack of information sharing, and could lead to withdrawal from participation in medical research.

> *"Maybe also again with the [value conflict of the] patient and [medical] researcher, and I think a tension arises between the practicality for the researcher, who of course would like to have a lot of data, a lot of biographical data, etc., for statistical analyses as widely available as possible and always use it in follow-up studies and then, I say, information involvement and revocability needs of the patients, who would, of course, like to be informed about every study and every analysis that is to be done with their data at some point and maybe also have that in hand to then be able to decide again and again about it, i.e., to be involved, and this leads to a great effort and also to the impossibility of studies and the administrative effort through this information and consents for the researchers."* — P9

In summary, I found that patient autonomy in health data donation revolves around voluntary participation. Participants emphasized the importance of patients retaining ownership of their data, particularly concerning third parties' secondary use of data. Furthermore, the tension between the medical research's need for comprehensive data and patients' desire for control over their information underscores the complexity of balancing data access and privacy concerns.

Fourth, *promoting patients' health sovereignty*. An issue driving participants during the workshops was the maintenance and enhancement of patients' health sovereignty and how this can be respected in health data donation. However, participants expressed concerns that standard consent forms did not enable patients to achieve an adequate level of *data sovereignty*, for example, by allowing them to anticipate potential negative consequences of data exposure, particularly for patients with rare diseases. I found that *data sovereignty* played a central role for participants. One participant (P9) emphasized the need for continuous information to preserve sovereignty.

> *"[...] the patient might have a right and an interest [to receive continuous information]. The patient should also be informed if data are repeatedly used for new studies."* — P9

At the same time, another participant (P16) specifically highlighted the lack of clarity regarding consequences, such as the absence of treatment if consent to data donation is not provided, which could undermine patients' health sovereignty.

> *"[...] what consequences does this have for me if I don't [sign a consent form]? Then, there is also the fear that I won't be treated if I don't sign. And basically, every decision has consequences, so it would have a consequence for me whether I sign it or not. And often it's like this [...]: 'Data protection, please sign,' and no effort is made for anything. You sign, in my case, out of fear; if I don't sign it, then it might be that I won't be treated, or not properly. So, the consequence is not exactly stated: what happens if I do it or don't? That's already a big decision for me, whether I sign now or not. Most of the time, you sign because you have the feeling: It's not going to continue here."* — P16

In this regard, participants offered another perspective: they highlighted that *anonymity* could help protect patients from social and professional consequences, such as an employer learning of an illness and it affecting the employment relationship, and could promote data sovereignty. Participants emphasized that patients could be identified through their data, underscoring the importance of *anonymity*, especially in the context of rare diseases, to avoid negative consequences. One participant (P9) reaffirmed:

> *"For me, it is important that it cannot be [traced] back to the specific natural person."* — P9

I found that participants repeatedly reflected on *data sovereignty* and *anonymity*, i.e., they sought to contextualize their values beyond their health experiences. I realized that the values of *data sovereignty* and *anonymity* converged in *equality*, i.e., equal access to information about medical research as patients contribute their data. One participant (P9) called for enhancing *equality* by handling information about medical research results and ensuring their dissemination to third parties. Another participant (P1) viewed medical institutions, rather than physicians or medical researchers, as responsible for addressing the uncertainties raised by consent forms. While physicians or medical researchers may play a role in promoting *equality* by obtaining consent, they do not set the terms and conditions that enable patients to understand data donation. This responsibility aligns more with the role of medical institutions.

> *"[...] in the end, it is approved by the university hospital, which comes out as a [consent] form, and not the individual physician who hands it over, who is then the messenger. And in the end, [the physicians] are just the representatives for all the researchers who stand behind."* — P1

In summary, participants emphasized the importance of continuous information provision, which might empower patients' health sovereignty. Such education, facilitated by medical researchers (acting on behalf of medical institutions), can foster *equality* in health data donation between patients and medical institutions.

In the following, I leverage the insights through the findings of the second analysis step to arrive at suggestions for patient-centered health data donation.

Findings

As described in Chapter 6.2, the first step of the analysis clarified how participants contextualized their values regarding the donation of health data. I was able to delineate in detail the prevailing participants' values, as shown in Table 3 (p. 105), and synthesized them into four categories: *ethical considerations in healthcare*; *enhancing decision support for patients*; *preserving patient autonomy*; and *promoting patients' health sovereignty*.

This synthesis served as the basis for the second step of the analysis, which aims to derive value-sensitive recommendations to inform the design of patient-centered user interfaces for health data donation. These suggestions primarily stem from the value scenarios articulated by participants in subgroups of two to three. When dividing participants into subgroups, I aim for an even distribution to balance their divergent characteristics, considering, for example, extroverted participants alongside more reserved ones to ensure that participants could contribute their insights equally within each subgroup. The subgroups utilized at least three values from a value map to create the value scenarios. A total of six value scenarios emerged; two from the workshops with the patient representatives, i.e., the first subgroup with P1 and P3 and the second subgroup with

P2, P4, and P5; and four value scenarios with patients in clinical care, i.e., the third subgroup with P9, P10 and P11, the fourth subgroup with P6, P7, and P8, the fifth subgroup with P12 and P13 and the sixth subgroup with P14, P15, and P16. I present the value scenarios and suggestions below.

The subgroups generally focused on the three values they considered inevitable in health data donations. They also linked the values to stakeholders they argued were responsible for a particular task in the health data practices. The subgroups regarded *physicians* or *medical researchers* as the primary contacts for consent to donate data or for providing information on medical research purposes, data processing, and data use.

I encouraged the subgroups to approach the creation of the value scenarios freely and at their discretion. In other words, they could determine how to design value scenarios to envision patient-centered health data donations that embody those values. Accordingly, different representations were realized in the value scenarios of the subgroups: The first and fifth subgroups opted for an overview of information flows to establish value responsibilities for stakeholders, as shown in Figure 10 (p. 118) and Figure 14 (p. 120). The second and fourth subgroups used a timeline to recall values at specific points in the health data donation process, as shown in Figure 11 (p. 118) and Figure 13 (p. 119). The third subgroup orchestrated values in a color-coded matrix to distinguish challenges and solutions in sustaining values in health data donation, as shown in Figure 12 (p. 119). The sixth subgroup attempted a comprehensive approach, with additional stakeholders (besides *physicians* and *medical researchers*) such as *data protection officers*, *health insurance companies*, and *healthcare providers* arranged around the patients at the center, primarily responsible for the same values, as shown in Figure 15 (p. 120). In this value scenario, understanding how individual stakeholders account for values was difficult since the same values were assigned to multiple stakeholders. It seemed that responsibilities were being diluted, as all stakeholders appeared to have the same level of discretion. In comparison with the contextualized values from Table 3 (p. 105), I found in the first analysis that some values, such as *competence*, *equality*, or *withholding*, were less discussed compared to, for example, *transparency* and *purpose*. Yet, in the value scenarios, *competence*, *equality*, or *withholding* found increased resonance. I attribute this to the subgroups' challenge of ensuring the practicability and appropriateness of the health data donation process in patients' interests. For example, *transparency* serves as an overarching construct to disclose how data are collected, processed, and stored. In contrast, *equality* facilitates data donation for patients from diverse socio-demographic backgrounds.

Informed by the discussions from the fourth workshop phase *reflect* (see Chapter 6.1) and culminations of how the subgroup distinguishes between values as an overarching construct to encompass patient-centered health data donations on the one hand and on the other values that support patients in their health data donation, I differentiate the resulting suggestions into two essential areas that emerge from the second analysis step: First, *strengthening patient literacy in health data donation* and second, *promoting patients' accessibility in health data donation processes*.

In *strengthening patient literacy in health data donation*, as in the first analysis step, I identified tendencies that challenged the relationship between patients and institutions that collect health data. From the subgroups' perspective, physicians or medical researchers represented medical institutions, which were seen as patients' first point of contact for donating health data. Evidence for this was primarily found in the value scenarios

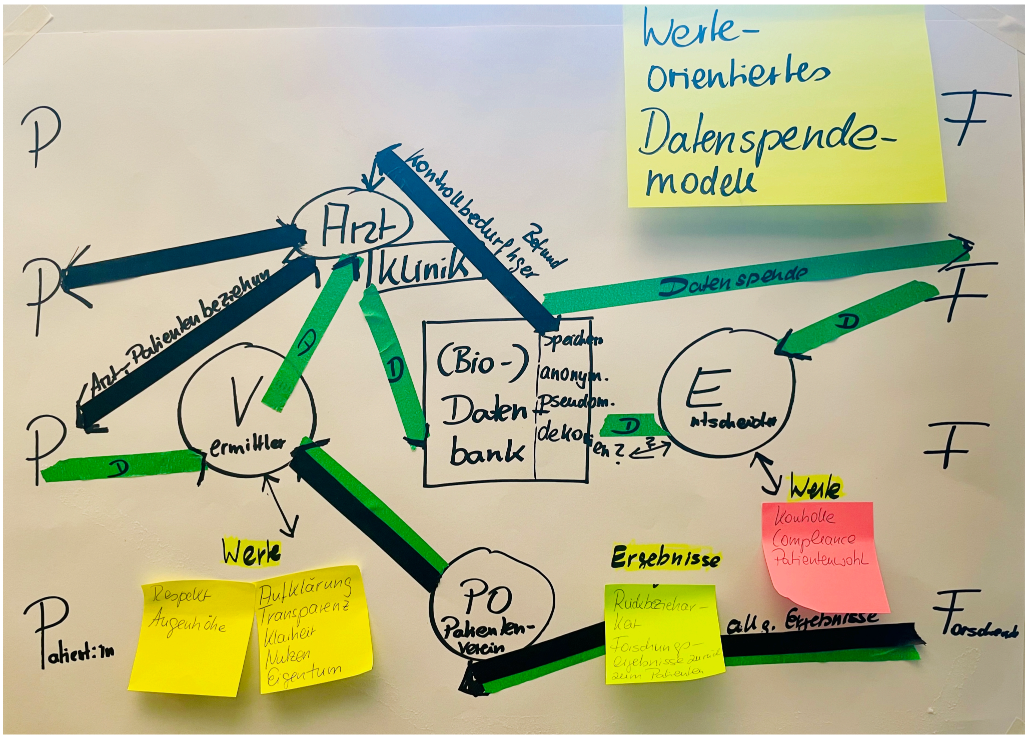

Figure 10: Value scenario 1 shows a process-like visualization to capture information flows after a data donation; each flow (arrow) incorporates a specific value

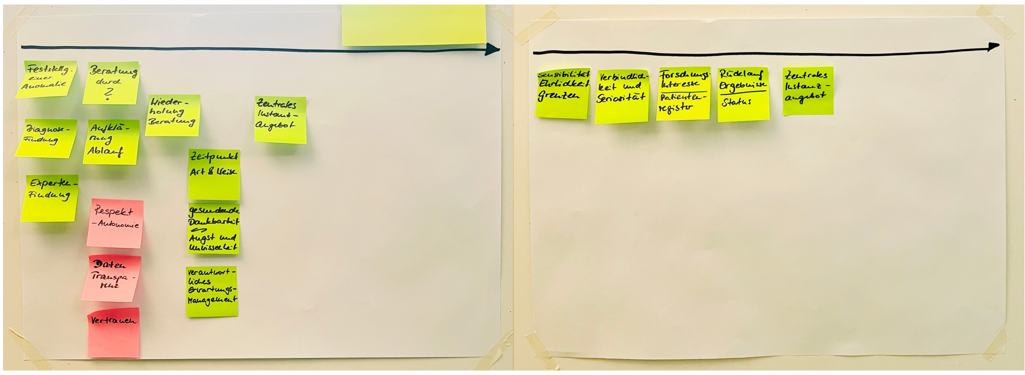

Figure 11: Value scenario 2 shows a timeline considering values with a certain time stamp.

Figure 12: Value scenario 3 shows a color-coded matrix, supporting values around data protection; each sticky note color indicates a data protection criterion.

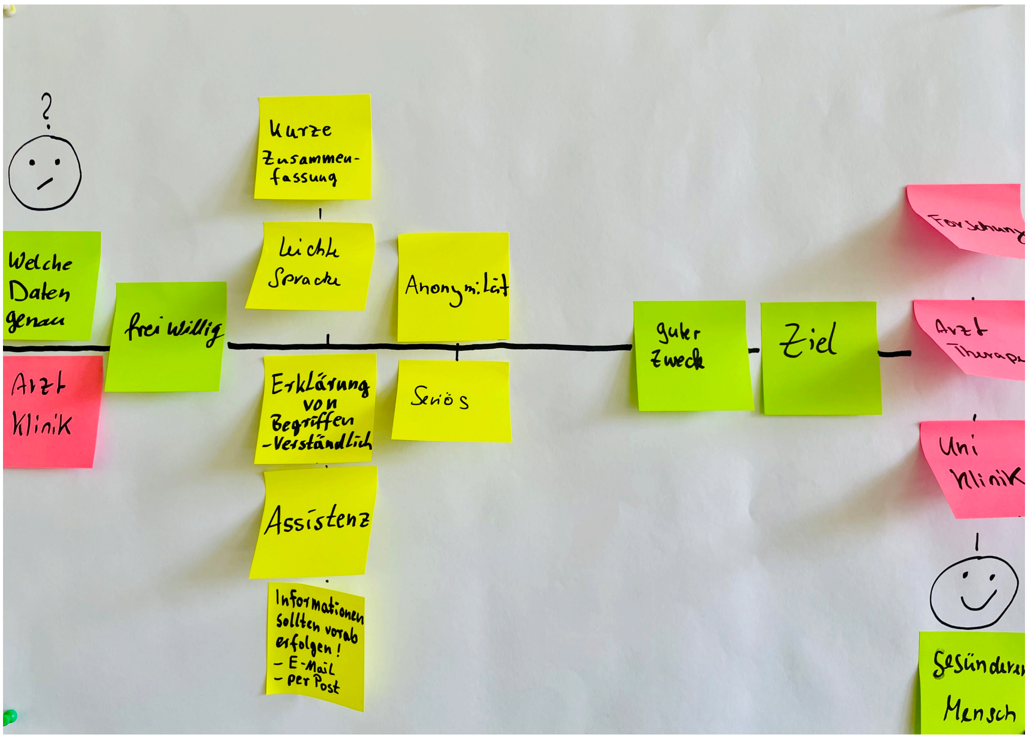

Figure 13: Value scenario 4 shows a color-coded matrix on a graph starting from receiving a consent form to disclosing health data; each sticky note color indicates a value that should be incorporated into this process.

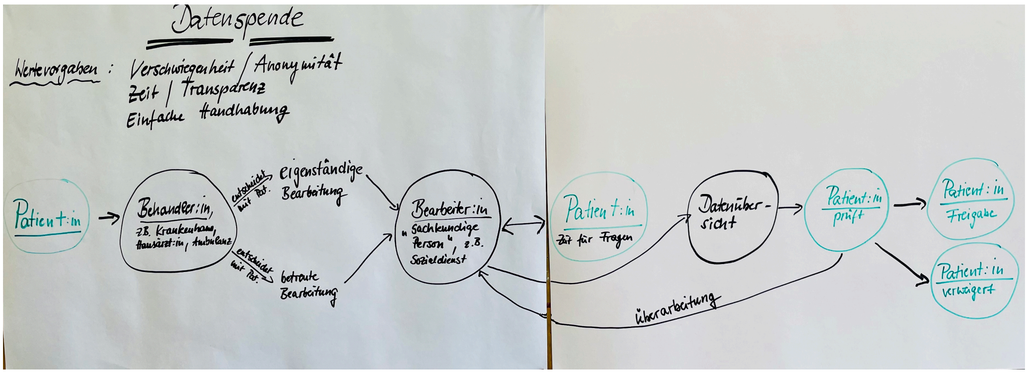

Figure 14: Value scenario 5 shows a process-like visualization considering specific touchpoints, i.e., circles, advocating specific values.

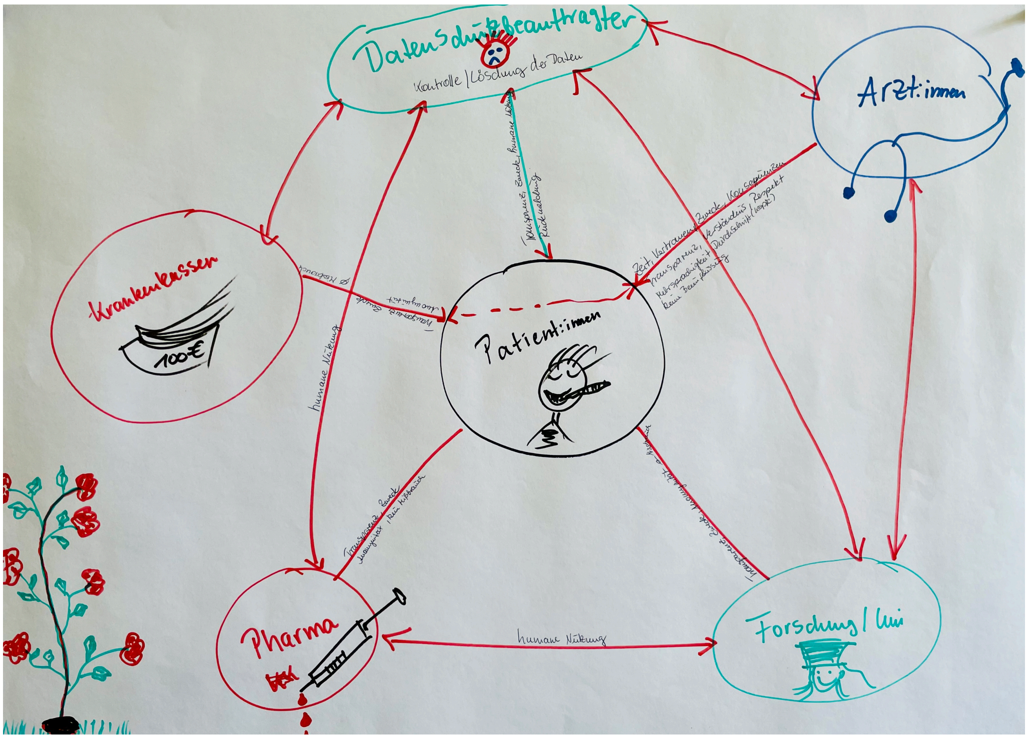

Figure 15: Value scenario 6 shows a radial graphic with patients in the center surrounded by multiple stakeholders, each responsible for multiple values.

of patient representatives, i.e., proposals to support patients in data donation, as shown in Figure 10 (p. 118), and to increase transparent data donation processes through decision support, as shown in Figure 11 (p. 118).

The first subgroup, furthermore, critically examined the importance of informed decision-making in health data donation to improve patients' understanding of data donation. However, they assumed that neither physicians, medical researchers, nor hospital staff are adequately equipped with resources to provide patient information. The subgroup suggested that decision support could help physicians and medical researchers educate patients. This support could take the form of human experts (e.g., consultants with extensive knowledge of institutional healthcare practices) or non-human solutions (e.g., digital assistants), both operating independently. An example of the latter is the integration of chatbots into applications designed for health data donation, which facilitates patient understanding and engagement. Such decision support would then incorporate values such as *integrity* and *accountability* to prioritize an ethical stance in safeguarding patient well-being:

"The decision support has [values like integrity and accountability]. [...] Here we have these ethical values." — P3

I also found that across the first and second subgroups, decision support should primarily benefit patients' well-being by enabling them to make health data donation decisions in their best interests. For example, the first subgroup argued that physicians or medical researchers must provide accurate information about the research purpose, i.e., the *purpose* of the research, as well as the use and processing of data. This information would be relayed and revised by a decision support:

"And [the medical researchers] have to say what they want to do, for what

> *purpose, and only then are they allowed to access [patient data]."* — P3

The second subgroup drew similar conclusions in their value scenario and confirmed the assumption of the first subgroup that decision support could significantly promote mutual exchange between physician and patient:

> *"I found the idea [...] of [gaining literacy through decision support], whether you call it a mediator or advisor or educator, quite interesting. Because I think much more trust can be built [compared to] a physician who sometimes misspeaks verbally."* — P2

Additionally, the second subgroup relied on the value *data sovereignty* to reduce patients' uncertainty, potentially leading to a decision to donate health data (e.g., regarding data use and processing). The subgroup advocated for a patient-supporting entity to increase transparency about health data donation processes:

> *"[A decision support] doesn't have to be the physician, but people who are qualified and also have time for [consultation]; also an explanation of the process of such data donation [...]."* — P5

Interestingly, I found a similar concern in the value scenarios of patients in clinical care, although these scenarios did not directly require decision support. For example, the third subgroup was concerned with informing patients about relevant results for their healthcare, as shown in Figure 12 (p. 119), which indicated support for decision-making that favors a data donation to improve patients' healthcare.

> *"[...] patients have the right to receive feedback on [medical] research results achieved with their data. So that if [patients] have contributed to the development of a groundbreaking new therapy, they will be informed accordingly*

[...]." — P9

In summary, exploring patient health data donation competence highlighted challenges in the patient-hospital relationship, particularly regarding patient education and the potential consequences of data donation. Subgroups emphasized the need for decision support to enhance transport health data practices and patient well-being. These insights underscore the importance of empowering patients with accurate information about how their data are used and processed, thereby fostering trust and facilitating mutual exchange between patients and medical institutions.

In *promoting patients' accessibility in health data donation processes*, I found that the value scenarios of the third to sixth subgroups, i.e., patients in clinical care, aimed to facilitate patients' accessibility in consent processes for health data donation.

The subgroups noticeably incorporated their emotionally charged experiences stemming from their health history. These experiences ultimately shaped their value scenarios to support patients in decision-making regarding health data donation and to embed values in health data donation processes. For example, in Figure 12 (p. 119), the third subgroup considered *withholding* as a type of privacy traffic light to support selection based on individual privacy preferences. In Figure 13 (p. 119), the fourth subgroup materialized *equality*, where contents of typically lengthy consent forms are structured and presented in simple language. In Figure 14 and Figure 15 (p. 120), the fifth and sixth subgroups recommended *autonomy* on consenting to health data donation.

By synthesizing the value scenarios, I found that the subgroups prioritized values that would make health data donation processes more accessible to patients. All subgroups of the workshops with patients in clinical care negotiated to enable the revocation of a data donation, for example, even before the end of the storage period set by the medical institution. The third subgroup devised an unconventional way of *withholding* that resembles the idea of decision support from the first and second subgroups. The third subgroup proposed an alternative, namely a privacy traffic light, to support patients at the time of consent in understanding the implications of health data donation and to provide an opportunity to object to data donation.

> *"[...] introduce a kind of data traffic light on the [consent forms]: green, yellow, and orange. Each explains something about the storage period, the usability of the data, and the degree of personalization."* — P9

Similarly, the fifth subgroup considered providing a time-independent opportunity for *autonomy* with respect to consent, or revising consent and the associated privacy options, such as sharing data with third parties or using secondary data. To further support accessibility through *autonomy* for patients, the subgroup proposed visual elements paired with appropriate content structure in the value scenario:

> *"[...] I could imagine filling out a questionnaire on a tablet and just clicking, and sometimes, when I have to fill out questionnaires like this: 'And now evaluate and do that.' So, sometimes, I would prefer a yes/no answer. Of course, sometimes differentiation is necessary [...]."* — P13

Similarly, regarding a patient-centered structure for a data donation process, the fourth subgroup responded that compliance with *equality* is essential to counteract language barriers and exclusion in the consent process.

> *"In the overall context, it was particularly important for us in the [subgroup] that the whole [consent form] be kept short and understandable and offer options for simple language [...]."* — P8

In summary, enhancing patient accessibility in health data donation processes was emotionally salient to patients' experiences. Subgroup recommendations included innovative approaches, such as introducing a privacy traffic light and empowering patients to understand and control their health data donation. Strategies discussed ranged from simplifying consent forms to incorporating visual elements to enhance the transparency of patient data donation.

Summary

As disclosed in Chapter 7.1, the data-driven healthcare system faces challenges rooted in the need for 'more' data for medical research to improve, for example, individualized medicine for patient care. Therefore, addressing patients' privacy concerns through regulatory measures is crucial. However, the significance of these measures in healthcare, including consent forms that reflect patients' values, remains uncertain. Hence, this context critically reflects on these circumstances and examines how health data donation can be made more patient-centered in the future. Based on the proposed method in Chapter 6, I derived value-sensitive suggestions (see *Findings*, p. 115) from empirically collected data to open a design space to support this context.

The three workshops provided participants (patients and patient representatives) a platform to contribute to the growing efforts to digitize healthcare. These efforts acknowledge the importance of including diverse perspectives, especially those of patients directly affected by health-related decisions who may have little or no discretion to voice their opinions. The suggestions for patient-centered health data donation highlighted the need to uphold patient autonomy, transparency, and decision-making in health data practices. To be more precise, the proposed suggestions to strengthen patient literacy in healthcare data donation align with the rapidly evolving digital health initiatives. As the healthcare sector increasingly relies on data-driven technologies, initiatives such as the German "Digitalisation Strategy for Health and Care" (Federal Ministry of Health, 2023) aim to enhance patients' understanding of data use and privacy. Nonetheless, the suggestions may provide more concrete strategies to bridge the gap between patient values and institutional requirements in healthcare.

Furthermore, these suggestions underscore the need for patient-centered user interfaces for health data donation. Patients in clinical care, especially those with psychosomatic disorders, face unique challenges in navigating consent forms and understanding the implications of data donation. For example, this can be addressed by simplifying language, providing visual aids, and creating opportunities for reflection to accommodate diverse socio-demographic backgrounds, needs, and abilities. In addition, the emphasis on decision support underscores the significance of empowering patients with context-specific information to make informed decisions about their data donation.

In this context, my inquiry demonstrated that the participatory value elicitation method can yield valuable findings by addressing patients' inner values and concerns, on the one hand, and by recognizing broader systemic challenges in healthcare, on the other. For example, the complex interplay of regulatory requirements, technological advancements, and ethical considerations demands ongoing dialogue and collaboration among stakeholders. As mentioned, the consultation process for specifying the broad consent form might have led to an asymmetry in patient engagement and participation. Thus, further efforts are needed to foster greater patient involvement that prioritizes their values and the right to participate in healthcare decisions. I argue actively involving patients in shaping health data practices fosters a culture of empowerment within the healthcare system, but sustaining this requires ongoing efforts to promote a patient-centered approach at all levels of care.

7.2 Citizen Values toward Mobility Data Donation

Citizens' involvement in political and economic decision-making is pivotal in fostering active participation, including contributions to scientific research. This form of public engagement is known as citizen science (CS). CS encompasses scientific research activities involving volunteers' collection, analysis, or interpretation of data and spans various domains, such as mobility (Puussaar et al., 2022), biodiversity (Sullivan et al., 2014), and healthcare (Diethei et al., 2021). By generating substantial volumes of data, CS can provide and accelerate localized insights that enhance research and decision-making, for example, through "mit:forschen!" projects of Wissenschaft im Dialog gGmbH (2023). For instance, community-led environmental monitoring initiatives can track air quality, enabling local governments to make informed decisions about pollution control. Similarly, health studies involving individuals who contribute health data can support advances in disease understanding and the development of treatments.

Many CS initiatives rely on the involvement of thousands of volunteers, often engaged through crowdsourcing activities facilitated by smartphones or wearable devices (Curtis et al., 2017). While CS aims to improve societal well-being by collecting and connecting data, such as mobility information, critics have raised concerns that it may exacerbate power imbalances between companies and government agencies by sidelining citizens' privacy concerns (Cooper et al., 2021). Addressing these imbalances requires examining contexts where citizens' values and concerns may conflict with those of other stakeholders, such as government agencies, healthcare providers, and private corporations (Hsu & Nourbakhsh, 2020). For example, while citizens may prioritize access to affordable healthcare, private healthcare companies might emphasize profitability, creating tensions in policy discussions.

To enhance citizens' clarity of CS data practices, it is essential to explore mechanisms that promote citizen governance, such as establishing clear guidelines for (digital) participation. This consideration leads to the hypothesis that meaningful public participation can be facilitated, primarily through mobility data donation practices that reflect citizens' values in CS projects. In this context, the responsible collection and use of mobility data should be a central focus of CS, including initiatives led by public institutions and private companies. For instance, co-designing data collection technologies with local communities can help appreciate that citizens' values, needs, and concerns are adequately addressed (Hsu & Nourbakhsh, 2020). In turn, eliciting these values is vital to developing new approaches to data practices in CS, particularly regarding the donation of mobility data. Such efforts can support the integration of citizens' priorities into project design and implementation, fostering trust, inclusivity, and accountability. Eventually, these efforts can enhance CS initiatives aimed at addressing societal challenges.

This context arises from the research project "freemove – Privacy-Centered Urban Mobility Data"[27], funded by the BMBF (grant number 01UV2090B) from January 2021 to June 2024. This transdisciplinary project, where I conducted qualitative research, explored the privacy-conscious provision of movement data for sustainable urban mobility. The project aimed to develop a scientifically grounded framework specifying requirements for the fair, practical, secure, and understandable use of mobility data for public benefit (e.g., by citizens and institutions). For instance, mobility data donation is increasingly significant for generating scientific insights and supporting policymaking. However, citizens are often unaware of the sensitivity of the data they donate or how it is managed. Consequently, ensuring the ethically required protection of citizens' privacy, aligned with their values and beliefs, presents a promising avenue for designing mobility data donation processes that offer new perspectives and insights.

Encountering Participants

In three workshops I conducted with 13 participants in total that took place in March and April 2023 at the partner institution CityLAB Berlin[28]. Based on my experience from the workshops in the previous context (see Chapter 7.1), I reduced the number of facilitators from three to two, which included a research project partner and me. I also shortened the work-

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[27] https://www.freemove.space

[28] The CityLAB Berlin is an innovation hub that unites government, academia, industry, and the community to explore digital solutions to enhance urban development for the benefit of society.

shop duration to two hours, excluding breaks, as the workshops were held in the evening on weekdays. Below, I describe the preliminary measures for the workshops.

Recruitment was conducted through an open call via newsletters, network referrals, and postings on CityLAB's social media channels. Anticipating an unexpected dropout rate (e.g., cancellations due to illness or other commitments), we extended the workshop call to the websites of local universities in Berlin. Unlike the previous workshops, participants received a €25 voucher for a local bookstore. However, the research partner and I did not disclose this incentive during our call to ensure that participants joined voluntarily. The recruited participants, i.e., citizens, had diverse educational backgrounds and professional fields (e.g., social science and urban planning students, digital policy experts, and volunteer workers). In contrast to the previous workshops, this recruitment led to an uneven distribution of participants across the workshops: four in the first, seven in the second, and only two in the third. Initially, I was concerned that fewer participants in the first and last workshops might lead to less exchange among participants and, consequently, fewer data points for analysis. Although I initially aimed for at least six participants per workshop, I discovered that smaller groups facilitated deeper exchanges and relationship-building. The following sections further support this observation.

Contextualizing Participants' Values

I conducted the three workshops with engaged participants. In talks at the beginning of each workshop, I found that participants sought to promote social change and improve democratic processes through voluntary activities, such as joining associations or foundations, and to enhance people's quality of life in their neighborhoods or work settings. This attitude of engagement is strongly reflected in the findings.

During the workshops, I recorded a total of nine hours of audio, which I transcribed verbatim. Similar to the context of health data donation, as described in Chapter 7.1, I analyzed the empirically collected data following the procedure outlined in Chapter 6.2, i.e., the transcripts and the outcomes of the workshop activities, including 13 value questionnaires, three value maps, and six value scenarios.

I familiarized myself with the transcripts and the value maps. During familiarization with the transcripts, I found that I had to consult my notes or value questionnaires much less frequently than during workshops with patients in clinical care. The participants were more precise in articulating or describing values. Unlike the citizens, I assume the patients, especially those in clinical care, struggled more with their ongoing depression or exhaustion at the time of the workshops, hindering them, for example, from expressing their thoughts concisely.

Recall that, due to the two-hour workshop (held in the evening during the week), participants were unevenly distributed: the first workshop had four participants, the second had seven, and the third had only two. However, the participants' involvement was active, open, and lively in all four workshop phases. These characteristics are also reflected in the activities undertaken by each cohort. The participants needed less guidance in developing the value maps. In all workshop cohorts, participants assigned values to the value map with minimal prompting, and additional values were added in discussion during the realization of the value map, or even expanded with new values that were not disclosed in the first phase *explore*. I observed the same level of engagement with four or fewer participants in both the first and last workshops. During the third workshop, with two participants, I observed that they were deeply immersed in the discussion of value map development and seemed to spur one another on, indicating that a value map could also be created with a minimal group size.

The value maps of the first two workshops showed five (see Figure 16, p. 133) to six value relationships among stakeholders (see Figure 17, p. 133). In contrast, the value map of the third workshop (see Figure 18, p. 134) led to seven. I attribute this difference to the dynamics of the respective cohorts when creating a value map. In the first and second workshop cohorts, some relationships or value conflicts were excluded from the value map because participants deemed them non-essential or unproductive and thus not worth further consideration. In contrast, the third cohort achieved a more apparent and unanimous consensus on these issues. All value maps showed nearly the same level of detail regarding group sizes.

As shown in Table 4 (p. 135), the participants' overarching values regarding mobility data donation are categorized and listed according to their appearance in the workshops. In conducting the first analysis step, however, I initially assumed that participants across the three cohorts held profoundly different values and needs. After reviewing and reflecting on the values, I realized that the participants formulated their values in distinct ways (e.g., *privacy*, *dignity*, or *autonomy*). As I became more familiar with the participants' statements, i.e., the descriptions of their values, I realized that seemingly contradictory values concealed a joint underlying value, for example, the assurance that shared information is

Figure 16: Value Map 1 from the first workshop highlights values not directly assigned to stakeholders or linked to others, instead reflecting an overarching mindset, which values should be sustained in mobility data donation.

Figure 17: Value Map 2 from the second workshop features an equal distribution of values across stakeholders. Yet, some stakeholders are assigned values that appear unrelated or show no potential for value conflict.

Figure 18: Value map 3 of the third workshop illustrates equally aligned values across stakeholders. Nearly every stakeholder demonstrates either a relationship or a conflict arising from these values.

kept secret and protected from unauthorized access.

Next, I consolidate the participants' values into four categories: first, *striving for genuine infrastructures*; second, *safeguarding citizens' data*; third, *promoting ethical data use*; and finally, *enhancing citizens' data literacy*. Each category incorporates and is informed by a specific set of values and is strengthened by participant quotes (P1 to P13).

Table 4: Overview of values uncovered using the first analysis step. Each value is accompanied by a description to address the citizen's perspective.

Value	Description
Category 1: Striving for Genuine Infrastructures	
Equality	Public institutions create data infrastructures that are independent of socioeconomic status or demographic factors to avoid data biases.
Transparency	Public institutions openly and transparently inform citizens about the purposes and methods of data collection.
Purpose	Public institutions openly declare the goals of mobility data donation practices to citizens.
Fairness	Public institutions ensure that marginalized groups or communities are not disadvantaged in data donation processes.
Category 2: Safeguarding Citizens' Data	
Anonymization	Public institutions apply techniques to anonymize personally identifiable information from mobility data before sharing it with third parties.
Data Protection	Public institutions uphold legal measures and minimize the risks of data breaches or misuse.
Category 3: Promoting Ethical Data Use	
Common Good	Public institutions significantly utilize mobility data to optimize all citizens' transportation infrastructure.
Awareness	Public institutions raise awareness among citizens that data donations can have ecological impacts on transportation infrastructures.
Sustainability	Public institutions should use data socially and economically sustainably to avoid harming communities or future generations.
Participation	Public institutions empower citizens in mobility policies and acknowledge the integration of their contributions to urban mobility.
Category 4: Enhancing Citizens' Data Literacy	
Comprehensibility	Public institutions present data in a way that is easily understandable for citizens.
Reliability	Public institutions anticipate citizens' needs for adequate information dissemination.
Autonomy	Public institutions enable citizens to reflect on their mobility behavior through their data donated.

First, *striving for genuine infrastructures*. Citizens should be encouraged to question imbalances, including those in urban societal structures. Accordingly, I found that participants expressed a desire for *equality* in the distribution of mobility data donation resources, including representation of population groups in public spaces (e.g., neighborhood inhabitants). As one participant (P1) expressed, prioritizing spatial equity reflects the aspiration for citizens to have unrestricted access to public data spaces.

"Yes, and why is this topic, this value important to me, [equality], because I've always felt that there is a great injustice [...] in our society." — P1

Another participant (P3) elaborated on this, noting that, to achieve *equality*, data collection methods should be communicated to citizens and that *transparency* is a requirement.

"So it is clear which data is being collected and what it is being used for in principle. Why important? Well, the donation is voluntary, so I need transparency first to decide whether I want to donate at all." — P3

Thus, *transparency* is a fundamental requirement for voluntary data sharing, encompassing the disclosure of data collection methods on the one hand and the intended uses on the other hand, to foster trust and willingness to participate in mobility data donation, for example, in CS projects, as explicitly stated by a participant (P2):

"And how do you define [transparency], if [mobility data donations] were transparent everywhere, they would enable measures to improve situations, either individually or through citizen councils." — P2

I, furthermore, found that disclosing the *purpose* of data use is crucial from the participants' perspective to ensure that their data are used only for legitimate, predetermined objectives of a CS project. Aligning with *transparency*, one participant (P12) reinforced *purpose* by suggesting that only the data necessary for research in CS should be collected.

> *"So, that it's appropriate [...]: yeah, if you already have the connection to the consumer, well, then I also grab which age they have, even though I'm only interested in whether they take the bike or the car."* — P12

Similarly, participants agreed that pursuing *fairness* includes disclosing collected data and ensuring transparent and responsible handling of citizens' data. Bundled as *fairness*, I found that one participant (P11) argued that data should only be used for legitimate purposes, and eventually, findings from CS projects should be fed back to the participating citizens, for example, in the form of infrastructure renewal for an improved quality of life in a district.

> *"I feel like if I donate data, I also want something from the results."* — P11

In summary, participants highlighted a societal demand for equitable distribution of resources and access to public data spaces, as expressed by participants advocating for *equality*. This quest for *fairness* extends to data sharing, where *transparency* and *purpose* serve as cornerstones, enabling citizens to make informed decisions about a data donation and its rationale.

Second, *safeguarding citizens' data*. Anonymity and the protection of citizens' data emerged as crucial aspects of data exchange in public spaces during the workshops, thereby helping citizens resist feelings of surveillance in their personal lives. Accordingly, *anonymization* of donated data was a central aspect of ensuring citizens' privacy and security, for example, in CS projects. The definition of *anonymization* also includes protection against the unwanted disclosure of movement or location data, as summarized by participants (P6 and P4).

> *"Primarily, it's about self-protection and not feeling spied upon."* — P6

> *"So when we walk around the city. Why is anonymization important? For many people, [...] it is pleasant not to be watched."* — P4

Moreover, according to participants, *data protection* is closely linked to *anonymization* to safeguard citizens' identities in large datasets. One participant (P11) stated that *data protection* includes the right to know who has access to which data and how it is used. In contrast, another participant (P8) emphasized the need to take precautions when donating mobility data to ensure that third parties, such as the government, have restricted access.

> *"So I know who sees and gets access to it [...]."* — P11

> *"[...] the transparent citizen should not exist, and the state should only be able to access information to a very limited extent."* — P18

In summary, participants emphasized *anonymity* and *data protection* in CS data exchange, thereby fostering citizens' resistance to surveillance. *Anonymization*, particularly in civic engagement projects, was highlighted for safeguarding privacy and security. Participants also stressed the importance of *data protection* to uphold citizens' rights while advocating for limited access (e.g., of third parties) to personal information.

Third, *promoting ethical data use*. As noted in the previous category, pursuing the *common good* through mobility data donations requires the ethical and responsible use of collected data for societal benefit. However, I found that participants advocated for more cooperative approaches, prioritizing community well-being while also considering concerns about data practices and fair access. In addition, the use of mobility data in CS to promote the *common good* was a recurring focus of discussions at each workshop.

Building on this, questions arose about who is responsible for data collection in projects such as CS. Consequently, raising public *awareness* of the importance of donated data and the risks of misuse, such as sharing them with third parties, became essential. To uphold both *common good* and *awareness*, one participant (P2) argued that educational measures are necessary to inform the general public about the potential risks, such as data breaches.

> *"Conducting [common good and awareness] campaigns [...], educating the population again about the benefits, but also the misuse [of donated data]."* — P2

Accompanied by *common good*, participants reflected on *sustainability* in the context of mobility data donation. The challenge discussed was the implementation of methods to assess public understanding and education regarding mobility data donation. One participant (P2) suggested that a bold approach, similar to the World Debt Clock, could also be practical.

> *"[...] enabling measures to improve situations individually or through citizen councils. I imagine it like this: there used to be this big display [in public]. There should be such a display everywhere on major streets or districts, [...] to sensitize people."* — P2

This participant added that societal and ecological change can be driven, enabling citizen control over donated data:

> *"[...] ecological sustainability. By that, I mean [the] science, as I mentioned earlier, [so that citizens can] better control it."* — P2

I found, despite the lack of clarification on data use after donation, participants associated the concern with promoting a willingness for *participation* in mobility data donation. Participants advocated for CS coordinators to minimize restrictions such as formal barriers or inconsistencies when consenting to CS projects for acquiring more citizens to support urban mobility research, as one participant remarked (P11):

> *"I have participation, so as few conditions as possible should be set [to not] restrict individuals. So that you also get as representative results as possible."*
> — P11

In summary, participants underscored the need to pursue the *common good* through mobility data donations, emphasizing societal benefit while addressing concerns about ethical data practices. Participants also valued cooperative approaches that prioritize community well-being. Further, they advocated for greater public *awareness* of the benefits and *sustainability* of these efforts to help prevent potential misuse of donated data. Building on these ideas, the discussions led to educational strategies and fewer restrictions, both intended to encourage meaningful *participation* in mobility data donation.

Fourth, *enhancing citizens' data literacy*. Given participants' professional backgrounds, such as urban planning and information science, and their voluntary commitment to civic participation, discussions focused on promoting data literacy to empower citizens and encourage critical reflection on data practices. Based on this, participants emphasized the importance of *comprehensibility* to enable citizens to understand the implications of data collection and usage and to promote agency in data-driven environments.

I found that *comprehensibility*, from the participants' perspective, leads to retaining control over citizens' data and to its practical use; in other words, if data processing practices become more controllable and understandable, citizens can take actions, for example, to restrict third-party reuse of their data. One participant (P7) suggested that *comprehensibility* helps citizens understand the potential and risks associated with their data donations, thereby empowering them to participate actively in data practices, a point echoed by another participant (P8) regarding data literacy.

> *"So, my point is comprehensibility. Why is it important to me? Because I want to gain an understanding of something, or I want to classify it in my knowledge [...]."* — P7

> *"Yes, I agree quite well because I wrote down the value, let's say, comprehensibility. And why is this value important? Only those who understand what it's all about understand what data is. So, it also goes a bit to the point from the side that donates, so a bit to the point of data literacy."* — P8

However, due to diverse socio-demographic backgrounds, citizens' acquisition of data literacy may pose challenges, as participants' discussions suggested. As a solution, the value of *reliability* emerged in the workshops to facilitate access to data-processing practices, such as in CS projects, as noted by participants (P11 and P13).

> *"Because I've written down reliability as a value. While I agree with all of you in some way. But the value was important because it's the fundamental incentive to participate at all [...]."* — P11

> *"Data donation processes should not be complicated."* — P13

Participants were willing to facilitate the donation of mobility data. However, this raised concerns about the possibility of unintentional data donations or those made without careful consideration. They supposed that even if citizens prefer simplified data donation, they should critically reflect on their behavior and interpret it in light of their needs and interests. Interestingly, one participant (P7) described *autonomy* as the acquisition of a profound understanding of the subject, such as the donation of mobility data.

> *"I also define [autonomy] similarly, that it is the acquisition. Promotes understanding and helps me orient myself."* — P7

Supplemented by another participant (P8), *autonomy* can improve data literacy and promote citizens' informational self-determination, including future participation in CS projects.

> *"[...] it's data literacy, that the person somehow knows what data are and [...] that the person is also enabled to apply this knowledge in the situation again or draw the information from the situation that they can classify and process."* — P8

In summary, participants highlighted the pivotal role of *comprehensibility* in empowering citizens to understand and control their data, fostering data literacy in data-driven environments. However, challenges in individual data literacy acquisition were recognized, prompting the emergence of *reliability* as a value to facilitate access to data practices. Though streamlined mobility data donation processes were advocated, I noticed participants' concerns about unintentional or careless data sharing. This highlighted the need to emphasize *autonomy*, fostering a deeper understanding of and encouraging informed participation in CS projects.

In the next chapter, I expand on these findings by offering value-sensitive suggestions for enhancing mobility data donation practices from a citizens' perspective.

Findings

The participants' core values, discussed in the previous chapter, are summarized below as value-sensitive suggestions to guide reflections on the practice of mobility data donation in CS projects. To achieve this, I refer to the second analysis step outlined in Chapter 6.2 to illustrate how participants embedded their contextualized values from Table 4 (p. 135) into value scenarios.

To recall, I instructed subgroups to select at least three values from the value map for their value scenarios. The distribution of participants across subgroups was as follows: the first subgroup consisted of P1 and P4, the second of P2 and P3, the third of P5 and P6, the fourth of P8 and P11, the fifth of P9 and P10, and the sixth of P12 and P13.[29]

The participants in the respective workshops demonstrated equally active engagement and commitment in creating their value scenarios. The subgroups considered, for example, creative three-dimensional representations to articulate their visions of future mobility data donations, in contrast to the workshops with patient representatives and patients in clinical care in the first context, as described in *Contextualizing Participants' Values* (p. 99). Next, I examine each value scenario before introducing suggestions for enhancing citizen donations of mobility data.

The six subgroups successfully created one value scenario each. Generally, the subgroups imagined a context close to reality in which values are essential for citizens in donating mobility data. Overall, the value scenarios illustrated specific situations: the first subgroup addressed resi-

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[29] One participant (P7) was not included in the results due to an unforeseen personal event, leading them to withdraw from the workshop participation before subgroup allocation.

dents in a particular urban district, and the second subgroup considered marginalized groups, such as minors or youth, in a neighborhood. The third, fourth, and fifth subgroups developed a comprehensive set of data protection requirements for Germany, including smartphone apps that collect data. The sixth subgroup considered a broader range of citizens and governments. These situations and their accompanying stakeholders were reflected in the envisioned value scenarios.

The value scenarios of the first subgroup in Figure 19 (p. 145), the second in Figure 20 (p. 145) and the sixth in Figure 24 (p. 147) used tangible and interactive elements such as figures or small polystyrene pieces for data representing inhabitants of an urban area and how their data is collected and processed by a public institution. In contrast, the third subgroup in Figure 21 (p. 146) and fifth in Figure 23 (p. 147) used a more procedural two-dimensional representation to consider values embedded in the visual design of a digital application or a data donation platform storing a large amount of citizen data. The fourth subgroup in Figure 22 (p. 146) stands out from the other subgroups by defining a value scenario as a criteria catalog (e.g., a step-by-step guide) detailing how citizens' values can be maintained when using public transit mobility applications.

The subgroups generally followed the activity guidelines by selecting three values they considered essential for mobility data donation. Similar to the value maps, they also linked values to stakeholders, such as data-collecting companies or public institutions. I also found that the subgroups primarily relied on all values from Table 4 (p. 135) to substantiate their concerns regarding citizen-centered mobility data donation. Some subgroups, such as the first and second, subsumed these values under the overarching value of *participation* to facilitate equitable data donation

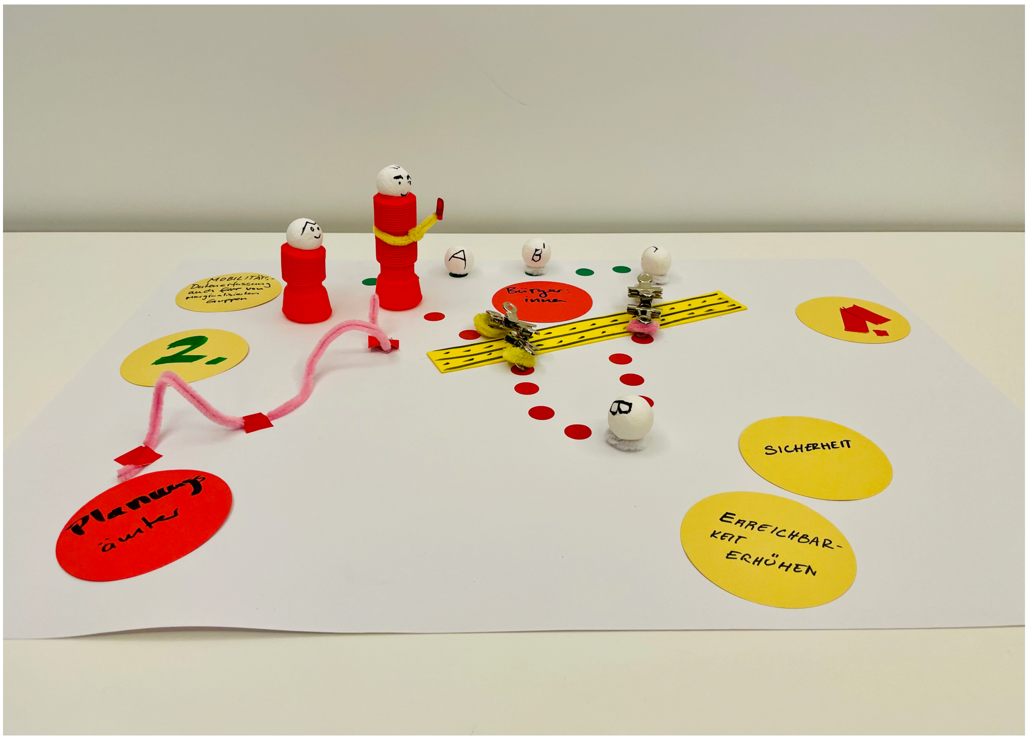


Figure 19: Value scenario 1 shows an urban district. It uses small figures representing citizens to indicate when and where they donate data in public spaces, through interactive elements such as movable objects that show citizens' interactions.

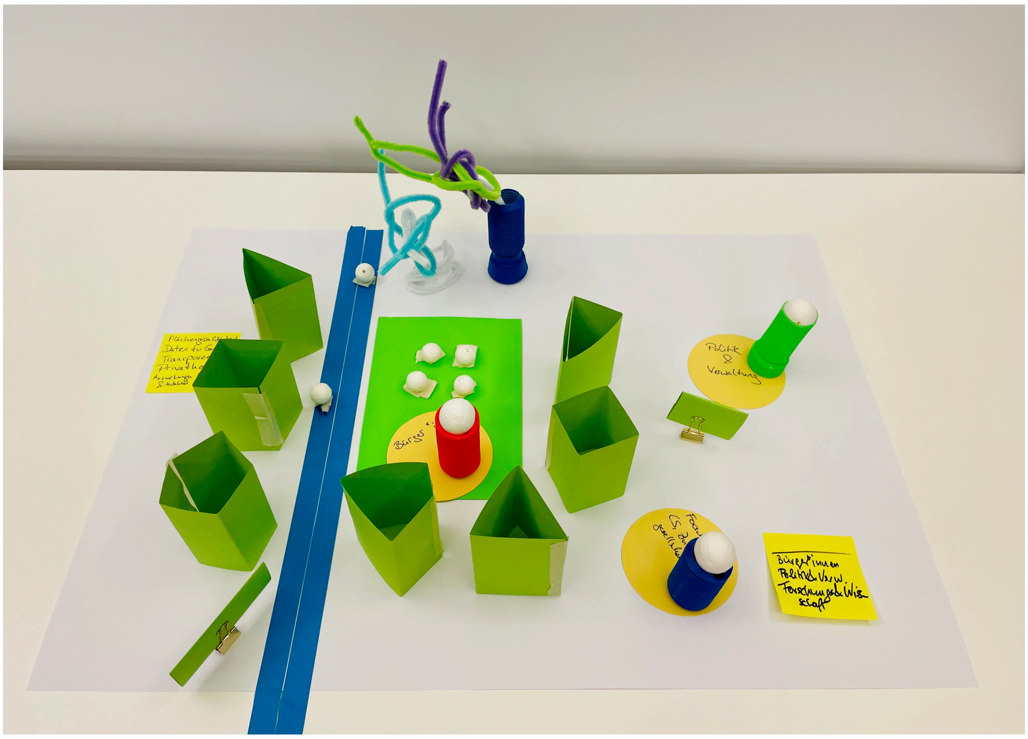
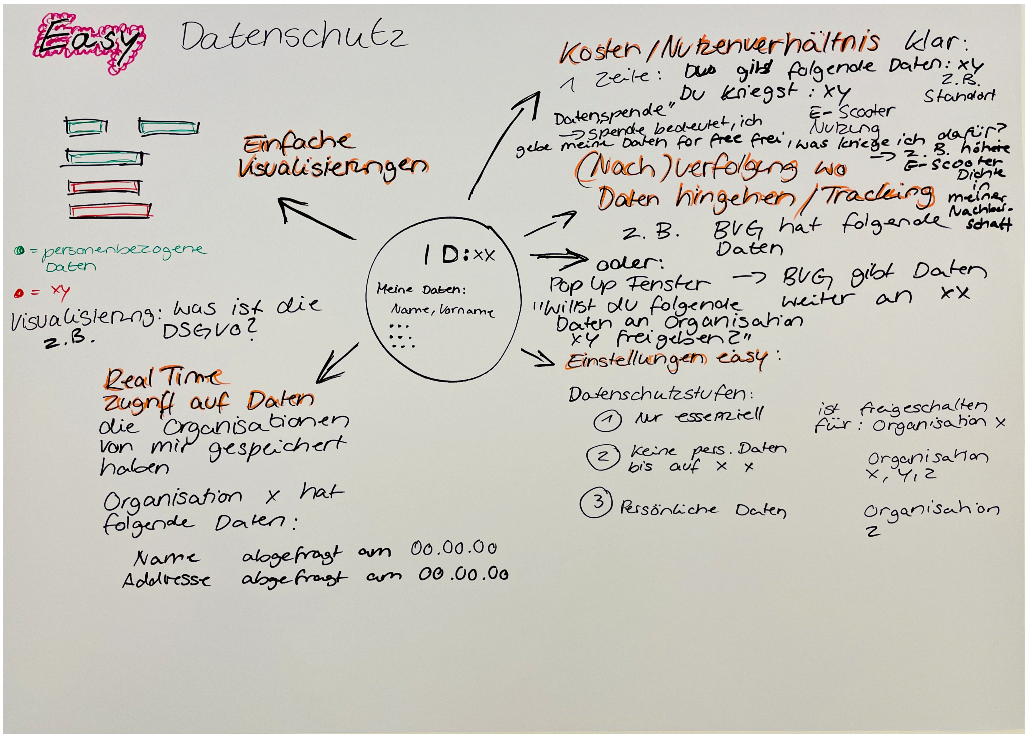


Figure 20: Value scenario 2 shows round colored zones pointing to secure mobility data donations of a neighborhood using interactive elements similar to Figure 19.



Easy Datenschutz

Einfache Visualisierungen

🟩 = personenbezogene Daten

🟥 = xy

Visualisierung: was ist die DSGVO?
z.B.

I D: xx

Meine Daten:
Name, Vorname
...

Kosten / Nutzenverhältnis klar:
1 Zeile: Du gibst folgende Daten: xy z.B. Standort
Du kriegst: xy E-Scooter Nutzung
„Datenspende"
→ Spende bedeutet, ich gebe meine Daten for free frei, was kriege ich dafür?
→ z.B. höhere E-Scooter Dichte in meiner Nachbarschaft

(Nach)verfolgung wo Daten hingehen / Tracking
z.B. BVG hat folgende Daten
oder:
Pop Up Fenster → BVG gibt Daten weiter an xx
"Willst du folgende Daten an Organisation xy freigeben?"

Einstellungen easy:

Datenschutzstufen:

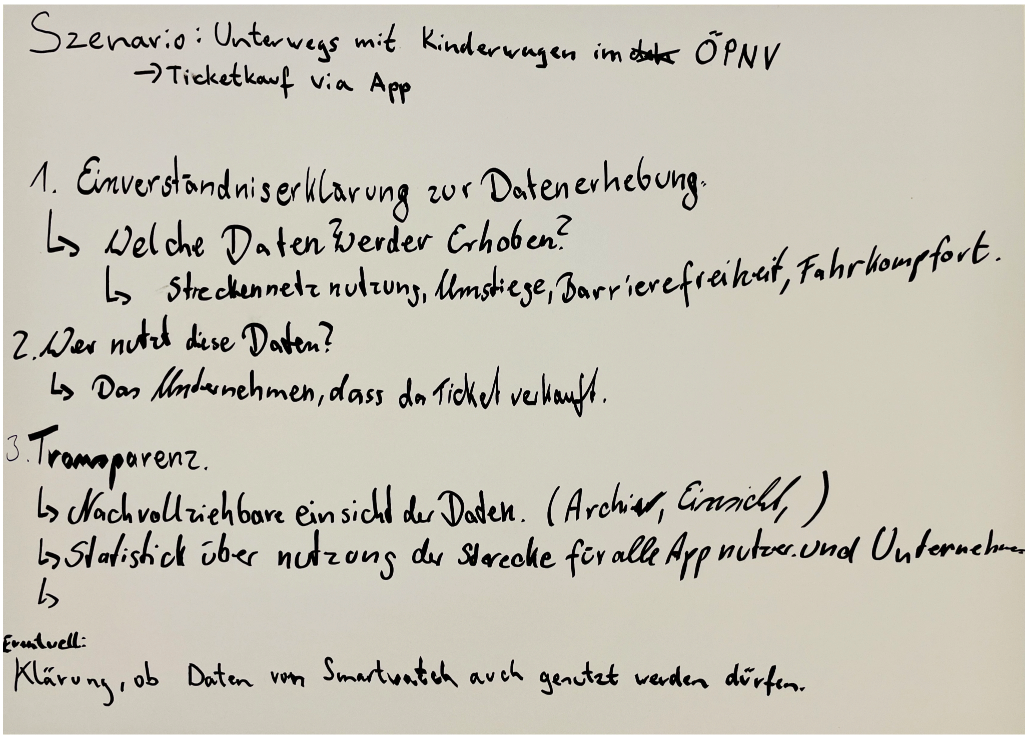
	ist freigeschalten für:
① Nur essenziell	Organisation x
② Keine pers. Daten bis auf x x	Organisation x, y, z
③ Persönliche Daten	Organisation z

Real Time Zugriff auf Daten
die Organisationen von mir gespeichert haben

Organisation x hat folgende Daten:

Name abgefragt am 00.00.00
Addresse abgefragt am 00.00.00

Figure 21: Value scenario 3 shows an interaction concept for digital applications, such as user interfaces for mobility data donation.



Szenario: Unterwegs mit Kinderwagen im ÖPNV
→ Ticketkauf via App

1. Einverständniserklarung zur Datenerhebung.
   ↳ Welche Daten werder Erhoben?
      ↳ Streckennetz nutzung, Umstiege, Barrierefreiheit, Fahrkomfort.
2. Wer nutzt diese Daten?
   ↳ Das Unternehmen, dass das Ticket verkauft.
3. Transparenz.
   ↳ Nachvollziehbare einsicht der Daten. (Archiv, Einsicht,)
   ↳ Statistick über nutzung der Strecke für alle App nutzer. und Unternehm
   ↳

Eventuell:
Klärung, ob Daten von Smartwatch auch genutzt werden dürfen.

Figure 22: Value scenario 4 shows conceptual value guidelines for mobility data donation through digital applications.

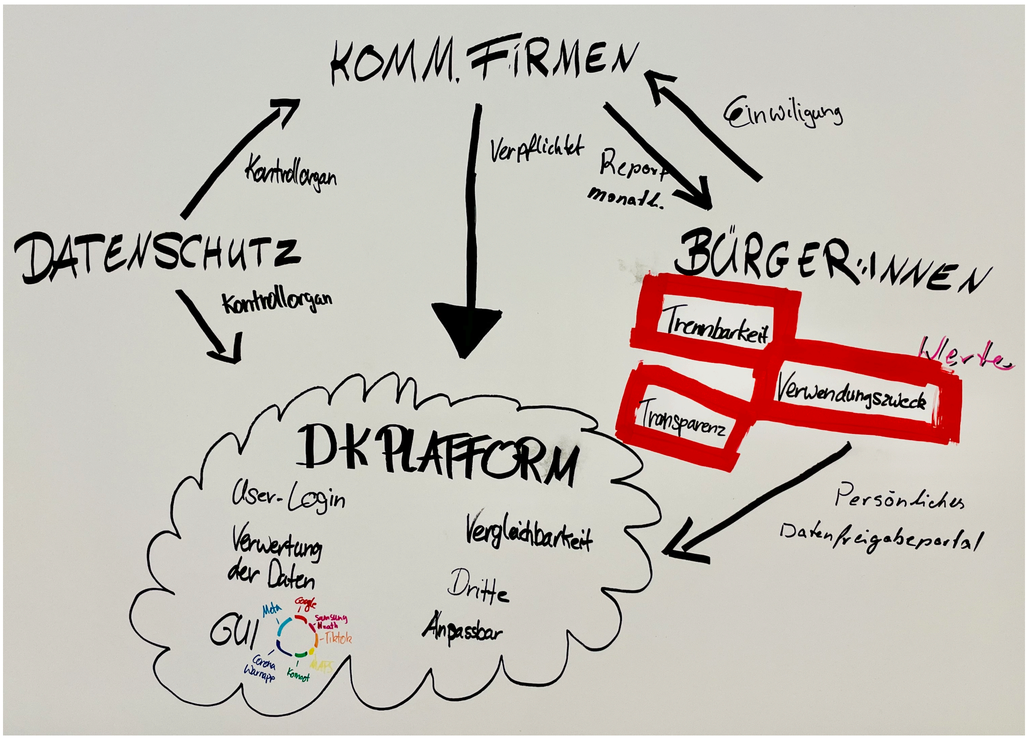


Figure 23: Value scenario 5 presents an overview of stakeholder responsibilities that should be considered when designing with values for mobility data donation.

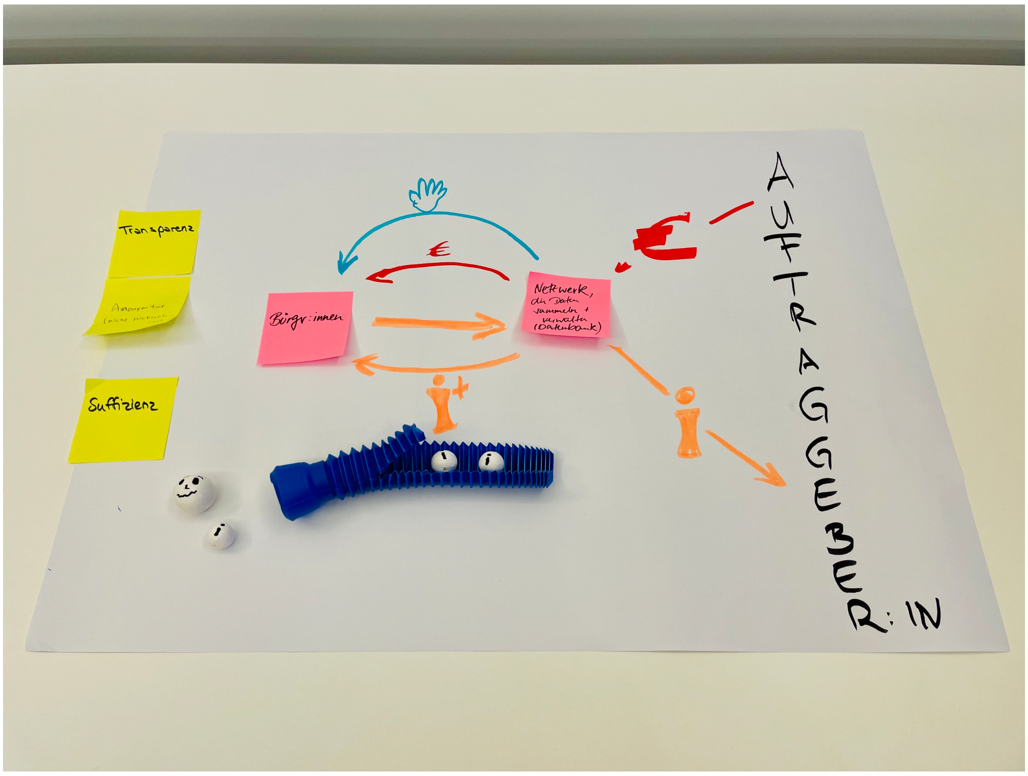


Figure 24: Value scenario 6 shows a tangible interaction concept for a user interface, i.e., data donations symbolized through small polystyrene balls. Values are incorporated at certain steps of interaction to ensure that citizens' rights toward a mobility data donation.

in urban areas. In contrast, the third subgroup integrated these values into an interaction concept, subordinated to the value of *reliability*. Subsequently, these values were used to explore and develop proposals for designing mobility data donations to strengthen citizens' perspectives. However, the values *sustainability*, *common good*, and *awareness* were not directly incorporated into the value scenarios. I assume these values are implicitly reflected in the subgroups' underlying tenets. For example, during discussions on creating the value maps, I observed that participants viewed *sustainability* as a long-term goal that could not be fully addressed within a value scenario. Similarly, the *common good* was regarded as a core concern, making it challenging to depict in a value scenario, as it embodies a broader societal benefit or mindset.

I therefore found that the subgroups proposed two distinct suggestions, as reflected in the value scenarios: first, *improving mobility data practices through community-centered approaches*, and second, *strengthening citizens' agency in mobility data practices*.

In *improving mobility data practices through community-centered approaches,* I found the subgroups aimed to strengthen citizens' data sovereignty in data donation initiatives such as CS projects. This included prioritizing *data protection* and *participation* to effectively align local safety concerns with citizens' community-specific needs, such as *transparency* and *fairness*. One participant of the second subgroup (P3) emphasized this community-centered approach to underline how citizen motivation for data donation in urban areas can be enhanced.

> *"Data donation occurs on different levels. So, we asked ourselves, how do we collect data at which point? What needs are particularly present? And then we said, yes, does something like this happen through a microcensus, or can*

> *something like this also be achieved through data donation? In a way, much is resolved by the fact that we said: The decision for the neighborhood block has been made. And then it's somehow much easier with data donation to motivate and clarify what the data will be used for afterward."* — P3

I noticed that this participant's reflection underscored the need to frame mobility data donations in CS in ways that are sensitive to the challenges and preferences of different communities; subsequently, another recommendation focused on *transparency* in data collection by public institutions. The subgroups emphasized the importance of *transparency* in developing mobility data donation processes that accommodate the needs of a district's citizens or urban community, including marginalized or underrepresented groups (e.g., older adults or minors).

One participant (P1) in the first subgroup clarified this point, emphasizing the need for transparent, scalable solutions to enable data donation initiatives to adapt effectively to communities' evolving needs over time.

> *"[...] it's a bit the idea that you don't always go everywhere and leave your data somewhere and then of course completely lose track of it, because I mean, how often in the week, in the month, do you always create a new account somewhere and leave data there, but that there is a central place where you deposit your data and request it there because that way you have a bit of an overview."* — P8

The subgroups emphasized the importance of clear governance structures and communication channels to promote effective data donation processes. By establishing such structures and channels, public institutions, for example, can promote *equality* and *fairness*, ultimately improving the effectiveness and inclusivity of data donation initiatives. One participant in the sixth subgroup (P12) discussed the potential of data donations to address community needs and placed this responsibility on data-collecting institutions.

> *"[Institutions] set the standards, [...] they might also develop procedures, and have control over how [mobility data practices] are conducted [...]."* — P12

In this context, the subgroups emphasized the importance of *autonomy* on mobility data practices, enabling a deeper understanding of *data protection* regarding CS projects. One participant from the third subgroup (P8) emphasized the need for simplified data practices, specifically highlighting the importance of providing clear and understandable information.

> *"[...] that [citizens] automatically receive a report from an organization once a month. Basically, about the data that has been collected."* — P12

In summary, improving mobility data donation practices in urban areas should include community-based approaches to strengthen citizens' data sovereignty, focusing on *data protection* and *participation* to address community-specific needs such as local security and privacy concerns. The subgroups also emphasized the need for transparent, scalable frameworks that can be adapted over time to meet the community's evolving needs. These considerations underscore the importance of governance structures in promoting, for example, *equality* and *fairness* in data donation initiatives. In addition, promoting *autonomy* on handling mobility data can deepen understanding of *data protection* and improve the *comprehensibility* of data donation processes, ultimately contributing to greater citizen engagement.

In *strengthening citizens' agency in mobility data practices*, I found that the value scenarios primarily indicated practical proposals to enhance citizens' agency in mobility data practices, as seen in Figure 21 (p. 146) and Figure 23 (p. 147). This suggestion includes strategies to promote data protection, such as the design of accessible digital data donation applications. Hence, the subgroups highlighted the importance of actively involving citizens, particularly to enhance collaboration in CS projects. Another crucial aspect was the need for transparent communication about data collection and usage. This communication should primarily convey the *purpose* of the data collection, justify how the data will be used, and allow citizens to make informed decisions about their data contributions. One participant from the third subgroup (P8) exemplified this as interacting with a digital application to support citizens' decision-making regarding data donation.

> *"Then another thing we thought would be cool is to have real-time access via an app to see which organization, for example, has what data from me. So that I can click on the organization, and then there's another click, and then I'm shown a list in understandable terms, not completely in coder language. Still, it says, for example, 'your name was queried,' then, 'your address was queried.' So that I can see how much the organization has from me."* — P8

Following this, there was a recurring concern about the importance of accessible designs for mobility data donations on CS platforms. For example, the third subgroup indicated that intuitive data donation interfaces could reduce barriers to promote greater citizen involvement in CS projects. One participant from the third subgroup (P11) highlighted the *reliability*, which was further elaborated by participant (P8) to implement meaningful data protection measures for empowering citizens to retain control over their data before, during, and after donation:

> *"But [citizens] then have control over [mobility data donations] themselves, right from the start [of a data donation]. This could also be implemented directly [...]. And [citizens] could also infer personally identifiable data and*

> *what goes beyond that. What might be more sensitive data? And that such things are displayed directly, and [citizens are] warned without having to, let's say, inform themselves and read ten articles of law first."* — P11

> *"[...] then we have the [reliability] setting, where one says. It would be practical if you could set categories from the beginning. One could say that one category is personally identifiable and sensitive data. The third category contains only the most essential things, and there's also a middle one. Then you can unlock from the beginning, saying: I never want my data to be used for commercial purposes [...], and for example, [...]: Do I want science to have access to it, and so on. So you set levels from the beginning, and then the thing can run in the background."* — P8

The sixth subgroup viewed control, i.e., *reliability*, as a means of determining the handling of personal data. Interestingly, the subgroup consolidated this under *anonymization*. One participant (P13), supported by another (P12), argued that maintaining anonymity is fundamental for data-collecting institutions to safeguard citizens' identities, thereby alleviating concerns about losing control over data donations.

> *"So anonymity makes it possible for me, for example, to consider whether I give or donate data or not."* — P13

> *"Exactly, and anonymity was a bit of a synonym for citizens having a say. So, do I want to remain anonymous? Or if yes, to what extent? Or for whom?"* — P12

In summary, the value scenarios offered practical suggestions that public institutions and CS project coordinators can apply to improve accessibility and control, thereby enhancing participation in mobility data donation processes. In particular, the suggestions promote active involvement in mobility data practices through citizen-centered design approaches, such as user interfaces for CS initiatives that incorporate transparent communication, thereby supporting informed decision-making and protecting citizens' identities.

Summary

As outlined in Chapter 7.2, fostering community-centered approaches in mobility data practices and ensuring the responsible collection and processing of mobility data are essential for enhancing citizens' agency and data literacy. However, within the context of CS projects, these approaches may necessitate varying levels of participation.

Currently, CS relies on digital data collection, marking a shift in how research is conducted. This evolution aims to democratize scientific processes by engaging citizens at every phase, from data collection to analysis and interpretation. Nevertheless, this democratization faces several challenges. Notable among these are power imbalances between data-collecting institutions and citizens, concerns regarding data privacy, and instances of merely symbolic participation, such as in expert forums. These issues can compromise the integrity and inclusivity of CS projects.

Furthermore, emphasizing community-centered approaches underscores the need to recognize and address citizens' diverse values, needs, and concerns within their specific life contexts, such as neighborhoods or districts. For example, a community-centered approach in an urban neighborhood might focus on understanding residents' unique challenges, such as inadequate public transportation or high levels of air pollution. In contrast, a rural community might prioritize issues like access to healthcare or the preservation of local agricultural practices. By acknowledging these diverse contexts, community-driven projects can support solutions that are relevant and impactful for each specific group.

Therefore, CS projects should adopt scalable strategies tailored to the unique needs of different communities. For example, a citywide air quality monitoring program could leverage advanced technologies, such as sensor networks and data analytics, to collect and analyze environmental data across neighborhoods, thereby identifying pollution hotspots and informing local policies. Still, it must also consider local concerns, such as how the data will be used to improve health outcomes for distinct neighborhoods. Similarly, a citizen science project on biodiversity in rural areas might involve local farmers in data collection about species conservation while incorporating their traditional ecological knowledge. In contrast, in a project aimed at reducing waste in a community, involving citizens in the design of the waste management system ensures that their values, such as convenience or environmental impact, are considered, increasing the likelihood that they will adopt the proposed changes. Such approaches not only enhance the relevance and acceptance of CS but also empower citizens, transforming them from passive participants into active collaborators in the scientific process. CS can then maximize societal benefits without compromising research objectives by co-designing initiatives with citizens and prioritizing their values and needs.

Engaging in dialogue with citizens has significantly deepened my understanding of their concerns and needs. I believe future CS initiatives should prioritize genuine participation, transparency, and community involvement to effectively address the complexities of today's data landscape while upholding citizens' values. However, addressing these values can only be achieved through ongoing dialogue with citizens, policymakers, and CS researchers to uncover the lived experiences arising from the data-driven realities citizens face.

In response to the latter, I promoted active citizen participation in mobility data donation within CS projects. Through three workshops with citizens, I applied the method for participatory value elicitation, yielding value-sensitive suggestions for improving mobility data practices, as presented in *Findings* (p. 143). From the citizens' perspective, transparent communication regarding mobility data practices is crucial for holding data-collecting institutions accountable to the public. Moreover, communicating the purpose, methods, and potential impacts of data collection in CS projects can help empower citizens to make more informed decisions about data donation.

7.3 Requirements to Navigate Value Elicitation and Analysis in Design Practice

After investigating the method in two different contexts, I will synthesize my knowledge and experiences from a design practice perspective by reflecting on the workshop concept and its facilitation to elicit values and then reviewing the analysis procedure used to evaluate empirical data, i.e., the values collected.

Elicitating Values in Design Practice

To recall, the workshop concept I developed is designed to elicit and analyze the values of individuals directly affected by a given context. The goal is to create a space where facilitators, such as designers, can promote and spark conversations about values, guide participants through reflection, and help translate values into value-sensitive suggestions, such as hypotheses or requirements that support design ideas from a value perspective. The latter is crucial, as understanding people's values can significantly shape the conception and design of, for example, a technology, ensuring it aligns with individual needs, concerns, and ethical considerations.

The workshop, structured into four distinct phases, is paired with specific activities: *explore*, featuring the value questionnaire; *contextualize*, involving the value map; *translate*, using the value scenario; and *reflect*, which revisits and reviews the previous three activities. Each phase serves a distinct objective, but from a design practice perspective, the key challenge is how designers facilitate each phase to help participants engage meaningfully to yield practical insights for a design.

When devising the first phase, *explore*, I envisioned it as a starting point for participants to reflect on their values in the context under discussion. The challenge for designers in this phase is to help participants articulate their values thoroughly. The process involves administering a value questionnaire that prompts participants to identify the most important value for them based on their experiences. As a designer facilitating this phase, I quickly realized that it wasn't always easy for people to express their values, especially when it came to abstract concepts like donating health data. I noticed that values are difficult to grasp, often interwoven with beliefs and experiences, and can be hard to pin down with a simple answer. The questionnaire, while helpful, is not a one-size-fits-all tool, and the facilitator's responsibility is to create freedom for participants to explore their values introspectively rather than merely identify them. Also, I recognized that some participants might struggle to verbalize their values. As a facilitator, it is essential to be aware of individuals' abilities and to guide them, without imposing influence, to reflect more deeply. The value questionnaire may help frame the discussion. Still, for designers, it's really about facilitating a conversation that encourages participants to engage with their values in a way that feels personal and grounded. In my experience, this engagement was as much about helping participants articulate their values as about assisting them, without influencing them, in reflecting on why these values matter to them.

Once values are explored, the *contextualize* phase begins. This phase involves allowing participants to externalize their values and situate them within a broader context. In the workshops, participants created a value map to identify stakeholders and understand how their values intersect and are assigned to them. I found this phase crucial for enabling participants to grasp the broader context and to recognize how their values relate to those of other participants and to the context itself. For example, participants might acknowledge the need for privacy in health data donation, but understanding which stakeholder in this context is responsible for safeguarding privacy is a separate layer. The value map becomes a tool for visualizing these layers. However, facilitating this phase might not always be straightforward. Not every participant is comfortable speaking up in group settings; therefore, for designers, it is crucial to create an environment in which participants feel at ease sharing their thoughts. This is not only to encourage a group but also to recognize that, for example, more reserved participants may have the latitude to contribute their thoughts. I also had to be mindful of the intricacies that arise when values conflict or when participants interpret them differently. A well-facilitated discussion can help clarify misunderstandings and foster productive dialogue about shared objectives and ideals, but it can also surface difficult conversations. Designers should be prepared for this and remain impartial, assisting participants in navigating these tensions respectfully.

The *translate* phase involved prompting participants to generate ideas and consider how a given context could be enhanced from a values perspective. In this phase, participants are divided into subgroups and tasked with creating a value scenario. Essentially, a value scenario illustrates how at least three selected values from a value map can be realized in a specific context. I found that this phase can disclose what participants value most. Some subgroups chose for two-dimensional visualizations, such as sketches or diagrams, while others took a more hands-on approach, building three-dimensional models with cardboard and other materials. Reflecting on this, the choice of visualization type was often implicitly determined by the context and participants' conceptualization of it. For example, subgroups focused on urban mobility data were more likely to opt for three-dimensional value scenarios because the physical space of cities felt more graspable than in two-dimensional visualizations. For designers, this phase can be both exciting and challenging. They need to know that this phase allows participants to let their ideas flow and consider how values can be translated into something tangible and meaningful to them. However, subgroups must be consulted in this activity to ensure their ideas don't get too far off track. The creative freedom subgroups I experienced were also noteworthy. Still, there was sometimes a chance that subgroups would try to do the right thing they thought I, the facilitator, would expect of them. In such cases, designers should gently guide the subgroups while sustaining and promoting their freedom to create, aligning with the workshop's primary objective.

In the final *reflect* phase, subgroups review their value scenarios and discuss them within a group. This is where insights into value elicitation emerge, as reflecting on the value scenarios provides participants with an opportunity to critique and refine their thinking. It also allows them to reflect on the values that are vital to them within a workshop cohort and context. I found this phase valuable since it helps uncover the challenges of translating values into more practical means. In this phase, designers might need to acknowledge participants' ideas, carefully challenge them, ensure they are valued, and encourage constructive reflection. For example, designers might deem aspects of a value scenario inconsistent or unclear, expecting more explanation without conveying that participants did something inappropriate.

Reflecting on the phases, I believe the workshop can benefit a value-sensitive design practice and help designers adopt a more mindful stance. One of the biggest hurdles I faced was managing group dynamics. Some participants are naturally more vocal than others, and as a facilitator, it's crucial to support participants so that they feel included and heard. The workshop also relies heavily on the facilitator's ability to maintain group focus, particularly when the discussion turns to other topics related to the context. The balance between guiding the conversation and allowing free expression is delicate but essential. I also realized that, while the workshop offers a structured process, the phases are sufficiently flexible to adjust timing so that participants don't feel rushed. Some participants, for example, may struggle to articulate their values. In contrast, others might be more comfortable with having more time to reflect on a task or activity, to ask questions, or to feel more secure in completing it. In addition, for design practice, I believe the workshop concept should be adaptable and accessible, helping participants and designers alike overcome challenges as they approach the activities in each phase.

Blending Values into Design Practice

As Shilton et al. (2013) suggested, inductive approaches to eliciting values are particularly useful for uncovering implicit individual and collective values. In contrast, deductive approaches examine how these uncovered values manifest within a context. Similarly, the proposed analysis procedure combined inductive and deductive coding to explore the collected values across two contexts. Beyond deriving inductive and deductive coding findings, I increasingly anticipated the participants' life realities, concerns, and needs. In particular, deep engagement with the data, i.e., transcripts, through qualitative coding provided rich insights and helped me internalize the participants' perspectives and values.

My years of experience in qualitative research have lowered the threshold for in-depth analysis of empirical data. However, designers may face challenges in data analysis, such as being unfamiliar with, or even neglecting, qualitative research tools, including coding software such as MAXQDA. While the strength of design practice lies in the practical, vivid application of design principles and tools, it typically provides limited exposure to qualitative research methods, such as content analysis, thematic analysis, and other interpretive approaches. Designers may find qualitative data analysis demanding. Qualitative coding, crucial for extracting meaningful insights from data, often requires resources, repetition, and attention to detail, which may hamper carefully scheduled design processes. As a result, designers may feel overwhelmed, hindering their ability to engage meaningfully with the data through such qualitative research approaches.

Expanding on this, the time required for qualitative data analysis presents another significant barrier. Tight deadlines often bind design projects, and designers are usually expected to deliver tangible results quickly. In contrast, qualitative analysis is a time-consuming process that requires careful transcription, reading of transcripts, and data coding across multiple rounds, followed by synthesis and interpretation. Before initiating coding, designers should be aware that transcription, especially when done manually or with transcription software that requires results to be checked verbatim, can be labor-intensive and require careful attention to detail. Transcription errors, for example, can lead to inaccurate representations of participants' perspectives, thereby affecting the quality of the analysis. Another challenge in qualitative coding that designers face is identifying themes or patterns in large volumes of data. In my experience, repeatedly reading through workshop transcripts revealed insights that were not immediately apparent, such as participants' motivations or how their values related to one another. However, this process of engagement requires significant patience and critical thinking. For designers unfamiliar with qualitative methods, the subjectivity inherent in data interpretation can be challenging, as they must distill meaningful findings to inform design processes.

This process may take valuable time away from more immediately visible design aspects, such as prototyping and testing. Designers may struggle to justify the time required for in-depth qualitative analysis, especially when the results do not immediately yield clear design resolutions. This tension between the need for immediate outcomes and the deep engagement required for qualitative analysis might lead to reluctance to adopt such qualitative research. For example, the sometimes abstract qualitative findings can be problematic for designers to grasp. In design workflows, the emphasis is on creating compelling outcomes, such as functional or non-functional prototypes. Qualitative data, however, often leads to conceptual or theoretical insights that are less immediately tangible. In my case, even if I were to arrive at well-formulated, consistent, value-sensitive suggestions, they might still be too vague for designers, requiring further clarification before they can be translated into concrete designs. This disconnect between supposedly abstract qualitative insights and the practical demands can be tiring for designers. Despite these challenges, the potential benefits of qualitative analysis in design are considerable. By profoundly engaging with participants' values and perspectives, designers can create more reflective designs (Sengers et al., 2005).

Additionally, in investigating the method, I discovered that the analysis of workshop data primarily centers around two key phases and their associated activities. First, in the second workshop phase, values are contextualized using a value map. Specifically, the *contextualize* phase allows participants to articulate and refine their values within a value map, thereby forming value clusters or categories. Second, values are depicted in a value scenario based on the value map in the *translate* phase. This phase revises and organizes these categories into a value scenario. All in all, I realized that the phases and activities themselves act as a form of analysis, as the very act of engaging in them begins to shape and structure the data.

In summary, the method for participatory value elicitation, as I have found in my work, offers a meaningful way to reflect and understand the values that shape people's experiences. This method enables designers to move beyond shallow assumptions and to adopt viewpoints that resonate with people, thereby addressing their concerns and aspirations. However, for this approach to become more widely adopted in design practice, I believe there is a need for accessible, intuitive, and tangible tools that support this method by lowering the threshold for facilitation and engagement with qualitative analysis. The latter would involve advancements that align with designers' expertise and recognize and leverage their skill set.

In the next chapter, I will reflect on the knowledge I gained to refine the method for participatory value elicitation in design practice.

8

Refining the Method for Participatory Value Elicitation in Design Practice

"[M]ethods are like toothbrushes.

Everyone uses them, but no one likes to use someone else's."

—John Zimmerman cited in Harrison & Tatar (2011, p. 11)

As a student, I was encouraged to pursue novel interaction design concepts, often without consulting valuable design methods to strengthen my design processes, mainly because I was unaware of them. When I did, I worried that adopting them might make my designs seem less original or that my limited skills would prevent me from using them effectively. However, my supervisors encouraged me by emphasizing that what truly mattered was how I applied them in unique ways.

These concerns, which I believe affect not only design students but also experienced designers, prompted me to consider how a method for participatory value elicitation from research could be translated into design practice. In a talk at Carnegie Mellon University, Zimmerman emphasized that the use of methods is integral to learning in design (Harrison & Tatar, 2011). He noted that designers learn through their use and modification of methods as they are repeatedly applied and adapted to different contexts. This perspective inspired me and helped address my second research question: *How can a method for participatory value elicitation be embedded in and contribute to design practice?*

To address this question, I synthesized the method for participatory value elicitation outlined in Chapter 6 with the insights gained from the contexts discussed in Chapter 7. This synthesis forms the foundation of my primary contribution, namely the *be part* toolkit, which makes participatory value elicitation tangible and adaptable for designers within their design processes. In the following, I first establish the relevance of design practice to the concept of toolkits in Chapter 8.1. Then, I introduce the *be part* toolkit in Chapter 8.2 and conclude this chapter in Chapter 8.3.

8.1 Toolkitting as Means for Participatory Value Elicitation in Design

In my view, toolkitting is a practice close to design, as designers carefully curate and deploy design methods such as personas, user journeys, or storyboards to guide their creative efforts. This reflective act of assembling, contextualizing, and applying tools throughout design processes mirrors the idea of toolkitting. In other words, an intentional and adaptive approach to equipping oneself with the means to address and reflect on design challenges.

Defining Toolkits

The term “kit,” which has evolved into the modern “toolkit,” originated in Middle Dutch as “kitte,” meaning “wooden vessel” (Oxford Learner's Dictionaries, 2025). Initially referring to wooden containers, the term later, in the 18th century, extended to denote collections of items, such as a soldier's gear organized for specific tasks. Mattern (2021) further developed this understanding, highlighting that toolkits go beyond mere practicality; they structure tasks, influence interactions, and shape understanding. For example, a sewing kit not only provides the tools for mending but also organizes them to make the process intuitive. Even in cultural practices, the Japanese bento box serves as a toolkit, organizing meals into compartments that blend aesthetics and mindfulness, transforming dining into a curated experience. Toolkits, therefore, are thoughtfully crafted to guide users through tasks, often transcending utility by shaping identities and inspiring narratives (Mattern, 2021). They combine and embody aesthetic and rhetorical elements, reflecting values and assumptions about the world while promoting specific ways of thinking and acting. This perspective emphasizes the ethical dimension of toolkits, which are designed not only for functionality but also to encourage particular behaviors and mindsets.

Toolkits have been employed across domains to serve diverse objectives. In the 1970s, Goddard's Rape Kit transformed forensic evidence collection by providing standardized tools such as nail clippers and combs, coupled with support service cards, effectively challenging harmful societal assumptions about rape and its victims (Mufarech, 2022). Similarly, in 1988, Johnson & Johnson's First Aid Kit revolutionized emergency care by providing railway workers with sterile supplies in portable packaging, as showcased in Johnson & Johnson (2017). Educational applications of toolkits further demonstrate their versatility. The PIIQUE (2021) toolkit, for instance, supports children's learning about media use through pedagogical guidance. Incorporating self-monitoring materials, such as a diary, enables children to integrate structured and reflexive learning with exploratory play. Similarly, the Viva Toolkit, designed by IDEO for MEDA (2019), assists Latin American families in managing finances with culturally sensitive tools such as budgeting worksheets and goal-setting checklists. These resources contain practical advice and reflections on personal and community values, fostering a deeper understanding of economic decisions. Another example is the COVID-19 test, which is not immediately recognizable as a toolkit, but was used by almost everyone at some point. These kits, particularly at-home rapid antigen tests, were implemented individually, step by step, and became essential for enabling individuals to monitor their health and prevent the spread of the virus.

These examples show that toolkits are far more than practical aids; they can be instruments of cultural, educational, and political reflection. Due to sensitive topics, a toolkit might serve, it requires thoughtful design and deployment to address diverse contexts while mirroring the values and assumptions that guide their use.

Utilizing Toolkits in Design Practice

Toolkits can be pivotal in design practice, fostering creativity, encouraging reflection, and facilitating problem-solving. Hoban (2018), in this regard, argued that toolkits should accommodate both guided and independent use while maintaining a specific objective. In participatory design (PD), toolkits are described by Sanders et al. (2010) as curated sets of tools designed to achieve particular goals through combined use. Tools are the tangible components of these toolkits, whereas techniques specify how they are applied. As Sanders et al. (2010) elaborated, a method integrates tools, toolkits, and strategies into a structured approach to problem-solving. They also noted that methods could enable individual engagement, such as sharing insights verbally or in writing, creating tangible artifacts that externalize ideas, or simulating real-life scenarios via role-playing or performance. However, as noted by Meissner et al. (2018), the success of a toolkit depends on its rhetorical design to provide a meaningful application. Without such intentionality, toolkits risk becoming disconnected from their intended purpose. Reflecting on this, I focused on toolkits with greater ethical significance, either directly aimed at design practice or integral to the design process.

The Participatory Development Kit by Kelty (2017), for example, demonstrates rhetoric, as mentioned by Meissner et al. (2018), through its activity cards or guidebooks that promote community engagement in collaborative problem-solving. Despite its strengths, it also prompts reflection on how institutional agendas might influence participatory outcomes. Similarly, the Social Design Toolkit resists exploitative practices by empowering communities with cultural probes and critical readings, ensuring local agency remains central to the process (Lamadrid, 2019). Portable network kits, as demonstrated by Community Tech NY (2024), showcase how a suitcase equipped with various components to create a wireless networking system can empower individuals to understand how the internet operates and is governed.

To stimulate different challenges in design practice, such as supporting ideation, concept development, or design sprints, the IDEO (2015) Design Kit offers an accessible entry point for designers, distilling facets of design processes into practical tools, including how-to guides and templates. Its aspirational framing encourages creative adaptability, making methods approachable and engaging. Another example includes the so-called ToolboxToolbox, which acts as a meta-toolkit, curating resources for diverse challenges such as decolonization and remote work, showcasing a breadth of toolkit applications (Thakurata, 2020). Card-based approaches also belong to toolkits and are commonly used in idea generation for technology development among designers or for reflecting on individual needs. As part of developing my method, rooted in value sensitive design (VSD), I also considered the Envisioning Cards by Friedman & Hendry (2012). These cards facilitate ethical reflection by helping stakeholders articulate and explore values across various topics, with accompanying prompts. I also came across additional examples through befriended designers, such as the AI & Ethics Cards by IDEO (2019), which promote ethical and responsible design of and with data. Similarly, the Ethical Explorer Pack focuses on pressing challenges like algorithmic bias and surveillance, prompting users to reflect on ethical considerations in technology and design (Drinkwater, 2020). Others I identified through independent research include the MethodKit (2025) decks, which address topics ranging from workshop planning to public health, and the Method Cards by IDEO (2003), which spark ideas in design practice through various prompts. More broadly, the New Metaphors card deck by Imaginaries Lab (2023) encourages designers to rethink collective futures through metaphorical exploration, fostering imaginative and reflective practices.

What stood out to me—and what all these toolkits have in common—is the carefully crafted visual presentation of their content, designed to make them engaging, accessible, and intuitive. A prominent aspect of card-based toolkits is their modularity: specific cards tailored to a particular topic can be omitted if they are irrelevant to the reflection or activity at hand, such as in a workshop setting.

Reflecting on the diverse realizations of existing toolkits, several insights emerge that inform the design of the *be part* toolkit and address the challenges identified in developing the method for participatory value elicitation, as discussed in Chapter 7.3. First, many toolkits demonstrated careful curation of materials and clear visual presentation to support accessibility and intuitive use. This use addressed my observations from the workshops in both contexts (see Chapter 7.1 and Chapter 7.2), where participants were unsure how to engage with the activities. By designing the *be part* toolkit with visually distinct materials, participants can more easily navigate each workshop activity, understand them independently, and maintain agency in articulating and exploring values. Second, existing toolkits often integrate structured guidance with creative freedom, balancing a scaffolded process with room for improvisation. This consideration informed the *be part* toolkit in two ways: facilitators provide overarching objectives rather than detailed prescriptions, and participants are encouraged to externalize their values. This approach mitigates the problem of inadvertently steering participants' reflections, as observed in the pilot study (see Chapter 6.3). Finally, several toolkits emphasized reflexivity and dialogue, enabling participants to examine their assumptions and decisions. This insight informs the inclusion of reflection tasks in the accompanying materials for the *be part* toolkit, prompting participants to reflect critically on their values throughout the workshop activities.

In conclusion, my inquiry of existing toolkits provided both conceptual guidance and visual design aspects that inform the components and materials of the *be part* toolkit. The challenges identified in method development (e.g., maintaining participant agency, enabling reflection, supporting abilities, and grounding abstract values in tangible exercises) can be addressed by drawing on and adapting principles from these toolkits, as noted above. Regarding the *be part* toolkit, I aim to integrate these insights and make the method practical for design practice. However, a key issue I identified is that existing toolkits, while often detailed and visually appealing, are primarily designed to explore ideas or facilitate exchange, offering limited opportunities to apply them in practice or to analyze their outcomes systematically. Particularly motivated by the latter and inspired by the insights gained, I introduce the *be part* toolkit in the following.

8.2 Introducing the be part Toolkit

While developing the *be part* toolkit, I reflected on the insights from Chapter 8.1 regarding existing toolkits to support meaningful design practices. One key insight was the need to balance structure, facilitation, and adaptability. In this regard, the PIIQUE (2021) toolkit offers a compelling example of how thoughtful design can enhance usability. Its compact box format includes carefully selected activities, each accompanied by brief, comprehensible instructions and a visual layout that guides facilitators. The Envisioning Cards demonstrate how visually engaging, card-based tools with concise descriptions or questions can stimulate reflection and imagination (Friedman & Hendry, 2012). These examples showed me that toolkits help delve into a topic and engage with it intuitively.

In designing the *be part* toolkit, I prioritized meeting the needs of both participants and facilitators, such as designers, when using the method for participatory value elicitation. While participants should be enabled to explore and articulate their values in a specific context through activities, it is equally vital for facilitators to understand how to deploy these activities within a workshop. Facilitators need resources that explain an activity and how to approach participants respectfully, conduct workshops responsibly, and create an environment conducive to meaningful collaboration. Another crucial consideration was addressing the gap I observed in many toolkits: the lack of guidance on reflecting upon and analyzing the outcomes of toolkit activities. Toolkits such as the Envisioning Cards inspire designers to approach contexts creatively but often fall short of supporting their processing and evaluation of the insights they generate. I wanted the *be part* toolkit to fill this gap by not only eliciting values and fostering engagement but also equipping designers with strategies to organize, interpret, and act upon their findings. This includes reflecting and categorizing values and aligning them with design objectives.

Looking back at Chapter 2, my experiences teaching design students also shaped the development of the *be part* toolkit. Many students struggle to blend theoretical research or design methods with their application in design projects. They often seek intuitive, adaptable, and relevant tools for their needs. With this in mind, I designed the *be part* toolkit, which can be seamlessly integrated into various phases of the design process, such as ideation and prototyping. The *be part* toolkit embodies these design rationales, which I elaborate on in the following section.

Unboxing the be part Toolkit

I developed the *bepart* toolkit to enhance design practice through a value-sensitive approach. It is important to me that the method for participatory value elicitation can be seamlessly integrated into different stages of the design process. For example, referring to Figure 1 (p. 8), the *bepart* toolkit can be used in the ideation phase to gather participants' concerns, needs, and values in a specific context. It can also be used during the prototyping phase to uncover the values of stakeholders such as designers, coordinators, or developers in a project, thereby fostering discussions that help align potentially conflicting values. Building on this, I aimed to provide a toolkit that can adapt to different design scopes. Although the *bepart* toolkit includes a guide for collecting and analyzing values, it is designed to be expandable. I will revisit and reflect in Chapter 8.3.

The *be part* toolkit consists of a box, as shown in Figure 25a (p. 174).[30] Inside the box, there are four inlays: *How-To Guide*, *Value Map*, and *Value Scenario*, to guide the systematic execution of the four workshop phases: *explore*, *contextualize*, *translate*, and *reflect*. Furthermore, the inlay *Analysis Kit* supports the manual data analysis, i.e., values gathered in a workshop, as shown in Figure 25b (p. 174). These inlays are flexible and can be adapted to a workshop's specific investigations or objectives. They can be arranged or deployed individually, as illustrated in Figure 25c (p. 174). For example, an inlay introducing a particular workshop phase can be

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[30] The be part toolkit, which includes printable materials (shown in Appendix 10), is available as open-source in German. These files can be accessed via a wiki on OSF. The files are licensed under the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0), permitting sharing and adaptation with proper attribution, provided that derivative works are licensed under the same terms.

(a) The be part toolkit box.

(b) Toolkit box containing the inlays.

(c) Four modifiable toolkit inlays.

Figure 25: The be part toolkit.

omitted, or the sequence of phases can be modified. Below, I detail each inlay; the inlays and corresponding materials are summarized in Table 5 (p. 175).

The first inlay, *How-To Guide*, as shown in Figure 26 (p. 178), primarily focuses on the careful planning and execution of a workshop, emphasiz-

Table 5: Overview of inlays and accompanying materials of the be part toolkit.

Inlay	**Purpose**	**Materials Included**
How-To Guide	Provides detailed guidance on planning and conducting a workshop, informing participants, offering clear instructions, and fostering a supportive environment between facilitator(s) and participants.	• Facilitator Information, Appendix A.1 • Workshop Leaflet, Appendix A.2 • Consent Form, Appendix A.3 • Value Questionnaire, Appendix A.4
Value Map	Enables participants to capture and cluster values concerning stakeholders through activity cards toward a (workshop) context.	• Activity Cards, Appendix A.5
Value Scenario	Provides participants with a prompt card and necessary materials (e.g., drawing and prototyping utensils) to help them focus on and develop an idealized scenario, ensuring alignment of values with a context.	• Prompt Card, Appendix A.6
Analysis Kit	Provides a structured, hands-on process for designers to analyze workshop outcomes to arrive at value-sensitive suggestions without using qualitative coding software.	• Analysis Cards, Appendix A.7

ing informing participants, providing clear instructions, and fostering a supportive environment throughout. This inlay includes several critical materials that support participation: first, facilitator information, which outlines the four workshop phases, their objectives, duration, and the materials needed for each phase (see Appendix A.1). An adapted, shorter version of this guide is available to participants as a leaflet that includes information on the workshop facilitators, the agenda, and the workshop context (see Appendix A.2). Second, a consent form that clearly explains the workshop's scope, the methods of data collection, processing, and storage, and the participants' rights, such as the freedom to withdraw from the workshop at any time (see Appendix A.3). Third, a revised version of the value questionnaire regarding the formulation of questions for the first phase *explore* (see Appendix A.4).

The second inlay, *Value Map*, as shown in Figure 27 (p. 178), contains the activity cards, including value cards in blue, stakeholder cards in green, and conflict cards in orange (see Appendix A.5). To recall, in the workshops on participatory value facilitation that I conducted in two contexts, as described in Chapter 7, I provided color-coded sticky notes for participants to write down their values in phase *explore*, as well as stakeholders, and conflicts as part of the value map in phase *contextualize*. I evolved from sticky notes to newly created activity cards. During the workshops, for example, I observed that participants often captured their values in a single word or described them in terms of a specific experience. I incorporated these observations into the activity cards to encourage participants to document their thoughts more thoroughly. As a result, the activity cards are divided into two sections: the value card first asks participants to determine a value and then describe it with an example; the stakeholder card asks participants to name a stakeholder in one word and explain their role in the context of the workshop; and the conflict card cues participants to express a value conflict and explain its origin concerning two or more stakeholders. This allows workshop facilitators to understand better how a value, expressed through one or more terms, is exemplified in a person's life. Moreover, this refinement of the conflict cards helps participants articulate relations.

The third inlay, *Value Scenario*, as shown in Figure 28 (p. 179), includes the prompt card (see also Appendix A.6). This card contains a one-sentence prompt that describes the context to be explored, helping participants focus when developing a value scenario. Unlike in the two contexts I investigated, where I presented the prompt as a slide in the presentation or read it aloud only once at the beginning of the *translate* phase, I chose to include a prompt card in the toolkit. This decision was based on my observation that participants frequently requested the prompt during this phase. The advantage of a prompt card is that participants have it readily available, allowing them to align their thoughts with it on their discretion. For example, they can discuss and reflect on the relevant values in subgroups, focusing on those critical to the prompt. Additionally, this inlay includes essential drawing tools, such as felt-tip pens or markers. Additionally, this inlay can be expanded with comprehensive prototyping boxes, such as the Protobox[31], which include small building blocks, styrofoam shapes, or modeling clay.

The fourth inlay, *Analysis Kit*, as shown in Figure 29 (p. 179), is a new addition that enables analog or hands-on analysis of workshop data through analysis cards (see also Appendix A.7). Unlike the qualitative analyses I conducted with coding software in the two contexts, as described in Chapter 7, the analog analysis directly evaluates the workshop outcomes of the *contextualize* phase, i.e., the value maps, and the *translate* phase, i.e., the value scenarios. Designers then analyze only the outcomes of these phases, which has the advantage that the workshop need not be recorded, thereby making transcripts unnecessary. Designers approach qualitative analysis by following the step-by-step instructions on the analysis cards, coding outcomes with colored tokens, and using the requirement cards to derive suggestions that inform the context.

Based on this conception of the *be part* toolkit, I describe its use in the next section.

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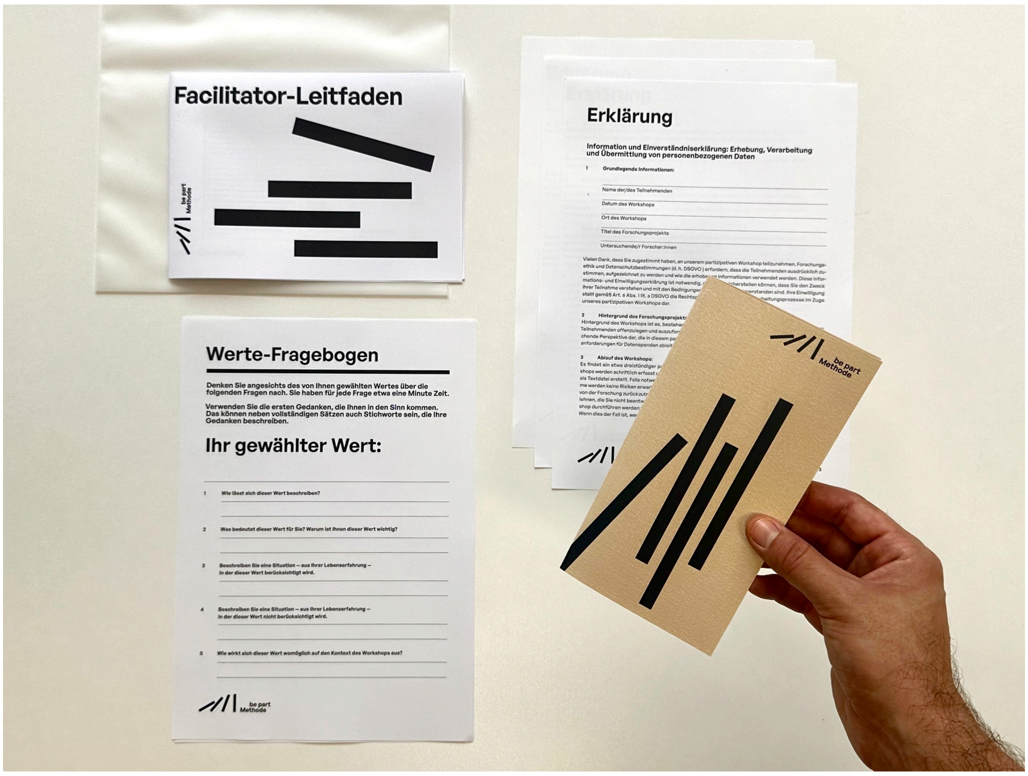
[31] https://protobox.eu



Erklärung

Information und Einverständniserklärung: Erhebung, Verarbeitung und Übermittlung von personenbezogenen Daten

1 Grundlegende Informationen:

Name der/des Teilnehmenden

Datum des Workshops

Ort des Workshops

Titel des Forschungsprojekts

Untersuchende/r Forscher:innen

Werte-Fragebogen

Denken Sie angesichts des von Ihnen gewählten Wertes über die folgenden Fragen nach. Sie haben für jede Frage etwa eine Minute Zeit.

Verwenden Sie die ersten Gedanken, die Ihnen in den Sinn kommen. Das können neben vollständigen Sätzen auch Stichworte sein, die Ihre Gedanken beschreiben.

Ihr gewählter Wert:

1 Wie lässt sich dieser Wert beschreiben?

2 Was bedeutet dieser Wert für Sie? Warum ist Ihnen dieser Wert wichtig?

3 Beschreiben Sie eine Situation – aus Ihrer Lebenserfahrung – in der dieser Wert berücksichtigt wird.

4 Beschreiben Sie eine Situation – aus Ihrer Lebenserfahrung – in der dieser Wert nicht berücksichtigt wird.

5 Wie wirkt sich dieser Wert womöglich auf den Kontext des Workshops aus?

Figure 26: First inlay, How-To Guide, containing facilitation information, consent form, workshop leaflet, and value questionnaires.

Figure 27: Second inlay, Value Map, containing the activity cards, i.e., value cards in blue, stakeholder cards in green, and conflict cards in orange.

Figure 28: Third inlay, Value Scenario, containing the value scenario materials, such as the prompt card and an expandable set of drawing and writing utensils.

Figure 29: Forth inlay, Analysis Kit, containing the analysis cards, requirement cards, and colored tokens for hands-on coding.

Engaging in Values through the be part Toolkit

As described in Table 5 (p. 175), the phases of the *be part* toolkit take shape as inlays, each accompanied by visually engaging materials. In particular, using the activity cards, especially those for exploring values, shown in Figure 30 (p. 181), can be a pivotal step in analyzing values for the following reasons. Based on my experiences contextualizing values across the two contexts, as detailed in *Contextualizing Participants' Values* (p. 99 and 130), I recognized overlaps in how participants described values across the six workshops. I also noticed that pre-structuring values would have significantly improved my investigations and facilitated analysis of the transcripts regarding participants' values. This observation led me to the idea that values should be structured and prepared before coding, which is also helpful for developing the values map shown in Figure 31 (p. 181), rather than relying on qualitative coding.

To further reflect on this, I now turn to two key insights I mentioned in Chapter 7.3, namely, the analysis of workshop data largely centers on two critical phases and their related activities. First, in the *contextualize* phase, values are explored and structured using the value map. Second, in the *translate* phase, these values are translated into actionable insights through a value scenario. The *contextualize* phase is notable for guiding participants in articulating and refining their values through the value map representation. This activity naturally yields value clusters or categories, providing an organized understanding of the values within a specific context. In contrast, the *translate* phase further extends this by revisiting and reorganizing these categories into a cohesive value scenario. Through facilitating these phases, I realized that they serve as a kind of pre-analysis, instrumental in developing the *Analysis Kit*.

Figure 30: Overview of the activity cards, including stakeholder, value, and conflict cards.

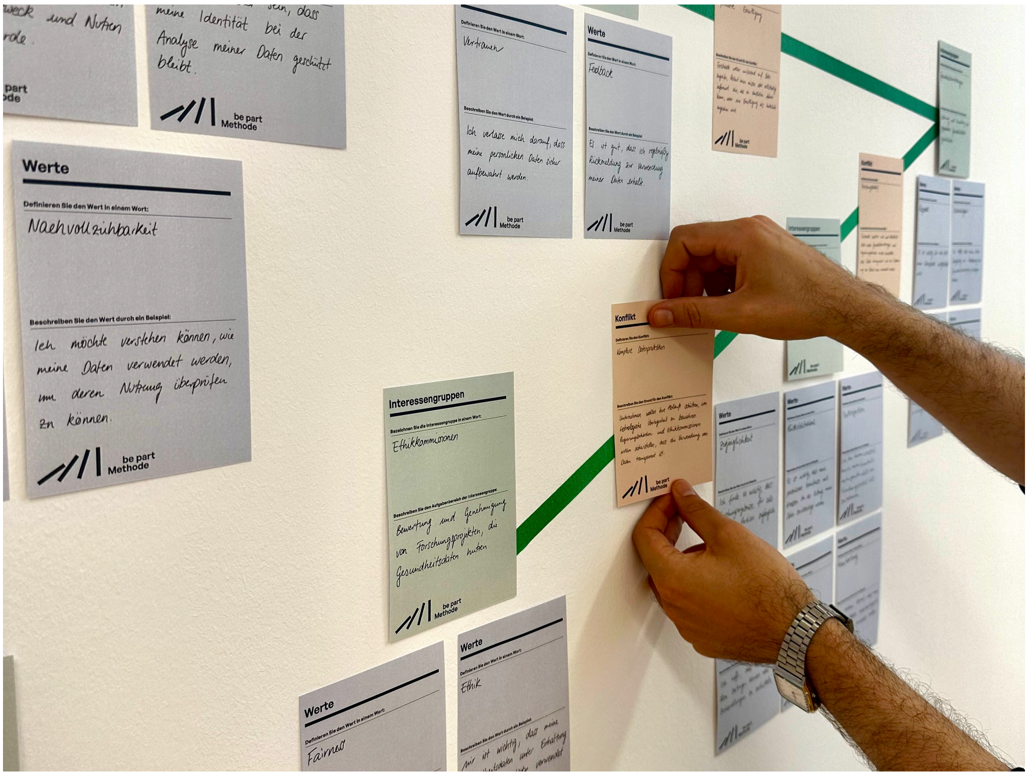


Figure 31: Using the activity cards to create a value map.

The *Analysis Kit* builds upon the analysis procedure outlined in Chapter 6.2. Unlike the two-step analysis procedure, this approach focuses on deriving value-sensitive suggestions, i.e., requirements incorporating values to inform a specific context by following the analysis cards, *preparing and proceeding*, A *marking*, B *applying*, and C *sorting*, stepwise, as shown in Appendix A.7. As they guide the analysis process, these cards must be completed thoroughly or repeated as needed to yield usable results. This approach to analysis offers an alternative for design practice to conduct qualitative research systematically, eliminating the need for specialized skills, such as audio transcription or the use of qualitative analysis software for coding empirical data. In the following, I provide a detailed description of this step-by-step analysis process.

To initiate the analysis, the *preparation and procedure* card is considered. All relevant analysis cards covering steps A to C are laid out alphabetically, as shown in Figure 32 (p. 184). The value cards representing the values are placed below, along with the value scenarios in which these values will be examined. This approach provides a clear overview of the analysis process by using all necessary materials (e.g., workshop activity outcomes), such as value cards and value scenarios. The preparation concludes with a thorough review of the materials to ensure that one or more persons, such as the designers who conduct the analysis, are familiar with the analysis kit's procedure and the materials. Once all materials are prepared, the analysis can begin. Each analysis card provides specific instructions for actions to be performed. It is essential to read these instructions carefully and follow them. Once an analysis step is completed, a card is flipped over to proceed to the next step. An individual or a group can conduct the analysis. After each analysis step, the results should be critically reflected upon and thoroughly discussed in both cases. The study's duration depends on the number of workshop outcomes. Based on a trial in which the following descriptions and pictures emerged, I conducted the analog analysis using materials from the first workshop on health data donation. As a result, I estimate that the analysis would take approximately 60 minutes to examine a value map with three distinct value scenarios.

In step A, *marking*, the values are carefully examined, as shown in Figure 33 (p. 184). This step aims to ensure that the values represented in the value scenarios are reflected. For this, values are linked to specific color markings, i.e., tokens provided with the fourth inlay of the *Analysis Kit*, similar to the coding process used in qualitative analysis software. The person conducting the analysis should carefully examine the values, i.e., the value cards and their descriptions. In this step, any values used in the value scenarios are marked with a token (one specific-colored token for each value). The token is placed at the relevant point in the value scenario where a value *appears*. If a value is not considered to be applied meaningfully within a value scenario, it will not be marked with a token. This procedure helps ensure that the analysis remains focused on the participants' relevant values. Once all values have been marked, the person or group conducting the analysis should reflect critically on the results and discuss them so that no important aspects are overlooked. After reviewing the marked values, any adjustments to the token distribution should be made by relocating or removing tokens as needed. Once complete, the analysis proceeds with the next step.

In step B, *applying*, the marked values are thoroughly examined, in other words, their relevance or intended use in a context, as shown in Fig-

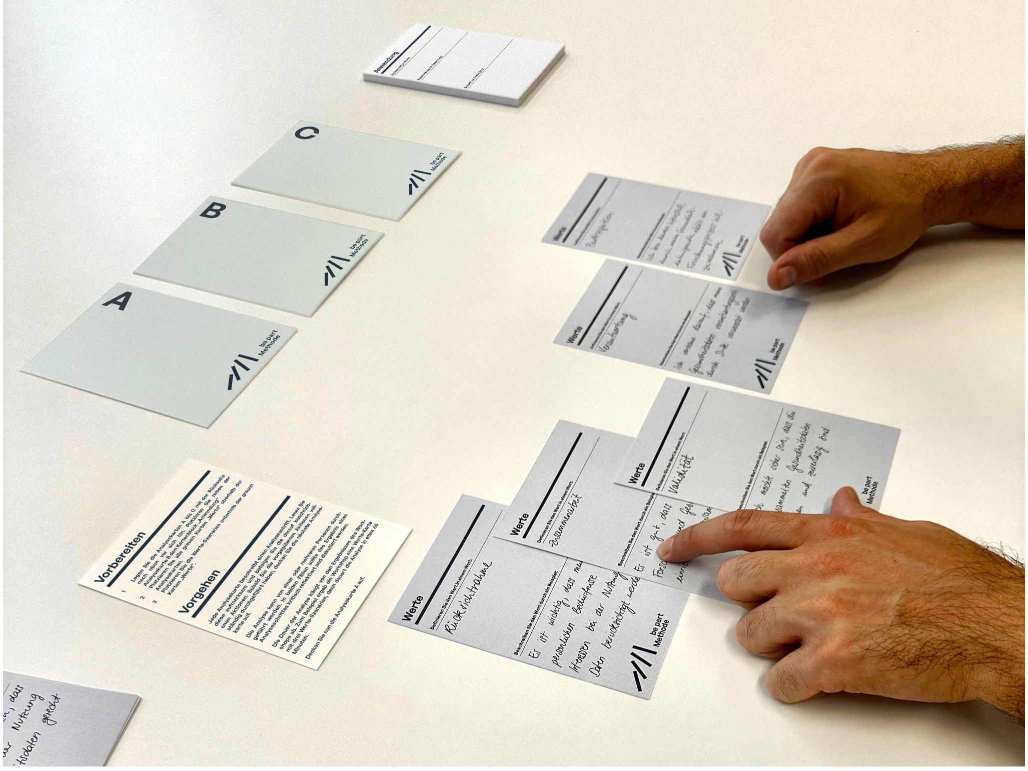


Figure 32: Preparing the analog analysis by placing the analysis cards alphabetically.

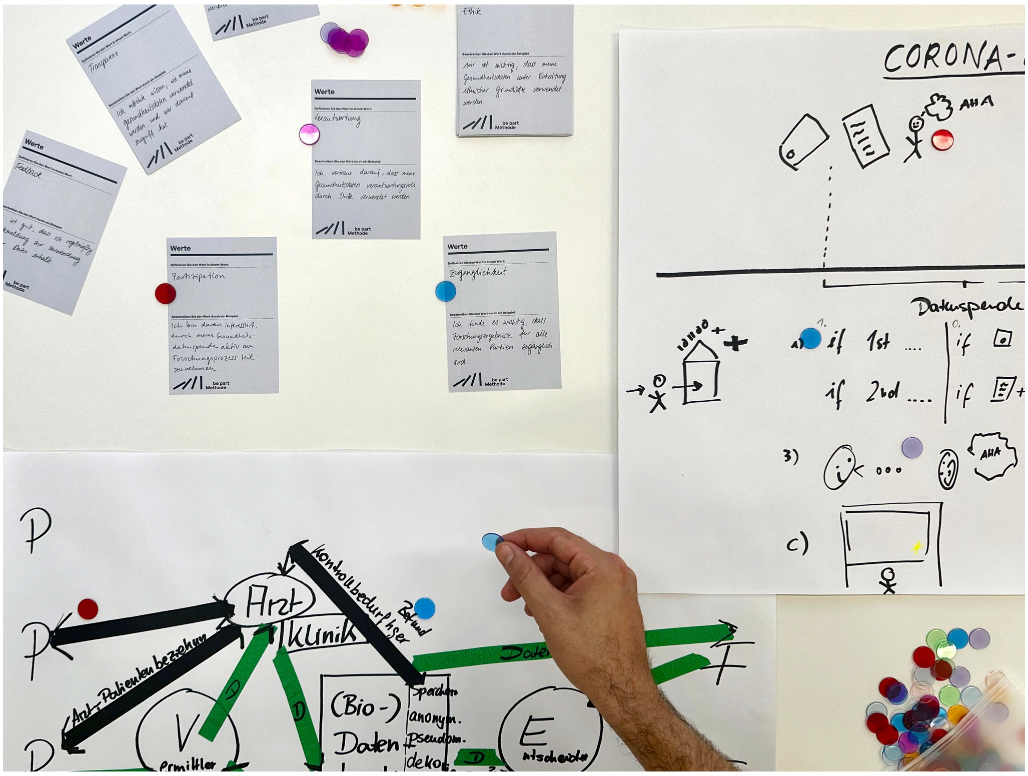


Figure 33: Assigning the value cards to value scenarios using the colored tokens.

ure 34 (p. 186). This step ensures that the analysis results can be applied in design practice. To achieve this, the potential applications of the values in a given context are explored by formulating requirements based on the value conceptions expressed by participants and aligning them with their contextualization of the respective value cards. This step begins with a token color previously used to mark a value. A requirement card is used, and the relevant and marked value, a description, and an example of a related requirement for a context are documented. When documenting, it is possible to merge one or more similar values when they demonstrate comparable participant objectives within a given context. Once all marked values are reported on a requirement card, the analysis proceeds to the next step.

In step C, *sorting*, the resulting requirement cards are sorted by their emergence within a context. First, all requirement cards are laid out and carefully read. Unclear or redundant requirement cards are sorted out, and similar cards are re-evaluated and consolidated into a new requirement card if necessary. The outcome is a refined set of requirement cards that accurately reflect the practical suitability of the values for a context. After the requirement cards are sorted, the person conducting the analysis should reflect on and/or discuss the sorting by comparing the requirement cards with the value scenarios to determine whether the sorting is reasonable, i.e., relevant to the context and has not shifted in focus. Finally, the value cards should be assigned to the corresponding requirement cards representing those values to strengthen their emergence. Once this assignment is completed, the analysis process is finished. As shown in Figure 35 (p. 186), I recommend documenting or storing the final results of this step, as they can be used to present

Figure 34: Reviewing values toward design practice using requirement cards.

Anwendung

Berücksichtigte Werte:
Bildung, Aufklärung, Zusammenarbeit und Partizipation

Beschreibung zur Anwendung:
Bereitstellung umfassender und verständlicher Bildungsressourcen wie Funktionen für den Austausch und aktiven Betiligungsmöglichkeiten, um Menschen in Entscheidungsprozesse einzubinden.

Beispiel zur Anwendung:
Bei der Gesundheitsdatenspende werden licht verständliche Tutorials bereitgestellt, Chat-Funktionen zum Austausch mit Kliniken und Umfragen zu medizinischen Erkenntnissen.

Werte

Definieren Sie den Wert in einem Wort:
Vertrauen

Beschreiben Sie den Wert durch ein Beispiel:
Ich verlasse mich darauf, dass meine persönlichen Daten sicher aufbewahrt werden.

be part Methode

Figure 35: Documenting the results of the analog analysis by storing the final sorting of requirement and value cards, for example, by taking pictures.

outcomes to other project team members and serve as a foundation for design sprints or additional co-creation workshops.

8.3 Key Contributions and Future Directions of the be part Toolkit

As outlined in Chapter 5.4, I identified a specific desideratum regarding value work: the lack of documented, systematic methods within participatory and value-sensitive design approaches for eliciting, evaluating, and integrating values in design processes. Existing approaches, although they have produced a variety of valuable contributions, often remain difficult to apply in subsequent use. This starting point motivated me to develop a method for participatory value elicitation and finally the *be part* toolkit, a resource applicable to design practice. The toolkits' purpose, however, is not to replace existing participatory and value-sensitive approaches but to augment them by translating theoretical discussions of values into more tangible outcomes.

The development of the method for participatory value elicitation (see Chapter 6), and thus the *be part* toolkit as well, draws on VSD and PD, along with other related approaches (see Chapter 5) that, although differing in orientation, similarly emphasize embedding values into design processes. For example, VSD provides a structured framework for conceptual and empirical reflection on values, but has been criticized for methodological deployment and suggesting universal values. PD, on the other hand, foregrounds participation, co-creation, and negotiation, but typically lacks explicit procedures for determining and analyzing values.

The method for participatory value elicitation, and thus the *be part* toolkit, was developed to address these shortcomings by integrating VSD's value focus with PD's core concern, namely, meaningful participation.

As the case studies in Chapter 7 showed, the method for participatory value elicitation can be adapted to different contexts. Expanding the methodical insights of these case studies to the *be part* toolkit, I aimed for a toolkit to be used in different phases of a design process, such as during the ideation phase to identify participants' concerns, needs, and values, and during prototyping to elicit values in different design contexts. The carefully developed toolkit materials, including guides for conducting workshops and accompanying activities, support both facilitators, such as designers, and participants. With these materials, the toolkit creates a space for dialogue and reflection by mediating between theoretical conceptions of values and participants' lived experiences of the same. However, as I learned in the course of this work, participatory value elicitation is not neutral. In other words, facilitators co-construct meaning with participants. Consequently, facilitation should be reflexive, acknowledging the potential for bias. This insight had direct implications for the *be part* toolkit, which I considered to encompass not only procedural guidance but also reflexive elements, such as activity cards that support facilitators and, of course, participants in critically reflecting on values throughout a workshop.

Another critical point concerns the translation of workshop insights into design decisions. Without an analysis procedure, elicited values risk remaining abstract or symbolic. Against this background, I developed an analysis procedure to address this shortcoming. Unlike conventional qualitative research methods, which often rely on coding software, the analog, hands-on analysis of the *be part* toolkit encourages engagement with workshop outcomes through systematic evaluation. When the analysis procedure is used collaboratively, it can enhance team discussions, stimulate critical reflection on current projects, and generate ideas for future design sprints.

Nevertheless, the current version of the *be part* toolkit remains conceptual. The workshops referenced in the case studies occurred before the toolkit's final development; therefore, a systematic empirical comparison between the method for participatory value elicitation and the toolkit itself remains pending. I am thus aware that such a comparison is vital to demonstrate whether and how the toolkit contributes to value work in design practice. The absence of an extended evaluation in this dissertation is a limitation, even though the iterative development process following research through design (RtD) of the toolkit was reflexive and took place in real-world contexts. While this might represent a weakness of the *be part* toolkit, it simultaneously prompted me to consider how its future application could be supported.

At this point, the *be part* toolkit, which I further developed after completing my dissertation, as shown in Figure 36 (p. 190), can be understood as an exploratory design probe (Gaver et al., 1999).[32] Based on the idea of a design probe, the toolkit is structured in two parts, namely the *Workshop Kit* (see Figure 37, p. 190) and *Analysis Kit* (see Figure 38, p. 191).

In my view, designers can treat the next iteration of the *be part* toolkit as a living artifact and iteratively use its materials, prompts, and analysis methods across different domains, cultural contexts, or organizational

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[32] The be part toolkit-boxes, which include assembly files, are available as open-source. These files can be accessed via a wiki on OSF. The files are licensed under the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0), permitting sharing and adaptation with proper attribution, provided that derivative works are licensed under the same terms.

Figure 36: The next iteration of the be part toolkit, structured into two complementary components: the Workshop Kit and the Analysis Kit.

Figure 37: The Workshop Kit contains the activity cards and supporting materials for workshop facilitation, including facilitator guides and prompt cards.

Figure 38: The Analysis Kit provides all materials required for hands-on analysis, including instruction cards, tokens, and requirement cards.

settings. In professional teams, for example, the toolkit can catalyze collective reflection, helping to establish shared mindsets and negotiation practices regarding values before concrete design decisions are made. Designers could first conduct small exploratory sessions with the *Workshop Kit* to collect initial values, and then use the *Analysis Kit* within the team to map connections, conflicts, and gaps among values. Beyond this internal reflection, the analysis could also involve participants or users as co-analysts to collaboratively generate insights. The *be part* toolkit thus serves as a medium for co-experimentation, not only for value elicitation, but also for enabling designers to test how different interpretations of values are expressed in concrete design concepts. In educational contexts, *Workshop Kit* and *Analysis Kit* can help design students develop critical sensitivity to value tensions and ethical questions of people affected in their design projects. Students could use these insights to prototype value-oriented interventions and evaluate trade-offs through values, thereby refining their designs iteratively. This exploratory framing augments the method for participatory value elicitation into a toolkit for learning, experimentation, and co-creation, enabling designers to examine the interplay between values and design decisions.

With the *be part* toolkit, situated between values and participation, I aim to create a space in which values can be discussed and acted upon. From a critical perspective, the strength of the toolkit lies precisely in its openness. To recall, it can make implicit, everyday values visible and discussable that might otherwise be overlooked. Although validation of the toolkit falls beyond the scope of this dissertation, I demonstrated in two contexts that participatory value elicitation provided insights that I have incorporated into the *be part* toolkit. The foundations for integrating value-oriented methods using the *be part* toolkit into design practice are thus laid; it is now up to designers, researchers, and other practitioners to adopt the toolkit, expand their practices, and actively incorporate values through participatory processes.

In summary, the *be part* toolkit should not be understood as a finished solution; however, it reflects my efforts to systematize participatory value work with contextual sensitivity. I thus argue that the future of *be part* depends on its continuous iteration and application across diverse contexts, including educational, professional, and research environments, where its strengths, weaknesses, and potential can continue to be tested, questioned, and expanded. Only through critical engagement can the toolkit evolve from a conceptual contribution to a mature resource in design practice. I hope the *be part* toolkit will inspire designers to integrate value elicitation and analysis into their practice, and that its use will extend beyond design to influence other disciplines.

Building on these contributions, I extend the reflections of my work in the following discussion.

9
Discussion

My research journey for this dissertation has been both challenging and rewarding, revealing the potential of research through design (RtD) to advance design practice through a value-sensitive lens. By exploring value sensitive design (VSD) and participatory design (PD) enhanced through value-led PD and related approaches, I sought to contribute to these fields by developing a method for participatory value elicitation. This method was applied in two contexts to uncover values and illustrate the importance of engaging with values in design practice. In reflection, I consolidated the insights gained throughout this process into the *be part* toolkit.

My ambition is not to overhaul the entire design process but to offer new methodological prospects through the *be part* toolkit, which designers can adopt seamlessly and without barriers in their practice. However, I encountered great resonance and interest in my work. For example, I had the opportunity to introduce my work to design students in the lecture series “Mitgestalten” at the Burg Giebichenstein University of Art and Design Halle. Based on this and other experiences I gathered while conducting this work, I critically reflect on the RtD process deployed in Chapter 9.1 and discuss challenges encountered in facilitating participation and working with values in Chapter 9.2.

9.1 Reflecting on Research through Design

In Chapter 3, I detailed how RtD is situated within the research and design practice. To recall, Frayling (1993) described the evolution of RtD as we know it today and how it is recognized as a legitimate approach to research (Redström, 2021; Zimmerman et al., 2007). Initially, RtD considers an artifact (e.g., an object or technology) the primary research subject, explored through an iterative inquiry process, thereby constituting a significant contribution to RtD. Over the years, however, RtD has evolved, with Gaver (2012) asserting that new forms such as methods and their careful documentation also count as contributions.

To reflect on my work’s contribution to RtD, I draw on the four criteria proposed by Zimmerman et al. (2007): *process*, *invention*, *relevance*, and *extensibility*. Each of the four criteria is introduced with a guiding question and a brief description of its objective, which I use to contemplate my efforts in this work.

Process

The criterion *process* defines the level of detail and reasoning behind an RtD work by asking:

> *How thoroughly is the process of work documented, including the methods used and their specificity, and how well-founded is the reasoning for choosing these methods?*

In RtD, a work should document each step carefully to explain how approaches, methods, or ways of acting fit together and why they were chosen. This documentation helps others follow the process, understand its rationale, and potentially replicate it. The focus should be on demonstrating how RtD was implemented by outlining how data were collected and analyzed throughout the process, thereby enabling others to follow these steps if necessary.

Breaking this down, I employed a four-stage approach, as shown in Figure 3 (p. 27), namely *defining*, *developing*, *investigating*, and *refining*. This structure helped me progress from one stage to the next while maintaining focus, namely, by developing a method for participatory value elicitation suitable for design practice. Below, I critically reflect on the stages and how the decisions made in each stage shaped my work.

The first stage, *defining*, required me to dive into the research areas of PD, VSD, and value-led PD, as well as related approaches. I needed a solid theoretical foundation to understand how participatory methods could bring out people's values. In Chapter 5, I engaged with this issue and focused on how VSD methods could genuinely address and amplify values. I also critically examined how participatory activities can create, evaluate, and validate interventions to elicit values. Based on this, I researched and discussed how PD can help better understand individual values. However, I grappled with how participation is sometimes diluted in practice. For example, participation is often reduced to mere interviews, which may not align with PD, thus limiting genuine collaboration. This situation not only undermines the depth of people's engagement but also risks overlooking critical insights. *True* PD requires active involvement, with participants contributing meaningfully beyond passive responses, shaping design outcomes through shared decision-making and creative exploration. This led me to focus on value-led PD that preserves the integrity of people's values, ensuring that design practice does not simply impose the values of the designer or the project, but those of the people who participate in and guide design processes through their values. This theoretical grounding provided me with a better understanding of the interplay among values, participation, and design practice. It shaped my approach to participatory value elicitation by emphasizing reflexivity in design. These considerations directly informed the development of my method, ensuring it aligned with the principles of VSD, PD, and value-led PD.

The second stage, *developing*, shifted from theory to practice. My goal was to translate the insights I had gained into an actionable method for participatory value elicitation, which I described in Chapter 6. I designed a workshop concept to guide participants in articulating their values and developed a procedure to analyze the values they provided. To test the method, I ran a pilot study. Although the method development was concise, I identified during this stage that some descriptions of workshop activities required improvement. For example, I understood that clarity in the activity descriptions was necessary. Still, I had to leave room for participants' creative expression. I realized that the way activities, such as the value map or value scenario, were presented affected how participants approached them. I therefore had to find ways to help participants feel more confident, especially when discussing sensitive topics such as health data donation. This also led me to implement methodological adjustments to minimize the risk of facilitator bias during a workshop. This stage marked a key shift from theoretical concepts to a practical, structured method. The pilot study enabled me to reflect on how to conduct participatory value elicitation. These insights shaped how I adapted the method in the subsequent stage, *investigating*, ensuring it would be flexible in use across different contexts and with diverse participant groups.

In the third stage, *investigating*, I deployed the method in two real-world contexts. As outlined in Chapter 7, I conducted six workshops on the donation of health and mobility data. Also, I showed that the two-step analysis could yield value-sensitive suggestions that inform both contexts. The workshop activities, like the value map, helped participants articulate abstract or deeply personal values and make sense of value relationships. The value scenarios prompted consideration of how values can be embedded in real-world contexts. This stage validated the method, showing that it could generate actionable insights. It nonetheless pointed out areas where I needed to refine the method to make it more practical for design. I mainly recognized the need for analysis that bridges the gap between value discussions and design resolutions, which became a central consideration for the final stage. By reflecting on these insights, I proceeded to the final stage, in which I focused on making the method more adaptable for designers in practice.

The final stage, *refining*, culminated the previous stages into the *be part* toolkit, which I described in Chapter 8. The toolkit facilitates the integration of participatory value elicitation into the design process and can be adapted across various design phases. It also provides a streamlined analysis procedure that designers can utilize to examine and use workshop outcomes. The toolkit blends qualitative research methods with intuitive workflows, helping designers make sense of abstract insights and turn them into actionable requirements. By synthesizing the lessons from earlier stages, I created a toolkit that bridges the gap between value elicitation and the practical demands of design practice. Hence, I paid close attention to making the toolkit engaging for designers.

Overall, my work demonstrates a strong commitment to RtD by engaging deeply with the RtD process itself and thoughtfully documenting each stage. I have carefully detailed my actions across the four stages, enabling others to follow and adapt my approach to their own purposes. This process also involved ongoing reflection on my role as a designer and researcher, and I maintained a critical awareness of how my perspective influenced the design process. This self-awareness helped refine the method for participatory value elicitation through continuous engagement and thoughtful consideration. I carefully articulated how I prioritized concepts, approaches, and methods from VSD, PD, and value-led PD, as well as related approaches. By critically reflecting on these foundations concerning design practice, I established the rationale for my RtD-based work. Regarding the latter, my considerations of reflexivity have deepened the process, highlighting how my insights have shaped the method's development. In doing so, I provided clear descriptions of how I implemented and synthesized my knowledge, making it more transparent how my work contributes to design practice.

Intervention

The criterion *invention* defines the novelty of work about existing research, addressing the question:

> *How does a work demonstrate significant innovation through the new integration of various fields to support a specific situation?*

A work should highlight how different disciplines have been integrated in a novel way that has not been explored before. To demonstrate its progress, a work should be situated through a literature review, for example. This review should reference existing theories and clearly outline how the current state of research can be improved by providing empirical evidence, such as through qualitative studies.

The invention of my work, which embraces VSD, PD, and value-led PD, was already implicitly evident from the criterion *process*. However, I note that I have not created a new field; instead, I acknowledge the decades-long efforts to develop and refine the concepts and theories of PD, VSD, and value-led PD in my work. These three research areas have brought valuable directions to create discourse by letting people partake who are affected by decisions of a context. I outlined that VSD offers a variety of methods for determining values within the design process. These methods include, for example, *value source analysis*, *stakeholder analysis*, *value scenarios*, and *value-oriented coding manuals*, which are explained in *Methodology of Value Sensitive Design* (p. 38). PD encompasses activities, such as observations and workshops, to explore individuals' experiences, life situations, and concerns, thereby capturing their implicit knowledge, as discussed in *Facets of Participation* (p. 50). Value-led PD and experience-centered design focus on reflexive dialogues between designers and participants, as discussed in *Engaging in the Voice of People* (p. 60). Despite the plethora of research in these three areas, I did not find guidance on adapting a specific methodological approach for eliciting and analyzing values. Instead, I had to deduce it from many theories, concepts, and methods.

I therefore see a significant challenge for all designers who want to engage in participation and value elicitation in design processes but do not want to stray from their design practice into intensive research. Accordingly, I observe a novelty in my work: the unification of research methods within the *be part* toolkit. Specifically, I offered a thoroughly documented method for participatory value elicitation and analysis, enabling designers to apply it across different design situations without delving deeply into the research literature.

Furthermore, I believe that integrating existing research to support designers' design processes should not be discouraged by extensive engagement with qualitative research methods. For example, while examining the methodological work of design students, as discussed in Chapter 2, I discovered that the students appreciated the effort to understand what people, i.e., users of an imagined design, genuinely want. Achieving this is often challenging in design processes due to limited user contact or reliance on methods such as personas, especially in short-term design projects. To move beyond these design methods and help designers gain a deeper understanding of the people they design for, I aimed to make the method for participatory value elicitation tangible to designers through the *be part* toolkit.

Relevance

The criterion *relevance* combines the motivation and application of work in the real world under the question:

> *How well does a work articulate a current situation or design problem and the significance of this preferred state that could be considered valuable for the community?*

Here, it is crucial to investigate how a work transitions from validating what is true to establishing what is relevant regarding its impact. For example, contexts can illustrate the benefits or relevance that can emerge from a given work.

I clarified the transition from investigating the validity of my work to its relevance to design practice by applying the method for participatory value elicitation in two contexts: health and mobility data donation. To recall, in the first context on health data donation, as outlined in Chapter 7.1, the aim was to design the sharing of health data through user interfaces that account for patients' values and needs, thereby enabling them to make an informed and reflective consent when donating their data. Considering patients' values offers a promising perspective for rethinking consent procedures and developing novel data donation processes in the medical context. The second context regarding mobility data donation, outlined in Chapter 7.2, focused on how citizens provide mobility data by donating sensitive information for research projects, such as citizen science initiatives. This practice can conflict with citizens' values regarding data protection, raising concerns about data practices and underscoring the importance of incorporating citizens' perspectives.

Both contexts prioritized the exploration and disclosure of people's values affected by these contexts and recognized them as essential premises for design practice. Based on these two contexts, I demonstrated that the method for participatory value elicitation can serve as a blueprint for various endeavors. Furthermore, my analysis of the empirical data showed that the method could yield value-sensitive suggestions. These suggestions, which serve as requirements or resolutions, can inform the design of socially responsible technologies and underscore the benefits of integrating participatory value elicitation into design processes.

To further support this relevance, in late 2022, I responded to a request from patient representatives who participated in the first workshop on health data donation. They expressed interest in promoting the method as a promising approach to empower marginalized and vulnerable patients in their communities. As a result, an article was first published in the magazine of PRO RETINA[33], a self-help association that supports individuals with retinal degeneration caused by the gradual loss of retinal cells. A second article was published in the magazine of the Bundesverband Angeborene Gefäßfehlbildungen e.V.[34], an organization dedicated to assisting people with congenital vascular defects, which can lead to symptoms such as pain, swelling, skin discoloration, and potentially severe complications like organ damage.

Moreover, participating in the conference “Mensch und Computer 2023 – Building Bridges” enabled me to present my work as a short paper Sörries et al. (2023a) and a workshop paper Sörries et al. (2023b). This experience led to a collaboration between the Human-Centered Computing Research Group of the Freie Universität Berlin and the independent,

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[33] https://www.pro-retina.de/

[34] https://www.angiodysplasie.de/

internationally recognized research center Roessingh Research and Development (RRD)[35] in Twente, which focuses on patient-centered technologies for rehabilitation and telemedicine. This opportunity to engage with experts in the field was valuable to my efforts, as it allowed me to discuss my work and gain insights from a more practical perspective.

Also, I had the chance to present and reflect on the method for participatory value elicitation with experts from various fields, such as business, politics, research, and civil society, at several key events, such as the congress of the Plattform Privatheit on the topic of "Data Sharing – Datenkapitalismus by Default"[36]; the "Privacy & Mobility 2023 Symposium"[37] at the Technologiestiftung Berlin; or an invitation to the closing conference of the research project "FAIRDIENSTE – Faire digitale Dienste: Ko-Valuation in der Gestaltung datenökonomischer Geschäftsmodelle"[38].

Extensibility

The final criterion, *extensibility*, captures building upon the results of work following the questions:

> *How does a work describe the possibility of building on its results by applying a process to future design problems?*

Therefore, a work should be organized so that designers can use it for their projects and adapt it, for example, through structured design templates and detailed instructions that allow them to adopt the work's methods to investigate a given context.

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[35] https://www.rrd.nl/en/

[36] https://plattform-privatheit.de/

[37] https://www.technologiestiftung-berlin.de/profil/blog/privacy-mobility-2023-freemove

[38] https://www.uni-kassel.de/forschung/iteg/forschung/fairdienste

Beyond the comprehensive documentation of the method for participatory value elicitation, which I have detailed throughout this work, I assume that conducting the workshop is not a challenge for designers. Emerging from my stance and experience, designers possess qualities that manifest, for example, in the openness to organizing and facilitating participatory activities and engaging with people. However, I argue that designers might face challenges in analyzing empirically collected data. In other words, designers may reject the adoption of qualitative research methods, including coding software. Therefore, with respect to adaptation, I found significant value in developing and providing the *Analysis Kit*, as described in Chapter 8.2. This kit offers a systematic methodology for conducting workshops and analyzing empirical data, while acknowledging and supporting designers' expertise.

Although the development of the *be part* toolkit occurred after the method exploration discussed in Chapter 7 was completed, researchers and practitioners showed interest in adapting the method for participatory value elicitation, indicating its extensibility. For example, in the research project "FAIRDIENSTE – Faire digitale Dienste: Ko-Valuation in der Gestaltung datenökonomischer Geschäftsmodelle," the method was also applied in the context of online journalism to derive stakeholder values, including those from law, design, and journalism. In this project, Draude et al. (2024) assumed that business models in the data economy operate within an interdependent ecosystem in which seemingly conflicting values might coexist. They argued that if these values are not considered in digital services to which business models belong, such services may result in deceptive designs[39] that nudge users toward unintended

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[39] Deceptive design, better known as "dark patterns," originated in 2010 by Harry Brignull, are, for

decisions. Referring to Horn et al. (2022), the project members emphasized that digital business models should be designed to identify and reflect the values of all stakeholders within socio-technical systems that emphasize and support the interaction between social (e.g., people, culture, organizations) and technical (e.g., tools, technologies, processes) components. To incorporate values acceptable to their stakeholder groups and empower them to participate in value-sensitive business models, Draude et al. (2024) adopted a participatory approach to system design. To realize this approach, they adapted my workshop concept on participatory value elicitation. Specifically, they developed a two-part workshop concept (Engert et al., 2023), in which the first part involved an in-depth exploration of values inspired by the phases *explore*, *contextualize*, and *translate*; the second part aimed at the concrete development of novel business models. First, the participating stakeholders prioritized their values in the first workshop part, then translated them into a business model to address customer values and needs. Second, the business models were critically examined with respect to their purpose as revenue models[40], a key component of business models. Draude et al. (2024) highlighted that a value-sensitive approach could be used both to discuss a current business model within a company, on the one hand, and, on the other, to reveal the relationships among categories of data in business models (e.g., time, use, or products) that can have a significant impact on a models' development and design.

Beyond this, I was invited to conduct a workshop on value elicitation

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example, elements of a user interface that deliberately deceive users into manipulating their ability to act (Brignull et al., 2023).

[40] A revenue model is a framework that defines how a business generates income by identifying its revenue sources, pricing strategies, and value proposition to customers.

at the “INFORMATIK 2023 – Designing Futures” conference organized by the Gesellschaft für Informatik e.V. during the session titled “Zukunftswerkstatt Informatik & Gesellschaft”[41]. This exciting opportunity represented the first deployment of my method beyond data donation, specifically nuclear waste disposal. Interestingly, the workshop did not focus on deriving value-sensitive suggestions, such as actionable requirements, for nuclear waste management. Instead, the aim was to raise participants’ awareness through a lively, inspiring discussion of their values regarding information processes for identifying nuclear repository sites, especially for residents in sparsely populated regions of Germany. The participants critically reflected on the opportunities and challenges of implementing information processes that necessitate resident participation. Participants developed a variety of value scenarios, including participation spaces that could be utilized in online, offline, and hybrid formats, as shown in Figure 39 and Figure 40 (p. 208). A crucial element of these spaces was the role of information mediators among stakeholders, such as community members and politicians, who enabled residents to vote directly on the issues at hand. The discussion highlighted that current participatory approaches to information and decision-making about nuclear waste disposal tend to function more as venues for exchange than avenues for political co-determination. For instance, participants reflected on future public narratives that could foster genuine participation of residents affected by nuclear waste disposal, as well as the broader public, to educate them about impending political or infrastructural changes.

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[41] https://informatik2023.gi.de/

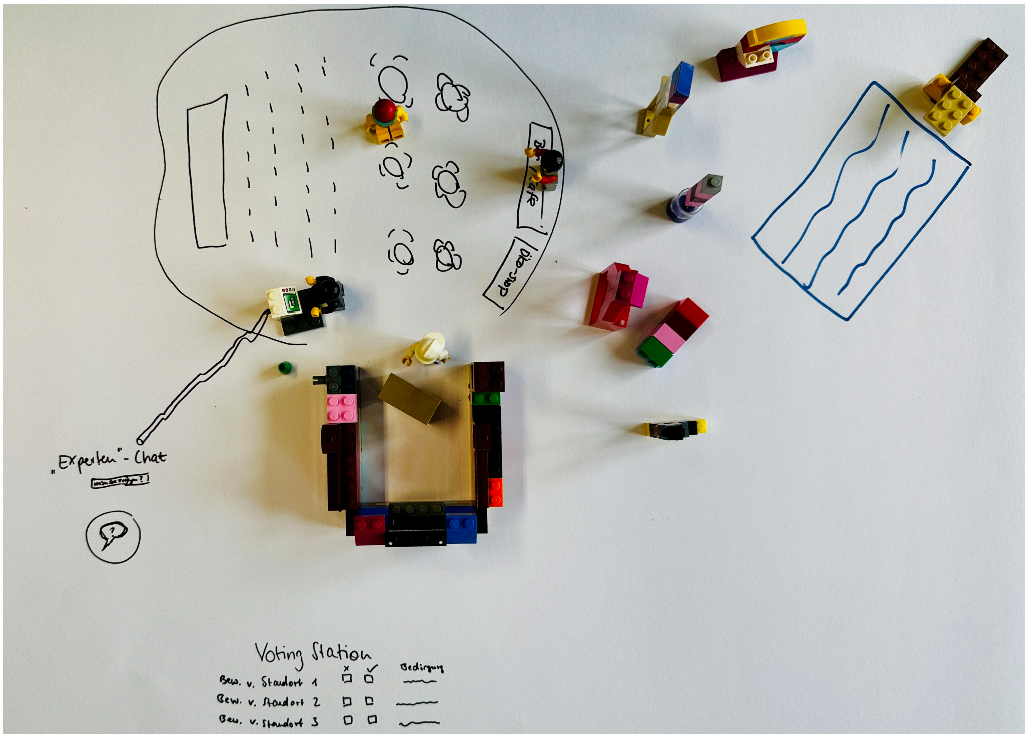

Figure 39: Exemplary value scenario of the Zukunftswerkstatt that envisions participation for residents in sparsely populated regions by combining online, offline, and hybrid solutions.

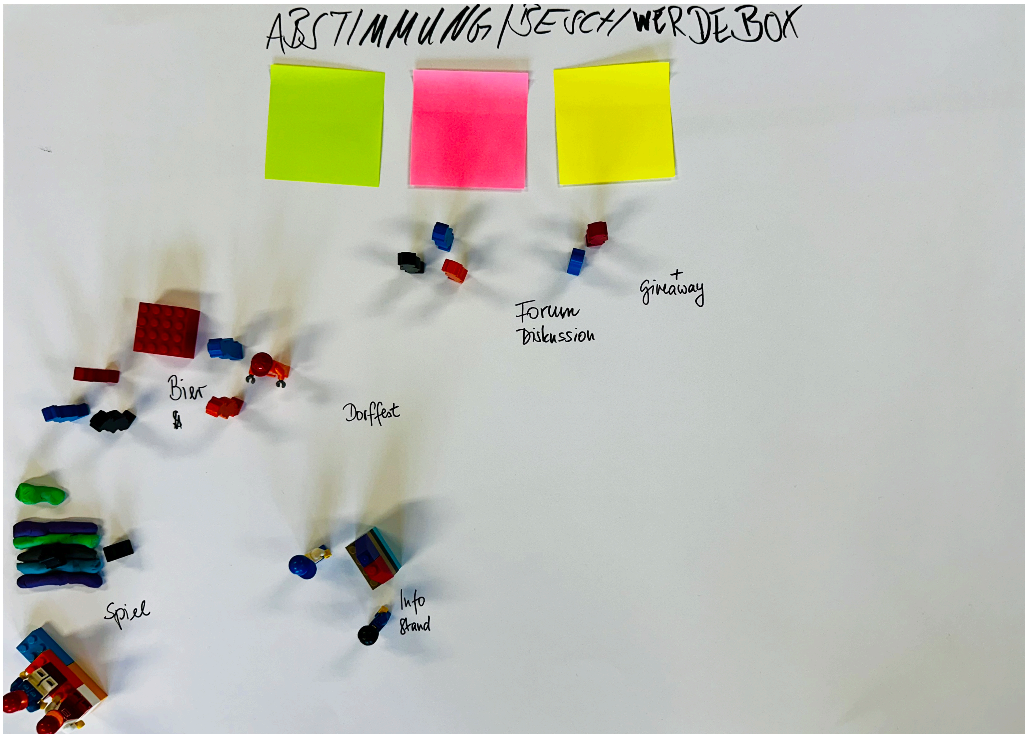

Figure 40: Exemplary value scenario of the Zukunftswerkstatt that depicts information mediators facilitating communication between, for example, residents, community members, and politicians, also allowing residents to vote directly on relevant issues.

In summary, my four-stage RtD process, including *defining*, *developing*, *investigating*, and *refining*, helped me to gain a deeper understanding of VSD, PD, and value-led PD. I began by developing a strong theoretical foundation for incorporating people's values into the design process. I translated these insights into a method that demonstrates the importance of making participatory activities engaging for participants. When I investigated the method in real-world contexts, I recognized its feasibility and identified areas for improvement. Pulling together experiences and insights, I designed the *be part* toolkit to augment designers' practice. Throughout this process, I carefully documented each step and justified my choices at each stage. This reflexivity at the core of RtD enabled me to closely examine how my perspective shaped the process, thereby contributing to RtD and design practice at the intersection of research and design.

9.2 Challenges in Facilitating Participation and Working with Values

This work has significantly shaped my perspective as a designer and researcher. It enabled me to anticipate how to see and understand the world from people's perspectives across different contexts, as presented in Chapter 7. Investigating these contexts led me to conclude that design should be approached more thoughtfully and responsibly by actively involving those affected by a specific situation.

Although the method for participatory value elicitation provides guidance for value elicitation, I argue that critical considerations are needed regarding how participation can become a meaningful part of design practice. Overall, the method promotes democratic processes without diluting the concept of participation or exhausting designers' resources. Regarding the latter, there is a need to address uncertainties about how participation can be created and facilitated, so that this knowledge can be seamlessly integrated into design practice or even design education. In doing so, I believe that designers can responsibly create and approach desirable futures. However, this may be possible only if the people we design for participate in designers' endeavors. But can this succeed in the future?

Arising from their research on future workshops, Jungk & Müllert (1997) noted that people are the last link in co-determining decisions. Whether technical or economic, the outcome is determined by selected protagonists, such as researchers, designers, or decision-makers, who may seek to reflect people's values and needs but do not do so comprehensively. People, therefore, should join and contribute to (design) processes from the beginning—that is, participation.

I pursued a similar mindset in both contexts, as described in Chapter 7. Both contexts highlighted areas for improvement from a human-centered perspective. However, such a human-centered approach requires revitalizing democracy (Jungk & Müllert, 1997). In other words, protagonists who want to promote participatory structures must encourage people to co-determine the future. I encountered similar challenges, particularly in the first context, with patients in clinical care at a psychosomatic clinic (see Chapter 7.1), who exhibited a less proactive attitude than citizens in the second context (see Chapter 7.2). Often, such vulnerable or marginalized groups, like patients with physical or mental disabilities, are underestimated in their capacities or contributions to explicate opinions and articulate viewpoints. In this regard, Jungk & Müllert (1997) referred to people who are supposedly put in a drawer because their level of education or foresight is considered insufficient, and their concerns are inadequately expressed. They nevertheless argued that supporting these individuals in their participation and in thoughtfully bearing their life experiences should be made possible.

I understood the importance of taking participants seriously, as they shared valuable and personal insights into their life experiences with me in both contexts. There were moments in all workshops when I had to respond to unforeseen situations. For example, one participant spoke limited or broken German and felt nearly excluded from the workshop, thinking they had little to contribute. Another participant frequently interrupted the activities to share personal backgrounds and thoughts. Although their participation disrupted my carefully planned workshop agenda, it reminded and compelled me to create opportunities for them to be heard.

These insights helped me better understand the concept of facilitation. As defined by Oxford Learner's Dictionaries (2024), the term "facilitate" involves more than just moderating participatory activities; it means "to make an action or a process possible or easier." I view a facilitator as a reliable and committed companion who supports participants in articulating their (often unspoken or implicit) goals, needs, and concerns without imposing personal opinions or perspectives.

The latter justifies facilitation as a necessary and responsible means of democratic decision-making, particularly in asymmetrical stakeholder relationships, such as those between patients and physicians or between patients and medical researchers. Asymmetries likely arise from individuals' difficulty communicating effectively, stemming from language barriers, differences in social status, or gaps in professional or institutional knowledge, thereby diminishing their ability to influence a situation. Such asymmetries in dialogical encounters may be disempowering for weaker or less verbally assertive people at a given time (Dahl & Svanæs, 2020), thereby contradicting PD principles intended to uphold democracy (Schuler & Namioka, 1993).

Based on my work, I assume a facilitator's neutrality or objectivity can be uncertain and sometimes challenging to maintain. For example, even if a facilitator is mindful of fully engaging with participants' perspectives, their expertise or manner may still influence and potentially restrict participant behavior during discussions. Thus, it is critical to consider the facilitator's approach to engagement and the degree of authority they hold over participant involvement. I encountered similar challenges, especially during the pilot study (see Chapter 6.3), where I tested the workshop concept for value elicitation. For example, I confused and limited participants by sharing my perspective on how to perform an activity correctly, focusing on what I considered right or good. I often intervened during activities and even proposed solutions, which led me to appear as if I were influencing them. This undermined participants' autonomy in carrying out activities based on their own interpretations and understanding. Reflecting on these experiences, I found it essential to consolidate my insights for designers, particularly those with limited or no experience in facilitating participatory activities. Hence, my intention in this work is to help them learn from my mistakes by offering guidance that underscores the importance of self-reflection in facilitation.

Dahl & Svanæs (2020) emphasized that self-reflection enables facilitators to be aware of both implicit and explicit actions and ethical responsibilities that may unintentionally affect participants in ways that are not immediately visible, potentially harming participation. Adopting a self-reflective stance involves continually subjecting facilitators' practices in PD activities to rigorous, critical evaluation, ensuring that their oversights do not affect participation. In a subsequent article, Dahl & Sharma (2022) summarized their earlier insights, emphasizing the facilitator's role as an inquirer into participants' values, including the identification and filtering of conflicts among them.

Regarding facilitation and promoting participation, I am aware that, in reflection, my work reveals a certain tension. While the practical implementation and facilitation of the participatory workshops produced tangible, context-sensitive insights, the methodological focus remained essentially pragmatic and, in some respects, uncritical of the conceptual foundations of participation itself. A more thorough engagement with how participation and values were determined within the workshops could have uncovered blind spots. For example, who was actually empowered by the method I proposed to determine relevant values, and whose voices remained unheard despite my participatory measures. Despite the intensive engagement with the theoretical foundations of PD, which emphasize the democratic potential of participation and its meaningful implementation, I argue that there remains a risk of underestimating structural constraints, such as power asymmetries between facilitators and participants, institutional barriers to access, or the limited scalability of the developed method and the *be part* toolkit. For my future work, I consider these aspects valuable as they call for a more explicit recognition of PD, particularly when it encounters organizational, temporal, or cultural barriers within a specific context. I therefore see possibilities for addressing this by deepening the theoretical foundation, for example, by engaging more closely with ongoing debates on research ethics and the politics of knowledge production within future contexts of my research. A more critical engagement with these discourses, I believe, would equip me with and strengthen my understanding of participation as a socio-political practice and, at the same time, reinforce the argument for reflective facilitation as an ethically demanding stance, rather than merely a procedural skill enabled through a methodologically guided approach.

In retrospect, I argue that the first step toward promoting participation may appear demanding. Yet it remains meaningful at both the individual and societal levels because participatory and value-sensitive practices, regardless of the number of participants or the political and organizational hurdles they face, can yield value for design practice and beyond.

10

Design Practice Toward a Value-Sensitive Future

Inspired by my design, research, and teaching background, I developed a deep curiosity about blending values into design practice. To me, this dissertation has been a journey throughout nearly the last five years of introspection, unraveling and combining the unique contributions design practice and research methods can offer one another, on the one hand, and, on the other, to carefully reflect on both disciplines in their respective uniqueness and ensure that the rigor of my work was met. I was confronted with varying demands across design studies, human-computer interaction, and design practice, which sometimes made it challenging to balance these viewpoints and address their respective demands in my work.

Reflecting on these perspectives led me to adopt a research-through-design process to engage with this triad in a meaningful way. By employing this process, I engaged in value sensitive design and participatory design, expanded by approaches on value-led participation. I identified a critical gap: Despite the availability of numerous methods, there is a notable lack of systematic, participatory inquiry for eliciting and analyzing values, particularly in design practice. These explorations led to the dissertation's primary contribution: the *be part* toolkit.

Designers often excel at dynamically prototyping, iterating, and evolving ideas and visions through creativity and hands-on exploration. However, the design process can reach new heights when research methods are incorporated, and real people are actively involved. By using the *be part* toolkit, I emphasize that incorporating people's values and needs can enrich design processes, resulting in artifacts that serve their intended users. By adopting this mindset, designers can more meaningfully engage with and address the social, cultural, and ethical implications of their work. Furthermore, this mindset is not confined to design practice; it applies to any domain in which individuals' values are at play. In this regard, Frauenberger et al. (2015, p. 94) insightfully stated: "[...] a 'tool-to-think with' [...] guides designers, researchers and practitioners in incorporating phases of critical reflection with the goal of giving them the means to reify the rigour inherent in their practice."

My efforts to augment designers' skill sets may help them advance their profession and remain attuned to the broader societal impact of their work. The future of design is not only about what we create but also how we create things thoughtfully and with deep respect for the values that shape our shared world.

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A.1 Facilitator Information

be part
Methode

Facilitator-Leitfaden

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Methode

Willkommen
zum Workshop

Um Werte systematisch offenzulegen, haben wir einen vierstufigen partizipativen Workshop entwickelt. Dieser Leitfaden beschreibt die Schritte, einschließlich einer Beschreibung, der Dauer und der benötigten Materialien zur erfolgreichen Durchführung des Workshops. Bereiten Sie zunächst alle benötigten Materialien vor, darunter die Einwilligungserklärung, Workshop-Flyer, Werte-Fragebogen, Aktivitätskarten und Aufforderungskarten zur Szenariengestaltung. Halten Sie zusätzlich Klebezettel, großformatiges Papier sowie Schreib- und Zeichenmaterialien bereit. Folgen Sie nun den Schritten des Leitfadens.

Aktivität	Ziel / Ergebnis	Material	Wer	Dauer
Eintreffen	Begrüßung der Teilnehmden		Workshop-Leitende	10 min
	Vorgehen Vorstellung der Workshop-Leitenden, der Räumlichkeiten in denen der Workshop durchgeführt wird und des Workshop-Kontexts			
Einführung in den Workshop	Erklärung und Aufklärung des Ziel und Zwecks des Workshops	Einverständniserklärung, Workshop-Flyer	Workshop-Leitende	10 min
	Vorgehen Erläuterung der Einwilligungserklärung und Vermittlung der Forschungsethik. Teilnehmende werden mit der Einverständniserklärung vertraut machen (alle gesammelten Daten anonymisiert und mit Sorgfalt behandelt werden, Erläuterungen zur Auswertung der Daten, Verwendung von Fotos für Veröffentlichungen).			

Teil 1: Werte-Exploration

Aktivität	Ziel / Ergebnis	Material	Wer	Dauer
Schritt 1	— Explorieren persönlicher Werte angesichts des Workshop-Kontext — Individuelle Werte-Übersicht	Grauen Karten (Werte)	Teilnehmende (einzeln)	5 min
	Vorgehen Teilnehmende notieren alle Werte auf gelbe Karten, von denen sie annehmen, dass sie aus ihrer Sicht mit Bezug auf dem Workshop-Kontext wichtig sind.			
Schritt 2	— Konkretisierung des wichtigsten Wertes anhand des Werte-Fragebogen — Definition des wichtigsten Wertes	Werte-Fragebogen	Teilnehmende (einzeln)	10 min
	Vorgehen Teilnehmende wählen einen Wert auf ihren gelben Karten aus, der aus ihrer Sicht besonders wichtig ist. Teilnehmende notieren diesen Wert wiederum auf dem Werte-Fragebogen und beantworten diesen.			
Schritt 3	— Präsentation des Werte-Fragebogens — Diskussion über Werte-Fragebögen innerhalb der Workshopgruppe		Teilnehmende (einzeln)	15 min
	Vorgehen Teilnehmende haben je eine Minute Zeit ihre Werte-Fragebögen vorzustellen. Frage an die Teilnehmenden: Können Sie Gemeinsamkeiten oder abweichende Verständnisse ihrer Werte feststellen?			

Teil 2: Werte-Karte

Aktivität	Ziel / Ergebnis	Material	Wer	Dauer
Schritt 4	Die gesammelten Werte aus Schritt 1 werden aus Sicht der Teilnehmenden gemeinsam zusammengeführt. Kontextualisierte Werte-Karte, die die Werte angesichts von Interessengruppen sowie deren möglichen Beziehungen oder Spannungen zwischen diesen aufzeigt.	— Ausgefüllte graue Karten (Werte) — Grüne Karten (Interessengruppen) — Gelbe Karten (Konflikt) — Klebeband oder Stift, um Verbindungen zwischen Interessengruppen (d.h. Beziehungen und Werte-Konflikte aufzuzeigen)	Alle Teilnehmende	5 min
	Vorgehen Die Erstellung der Wert-Karte erfolgt unter Anleitung der Facilitators. Die Teilnehmenden müssen überlegen, ob zusätzliche Interessengruppen erforderlich sind (graue Karten), wenn es um den Workshop-Kontext geht. Jede:r Teilnehmende verortet die Werte aus Schritt 1 zu den Interessengruppen. Die Teilnehmenden werden angeleitet, Beziehungen zwischen den einzelnen Interessengruppen aufzuzeigen (Klebeband) und mögliche Werte-Konflikte (grüne Karten) zu identifizieren.			
Pause				Dauer 20 min

Teil 3: Werte-Szenario

Aktivität	Ziel / Ergebnis	Material	Wer	Dauer
Schritt 5	— Die Teilnehmenden erhalten die Aufforderungskarte, um das Werte-Szenario zu gestalten. — In die Aufforderungskarte wird die Aufgabe eingetragen, an der die Teilnehmenden arbeiten werden. — Die Aufforderung ordnet den Workshop in einen thematischen Kontext ein.	Aufforderungskarte	Workshop-Leitende	5 min
	Vorgehen Aufforderung: Gestalten Sie eines ideales Szenario in Anbetracht des Workshop-Kontexts.			
Schritt 6	— Die Teilnehmenden (eingeteilt in Kleingruppen) verwenden die bereitgestellten Materialien, um ein Werte-Szenario zu gestalten, dass das vorgegebene Problem löst. — Jede Kleingruppe stellt ihr Werte-Szenario vor.	Prototyping-Materialien wie A2 Papier, Stifte, Styroporeinzelteile, Klemmbausteine, etc.)	Teilnehmende in Kleingruppen von 2 bis 3 Personen	30 min
	Vorgehen			

Teil 4: Reflexion

Aktivität	Ziel / Ergebnis	Material	Wer	Dauer
Schritt 7	— Die Kleingruppen stellen ihre Werte-Szenarien vor. — Die Kleingruppen werden aufgefordert über ihre gewählten Werte und die Interessengruppen zu reflektieren.	Aufforderungskarte	Alle Teilnehmende	15 min
	Vorgehen Jede Kleingruppe stellt ihr Werte-Szenario in 5 Minuten vor. Auf der Grundlage der Werteszenarien reflektieren die Teilnehmer die folgenden Fragen: Warum haben Sie diese drei Werte für Ihr Werte-Szenario gewählt? Wie wirken sich die Werte auf die Akteure in Ihrem Szenario aus? Konnten Sie durch Ihr Werte-Szenario die gegenwärtige Situation verbessern und Werte-Konflikte zwischen den Interessengruppen gar entgegenwirken?			
Dauer des Workshop				Dauer 150 min

A.2 Workshop Leaflet

HCC

Die Forschungsgruppe
Human-Centered Computing
Wir, das HCC, wollen Gesellschaft in Anbetracht neuer Herausforderungen mitgestalten, indem wir aus einer menschenzentrierten Perspektive sinnstiftende Interaktionskonzepte für bestehende und zukünftige Technologien erforschen. Aus unserer interdisziplinären Forschung heraus hinterfragen wir mit Hilfe von empirischen Methoden Annahmen und Auswirkungen von Technologien. Wir sehen es als unsere Verantwortung, Menschen und ihre unterschiedlichen Sichtweisen zentral in unsere Forschung einzubinden, um eine partizipative und werteorientierte Technologieentwicklung zu unterstützen. Unsere Erkenntnisse sind frei zugänglich und transparent, um Reproduzierbarkeit zu ermöglichen. Damit bieten wir allen Interessierten eine Grundlage für Lösungsansätze zu wissenschaftlichen, gesellschaftlichen und individuellen Fragestellungen.
hcc.mi.fu-berlin.de

be part
Methode

Partizipativer Workshop

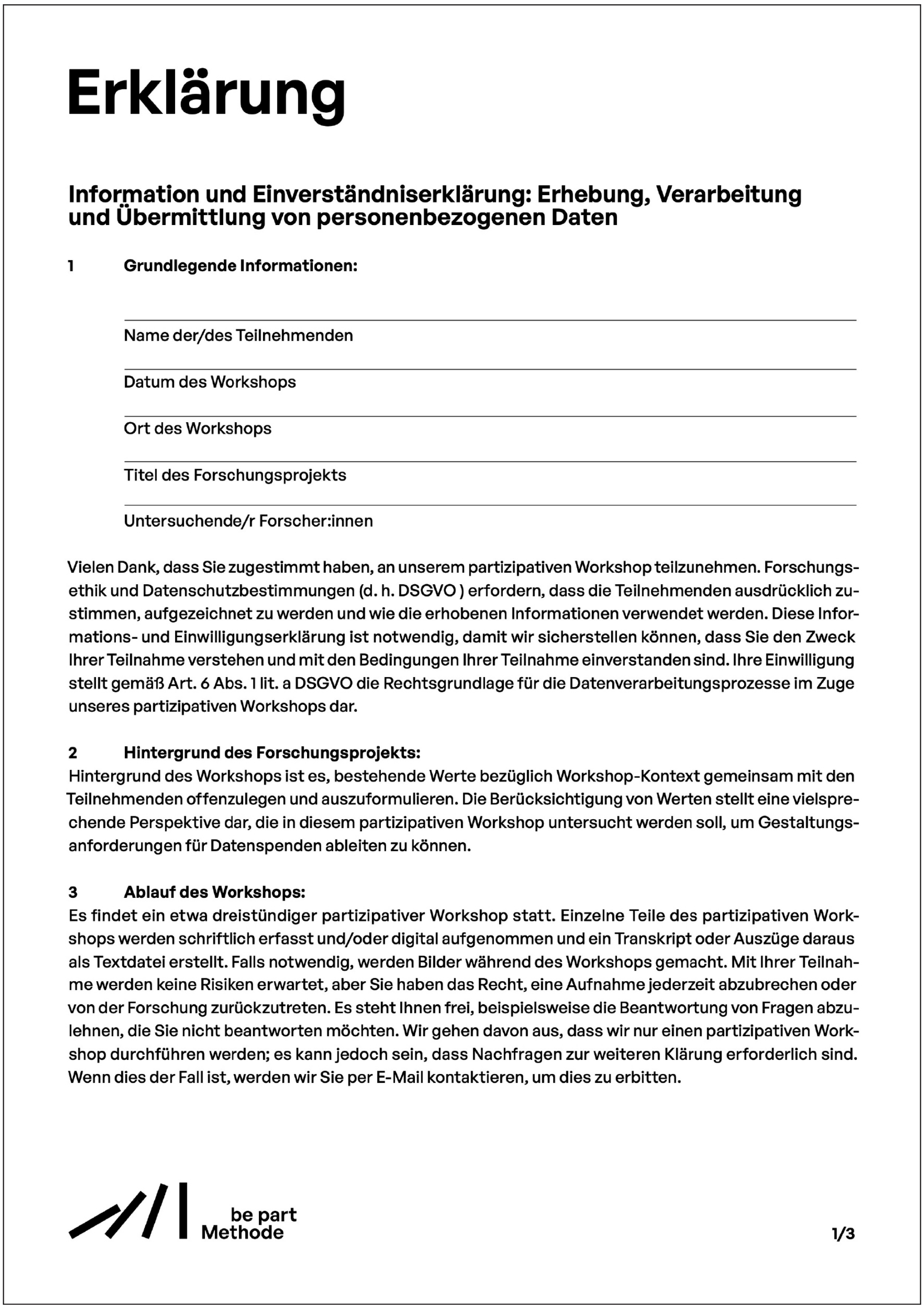
Über den Workshop
Einwilligungserklärungen im medizinischen Kontext erlauben in der Regel eine umfassende Nutzung medizinischer Daten. Obwohl diese Einwilligungserklärungen den gesetzlichen Anforderungen entsprechen, können diese unter Umständen die Anliegen, Bedürfnisse und Werte von Patient:innen nicht vollständig abbilden. Dies wirft die Frage auf, wie Einwilligungserklärungen gestaltet werden sollten, um Werte von Patient:innen rund um die Themen Datenschutz und Privatsphäre zu berücksichtigen. Gemeinsam mit Ihnen wollen wir diese Werte bezüglich einer medizinischen Datenspende offenlegen. Dabei stellt die Berücksichtigung solcher Werte eine mehrdimensionale Perspektive dar, die wir in diesem partizipativen Workshop untersuchen wollen. Für unsere zukünftige Forschung möchten wir die Erkenntnisse aus diesem Workshop nutzen, um diese in Maßnahmen für neuartige Interaktionskonzepte einer Datenspende im medizinischen Kontext zu überführen.

Hintergrund des Workshops
Hintergrund des Workshops ist es, bestehende Werte bezüglich des Workshop-Kontexts gemeinsam mit den Teilnehmenden offenzulegen und auszuformulieren. Die Berücksichtigung von Werten stellt eine vielsprechende Perspektive dar, die in diesem partizipativen Workshop untersucht werden soll, um Gestaltungsanforderungen für Datenspenden ableiten zu können.
www.werteradar.org

Programm

09:00 — 09:10	**Eintreffen**
09:10 — 09:20	**Workshop — Einführung**
09:20 — 10:00	**Workshop — Teil 1:** Werte-Exploration
10:00 — 10:30	**Workshop — Teil 2:** Werte-Karte
10:30 — 10:45	**Pause**
10:45 — 11:35	**Workshop — Teil 3:** Werte-Szenario
11:35 — 11:55	**Workshop — Teil 4:** Reflexion
11:55 — 12:00	**Verabschiedung**

A.3 Consent Form



Erklärung

Information und Einverständniserklärung: Erhebung, Verarbeitung und Übermittlung von personenbezogenen Daten

1 Grundlegende Informationen:

Name der/des Teilnehmenden

Datum des Workshops

Ort des Workshops

Titel des Forschungsprojekts

Untersuchende/r Forscher:innen

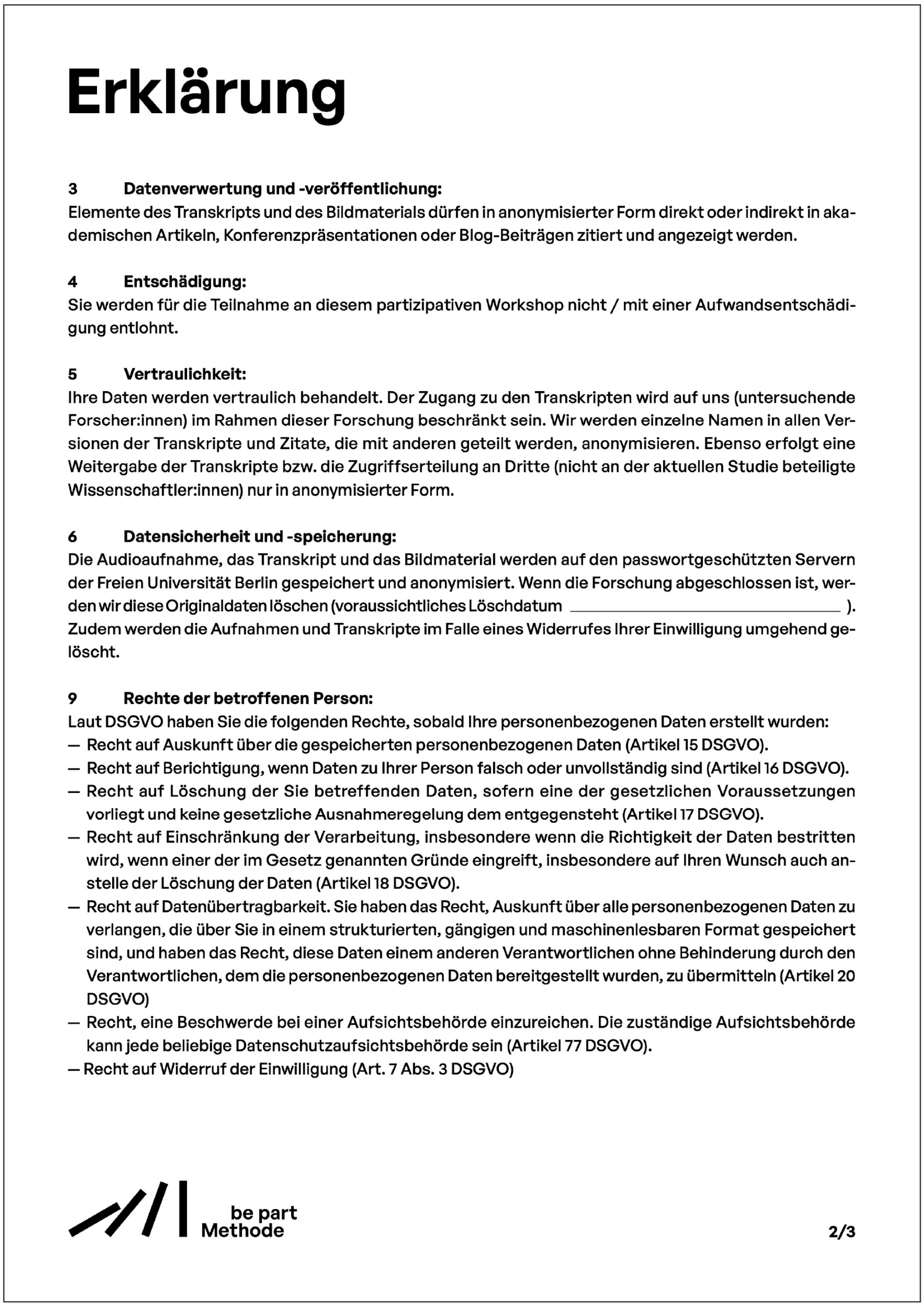
Vielen Dank, dass Sie zugestimmt haben, an unserem partizipativen Workshop teilzunehmen. Forschungsethik und Datenschutzbestimmungen (d. h. DSGVO) erfordern, dass die Teilnehmenden ausdrücklich zustimmen, aufgezeichnet zu werden und wie die erhobenen Informationen verwendet werden. Diese Informations- und Einwilligungserklärung ist notwendig, damit wir sicherstellen können, dass Sie den Zweck Ihrer Teilnahme verstehen und mit den Bedingungen Ihrer Teilnahme einverstanden sind. Ihre Einwilligung stellt gemäß Art. 6 Abs. 1 lit. a DSGVO die Rechtsgrundlage für die Datenverarbeitungsprozesse im Zuge unseres partizipativen Workshops dar.

2 Hintergrund des Forschungsprojekts:
Hintergrund des Workshops ist es, bestehende Werte bezüglich Workshop-Kontext gemeinsam mit den Teilnehmenden offenzulegen und auszuformulieren. Die Berücksichtigung von Werten stellt eine vielsprechende Perspektive dar, die in diesem partizipativen Workshop untersucht werden soll, um Gestaltungsanforderungen für Datenspenden ableiten zu können.

3 Ablauf des Workshops:
Es findet ein etwa dreistündiger partizipativer Workshop statt. Einzelne Teile des partizipativen Workshops werden schriftlich erfasst und/oder digital aufgenommen und ein Transkript oder Auszüge daraus als Textdatei erstellt. Falls notwendig, werden Bilder während des Workshops gemacht. Mit Ihrer Teilnahme werden keine Risiken erwartet, aber Sie haben das Recht, eine Aufnahme jederzeit abzubrechen oder von der Forschung zurückzutreten. Es steht Ihnen frei, beispielsweise die Beantwortung von Fragen abzulehnen, die Sie nicht beantworten möchten. Wir gehen davon aus, dass wir nur einen partizipativen Workshop durchführen werden; es kann jedoch sein, dass Nachfragen zur weiteren Klärung erforderlich sind. Wenn dies der Fall ist, werden wir Sie per E-Mail kontaktieren, um dies zu erbitten.

be part
Methode

1/3



Erklärung

3 Datenverwertung und -veröffentlichung:
Elemente des Transkripts und des Bildmaterials dürfen in anonymisierter Form direkt oder indirekt in akademischen Artikeln, Konferenzpräsentationen oder Blog-Beiträgen zitiert und angezeigt werden.

4 Entschädigung:
Sie werden für die Teilnahme an diesem partizipativen Workshop nicht / mit einer Aufwandsentschädigung entlohnt.

5 Vertraulichkeit:
Ihre Daten werden vertraulich behandelt. Der Zugang zu den Transkripten wird auf uns (untersuchende Forscher:innen) im Rahmen dieser Forschung beschränkt sein. Wir werden einzelne Namen in allen Versionen der Transkripte und Zitate, die mit anderen geteilt werden, anonymisieren. Ebenso erfolgt eine Weitergabe der Transkripte bzw. die Zugriffserteilung an Dritte (nicht an der aktuellen Studie beteiligte Wissenschaftler:innen) nur in anonymisierter Form.

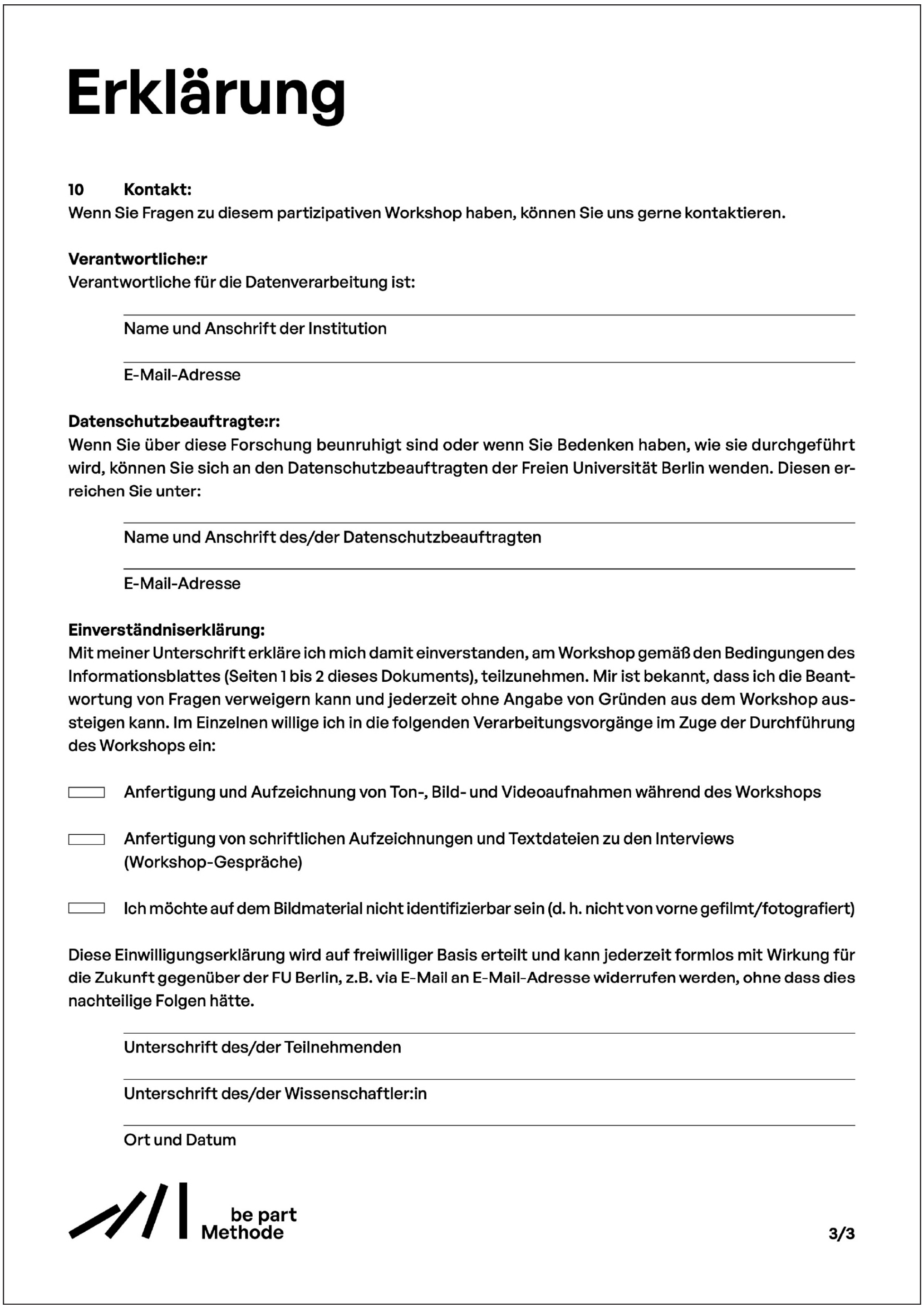
6 Datensicherheit und -speicherung:
Die Audioaufnahme, das Transkript und das Bildmaterial werden auf den passwortgeschützten Servern der Freien Universität Berlin gespeichert und anonymisiert. Wenn die Forschung abgeschlossen ist, werden wir diese Originaldaten löschen (voraussichtliches Löschdatum ______________________________). Zudem werden die Aufnahmen und Transkripte im Falle eines Widerrufes Ihrer Einwilligung umgehend gelöscht.

9 Rechte der betroffenen Person:
Laut DSGVO haben Sie die folgenden Rechte, sobald Ihre personenbezogenen Daten erstellt wurden:

- Recht auf Auskunft über die gespeicherten personenbezogenen Daten (Artikel 15 DSGVO).
- Recht auf Berichtigung, wenn Daten zu Ihrer Person falsch oder unvollständig sind (Artikel 16 DSGVO).
- Recht auf Löschung der Sie betreffenden Daten, sofern eine der gesetzlichen Voraussetzungen vorliegt und keine gesetzliche Ausnahmeregelung dem entgegensteht (Artikel 17 DSGVO).
- Recht auf Einschränkung der Verarbeitung, insbesondere wenn die Richtigkeit der Daten bestritten wird, wenn einer der im Gesetz genannten Gründe eingreift, insbesondere auf Ihren Wunsch auch anstelle der Löschung der Daten (Artikel 18 DSGVO).
- Recht auf Datenübertragbarkeit. Sie haben das Recht, Auskunft über alle personenbezogenen Daten zu verlangen, die über Sie in einem strukturierten, gängigen und maschinenlesbaren Format gespeichert sind, und haben das Recht, diese Daten einem anderen Verantwortlichen ohne Behinderung durch den Verantwortlichen, dem die personenbezogenen Daten bereitgestellt wurden, zu übermitteln (Artikel 20 DSGVO)
- Recht, eine Beschwerde bei einer Aufsichtsbehörde einzureichen. Die zuständige Aufsichtsbehörde kann jede beliebige Datenschutzaufsichtsbehörde sein (Artikel 77 DSGVO).
- Recht auf Widerruf der Einwilligung (Art. 7 Abs. 3 DSGVO)

be part
Methode

2/3



Erklärung

10 Kontakt:
Wenn Sie Fragen zu diesem partizipativen Workshop haben, können Sie uns gerne kontaktieren.

Verantwortliche:r
Verantwortliche für die Datenverarbeitung ist:

Name und Anschrift der Institution

E-Mail-Adresse

Datenschutzbeauftragte:r:
Wenn Sie über diese Forschung beunruhigt sind oder wenn Sie Bedenken haben, wie sie durchgeführt wird, können Sie sich an den Datenschutzbeauftragten der Freien Universität Berlin wenden. Diesen erreichen Sie unter:

Name und Anschrift des/der Datenschutzbeauftragten

E-Mail-Adresse

Einverständniserklärung:
Mit meiner Unterschrift erkläre ich mich damit einverstanden, am Workshop gemäß den Bedingungen des Informationsblattes (Seiten 1 bis 2 dieses Dokuments), teilzunehmen. Mir ist bekannt, dass ich die Beantwortung von Fragen verweigern kann und jederzeit ohne Angabe von Gründen aus dem Workshop aussteigen kann. Im Einzelnen willige ich in die folgenden Verarbeitungsvorgänge im Zuge der Durchführung des Workshops ein:

☐ Anfertigung und Aufzeichnung von Ton-, Bild- und Videoaufnahmen während des Workshops

☐ Anfertigung von schriftlichen Aufzeichnungen und Textdateien zu den Interviews (Workshop-Gespräche)

☐ Ich möchte auf dem Bildmaterial nicht identifizierbar sein (d. h. nicht von vorne gefilmt/fotografiert)

Diese Einwilligungserklärung wird auf freiwilliger Basis erteilt und kann jederzeit formlos mit Wirkung für die Zukunft gegenüber der FU Berlin, z.B. via E-Mail an E-Mail-Adresse widerrufen werden, ohne dass dies nachteilige Folgen hätte.

Unterschrift des/der Teilnehmenden

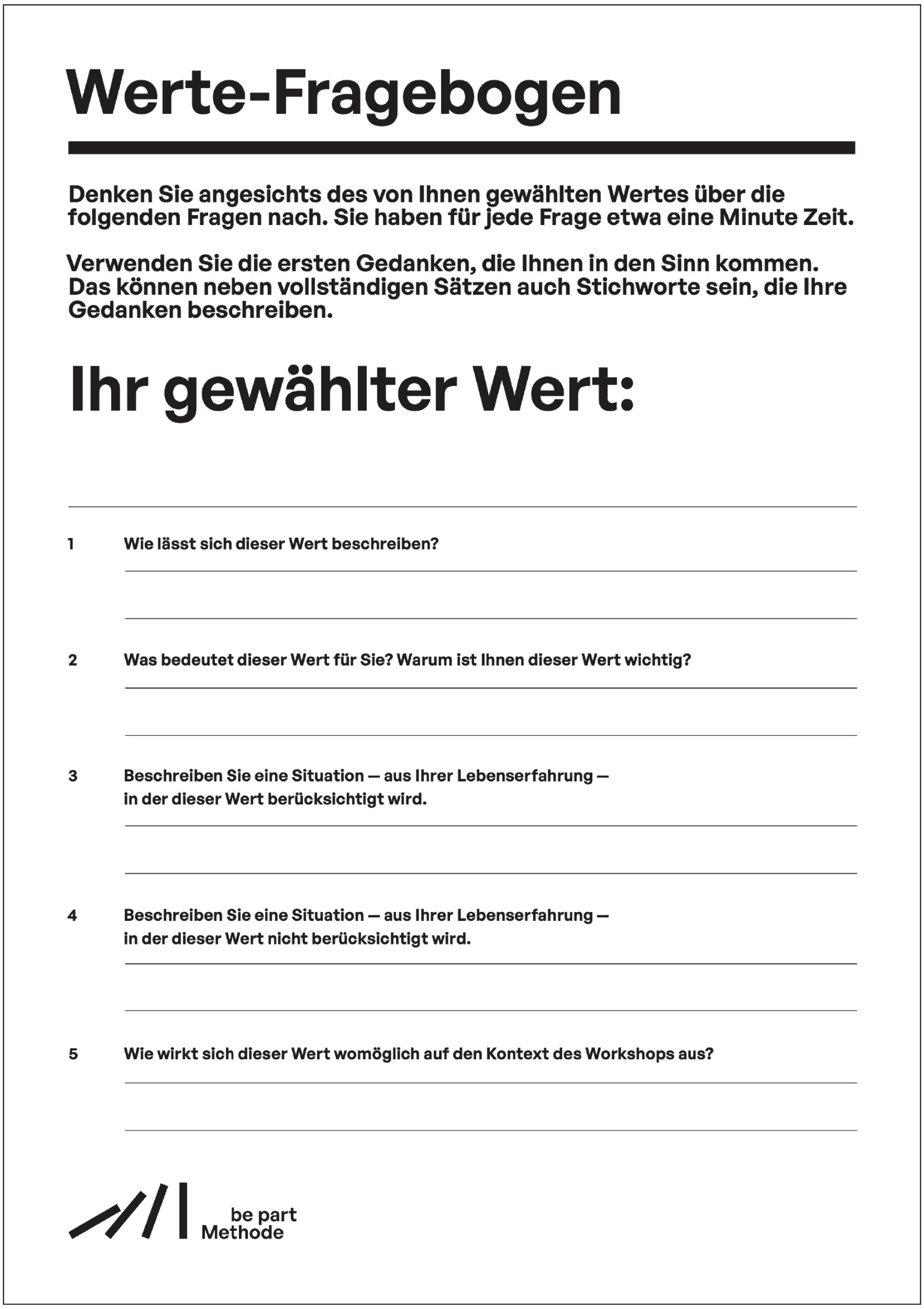
Unterschrift des/der Wissenschaftler:in

Ort und Datum

be part
Methode

3/3

A.4 Value Questionnaire



Werte-Fragebogen

Denken Sie angesichts des von Ihnen gewählten Wertes über die folgenden Fragen nach. Sie haben für jede Frage etwa eine Minute Zeit.

Verwenden Sie die ersten Gedanken, die Ihnen in den Sinn kommen. Das können neben vollständigen Sätzen auch Stichworte sein, die Ihre Gedanken beschreiben.

Ihr gewählter Wert:

1 **Wie lässt sich dieser Wert beschreiben?**

2 **Was bedeutet dieser Wert für Sie? Warum ist Ihnen dieser Wert wichtig?**

3 **Beschreiben Sie eine Situation — aus Ihrer Lebenserfahrung — in der dieser Wert berücksichtigt wird.**

4 **Beschreiben Sie eine Situation — aus Ihrer Lebenserfahrung — in der dieser Wert nicht berücksichtigt wird.**

5 **Wie wirkt sich dieser Wert womöglich auf den Kontext des Workshops aus?**

be part
Methode

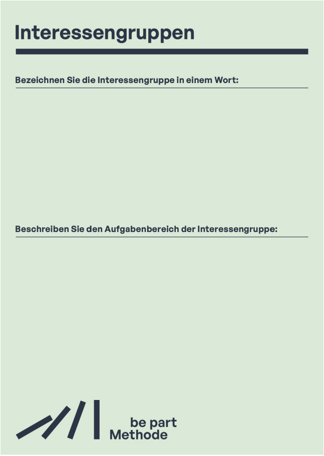
A.5 Activity Cards

Werte

Definieren Sie den Wert in einem Wort:

Beschreiben Sie den Wert durch ein Beispiel:

be part
Methode



Interessengruppen

Bezeichnen Sie die Interessengruppe in einem Wort:

Beschreiben Sie den Aufgabenbereich der Interessengruppe:

be part
Methode

Konflikt

Definieren Sie den Konflikt:

Beschreiben Sie den Grund für den Konflikt:

be part
Methode

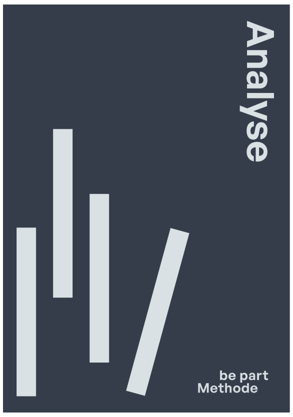
A.6 Prompt Card

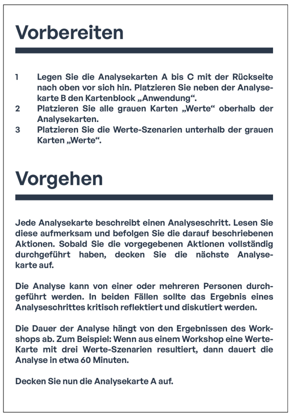
Aufforderungskarte

Aufforderung zur Gestaltung des Szenarios:
Gestalten Sie ein ideales Szenario in Anbetracht des
Workshop-Kontexts.

be part
Methode

A.7 Analysis Cards





Vorbereiten

1 Legen Sie die Analysekarten A bis C mit der Rückseite nach oben vor sich hin. Platzieren Sie neben der Analysekarte B den Kartenblock „Anwendung“.
2 Platzieren Sie alle grauen Karten „Werte“ oberhalb der Analysekarten.
3 Platzieren Sie die Werte-Szenarien unterhalb der grauen Karten „Werte“.

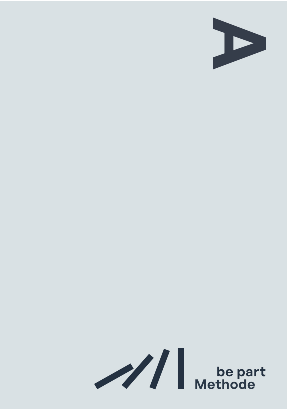
Vorgehen

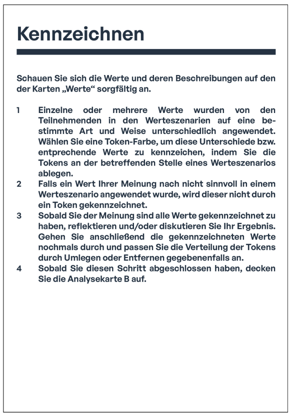
Jede Analysekarte beschreibt einen Analyseschritt. Lesen Sie diese aufmerksam und befolgen Sie die darauf beschriebenen Aktionen. Sobald Sie die vorgegebenen Aktionen vollständig durchgeführt haben, decken Sie die nächste Analysekarte auf.

Die Analyse kann von einer oder mehreren Personen durchgeführt werden. In beiden Fällen sollte das Ergebnis eines Analyseschrittes kritisch reflektiert und diskutiert werden.

Die Dauer der Analyse hängt von den Ergebnissen des Workshops ab. Zum Beispiel: Wenn aus einem Workshop eine Werte-Karte mit drei Werte-Szenarien resultiert, dann dauert die Analyse in etwa 60 Minuten.

Decken Sie nun die Analysekarte A auf.

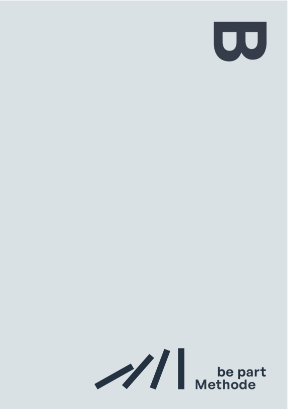


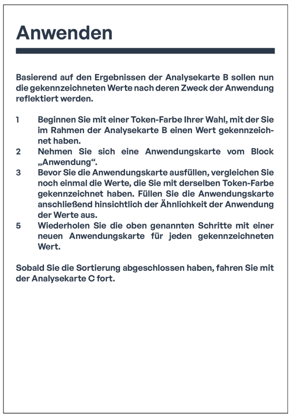


Kennzeichnen

Schauen Sie sich die Werte und deren Beschreibungen auf den der Karten „Werte“ sorgfältig an.

1 Einzelne oder mehrere Werte wurden von den Teilnehmenden in den Werteszenarien auf eine bestimmte Art und Weise unterschiedlich angewendet. Wählen Sie eine Token-Farbe, um diese Unterschiede bzw. entprechende Werte zu kennzeichen, indem Sie die Tokens an der betreffenden Stelle eines Werteszenarios ablegen.
2 Falls ein Wert Ihrer Meinung nach nicht sinnvoll in einem Werteszenario angewendet wurde, wird dieser nicht durch ein Token gekennzeichnet.
3 Sobald Sie der Meinung sind alle Werte gekennzeichnet zu haben, reflektieren und/oder diskutieren Sie Ihr Ergebnis. Gehen Sie anschließend die gekennzeichneten Werte nochmals durch und passen Sie die Verteilung der Tokens durch Umlegen oder Entfernen gegebenenfalls an.
4 Sobald Sie diesen Schritt abgeschlossen haben, decken Sie die Analysekarte B auf.



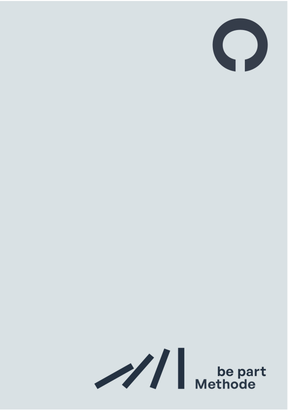


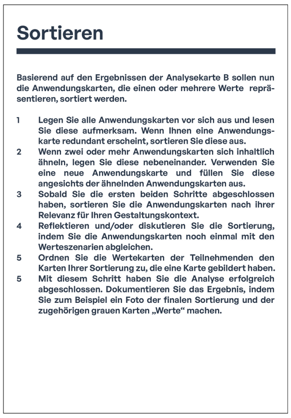
Anwenden

Basierend auf den Ergebnissen der Analysekarte B sollen nun die gekennzeichneten Werte nach deren Zweck der Anwendung reflektiert werden.

1 Beginnen Sie mit einer Token-Farbe Ihrer Wahl, mit der Sie im Rahmen der Analysekarte B einen Wert gekennzeichnet haben.
2 Nehmen Sie sich eine Anwendungskarte vom Block „Anwendung“.
3 Bevor Sie die Anwendungskarte ausfüllen, vergleichen Sie noch einmal die Werte, die Sie mit derselben Token-Farbe gekennzeichnet haben. Füllen Sie die Anwendungskarte anschließend hinsichtlich der Ähnlichkeit der Anwendung der Werte aus.
5 Wiederholen Sie die oben genannten Schritte mit einer neuen Anwendungskarte für jeden gekennzeichneten Wert.

Sobald Sie die Sortierung abgeschlossen haben, fahren Sie mit der Analysekarte C fort.





Sortieren

Basierend auf den Ergebnissen der Analysekarte B sollen nun die Anwendungskarten, die einen oder mehrere Werte repräsentieren, sortiert werden.

1 Legen Sie alle Anwendungskarten vor sich aus und lesen Sie diese aufmerksam. Wenn Ihnen eine Anwendungskarte redundant erscheint, sortieren Sie diese aus.
2 Wenn zwei oder mehr Anwendungskarten sich inhaltlich ähneln, legen Sie diese nebeneinander. Verwenden Sie eine neue Anwendungskarte und füllen Sie diese angesichts der ähnelnden Anwendungskarten aus.
3 Sobald Sie die ersten beiden Schritte abgeschlossen haben, sortieren Sie die Anwendungskarten nach ihrer Relevanz für Ihren Gestaltungskontext.
4 Reflektieren und/oder diskutieren Sie die Sortierung, indem Sie die Anwendungskarten noch einmal mit den Werteszenarien abgleichen.
5 Ordnen Sie die Wertekarten der Teilnehmenden den Karten Ihrer Sortierung zu, die eine Karte gebildert haben.
5 Mit diesem Schritt haben Sie die Analyse erfolgreich abgeschlossen. Dokumentieren Sie das Ergebnis, indem Sie zum Beispiel ein Foto der finalen Sortierung und der zugehörigen grauen Karten „Werte“ machen.

Anwendung

Berücksichtigte Werte:

Beschreibung zur Anwendung:

Beispiel zur Anwendung: