Enabling Citizens' Speculation

The method of Co-Speculation for collectively imagining possible futures of 'ikigai' in an aging society

Masafumi Kawachi
Master Thesis 2020
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A! Aalto University
School of Arts, Design
and Architecture

Author: Masafumi Kawachi

Department: Department of Design

Degree programme: MA in Collaborative and Industrial Design

Thesis advisor: Anna Salmi, Johanna Ylipulli

Supervisor: Tuuli Mattelmäki

Author Masafumi Kawachi

Title of thesis Enabling citizens' speculation: The method of Co-Speculation for collectively imagining possible futures of 'ikigai' in an aging society

Abstract

Modern industrialized society oppresses human autonomy and shapes dominant future images. Rapid enhancement of technologies adds much more complexity to our society, and it can be dystopian futures. These futures are often shaped by actors with power, such as experts, tech industries, institutions, or designers. On the other hand, recent design agendas including Transition Design and Collective Dreaming, claim a strong demand for empowering wider people to shape desirable futures. Therefore, the thesis presents the method of Co-Speculation as a participatory and experiential speculative method to enable non-expert citizens themselves to imagine possible futures.

The thesis is grounded on mainly two fields; speculative design and participatory design. It investigates how the Co-Speculation method can work for everyday citizens to collectively envision possible futures. In more detail, the research aims to investigate three sub-questions: 1) To explore why speculative design needs to be more participatory, 2) To explore what enables or challenges citizens to speculate futures, and 3) To explore what possible effects the method can create.

With this aim, the thesis conducted an empirical case study in the City of Takarazuka, in Japan. In collaboration with the local civic-tech organization, Community Link, the case study explored futures of ikigai, a psychological state of feeling worthy for a living, in the context of an aging society. The project engaged active citizens as co-futurists. Materials for analysis were collected from evaluative interviews with participants, audio records of the workshop and the researcher's reflection notes.

The research found that the Co-Speculation performs as a potential method for enabling citizens to envision alternative futures. It supports non-experts' imagination in several ways; diverse views of participants, making as an embodied act, and the empathic scaffolding tools. Some challenges were also identified, such as the difficulty in the suspension of disbelief, dominant pre-assumptions, and a lack of controversial views. Suggestions for further improvements and possible areas of the method application are also presented.

This study contributes to the academic discussion on speculative design and participatory design by providing findings and the empirical case of the method application. The conclusion indicates that the method can catalyse imagination and citizens can be involved in the visioning process as active co-futurists.

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INTRODUCTION

In this introduction, I outline all the key points of this thesis. Personal motivation, my background, research objectives and questions, the goal of the project, methods and finally the brief structure of this thesis will be explained. In general, this chapter aims to give a context and overview of this thesis.

1.1 Thesis overview

The 21st-century faces a radical transformation from the advancement of technologies to the growth of economies to population increase. Various interdependent factors generate a massive complexity in our current society. The complex world forces us to adapt constantly. In response to this unavoidable societal change, Buchanan (2001) introduces four orders of design models, starting from design as graphics to objects, to interactions and finally to systems. It indicates that the landscape and role of design has been changing to deal with societal change, and it has become much wider than in the past.

Design for societal change, represented by, for instance, transition design (Irwin, 2015) needs alternative future visions. The importance of future vision development is growing for societal transition (Irwin et al., 2015). Design interventions made at present are to be guided by future visions. Among various future-casting approaches, speculative design aims to create discursive space for alternative futures and it is especially useful for rethinking what is possible and desirable (Dunne & Raby, 2013). In contrast to conventional market-led design, it rejects simply meeting market desires, instead provoking thoughts on alternatives to dominant reality. This approach is often conducted by a transdisciplinary team, for instance, professional designers, artists, scientists, economists and philosophers, to create provocative artifacts to audiences (Dunne & Raby, 2013). For instance, a research product known as 'Tilting Bowl' was designed to explore how humans interact with digital artifacts in collaboration with philosophers (Wakkary et al., 2018), or 'Disaster Playground' is a documentary film to speculate what could happen in a future if an asteroid collides with the earth and to investigate emergency procedures. The project was developed by a designer Nelly Ben Hayoun with researchers at NASA ("Disaster Playground", 2015).

However, the approach is criticized for several reasons. The outcome tends to be confined to showrooms with an excessive emphasis on the aesthetic over the past decades. Consequently, it lacks participation and connection with the general public beyond showroom audiences, leading to the reduction of impact. A participatory process within this approach is still poorly understood. This lack of attention is significant because understanding how speculative design can be grounded on a democratic

principle could potentially provide more discursive space in public beyond showroom settings. Sanders and Stappers (2014) speculate the future of age, called 'Collective Dreaming' where literally everyone's creativity will be harnessed to collectively imagine our dream. A few attempts have been made to combine a participatory practice with speculative design and design fiction (Baumann et al., 2017; Desjardins et al., 2019; Nägele et al., 2018), yet more research to be done. Specifically, few research has been carried out on a method that aims to scaffold citizens to speculate possible futures by themselves.

Thus, the thesis explores the method for participatory-led speculative design to involve citizens as co-futurists to build effective reflection and dialogue by collectively imagining possible futures. The possible effects of its method are analyzed from the perspectives of its process and its expected effect; to create sufficient dialogue and reflection upon futures of 'ikigai'. In order to address this opportunity, I will describe a case study conducted in Takarazuka city, Japan. The case workshop is positioned as an experiment as a part of an ongoing project, 'Ikigai Work'. In short, 'ikigai' is the Japanese notion described as mental states where one feels life is worth living, associated with certain resources (Kamiya, 1980). See Subchapter 4.1.2 for more details. The case study focuses on speculation upon how the resources for ikigai, such as human relationship or health conditions, changes in futures.

1.2 Background contexts and personal motivations

The rationale of the choice of the research topic lies at the intersection of big societal trends and my personal interests. There are three developments that led me to work on the topic and they also provide the thesis with bigger contexts.

First, emerging technologies, such as AI, robotics, blockchain and IoT, require us to redesign existing social systems. For instance, AI would transform the way we work, how we make decisions and even human-to-human relationships. This rapid enhancement of technologies adds much more complexity to our society (Norman & Stappers, 2015). This might potentially create desirable futures, or causes dystopian ones although it is impossible to fully anticipate what will happen. However, as the word 'techlash',

described as public animosity towards large tech companies (Foroohar, 2018), implies currently our technological futures are shaped mostly by tech industries. This causes anxiety and actually leads to ethical issues, such as data privacy. Therefore, we should strive to develop a new approach to deal with this situation and explore what is desirable on our hands. The thesis relies on Speculative Design as one of the potential approaches to explore technological futures.

Second, economic growth industrialized our society and brought the 'radical monopoly' (Illich, 1973). Industrial goods and tools aiming at convenience are unintentionally designed to deprive individuals' capability and autonomy. People have the innate ability to meet their own basic needs, however, those capabilities are replaced by artificial products. Monopoly means "the exclusive control by one corporation over the means of producing (or selling) a commodity or service" (Illich, 1973, p. 35), and it would happen when people choose to hire something better to get things done which they can do on their own or with cooperation. Consequently, over-industrialization deprives ones' ability to act by themselves and people start to rely on industries and institutions. It also led to the loss of people's imagination of thinking alternatives in the current capitalism. This situation is described well in the quote, "it is easier to imagine an end to the world than an end to capitalism" (Fisher, 2009, p. 1). In line with the view, Sterling remarks "We have entered an unimagined culture" (2009, p. 3). Imagination, as a capability to build images of something that is not here, not now, is necessary to serve our desirable futures (Folkmann, 2010). The industrialized world is contrasted with a convivial society that is "designed to allow all its members the most autonomous action by means of tools least controlled by others" (Illich, 1973, p. 17). To regain our capacity to shape our own life with less dependence on external power towards convivial society, people need to be empowered and unleash their imagination to address this issue.

Third, to deal with complex socio-technical problems involving "large numbers of people and institutions intermingled with technologies", the importance of participatory practices to engage multiple stakeholders with different perspectives have risen (DesignX, 2014). For instance, the issue of well-being, relevant to the topic of the case study in this thesis, can be taken as an example of this type of problem. In facing complex issues, the everyday can be seen as a context of design as practices of daily life point out everything that limits or enables any possibilities in one's life, which affects a larger system causing problems (Manzini & Jegou, 2005). Given this, citizens are

perceived as important actors besides diverse experts from different disciplines. Participatory design was originally developed at the workplace rooted in a democratic mindset to empower people with less power. It has been expanding its field and recently "has become increasingly engaged in public spheres and everyday life" (Björgvinsson et al., 2010, p. 41). Thus, taking everyday life into account as a context for design to deal with complex issues grows its importance. This pushes the thesis to take participatory design engaging non-expert citizens also as a basis.

As a designer, I had worked in the digital industry to help clients develop new services and solve consumers' problems. However, gradually I started to question the way I designed, which actually could merely amplify desires for consumptions within a capitalistic paradigm, where market needs and business metrics are first priorities. This could eventually deprive autonomy of human-beings by providing excessive services. Plus, although design is inherently practice of futures-making, just responding to immediate needs in the market leads to 'defuturing', a structural unsustainability to destroy possible futures in the modern world (Fry, 2010). Due to short-sighted actions, modern design practices exploit resources from future generations and destroy their futures (Saijo, 2018). Shouldn't design give people more autonomy? Shouldn't design make a commitment to society beyond business from a more holistic perspective for futures?

Then, I came across the concept of conviviality, "individual freedom realized in personal interdependence", proposed by Illich (1973, p. 12). Inspired by this concept, I started to envision the society where people can deeply understand their own desires, collectively envision preferable futures, and mutually shape lives they want to live. This vision led me to study of co-design/participatory design at Aalto University to learn how designers can empower people's autonomy, imagination and creativity. Especially participatory design focuses on autonomy, self-realization, and empowerment through power distribution, resources and knowledge (Bratteteig & Wagner, 2016). Participatory design practice could emancipate people from institutions and industries by sharing power to act upon situations toward desirable futures.

Besides the study at the university, living in Finland puts myself in a different social system and environment where different types of discourse surrounds me. Design discourse and agenda here are also very new to me and it sparked my curiosity both in

participatory practices and futuristic-approaches such as backcasting and speculative design, as new possibilities for design for futures, beyond capitalism focusing on 'here, now'. This futuristic approach resonated with 'Collective Dreaming' describing that everyone will be designers with creativity to realize dream collectively in futures (Sanders & Stappers, 2014). Fighting against industrialized society taking autonomy and depersonalizing people, convivial society aims to emancipate from this oppression of capitalistic system and give people more power and control over provided tools, industries as well as institutions. One needs to be empowered to become capable of imagining possible futures against predetermined images and shaping actions to live with autonomy.

In summary, the starting point of this thesis was the intersection where speculative design and participatory design meets, ultimately toward a more convivial society (Illich, 1973). Figure 1 illustrates the overall research frame with its background motivation and vision though the concept of conviviality and mentioned backgrounds attributes are not the focus of the thesis. Now, I'm in the middle of the journey of exploration for a new role within society as a social designer, and this thesis is positioned as a small first step to move towards such a vision.
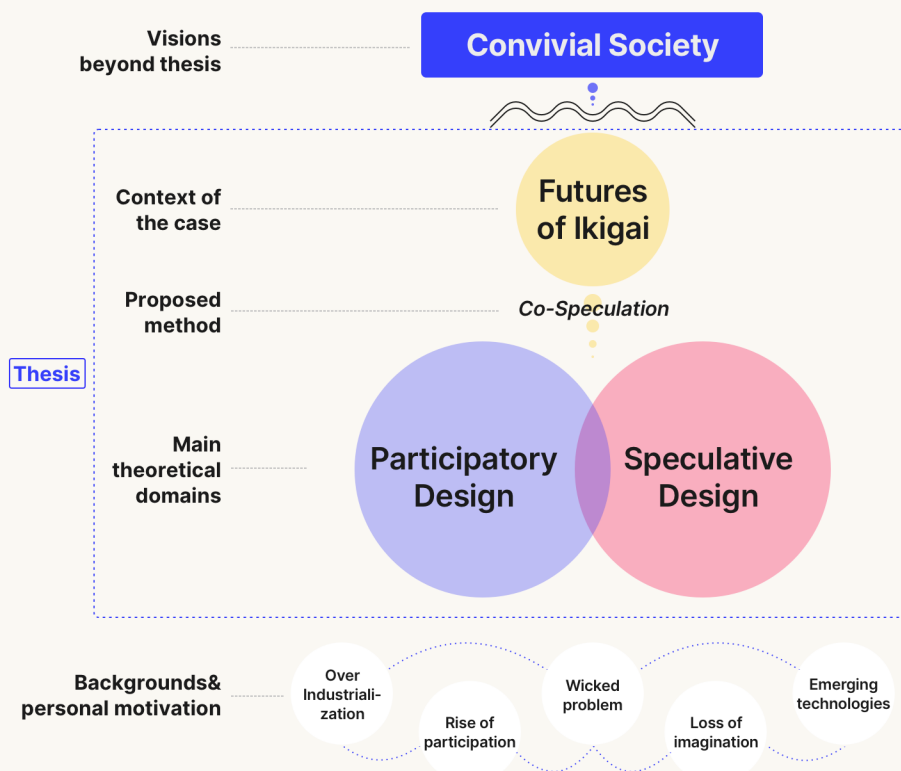
Figure 1. Overview of thesis

1.3 Research objectives

The most important research goal is to develop an evolved method for speculative design to be more participatory and collaborative for collectively dreaming possible futures. The academic contribution of this design research is to produce a detailed process description of the method of Co-Speculation and document its effects as well as suggestions of possible applications in practical contexts. I investigate the question by conducting the case study and gathering data. The research question is the following;

How can the Co-Speculation method work for everyday citizens to collectively envision possible futures of 'ikigai' ?

This question asks how speculative design process could be restructured around a participatory mindset to scaffold non-experts citizens for imagining and materializing futures. I'm interested in the exploration of the necessity of participation in speculation, current speculative design practices and how an alternative process can be developed based on those insights. With this method development, the research aims at answering the following sub questions:

1. Theorization: ***Why does speculative design need to be more participatory?***

2. Performance: ***How does the method perform from a designer's perspective?***
                        What enables or challenges citizens to speculate futures?

3. Effects: ***What possible effects can the method generate for rethinking futures in the topic of ikigai?***

First, the theorizing question builds a foundation for the method development. Clarifying current limitations of speculative design, logics to make it participatory, synergies between participatory design and speculative design, and demands for visioning methods are elaborated. This is explored through the literature reviews on speculative design, participatory design and related fields. Second, the question of method performance investigates what attributes of the method enable and challenge for citizens' speculation through the analysis of participants' interviews and the researcher's reflection. Third, possible effects are explored especially from the views of participants' thinking and perception on futures unter the topic of ikigai in relation to emerging technologies.

The second and the third questions are investigated through the empirical case study (Figure 2).

Besides these research objectives, the practical project goal was set in collaboration with my client partner, Community Link. This is a non-profit organization that promotes civic tech and helps city-planning with technologies. The project goal at individual level was to promote participants' self-reflection and lead to a new perception on futures of ikigai in order to encourage early-preparation for their retirement life, while it aimed to explore what life with 'ikigai' could be in futures of aging society to generate insights of the topic at a more general level. This will be described further in Chapter 4.

This research focuses on the development of the method and demonstrates how it scaffold everyday people to become able to envision futures. The empirical study is the main part of the research and it is context specific. The concept of 'ikigai' in the aging society is a general context of the research project to examine the method, but it is not the objective itself. The thesis argues for the need for participation in speculation and it touches upon power by distributing more control from designer to non-experts. However, the power structure in the empirical study is not a specific focus and normatively scrutinized. In general, the thesis is an exploratory research to open up possibilities for a participatory method to speculative design.

Literature Review

1 Theorization
Why does speculative design need to be more participatory?

Case Study

2 Performance
How does the method perform from a designer's perspective? What enables or challenges citizens to speculate futures?

3 Effects
What possible effects can the method generate for rethinking futures in the topic of ikigai?
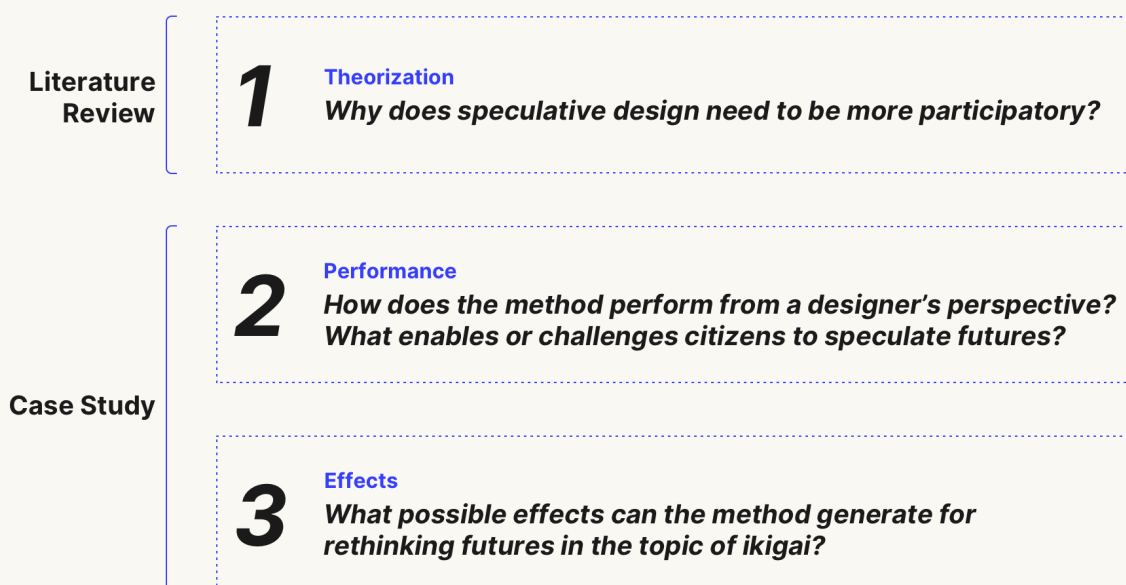
Figure 2. RQs and corresponding methods

1.4 Contributions

The thesis makes contributions both theoretically and practically (Figure 3). Answering this question seeks theoretical contributions from two perspectives. First, in the field of speculative design, the research outcome aims to promote further development of participatory methods based on the theorization. Also, by identifying current limitations, it tries to build up a possibility to improve speculative practices. Second, from the view of participatory design, the thesis positions speculative design as one of the new tools based on grounding theories and provides the empirical study where speculative design was used by everyday citizens in the workshop.

Through the case study, the design contribution is to introduce the method including a set of tools through the case study as well as detailed process descriptions to set up the workshop. The developed tools are specific to the context of the conducted project, yet they can be applied to different contexts if the contents are modified. The accessible methods and tools enable designers and academics to easily put them into practice to catalyse people's imagination for possible futures. I also hope that young practitioners in design who are not experienced with speculative design as well as civil servants in the public sector and business leaders can use this method as a starting point to envision futures.

	Speculative Design		Participatory Design
Theoretical Contribution	Promote further development of participatory methods	Identify current limitations for improvements	Regard SD as a new tool in participation
Design Contribution	Introduce the method including a set of tools	Provide a detailed process description of the case	Helps practitioners' practices in speculation with non-experts

Figure 3. Thesis contribution

1.5 Thesis structure

In this thesis, I will start with a literature review of existing research to build a theoretical framework as a foundation in Chapter 2. It covers speculative design with its relevant concepts, participatory design, and bridging theories between these two to justify why the method is important and set a direction for the development. In Chapter 3, research methods for data gathering and analysis are mainly introduced. The case study will be presented with a detailed description of processes, used methods, and outcomes of the workshop in Chapter 4. Finally, Chapter 5 will present research analysis and findings to answer research questions followed by Chapter 6 explaining the discussion, the further improvements, practical applications, limitations of the research and future explorations. Lastly, a brief conclusion will be presented.

02 /

THEORETICAL FRAMEWORK

This chapter reviews existing studies in relation to my topic. The literature review was conducted for three reasons. First, it explores why participation is necessary for speculation. Second, it develops a theoretical basis to give rationales for the method. Third, it establishes basic principles for the method, namely the Co-Speculation, which forms the backbone of this thesis.

To these aims, the first section discusses a basic concept of speculative design, its relevant field, and the critiques. The second section gives an overview of participatory design and co-design. Built on two sections, the third section bridges speculative design and participatory design for the Co-Speculation and then introduces existing approaches as inspirations for method development. Finally, key insights are summarized.

2.1 Speculative design and futures

This section introduces speculative design, three key characteristics of the method, and its critiques as well as its relevant subfields; critical design, design fiction, and discursive design.

2.1.1 Overview of speculative design

In recent debates in the expansion of design field, speculative design has been one of the rising topics. Although a common definition has not been established yet, according to Dunne and Raby (2013), the proponents of speculative design, the core of the concept is to critically address the existing reality by imagining alternative futures. Speculative design questions current practices, world views, social norms, economic systems and emerging technologies to encourage a dialogue on imaginative futures. To this aim, it turns envisioned futures into artifacts.

Speculative design has clear differences in comparison with conventional design. Dunne and Raby (2013) created a manifest illustrating the contrast between conventional industrial design and speculative design. Conventional design is concerned with industry problem-solving while critical and speculative design tackle questions for societal transformation (see Figure 4).

With this contrast, speculative design can be perceived as "an attitude than anything else, a position rather than a methodology" (Dunne & Raby, 2013, p. 34). It stands on a critical mindset to the status quo to pluralize possibilities.

The purpose of speculative design is not to solve problems, predict a singular future, or convince audiences if ideas are real or desirable. Rather it alters convention by providing plural possibilities with the emphasis on "philosophical inquiry into technological application" (Auger, 2014, p. 2). In line with Auger's view, many practices of speculative design explore from ethical and critical perspectives on how emerging technology could affect our lives. In the empirical part of research, it deals with how futures of ikigai could change in relation to emerging technologies as they can drastically change resources for ikigai both in good and bad ways (more detail in Chapter 4).

Furthermore, it aims to create a perception shift by materializing possible futures. The future that can be built depends on what options citizens consider they are able to choose and recognize, in other words, shaping changes requires a fundamental shift of their view of reality and futures. Dunne and Raby (2013) indicate that citizens need to transform "our belief systems" (p. 189). Bauman argues that the goal is to build "the imaginative frameworks" (2018, p. 53). Namely, the approach changes reality by making alternative social visions, which creates new perspectives of the world.

What could these effects bring at the end? Finally, to promote a new perception through discourse mediated by alternative futures can help people to think about what futures they want and increase the possibility towards desirable futures (Dunne & Raby,

A Conventional Design	**B** Speculative Design
Affirmative	Critical
Problem solving	Problem finding
Provides answers	Asks questions
Design for production	Design for debate
Design as solution	Design as medium
In the service of industry	In the service of society
Fictional functions	Functional fictions
For how the world is	For how the world could be
Change the world to suit us	Change us to suit the world
Science fiction	Social fiction
Futures	Parallel worlds
The "real" real	The "unreal" real
Narratives of production	Narratives of consumption
Applications	Implications
Fun	Humor
Innovation	Provocation
Concept design	Conceptual design
Consumer	Citizen
Makes us buy	Makes us think
Ergonomics	Rhetoric
User-friendliness	Ethics
Process	Authorship

Figure 4. A/B manifest (Adapted from Dunne & Raby, 2013, p. vii)

2013). In summary, speculative design aims to rethink a desirable future society.

To this end, speculative design emphasizes some important qualities. For instance, Auger (2013) mentions the use of prototypes and fictional scenarios to propose imaginary worlds. Lenskjold (2016) proposes three qualities; imaginative, future-oriented, and aesthetic. In agreement with these views, Dunne and Raby (2013) highlight fiction and materiality. The power of fiction allows citizens to enter a possible world, which could otherwise not be imagined. Designers create fictional worlds where the world is not occupied by reality. Material representation is also emphasized as an essential characteristic. The fictional world is sometimes too ambiguous and abstract to imagine concretely. Hence, tangible objects and images take significant roles as a bridge between everyday contexts and possible worlds to expose "the here-and-now, while belonging to another yet-to-exist" (Dunne & Raby, 2013, p. 43). With provoked reflection through representations, future possibilities are connected with past and current practices (Gunn and Donovan, 2012). In this way, speculative design provides the grounding for further dialogue and creates a "suspension of disbelief" (Dunne & Raby, 2013, p. 105). This arouses people to live in fictional worlds, which blur the boundary between reality and fiction. This enables a collective creation of plural possibilities for a new perception.

2.1.2 Related approaches of speculative design

Several relevant practices to speculative design are often discussed. The section briefly covers critical design, design fiction, and discursive design. The main aim in the section is not to establish a clear categorization among them but to clarify which term is relatively appropriate to use as well as to grasp a bigger context.

Critical design

Critical design is a prior concept to speculative design, proposed by Anthony Dunne and Fiona Raby. They discuss that critical design is an embodiment of critical thought with the purpose to spark debate (Dunne & Raby, 2001). It also rejects a transitional role of industrial design in contributing to capitalistic society, locating itself out of usefulness and functionality. It does not just criticize the present situation but is oriented towards generating alternatives to what reality is now. Designers should be aware of the risk that devised solutions that we think work may amplify further problems in

different time scale, and this calls for the shift toward critical practices concerned with critiques within one's own discipline and the wider society (Maze, 2008; Mazé & Redström, 2008). Apart from creating discourse, some researchers point out that critical design aims to enhance critical awareness not to take things as the status quo for both designers and consumers through designed objects (Bardzell & Bardzell, 2013).

Although critical design and speculative design are often mixed with the term such as SCD (Speculative and Critical Design), there are some observations of a slide difference. Tharp and Tharp (2019) illustrates that speculative design orients toward alternative futures with less focus on critiques. Critical design "became speculation" to explore various possible futures (Forlizzi et al., 2018, p. 7).

Design fiction

Similar to speculative design, design fiction has a number of definitions. The most prominent definition is "the deliberate use of diegetic prototypes to suspend disbelief about change" (Sterling, 2012). Diegetic prototypes are props used in cinemas and act as representations of imaginary worlds to let audiences temporarily believe them (Kirby, 2010). Design fiction can be summarized with three characteristics; "(1) something that creates a story world, (2) has something being prototyped within that story world, (3) does so in order to create a discursive space" (Lindley & Coulton, 2015, p. 1).

Design fiction and speculative design have a common ground. Dunne and Raby (2013) admit their overlaps in terms of the use of fiction and imaginary techniques while they argue design fiction has a narrower scope due to a focus on technological futures in a form of films and lack of critical view. On the other hand, Brown et al. (2016) oppose that design fiction can also embody critique. Tharp and Tharp (2019) argue that the slight difference exists in terms of an emphasis on the time-scale. Speculative design orients towards futures, one hand, design fiction does not necessarily stick to futures, rather it aims to build alternative worlds. Auger (2013) points out the identicality of diegetic prototypes and speculative design objects, and how the detail semantics could indicate different implications. The word 'fiction' instantly communicates that proposed artifacts are not real while the word 'speculative' constructs a close relationship to futures. Therefore, the focus of design fiction can be summarised as the material manifestation of fictional and alternative possibilities and it does not necessarily project into futures.

Discursive design

Discursive design can be understood as an umbrella term covering speculative design, design fiction and related forms of design as Figure 5 illustrates (Tharp & Tharp, 2019). Under this term, all aim to intellectually engage audiences in discourse through artifacts while each of the specific approaches has a subtle difference in their orientations. The term 'discourse' is defined as "systems of thought or knowledge" (Tharp & Tharp, 2019, p. 75), and designed artifacts mediate, provoke, and embody discourses. As a result of building discourse, it functions as a "catalyst for reflection" (Tharp & Tharp, 2019, p. 103). It creates an effective pathway toward reflection as a central tenet and only after meeting this baseline, further effects can be achieved. While societal change is expected result in many design approaches, such a deep transformation is not necessarily an intended impact in discursive design (Tharp & Tharp, 2019).

Discursive Design

Adversarial Design
Anti-Design
Contestational Design
Critical Design
Critical Jugaad
Design Fiction
Dissident Design
Guerrilla Design
Interrogative Design
Radical Design
Reflective Design
Speculative Design
Speculative Re-design
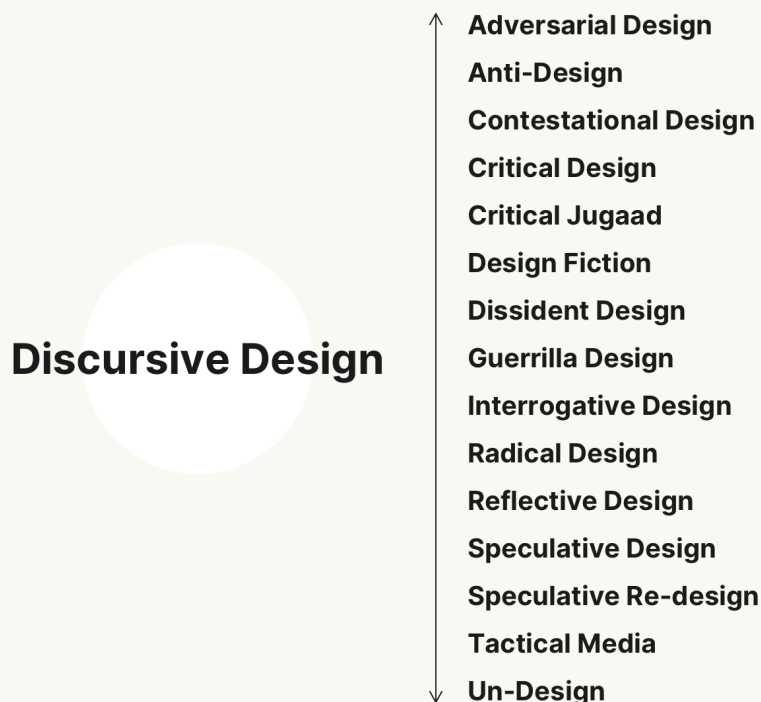Tactical Media
Un-Design

Figure 5. Discursive Design as a Genus (Tharp & Tharp, 2019, p. 184)

2.1.3 Critiques and limitations of speculative design

This part outlines three critiques or limitations of current speculative design to build a starting point for theorizing the thesis approach. Three critiques are; elitism, confined to showrooms, and lack of impact and evaluation.

Elitism; who needs to be involved?

Some researchers discuss that speculative design works are typically designed by professional designers, artists, engineers or fiction writers with specialized knowledge and backgrounds. Nägele et al (2018) question who needs to be included in the process and Gerber (2018) argues provoking debate in speculative design often fails due to who participates in the process. Without any concern about these questions, the work could just promote "elitist views" (Bowen, 2010, P. 4). It likely seems that an expert perspective is not necessarily aligned with public concerns and interests. Due to this limitation, the creation process is not accessible and the outcomes do not reach the wider public, which is often criticized for being homogenous and privileged (Bowen, 2010; Disalvo, 2012; Padro, 2014). These critical views imply the possibility that including wider audiences could allow more diverse perspectives and public involvement for better discourse creation. What if speculative design was more participatory-led practice?

Confined to showrooms; difficulties for debate creation

The main goal of speculative design is to spark discussion with the public to reconfigure reality and imagine what futures could be (Dunne & Raby, 2013). Despite this aim, current speculative design tends to prioritize the aesthetic images of final artifacts displayed in museums and fails at imaginative collaboration (Gerber, 2018). Similarly, Disalvo (2012) criticizes that speculative design mostly is just a spectacle with a lack of meaningful content and the necessity of debates. Furthermore, as many design works are often confined to showrooms, it reaches only specific social groups (Blythe et al., 2016). This argument can be interpreted that designers have difficulty in managing how discourses are created at showroom settings where objects are basically just displayed. The potential risk of failure lies as it depends on how it is perceived by viewers who have different perspectives, willingness to engage and capability to insightfully interpret, thus it requires the audience's effort (Bardzell & Bardzell, 2013; Vlugter, 2017).

Consequently, speculative design objects at showrooms might not necessarily create

sufficient participation and discourse. Built on these criticisms, the demand for involving people in dialogue about futures in a more engaging way rather than generating discourse is identified (Candy & Dunagan, 2017). In a showroom setting, audiences passively take information from displayed artifacts and it does not work well as a strategy for higher engagement. Given this nature, what if speculative design would become a more situated and embodied practice?

Lack of effects and evaluation

Speculative design is also criticized for the absence of impacts to shape social transformation. Although the purpose is to produce yet-to-exist futures as catalysts for public debate, this discussion does not directly feed into social change. Hanna & Ashby (2016) argue that simply being provocative does not lead to real-world transformation or any social impact. However, this critique needs to be examined. As speculative design, critical design and design fiction are often employed as a research method categorized as showroom genre (Koskinen et al., 2011), directly transforming society is not aimed in those cases. In this case, the goal might be to gather insights for further development. Another case might aim at mental change by eliciting dialogue based on materializing speculation into objects. However, in many cases, "societal change is certainly not an instantaneous consequence of some audience meeting a critical artifact (Tharp & Tharp, 2019, p. 289). Therefore, the instant impact for social change through speculative design solely is not its purpose in the first place.

Although speculative design does not focus on instant social change, the goal setting is important and effort to capture an effect is required as any kind of design ultimately needs to aim at preferred state (Simon, 1969). However, the evaluation of intended effects is often missing in some speculative design work (Tonkinwise, 2015), and overly self-reflexive practices within a closed community just downgraded its effectiveness (Malpass, 2017). Therefore, speculative design works need to clarify what they want to achieve, what effect is intended, what knowledge is generated through projects, for whom and why. Only with this intention, it can be delivered through appropriate channels (Ward, 2019). What could be the actual effects that speculative design could create?

2.1.4 Summary

I have introduced the basic concept of speculative design, its relevant fields, and current limitations. In my understanding, speculative design proposes alternative futures in close relation to emerging technology with the aim to stimulate reflections and discussions for reconfiguring dominant reality and desirable futures. Accordingly, the thesis is framed around specifically speculative design under an umbrella notion of discursive design. As the research involves future speculation rather than critiques of the present with a focus on how societal value could change with emerging technologies, speculative design may fit best in the work (Table1).

The existing reviews illustrate the privilege and critiques of the lack of participation in the current practices in speculative design. My view is aligned with them and I interpret this as demand for a participatory method to incorporate diverse peoples' views and activate dialogue in an engaging way beyond showrooms. Furthermore, the effects need to be more carefully examined. These reviews on limitations build a basis for further exploration of an application of participatory approaches to future speculations.

Approach	Description	Focus	Aim
Speculative Design	Imagining and materializing alternative futures	Possible futures, Emerging technologies	-Build discursive space -Open up alternatives -Catalyze reflection (Any approach sharing this agendas can be Discursive Design)
Critical Design	An embodiment of a critical thought	Critique of reality	
Design Fiction	Props that creates an imaginary story world	Fictional world	

Table 1. Summary of speculative design and its relevant terminologies

2.2 Participation and collaboration in design

This part explains briefly the concepts of participatory design and co-design, and compares both approaches to contextualize the thesis. The role between users and designers in these collaborative design approaches is also discussed to position the thesis.

2.2.1 Participatory design

Participatory design is a design approach to involve stakeholders in the design process (Bjögvinsson et al., 2012). This originally started in the 1970s in Scandinavia as a movement to democratize workplaces to empower legitimate workers in joint decision-making for technology tools and system developments (Ehn, 2008; Fuad-Luke, 2009). Thus, it was initially oriented to technological development at the workplace, and according to Ehn, its application has expanded in various fields nowadays "with a special focus on people participating in the design process as co-designers" (2008, p.93).

Participatory design entails two value principles: The moral and pragmatic effort (Carroll et al., 2007). It is built on a democratic principle that those who are affected by a design should have a voice in the design process. This comes from a political standpoint with the aim to mediate conflicting interests (Kensing & Blomberg, 1998; Ehn, 2008). It challenges and democratizes top-down decision-making, and redistributes power to legitimate participants so they can inform their voice in design (Fuad-Luke, 2009). According to Pitkin's 1973 study (as cited in Bratteteig & Wagner, 2016), power in participatory design can be distinguished as twofold; 'power over' and 'power to'. 'Power over' means power as domination over another person while 'power to' indicates agency as capacity or potential to shape actions. In this light, the key point of participatory design is to empower people to have a right, power, and resource to collaboratively design things that will eventually affect their life. Here, the role of designers and people change. Designers support and facilitate collaboration while people in design process are seen not as passive informants but as co-designers (Ehn, 2008) (See also 2.2.3).

With respect to practicality, it has a premise that direct involvement of users can

enhance the possibilities of better outcomes in design (Carroll et al., 2007). This indicates that the rich knowledge of users drives design processes and consequently outcome will meet the necessary requirement from users. As participants engage in the process, they aim to design alternatives collectively with designers to improve the situation. Therefore, participants are seen as critical actors who can provide resources, such as expertise of their current life, hope and dreams (Mattelmäki & Sleeswijk Visser, 2011).

Besides a deep commitment to a democratic principle, several principles are emphasized; situation-based action, mutual learning, tools and techniques, and alternative visions about technology (van der Velden & Mörtberg, 2014). Situation-based action deals with actors' expertise of their everyday activity rooted in situated contexts. Mutual learning emphasizes that people learn how design is practiced from designers, in turn, designers learn about the context of design, and all learn about the process, its outcomes and how these can affect the choices to be made (Robertson & Simonsen, 2012). It also highlights alternative visions about technology that are developed with co-designers together to fight against monopolistic choices. To enable these principles, tools and techniques need to be carefully employed and invented to scaffold people for collectively tackling issues as co-designers.

2.2.2 Co-design

Co-design is an approach involving various actors at a different stage of the design process. According to Sanders and Stappers, it is defined as "collective creativity as it is applied across the whole span of a design process" (2008, p. 2). This is considered as an approach that designers and people collaboratively act on creative work together through the entire process while the specific emphasis is placed on the 'fuzzy' front-end with massive uncertainty. By people, they refer to "expert of his/her experience" (Sanders and Stappers, 2008, p. 9) and play a role as co-designers. This requires a perspective shift from users as objects of design to partners in the design process. In the process of co-design, designers give control and ownership to participants, developing multiple tools to scaffold people to express their dream and desires. In line with the view, co-design is also defined "as an attempt to facilitate users, researchers, designers and others – or: diverse people with diverse backgrounds and skills – to cooperate creatively, so that they can jointly explore and envision ideas, make and discuss sketches, and tinker with

mock-ups or prototype" (Steen, 2011, p. 52). This definition may indicate that co-design prioritizes the pragmatic outcome for better design over democratic and ethical values.

Participatory design and co-design are often mixed and they can be seen interconnected. A common agreement on the differentiation of both concepts has not been built even though some attempts can be seen to differentiate them. Mattelmäki & Sleeswijk Visser (2011) state that co-design puts a bit less emphasis on the political concern compared to participatory design, but both are based on the same mindsets and tools. Therefore, they conclude that co-design is highly connected with PD with the agenda to empower people who are affected by the design. Fuad-Luke (2009) states that it is an umbrella term for various approaches that facilitate participation, including participatory design. Finally, Botero (2013) discusses co-design is not separated from participatory design and uses a different label to stress a contemporary opportunity based on the origin of participatory design.

There are diverse views of the connotations of co-design, however, in the framework of the thesis, it adopts Mattelmäki & Sleeswijk Visser's idea. Thus, co-design still aims to empower people while it puts less emphasis on political stance.

2.2.3 Role of designers & participants: design for/with/by

In participatory and collaborative design approaches, the designer's and participant's roles flexibly vary depending on the contexts. These approaches are in contrast with user-centered design that emerged in the US in the 1980s. This can be framed as an 'expert-mindset' and a 'research-led' approach. In this process, the user is "a passive object of study" (Sanders & Stappers, 2008, p. 2). In other words, users/participants play a role as a passive information providers to the experts. On the other hand, participatory design is framed as a 'participatory mindset' and a 'design-led' approach (Figure 6). Within this design domain, users/participants play a larger role in the design process. They can be described as 'partners' or 'co-designers'.

Lee (2008) proposes the mode of participation with the expected roles of designers and participants (See Table 2). In the designer's space, the aim of participation is designer-led innovation and this is often realized as top-down initiatives. Here, designers own the power and control and design for the users without any collaboration while users might participate as informants. In the realms of collaboration, there are two levels where designing with users can happen. The one is designer-driven where designers play a role as co-designers and facilitators to turn participants into partners. They collaboratively design together, still, designers lead the processes. The other one is a more user-driven collaborative act. Designers stimulate and support the process but the main actors are the users as co-designers. Finally, this moves forward towards space where users take initiatives and invite designers to work with them.
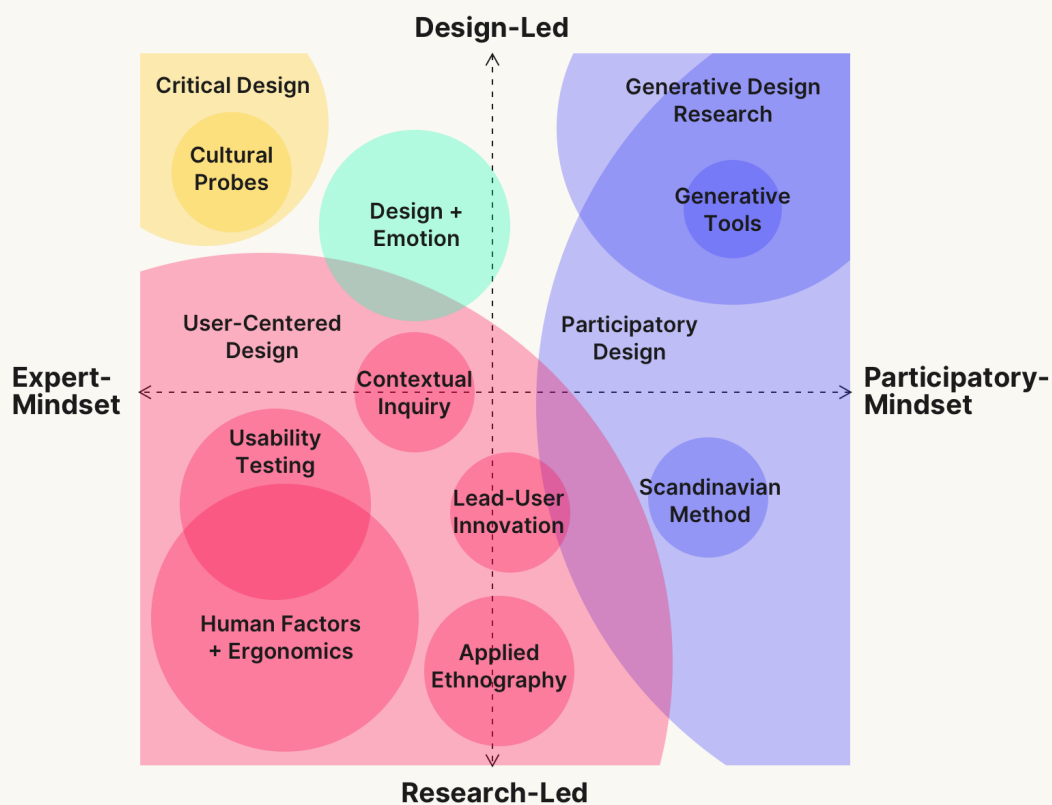

Figure 6. Evolving map of design research (Sanders & Stappers, 2008, p. 6)

Although this illustrates different degrees of participation and collaborations, Lee (2008) states that all of them can be covered by the notion of co-design. The point is not if participation matters or not, but in what level of participation should be aimed. Similarly, practices in design participation can be categorized into three typologies (Ho & Lee, 2012);

Design for People: **Designers maintain control through the entire process while people play a passive role in the design process.**

Design with People: **Designers delegate autonomy to share the process with people as active design agents.**

Design by People: **Designers give people control in the process, and people eventually act as creative designers.**

The practice of 'design for' might reduce people to passive roles, such as informants with little power. On the other hand, 'design by' provides people with full autonomy. In line with the view, Yu & Sangiorgi (2018) identified three typologies of designer and client relationships; Delivering, Partnering, and Facilitating. Each corresponds to 'design for', 'design with' and 'design by'.
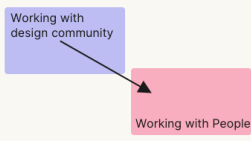
Space of operation	Aim of participation	Designers/users' relationship	Designer's role	User's role
Design FOR Delivering	Innovation (By designers)	Working with design community → Working with People	Masters/Authorities	Imagined users/ Representatives
Design WITH Partnering	Collaboration (Designer-driven)	Working with design community / Realm of Collaboration / Working with People	Co-designers/ Facilitators	Co-workers/ Partners
	Emancipation (People-driven)	Working with design community / Working with People	Stimulators	Creative people/ Advisers
Design BY Facilitating	Motivation (By People)	Working with design community / Working with People	Craftsmen/Builders	Active clients

Table 2. Design participation typology (Adapted from Lee, 2008, p. 36; Ho & Lee, 2012; Yu & Sangiorgi, 2018)

2.2.4 Summary

Although some differences are identified, participatory design and co-design share the same core agenda, shortly empowerment of people. In my interpretation, this means that those who are impacted by design and technology need to have a capacity for participation. The thesis aligns with Botero's view that co-design and participatory design are not separated movement, rather use a different label to remark concern (2013), but I decide to employ 'participatory design' to avoid confusion and place slightly more emphasis on a democratic principle to empower people to imagine possible futures. Built on this principle, the next section outlines why participation is necessary for future speculations and discusses the possibility to carry out speculative design in a participatory way.

Participation in design can be understood as a spectrum, and the degree of participation needs to be discussed since it affects the relationship between designers and participants, their role and the entire processes. In the case study (Chapter 4), the principle of participatory design is applied and it attempts to create a space for people who are affected by futures to actively involve them.

2.3 Speculative design meets participation

This part explains why participatory approach is necessary for speculative design, and what are commonalities between two different design disciplines. The purpose of the section is to demonstrate the necessity and synergy generated by a combination of two approaches.

2.3.1 Impact of futures: power and politics in futuring

Futures have an impact on our daily lives, on the other hand, we can affect what futures could be. The future is open and unpredictable, still, the present actions, aspirations, and imagination contain the premises for any possible future (Manzini & Jegou, 2005).

Different future images emerge from our social system and are connected to our needs and hopes at this moment (Masini, 1982). This indicates that the present mental state and choices construct our futures.

Vice versa, images of futures can influence our present actions, choices, and decisions. There are multiple ways that futures could affect how we act at present (Bell, 2002). Our choices depend on the images of futures. For instance, children study hard to enter good universities. The belief of what is possible also affects what people do, meaning that if one does not think some futures are impossible, they would not act along with them. In the above example, if children believe that they cannot pass entrance examinations of certain universities, they might stop studying. In this light, future is a "momentum for changes" (Ratcliffe & Krawczyk, 2011, p. 651). Futures visions make it possible to create futures that are different from the present although its seeds already exist around us.

However, the space for making futures belongs to the privileged group; entrepreneurs, policymakers, innovation labs, and design labs (Smith et al, 2016). These actors can be seen as power-holders who can shape actions with sufficient access to resources and knowledge. They envision futures that are "made from and for particular positions, in relation to specific conditions, contexts, and worldviews" (Mazé, 2016, p. 41). In this sense, visioning, speculating and making futures is a political act that mirrors the values of those who own power and develop images of futures. Political implications of futurring include "how reality and futurity are conceived, how present and future phenomenon can be known, and what difference our conceptions, knowledges, and choices make" (Mazé, 2019, p. 24). This implies that futures invented by the privileged people might ignore the value of the less-privileged (less power), furthermore, such futures have an impact on them and limit their space to imagine how futures could be different.

Participatory design builds on the political and moral standpoints that give more power to people who are affected by design in the process. Taking this view, the people with less power such as non-expert citizens should be empowered to have a voice and be involved in the future-visioning process since futures affect our present choices.

2.3.2 For more plural futures

The speculative design aims to create plural alternative futures through discourse mediated by artifacts. Figure 7 is a useful framework called 'Futures cone' to show the spectrum of futures (Voros, 2003). Probable futures are those which are likely to happen, evolved out of current trends. Plausible futures show those which could happen based on our current knowledge. Possible futures are any kinds of futures that might happen, emerging from what we do not know. The framework can help us to understand that futures are open and plural rather than fixed and singular.

Slaughter (1998) argues that the futures should be multiple to generate alternatives to the dominant reality. However, in contrast, the privilege in speculative design could reduce plurality. As discussed earlier, being confined to a privileged space could promote elitist worldviews since the speculated future is cast on designers' specific perspective of the present and futures.

In relation to this, the earlier section debates that any future is political in the light that it contains personal perceptions. Coulton et al (2016) propose that perception of what is possible or desirable in futures is connected to our past and present experience (Figure 8). As each of our experiences of the world is different, this difference shapes our worldviews in myriad ways and thus multiplies desirable futures. Therefore, different worldviews should be embraced rather than the singular future based on one specific world view. This might lead to colonizing the future if space is designed only for the privileged whilst more alternative future images could be generated if more diverse people participate in speculation. By engaging citizens in speculating futures, plural futures can be envisioned. Lohmann (2017) discusses that speculation in a collaborative way can generate multiple futures from the singular future of the designer as a starting point (Figure 9).

Figure 7. Futures cone (Voro, 2003, p. 13)

Plural pasts shapes plural worldviews leading to plural futures
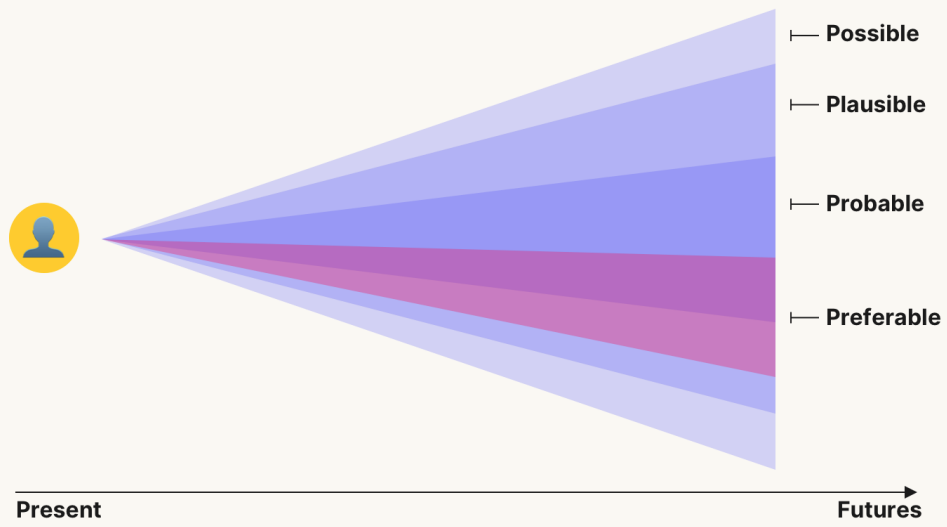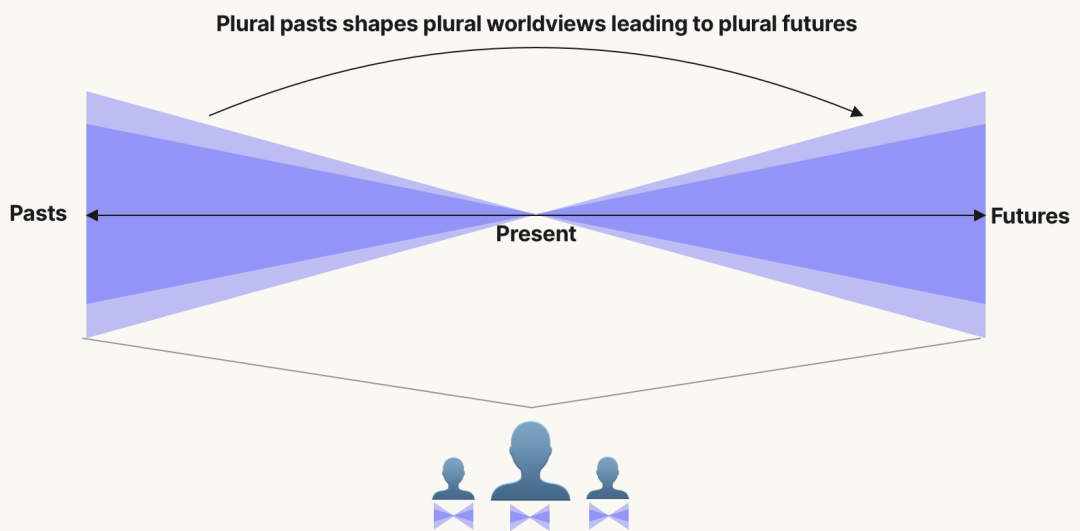
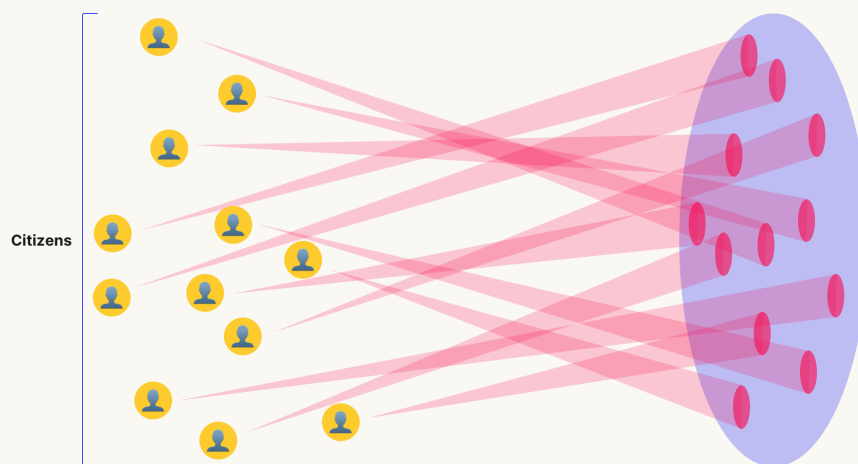Figure 8. Plurality of perception of past, present, and future (Coulton et al, 2016, p. 13)

Figure 9. Co-speculating with others (Adapted from Lohmann, 2017, p. 131)

2.3.3 More activated dialogue through making

Speculative design, critical design, design fiction, and discursive design all aim to build a discursive space and engage people in dialogue. However, they easily fall into a spectacle without building a productive public debate (DiSalvo, 2012). To activate effective dialogue, inclusiveness is the key, and the use of a participatory approach is proposed (Coulton et al., 2016). Dialogue can be considered as the social process facilitating the exchange of information and revealing each different view as tacit knowledge. As a result of effective dialogue, the need and expectation of futures are better understood in participatory design (Luck, 2003). Within a participatory setting, conflicting views and heterogeneity around issues are embraced (Ehn, 2008), and this aligns with multiple perceptions of the futures created by each participant.

Various methods can be employed to spark dialogues, such as prototyping, design game, and role-playing. Especially the act of making is growing and highlighted as the designerly way of doing to construct meaning (Sanders & Stappers, 2014). In participation in design, the methods and tools for making enable ordinary people to express their concerns, aspirations or future images. The form of making can vary from prototyping to scenarios to storyboards.

Making for productive dialogue and also debate is discussed from the perspective of design as rhetoric (Buchanan, 2001). Design can be framed as a form of argument and this calls for reflection that any designed artifacts stimulate particular perspectives. Accordingly, both of the processes of making and created artifacts can be "a discursive activity" (DiSalvo et al., 2008, p. 41). Speculative design places an emphasis on materializing futures into objects so anyone can feel and experience them. The act of making and the method adapted from participatory design can provide participants with tools for future speculations by themselves as co-futurists, and eventually, it could activate dialogue throughout the making process.

2.3.4 Synergies between two domains

Speculative design and participatory design have both common grounds and uniqueness that complement each other. This synergy between them seems to be acknowledged in some studies (Rosenbak & Feckenstedt, 2016), yet it is not clearly highlighted in much

of the literature.

First, they are both future-oriented. Not only speculative design, but also participatory design can look into futures since it envisions primarily things that have not yet existed. 'What-if' questions can be understood as one of the intersections between speculative design and participatory design as both approaches emphasize on "the propositional and imaginative what-if" (Rosenbak & Feckenstedt, 2016, p. 20). In speculative design, what-if question is often a starting point to extrapolate possible futures and to turn into materials to create discursive space (Dunne & Raby, 2013). Within participatory design, Brandt & Grunnet (2000) introduce the use of what-if questions to transport us from reality into the art world with full of questions in drama techniques. Furthermore, in the context of participatory design, 'Future Workshop' developed by Robert Jungk and Norbert Mullet (1987), is a technique aiming at giving more voices to citizens without enough resources for making sense of a problem, creating future visions, and planning how to implement. It is divided into three parts: the Critique, the Fantasy and the Implementation. In the Fantasy phase, freedom is given to participants to imagine 'what if' the situation was different (Bφdker et al., 1995). Summing up, both approaches share future-orientation.

Second, technologies are a central aspect in common. In the early history of participatory design, it tried to ensure that the users of the technological system were part of the design process as co-designers. While its application has been much wider at present, participatory design still places an importance on how new technologies are implemented with the involvement of future users to meet their needs by developing alternative visions about technologies (Schuler and Namioka 1993; van der Velden & Mörtberg, 2014). Likewise, speculative design deals with opening up alternative futures in relation to economic, social, political and especially technological implications (Auger, 2014; Dunne & Raby, 2013). Participatory design is anchored in solution development aiming to change the situation in opposition to speculative design with an attempt to reframe problems from a more philosophical point of view, and this attitude is a difference between two.

The third shared point is the emphasis on objects to spark engagement. The notion of 'boundary objects' is important in participatory design, but originally it is developed in the Science and Technology Studies (STS) field, describing them as "objects which are

both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (Star & work(s):, 1989, p. 393). In line with this description, Ehn (2008) explains that boundary objects are weakly structured for flexibility and commonality to create alignment, at the same time they are strong enough for each group to have different views. This can be interpreted that boundary objects can carry a variety of meanings to each group as manifestations in a participatory setting where different stakeholder groups with different perspectives collaborate. For instance, prototypes and sketches can act as boundary objects that align diverse actors' groups. With the help of such objects, various actors including non-human (sketches, prototypes and so on) can collaborate continuously to design after us (Bjögvinsson et al., 2012). In speculative design, the material manifestation of possible futures is highlighted. Designers speculate futures narratives and translate them into materialization to provoke and engage people in the debate (Auger, 2013). The materialization can take any form from physical products to magazines to films. The designed artifacts as a representation of futures envisioned by designers act as boundary objects for a formation of public around debate (Malpass, 2017).

2.3.5 Demands for radical visioning in a participatory way

The current world is facing a number of complex issues, for instance, climate emergency is one of them. As the field of design has expanded from graphic to service of social systems (Buchanan, 2001), several researchers have responded to the systemic sustainable problem by proposing new design approaches, such as 'Design for Social Innovation' and 'Transition Design'.

Manzini defined 'Design for Social Innovation' as "everything that expert design can do to activate sustain and orient processes of social change toward sustainability" (2015, p. 62). The core proposition is that we are living in a great transition era and thus everybody needs to design for changing everyday life conditions through collaboration. To clearly organize this thought, Manzini introduces a design mode map based on two axes; problem-solving/sense-making and expert-design/diffuse-design. Here, 'diffuse' design in which everyone, including everyday citizens, community, companies, and governments, brings their design capability is emphasized, such as the "capacity to imagine something that does not exist" (Manzini & Jegou, 2005, p. 14). In his thought, 'expert' designers play a role in creating collaborative conditions and supporting both

individuals and communities for social transformation and everybody can be involved in design. As a consequence of this support and distributed capability, society itself or everyday life functions as a laboratory where social experimentations happen and innovative solutions emerge. Taking the everyday dimension, bottom-up interventions can be generated and implemented. To this end, the shared vision is also required. This calls for designers' endeavor to develop a new conceptual and operational tool for facilitating building shared vision (Manzini & Jegou, 2005).

Similarly, 'Transition Design' is a comprehensive design framework with regard to "the need for societal transitions to more sustainable futures" proposed at CMU (Irwin et al., 2015, p. 16). According to the authors, Transition Design is seen as design of and with a new paradigm with a radical social and mental change in response to the climate emergency. The Transition Design Framework points out four areas mutually co-evolving; 1)Visions for Transitions, 2) Theories of Changes, 3) Mindsets & Posture, and 4) New Ways of Designing.

In this thesis, especially two key aspects are drawn from Transition Design. First, Transition Design requires radical, long-term, and compelling futures visions and some design approaches such as speculative design and scenario development are suggested. Future visions in Transition Design are "dynamic and grassroots based, that emerge from local conditions vs. a one-size-fits-all process, and that remain open-ended and speculative" (Irwin et al., 2015, p. 21). The emphasis on the locally developed visions is notable which is expanded next. Second, the local community and the importance of everyday practice are underlined as a basic context for design as transitions. Given that the transitions require the change of daily activities where ordinary citizens take initiatives, everyday life and the local - rather than macro perspectives - is the basis for design interventions.

Nevertheless, as Transition Design is still a newly theorized approach, not sufficient empirical study has been conducted. Specifically, the proponents do not indicate how radical and yet local-based futures can be envisioned apart from listing potential visioning methods. If transition design places an emphasis on the local initiatives, the visioning 'Vision for Transitions' needs to involve local citizens (Irwin et al., 2015). But as yet, communities lack methods for envisioning radical transformation (Angheloiu et al., 2017). There is an urgent demand for such a method.

2.3.6 Futures of participation: Collective Dreaming

Over the decades, the field of design has experienced a massive shift and development. Participation in design is currently applied to various social issues and domains from ICT to social innovation. This has brought different challenges and opportunities, calling for a new form of participation or future of participatory design (Smith et al., 2017). Sanders & Stappers (2014) explain a shift from product design to system design, and from designing for people to designing with and by people. Corresponding to these changes, they propose a past and current development of design practice as well as a vision of it from a co-design point of view.

In 1984, designers followed what clients told them to do, therefore the focus was not on 'what to design', but 'how to design'. This is the era of designing for clients and consumers. Thus, non-designer did not engage in the design process. By 2014, design disciplines have gradually matured and designers have started to be involved in the fuzzy front end of the process to explore 'what to design'. Participatory design and co-design are growing and they attract many sectors based on designing-with-people mindset. A group of users and stakeholders design in collaboration. Eventually, in 2044, Sanders and Stappers envision a future where everybody can be involved in the design process. The role of designers will become toolmakers who support everyone to express their dreams for futures through design tools in this scenario.

This is framed as 'Collective Dreaming'. It is "a participatory space where people convene to imagine and build worlds that they would like to live in" (McKenzie et al., 2016, p. 1). By people, Sanders (2017) refers not only to designers but also to all everyday people. In this vision, collective dreaming is not a future state where designers and futurists envision future scenarios to stimulate discussion with others, but more radical vision where "all the people can collaboratively imagine, create, and then enact their own future scenarios" (Sanders, 2017, p. 222). It stems from the belief that everyone is creative and capable if they are properly scaffolded. This vision seems inspiring also in terms of democratic stance of participatory design.

Dunne & Raby (2013) discuss that design is a catalyst for social dreaming while stressing that designers working with experts propose futures that catalyze public debates for

thinking desirable futures. Their position seems as an opposite to the view of Sanders and Stappers in terms of expert-focus. In short, professional designers and various domain experts envision futures to provoke in speculative design while citizens develop futures visions by themselves with scaffolds in collective dreaming.

2.3.7 Summary

In the age of transitions that we are living now, some studies demonstrate that visioning futures in a participatory way are urgent to catalyze transformation, but such methods have not been sufficiently developed yet. In the spectrum of future visioning, two attitudes, an expert mindset and a democratic mindset are identified. To realize the extreme citizens-led visioning known as collective dreaming where all the people can imagine and shape futures, the practical method is necessary. Here, speculative design can come into play if it can engage more people and facilitate them to collectively imagine as active agents.

Speculative design itself is framed as an attitude (See 2.1.1), however this is based on an expert-led mindset. The practical method is necessary for anyone to speculate futures. Speculative design can be a more participatory mindset to meet ethical demands and create active dialogue for plural futures. Speculative design and participatory design share common grounds, such as future-orientation, dealing with new technologies, and utilizing objects for engagement. They can create harmonized synergies due to the commonalities. For these reasons, the thesis aims to develop the method to enable citizens to envision futures, drawing from both speculative design and participatory design.

2.4 Methodological basis for method development

The thesis draws on methodological frameworks from various fields including participatory design, speculative design, and future study, as a basis for the method development. Also, the preceded practice by Extrapolation Factory is introduced as a central resource for inspiration.

2.4.1 Co-Speculation

As reviewed (see 2.1.3), speculative design lacks a participatory aspect. In response, there are some methodological practices to tackle the necessity for participation named as co-speculation. Wakkary et al. define co-speculation as "the recruiting and participation of study participants who are well positioned to actively and knowingly speculate with us in our inquiry in ways that we cannot alone" (2018, p. 1). In their practice, they collaborated with philosophers. Also, Lohmann (2017) proposes the method of co-speculation in collaboration with various actors, yet for instance museum visitors are not involved in the envisioning process itself . Thus, these practices prioritize collaboration in speculation, but do not necessarily address the empowerment aspect for everyday people.

In the thesis, I use the term of Co-Speculation for my method and this research draws on speculative design and the existing co-speculation method. Still, importantly it is built on the mindset of participatory design and ultimately collective dreaming to enable everyday citizens to speculate. In this light, the thesis potentially could expand the method of Co-Speculation further.

2.4.2 Experiential Futures

Futures are basically intangible, invisible and abstract. Given the nature of futures, researchers in future study claim the need for more experiential means for future speculations (Candy, 2010). 'Experiential Futures' was rooted in such challenges and it aims to engage the public in futures debates. It is described as the representation of possible future worlds in any medium, proposed by Candy (2010). It involves designing and staging interventions that "exploit the continuum of human experience, the full array of sensory and semiotic vectors, in order to enable a different and deeper engagement in thought and discussion about one or more futures, than has traditionally been possible through textual and statistical means of representing scenarios" (Candy, 2010, p. 3).

The concept and practice are situated at the intersection of future study and design, and it is closely tied with speculative design, although experiential futures seems to employ more diverse approaches such as theater performances, games, advertisements and so on

to make futures experiential, besides creating material artifacts (Candy & Dunagan, 2017). By doing so, it attempts to bridge 'experiential gulf', defined as "the difference between how we imagine or expect something to seem in advance, and what it's actually like being there" (Candy, 2010, p. 73).

The 'Experiential Futures Ladder' is a framework within Experiential Futures (Figure 10). This framework is "a conceptual model for scaffolding experiential scenarios and design fiction going forward" (Candy & Dunagan, 2017, p. 148). In other words, the model can help us to understand abstract conceptual futures by moving down to concrete experiential contexts. The model is composed of four layers:

Setting: **The kind of future world**
Scenario: **Specific narrative within the world**
Situation: **The circumstances of encounters, particular events**
Stuff: **Artifact used in the situation**

Inspired by this work, the Co-Speculation method aims to create a more experiential and embodied way to deal with futures. The theory and framework serve as a basis for workshop planning.
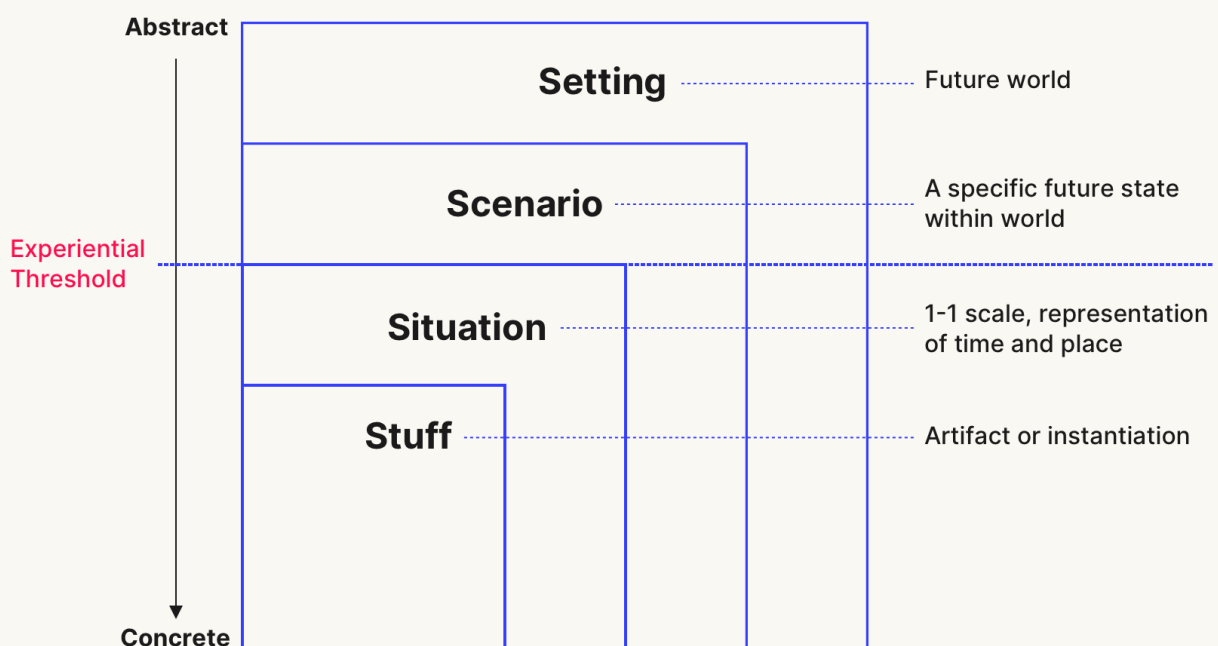

Figure 10. Experiential Future Ladder (Adapted from Candy & Dunagan, 2017, p. 149)

2.4.3 Generative methods: Make Tools

Generative methods are often used in the exploratory phases and described as "a new language that enables all the stakeholders to contribute directly to the development of products, goods and services" (Sanders, 2002, p. 5). Compared to research methods such as observation and interviews, the unique characteristic in generative methods is the use of visual materials to complement verbal literacy. The logic behind this is the focus on making which enables people to express their thoughts, emotions, and hopes. This is illustrated in the framework of 'say, do, make' (Figure 11). The interview corresponds to what people say and observation deals with what people do while generative methods focus on what people make to uncover hidden feelings. The Make Tools is a notion within generative methods that elicits participants to express. People are provided with emotional and cognitive toolkits to develop artifacts that tell stories associated with people's aspirations and thoughts.

To maximize the potential of generative methods, the process needs to be carefully crafted. 'The path of expression' model (Sanders, 2012) outlines how people are elicited for expressing their future dreams and structures the process. It first digs into what is happening by exploring the present experiences around the topic and then encourages people to bring out the past memory. This step deepens reflection and makes people aware of their concerns. Based on this reflection, new dreams will be envisioned.
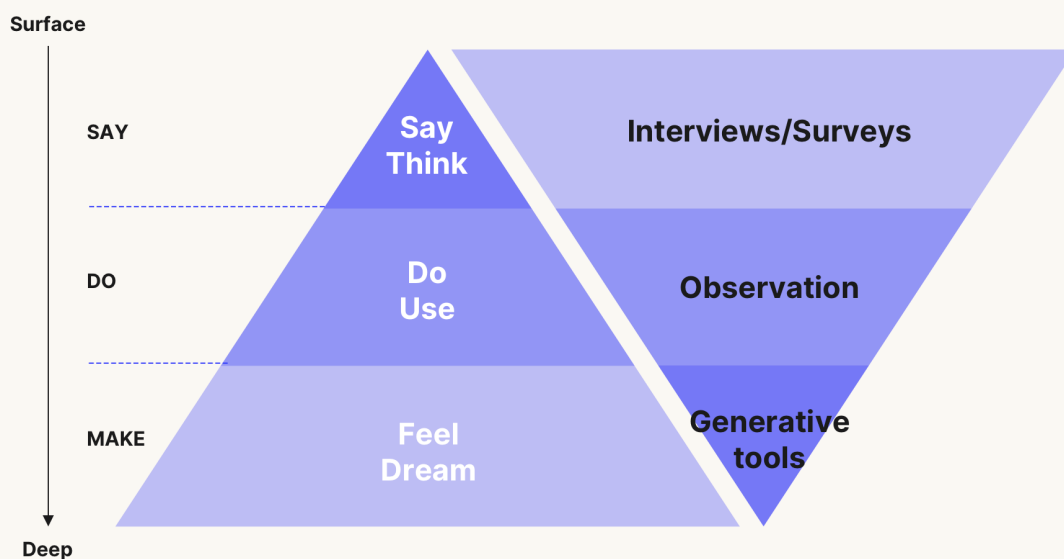

Figure 11. Make tools (Adapted from Sanders, 2002, p. 3)

In the thesis, the generative method with a focus on making can be a meaningful strategy to enable people to imagine futures. Furthermore, it can bring a more embodied way for people to actively engage in speculation, rather than just proposing constructed futures narratives.

2.4.4 Inspirational practices from Extrapolation Factory

The method of this thesis also draws on the practice level from a design-based research studio 'Extrapolation Factory' run by Elliott Montgomery and Chris Woebken. Their practice places emphasis on democratizing speculative and experimental approaches for envisioning possible futures. For instance, the most prominent case is '99¢ Futures' (Montgomery & Woebken, 2013). They organized participatory workshops and participants produced speculative artifacts. In common with many of their other practices, participants were exposed to a number of future signals, categorized them, and then created imaginative future scenarios extrapolated from chosen signals. Finally, they turn scenarios into products that might be sold at future 99¢ stores, with provided random materials. These produced artifacts were displayed at the real stores and created a discursive space even for the public.

In many cases, they developed a workshop format based on speculative design. Also, they involve non-designers, such as community residents and local citizens, in envisioning futures. This is aligned with my research interests and objectives.

The thesis refers to this practice in terms of structuring processes of the workshop, together with the Experiential Future Ladder framework.

2.5 Key insights for positioning the method of Co-Speculation

Finally, the summary of findings is outlined as a basic guideline for the method of Co-Speculation. This represents multiple components from a mindset behind the method to the objectives of the method.

2.5.1 Wider participation

Speculative design falls within elitism and is confined to closed settings that prevent it from incorporating wider views and engaging people actively. Additionally, a bottom-up futures visioning method is in demand in response to emerging design approaches to deal with transitions. The Co-Speculation can potentially be added to the methods box in these approaches with the aim to enable participation of the broader public, such as non-expert citizens beyond a showroom setting.

2.5.2 Democratic stance

Participatory design is built on a democratic and ethical stance to ensure that people who get affected by design can be involved in the design process and decision-making. If futures affect our present life, futures visioning should be also speculated not only by experts but everyday people. The Co-Speculation is built on this ethical underpinning. Plus, participatory design has a wide spectrum of roles between designers and citizens. Opposing to expert-led speculative design, Collective Dreaming aims at everyday citizens imagining futures by themselves based on a democratic mindset. The Co-Speculation is positioned as an empowerment method for all people to envision futures. In this mindset, designers play as a toolmaker to support collective imagination.

However, the thesis does not mirror directly collective dreaming, rather the first step towards it. Inspired by design participation typology (Table 2), the spectrum of participation is re-organized as 'speculate for/with/by'. The method of Co-Speculation in the thesis aims at 'speculate with' based on a democratic principle. Practices for 'speculate by', such as Collective Dreaming, delegates full power and control to people, however, the thesis does not take this position. In this thesis, a designer/researcher still owns

some power to structure the process and the project to meet research objectives. Yet, the designer plays a role as a facilitator and stimulator to emancipate citizens' imagination for speculation by giving them power to imagine futures. In this respect, the research positions itself within the realm of 'speculate with', but orients toward 'speculate by' (Figure 12).

2.5.3 Plural futures

Speculative design opens up multiple possibilities of futures and catalyzes debates as its purpose. The involvement of non-experts in speculation can bring up their desires and perspectives leading to plural futures. The Co-Speculation intends to pluralize futures and to activate dialogues in a more engaging and participatory way.

2.5.4 Experiential

Relating people to futures should be experiential as futures are abstract and intangible. Inspired by experiential futures, the Co-Speculation develops a more tangible, embodied and experiential way to think about futures. Especially, making can be a central strategy for experiential and collective speculation.
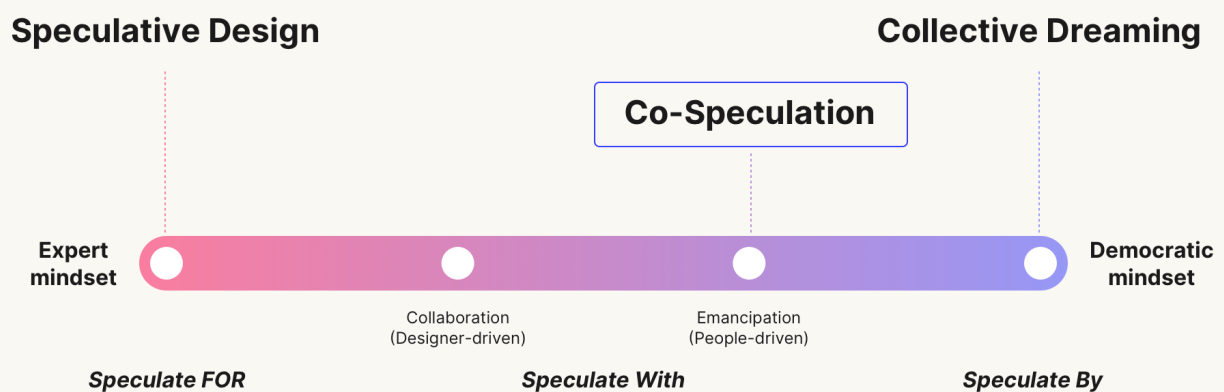
Figure 12. Positioning the method in the spectrum of speculate for/with/by

03 /

MATERIALS AND METHODS

This chapter describes the research methods and illustrates data collection. It also presents the framework for structuring a design process in the case study.

3.1 Research method

Among the three research questions, the first research question was investigated through a comprehensive literature review on speculative design, participatory design, and their relevant areas to clarify why participation is necessary for speculative design.

The rest of the research questions aim to explore how the method of Co-Speculation for the collaborative imagination of futures of 'ikigai' performed with the aimed target and what its potential effects are. With these objectives, an empirical inquiry was conducted by investigating the practical design project as a case. A case study is a useful method to discover the transition between design practices and theories (Breslin & Buchanan, 2008). It can open up the theory and connect it with the action to create wisdom about possible applications in the real-world context. It is also suitable for exploratory investigations. Yin (2009) describes that three preferable circumstances for the case study can be used. First, it is effective when research deals with 'how' and 'why' questions. Second, it is appropriate when the situation is uncontrollable and uncertain, and finally, when the investigation deals with an event in a real-life situation.

Matching with these criteria, the thesis questions how the method of Co-Speculation performs to scaffold citizen's imagination to envision futures. The method is developed on a theoretical foundation and framework reviewed in Chapter 2, however, the effectiveness and the result are unknown and not controllable. Finally, the research is confined to a specific context. For these reasons, the case study was employed as a research method. In the case study, the developed method was applied practically in the workshop, followed by the evaluative interviews for workshop participants.

3.2 Research materials & process

3.2.1 Data collection

In order to answer the research questions, data was gathered throughout the project. The materials include both primary and secondary data. Primary data consists of voice recordings in the workshop, 6 evaluative interviews, and the researcher's reflections. Secondary material is 5 pre-interviews used for the topic formation. All materials are

basically in Japanese, thus quoted materials and discovered findings were translated into English in the thesis by the researcher. Pre-interviews, workshop audios, evaluation interviews were coded into [A1-A5], [B1-B5 & C1-C5], and [D1-D6] respectively (The list of coding is in Appendix1).

The evaluation interviews were conducted after the workshop from 12th to 18th in July 2019. In total, 6 participants out of 8 cooperated. Each interview took 30-60 minutes and all the conversation was recorded with the app 'RecUp'. The standard semi-structured interview was chosen as a data-gathering method because this method provides flexibility and possibilities to adaptation (Galletta, 2013). It is loosely structured to address the study topic with enough spaces for interviewers to dig into a new focus. Semi-structured interviews create opportunities for deeply understanding personal viewpoints and opinions. Thus, predefined questions were prepared for the interviews, together with a simple visualization of the workshop process with used tools in each step to help to build participants' memory and encourage reflection upon their thoughts and feelings connected with the process (See questions in Appendix3).

The workshop conversation was recorded and turned into in total of 10 audio recordings, and each recording lasts 60 minutes though not all of the recordings were analyzed. The focus parts were the speculation phase, making scenarios and artifacts, so the recordings about these phases were transcribed and used for the analysis.

Workshop reflections were noted down by the researcher. To capture our own design activity, the importance of reflection is recognized in design research. This is also known as 'reflective practice' proposed by Schön (1983). This is composed of reflection-in-action (during an action) and reflection-on-action (after an action). The latter requires a deliberate consideration often using design outputs as stimulus (Pedgley, 2007). In the thesis, it takes a form of reflection-on-action.

For secondary data, I conducted five one-on-one semi-structured interviews with workshop participants and each session took 60 to 90 minutes. Due to the schedule adjustment, I could not conduct a pre-interview with the rest of the participants. The data was not directly used for the analysis of research questions, rather it aimed to narrow down the topic of the empirical study. Interviews were recorded, transcribed, and coded for insight analysis for the topic formulation (See questions in Appendix2).

In terms of research ethics, the consent forms for data and photo use were signed by all the participants. Those who took part in the pre-interview signed before the interview, and for the rest did at the beginning of the workshop (See Appendix5).

3.2.2 Recruitment

Workshop participants were recruited in parallel with developing the method. The initial goal was to recruit 10-12 participants in total. The main target was young citizens who are from 20 to 45 (More detail in Chapter 4).

The partner organization took an active role in the recruitment taking advantage of an existing network of active citizens. The recruitment started with contacting them. However, we struggled with it as the biggest group within the network was working or parenting mothers. They were very busy and some of them did not fit in the workshop schedule. It required to change the initial plan of the two days workshop, and it reduced to one day so more participants could adjust their schedule if interested. 3 working/parenting mothers and 1 single working woman were eventually recruited. Plus, 2 members from the partner decided to take part as they had a strong interest in the topic. To recruit more people, I contacted several associations and organizations supporting university students. Students were targeted to add more diversity in terms of age and different lifestyles; also, they were about to start working or looking for jobs, therefore reflection upon their future would be a great opportunity for them. Two organizations helped in the recruitment and distributed workshop information to their student's network, which resulted in engaging 4 students. In total 10 participants were recruited although 2 students canceled just before the workshop. Eventually, 8 participants took part in the workshop.

All recruitments were done without any financial reward, instead, the topic motivated people to participate. Some of them had more interest in the speculative design approach which is not common yet in Japan while others wanted to dig into ikigai in relation to their life.

A4 poster was designed for marketing the workshop and communicating the concept (Figure 13). The poster visually communicated the workshop topic and was easy to spread. To make a better understanding, I used the term 'Science Fiction' to explain the

concept at this point since speculative design is an unfamiliar term for most of the non-designers with its provoking questions, such as what if we overcame physical decline, for example.

Besides the target group, we wanted to recruit a few civil servants and seniors. Involving civil servants would create a more fruitful dialogue about futures and be helpful to take generated insights further for future plans as they have the power to implement bylaws. The current generation of elderlies could give an inspiring view and open up how the elderly's perspective could change in the future. However, civil servants could not take spare time besides their official tasks as they had to go through the bureaucratic process to get permission. We tried to recruit elderlies via the partner's network so they could participate in the final dialogue part of the workshop. As a result, one of the most active elderly, who is one of the leading members in the 'Ikigai Work' project, took part.

Figure 13. Advertisement for recruitment

3.2.3 Data analysis

To analyze the collected data, I used the affinity diagram method (or KJ method known as the origin of the affinity diagram). It is the method that helps to make sense of a large amount of raw data by synthesizing them to find out insights (Lucero, 2015). In the research, the online tool 'Miro' was used to save time and make the work more efficient (see Appendix4). First, focus recording parts from the workshop and all the recorded conversations from evaluative interviews were transcribed and coded into a single sticky note in the online tool, and then those which have a similar and relevant meaning are arranged into clusters. Each cluster was labeled and formed into a larger group. Through this process, the research tried to reveal the findings based on the research objectives.

3.2.4 Inspirational framework for evaluation

The case study was conducted as a part of 'Age-friendly city project' from June to July in 2019, in the city of Takarazuka, Japan. The project was set up to apply the method to a pragmatic context, and the main theme was to speculate possible futures of 'ikigai' given emerging technological and societal trends. Besides the research aim, the practical objectives were set in discussions with the partner organization; Encouraging future seniors to reflect upon technology trends and their future lives for early preparation in the aging society (described in Chapter 4 in detail). The research aim was to investigate how the Co-Speculation method performs in practice and examine its effects on workshop participants. The research on the effects partly stems from this practical project goal.

For the method evaluation, the study uses two lenses; how participants are enabled to imagine possible futures in the topic, and how dialogue and reflection about futures for new perceptions are activated. This was set by the original concept of dpeculative design and its umbrella concept, discursive design. Although there are no rigid criteria to examine if they are achieved or not, these are analyzed based on the workshop reflections, audio materials, and evaluative interviews with participants. The quality of artifacts, the dialogue content, the effectiveness of the processes, methods, and tools in the workshop are carefully investigated.

More specifically, discursive design forms the foundation for the impact evaluation. It has four major domains of application; Social Engagement, Practical Application, Applied Research, and Basic Research (Tharp & Tharp, 2019, pp. 290-293).

Social Engagement: **It aims to achieve preferred social conditions with explicit desirable states in mind.**

Practical Application: **It aims to reach preferred conditions for individuals or collectives although desirable states are not necessarily clearly defined.**

Applied Research: **It is used for the support of better creations, such as policies, services, and systems.**

Basic Research: **It aims to build a better understanding of certain topics by gathering related responses, without urgent needs for immediate impacts.**

In 'Social Engagement', the first level is preferred thinking. This changes the audience's awareness, belief, understanding and so on. The next level is to reach preferred actions. Actions can be small such as investigating a certain topic or build a new routine. The ultimate goal is to create preferable social conditions while this is hardly achieved through discursive design solely. (Tharp & Tharp, 2019)

In 'Practical Application', the first level deals with instrumental thinking meaning that it is new thinking or positive mental model, followed by the second level, preferred action. Discourses mediated through objects are provocative enough, it could motivate people to take desirable actions. Eventually, it leads to the preferred condition. Designers almost cannot make this happen at their own will, rather this will emerge as a consequence of preferred action. (Tharp & Tharp, 2019)

In 'Applied Research' uses discursive artifacts for the development of better products, services, and systems. Thus, this application is to probe people's value. The impact at the first level is to cause relevant thinking stimulated through material provocation. This thinking produces relevant responses to research themes or questions, which is the second level of the impact. This requires people to articulate or express their thoughts and ideas. Finally, it leads to actionable insights. This knowledge can be used instantly for a practical purpose. (Tharp & Tharp, 2019)

The first level of impact of 'Basic Research' is the degree of relevant thinking. It reveals

how much relevant thoughts in the framed topic can be evoked through discursive activities. At the second level, relevant responses deal with how well discursive acts elicit tacit knowledge from target audiences. Researchers need to be accessible to generated insights as a result. Finally, the impact could lead to new knowledge and meanings that are beneficial. (Tharp & Tharp, 2019)

As discussed earlier (Chapter 2), speculative design work frequently lacks the evaluation of effects. The difficulty of understanding actual effects is acknowledged because of its internal and intellectual nature. Reflection on certain thoughts and building preferred thinking occurs as a mental process. Furthermore, researchers should be aware of "the latency", in other words, how long it might take to have an effect. (Tharp & Tharp, 2019, p. 295). With a short time-span, the higher impact might be hard to reach although the level of the concern depends on the intended focus, for instance, actions basically cannot be expected to capture. As elaborated later, the project aligns with 'Practical Application' and 'Basic Research'. Given this challenge, the thesis evaluates what relevant and instrumental thinking the participants build through the workshop.

3.3 Structuring the design process

3.3.1 Ethnographic Experiential Futures (EXF)

Making invisible futures visible has been a challenge as the future does not exist as a real and lies in our mental image in nature. People cannot directly experience futures. To unfold this challenge, Ethnographic Experiential Futures, proposed by (Candy & Kornet, 2019) is one of the approaches to enable us to visibly feel futures. This is evolved from the combination of Ethnographic Futures Research (EFR) and Experiential Futures (XF). EFR, developed by Textor (1980), is used to evoke the images of possible and preferable futures from people in a social group with an emphasis on pluralism. To this aim, classic ethnographic methods, such as semi-structured interviews, are employed. However, this lacks a tangible way to approach futures. Alternatively, XF is an approach to make futures more visible and interactive. By applying various mediums, materials or performance, it creates experiences for futures as opposed to the traditional verbal-oriented field (Candy, 2010). Speculative design and design fiction can be included in this design-led and future-oriented activities (Candy & Kornet, 2019, p. 6). Thus, EFX is built on EFR's pluralism and experience-based

futures. The process of EFX forms a cycle and there are five main stages; Map1, Multiply, Mediate, Mount, and Map2 (Figure 14).

Map1: This step studies people's existing perceptions of futures using, for instance, ethnographic methods. To this aim, researchers firstly should set whose futures are investigated and how are they motivated to participate.

Multiply: Alternative futures are created given how the existing image of futures could be pluralized, challenged, or expanded. The direction can be varied. One might propose extended futures to warn the consequences of current phenomena.

Mediate: The generated futures need to be turned into experiential forms; tangible and interactive representations. The step involves how collaborative activity is set up with whom. There are many ways to manifest futures, from prototyping sessions to theater performance.

Mount: This is about setting discursive space for people to experience alternative futures. This is a continuous phase from the previous step as the accessibility to tangible futures depends on how they are mediated. Role-playing of narratives mediates and mounts at once while physical future artifacts are created and then might be exhibited.

Map2: Investigating responses and feedbacks as well as how the original image changes are conducted. The methods for mapping responses and recording them should be considered. This can be the formal interviews with original participants, direct observation, online feedback from a wider public, and so on.
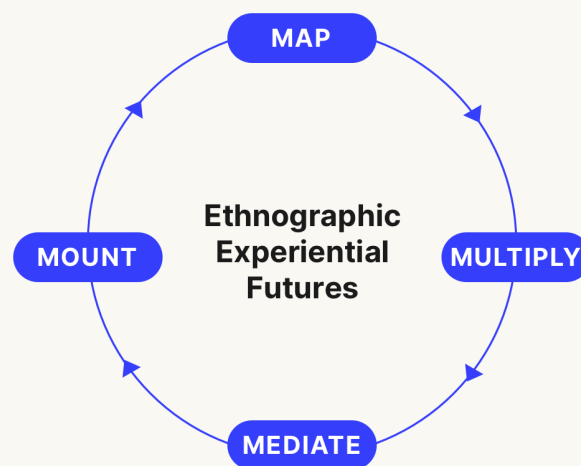

Figure 14. Ethnographic Experiential Futures (Candy & Kornet, 2019, p. 11)

This is a useful framework to structure the process of the case study for several reasons. First, any standardized process has not yet been established in speculative design, and thus, this can serve as a point of departure. Second, the framework is developed for increasing the accessibility of future images. The 'Map' phase represents this objective quite well by recording how participants respond to alternative futures and thus it is suitable for this thesis to see the effects of the method. Third, the framework gives flexibility and room for adaptation in each step. Each step may be done in collaboration or only by researchers. This enables optimizing the process for the thesis. Thus, the creative process in the research is developed based on EXF at a general level.

3.3.2 Double Diamond

To structure a design process at a more detailed level, the Double Diamond model developed by the Design Council serves as a basis. It describes simple steps that can be used in any design and innovation project (Ball, 2019). The two diamonds are visual representations of a process of discovering issues and developing focused interventions. The process in the framework is comprised of four distinct stages; discover, define, develop and deliver (Design Council, 2015):

Discover: The first diamond helps people understand, rather than simply assume, what the problem is. It involves speaking to and spending time with people who are affected by the issues.

Define: The insight gathered from the discovery phase can help you to define the challenge in a different way.

Develop: The second diamond encourages people to give different answers to the clearly defined problem, seeking inspiration from elsewhere and co-designing with a range of different people.

Deliver: Delivery involves testing out different solutions at small-scale, rejecting those that will not work and improving the ones that will.

As this model can be widely applicable and is familiar to me, framing design processes based on the above four steps help to work. This framework is mainly designed to deliver design intervention with less focus on the research purpose. Still, it offers practical value. Especially the model requires practitioners to reframe the focus issue through exploration, and this may fit into the research process to investigate futures of ikigai. The model structures the project at a more detail level to develop the method.

Two models complement each others' perspectives (See also Figure 19). The EXF provides a view with an emphasis on the transformation of images of futures while the Double Diamond orients towards delivering design outputs. This goes hand in hand with the project as the thesis aims to develop a method, tools, and a workshop as well as to understand participants' perceptions as effects of the method. Both models are used to frame and structure the process for the case description and the research does not highlight the effectiveness of the models themselves.

04 /

CASE STUDY: CO-SPECULATE FUTURES OF IKIGAI

In this chapter, Speculative futures of 'ikigai' workshop, as the empirical study where the Co-Speculation method was developed and applied, is presented. The chapter covers the bigger context of the project, its background, method development process, and the workshop outputs in the end.

4.1 Overview of the project

This section outlines the context and background of the project, which was conducted in Takarazuka, a city in Hyogo prefecture in Japan. The societal context of the project is an aging society. Also, the notion of ikigai is highlighted as a central topic. Takarazuka was nominated as the second 'age-friendly city' in the country by WHO in 2017, and this has pushed the city to be a more livable and friendly city for elderlies. In response to this, a non-profit organization that helps the municipality and active local citizens for community building and city-making decided to explore future possibilities of elderlies' life in collaboration with this research. The project itself is positioned as experimentation and exploration rather than aiming at developing a design solution. I conducted a workshop using a participatory speculative design method to empower citizens to speculate futures of ikigai.

4.1.1 Aging society as a bigger context

The rapid decrease in population is one of the biggest challenges to be tackled in Japan. Currently, 126 million people live in Japan according to the statistics published by the Ministry of International Affairs and Communications (2019). However, the report (National Institute of Population and Social Security Research, 2017, p. 2) estimates that it will reduce to less than 100 million in 2050, and eventually, it will be 88 million in 2065. As this trend illustrates, the population keeps decreasing at an accelerated pace.

The problems behind this phenomenon are intertwined. The main drivers are the aging population and the low birth rate. In this thesis, the aging society is specifically highlighted as a bigger context of the project. Aging society can be defined as a society where elderlies over 65 years old take up more than 7 % of the total population (National Institute of Population and Social Security Research, 2017, p. 4). When the rate becomes over 21%, it is called an 'extreme aging society'. What is the current situation in Japan? The aging society white paper (Cabinet office in Japan, 2019, p. 2) reports that the elderly rate in Japan has reached 28.8 %. In the conversion from its rate to the population, it counts 35 million elderlies which is equal to the total population in Canada. Moreover, one in 2.6 will be over 65 years old and one in 3.9 will be older than 75 in 2065 (Cabinet office in Japan, 2019, p. 2).

This aging society causes issues at many levels. One of the biggest concerns is that the younger generation as the workforce will have to shoulder the burden of elderlies to cover their pensions (Figure 15). This unbalance is caused due to the decrease in the working population and shrink of a domestic market. It requires the government to radically transform the social and welfare system. Moreover, it affects economic growth, leading to a recession if it is not coped with well.

This trend will definitely bring about massive problems at an individual level as well. Various problems can be observed, such as the increase of the elderly's solitary death, a burden of care workers, old-age bankruptcy and so on. Besides these issues, an emerging trend is longer life expectancy, questioning how meaningful we can live focusing on the quality of life (Harada, Kato, Oda, Uchida, & Ohno, 2011). Lynda Gratton, a professor at London Business School, argues in a book (Gratton, 2016) that a shift from a three-stage life composed of education, work, and retirement to a multi-stage life where more than three transitions of life stage will become normal due to the improved life expectancy.

4.1.2 Ikigai as a central concept

Although this significant transformation challenges all generations to actively navigate their life in a new way, what is the implication of this trend for elderlies? This has to do with the earlier question; how we can live meaningfully in the 100 year-life. Currently,
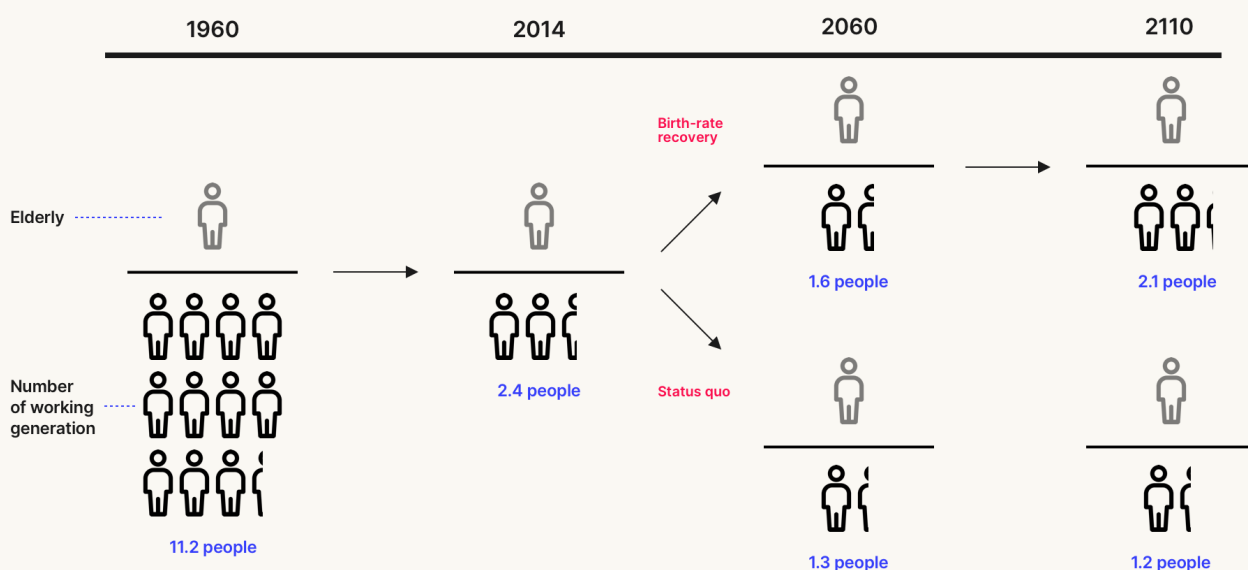

Figure 15. The ratio transition between elderlies and working generations supporting them
(Adapted from Cabinet office in Japan, 2019)

the retirement age in Japan is 60, and the government obliges companies to raise it to 65 by 2025. This implies that most people will still have roughly 30 years left after their retirement considering life expectancy. Watanuki (2014) describes that elderlies who have retired from their job often tend to fall in an isolated situation with an empty feeling and the loss of purpose in their life. 'Ikigai' is one of the key conceptions addressing this concern.

The concept of ikigai has no established definition. Kamiya (1980) argues that there are two usages of the term; the one means resources and objects for worth living, and the other is a psychological state that feels worthy. However, two meanings are not independent, rather they are intertwined. Resources and objects allow people to feel worthy for living, and people seek what are possible resources for themselves to sense the positive feeling. This can be seen as the most prevailing explanation among other researchers. Drawing on Kamiya's point, some researchers define it as "work of the mind which unified an 'object' and 'the feeling by which it is accompanied', when a person inquired as 'What is your IKIGAI ?'" (Hasegawa, Fujiwara, & Hoshi, 2001, p.1). Resources and objects include past experiences, the present occurrences and the image of futures. The feeling can be self-actualization, life satisfaction, zest for life and so on.

This notion of ikigai started to rise in the 1960s to 1970s. This was the time when Japan went through rapid economic growth which improved the standard of living. As the economy grew, people became less worried about making a living for the day and obtained a mental room to reflect upon their lives and futures. Moreover, one of the causes of the ikigai boom is a relativization of the dominant value (Kanda, 2015). People became able to choose how they want to live based on subjective value without being influenced by nationalistic ideology (Kamiya, 1980), and it led to an attraction of attention to ikigai.

Ikigai is a general concept while elderlies' ikigai has some unique characteristics. In old-age, various events that could transform, or lead to loss of ikigai can happen (Watanuki, 2014). For instance, livelihood is unstable due to retirement, health can take a turn for the worse as getting older, or social connection is lost as children become independent or partners and friends pass away. Elderlies are at the unique stage of entire life where the environment around them could change drastically and affect their ikigai. However, Kamiya (1980) notes that many people accept that they feel worthy if

could positively answer the question; for whom and what one's presence is necessary. Often, the elderly's sorrow is due to the unconfidence not to be able to believe in the importance of their presence to others. Therefore, it is pointed out that creating an environment where elderlies can play an active role within society and feel they are needed by others is essential.

Nomura (2005) analyzes the concept structure of elderlies' ikigai, and concludes that the core attributes are twofold; (1) meaning and value for living, and (2) introspective and positive feeling for living. The former points out what motivates us to keep alive. Put simply, it can be interpreted as a source of motivation to live a purposeful life. The latter is formed as a positive sense and recognition obtained by finding out the meaning of living. This is connected with 'subjective well-being' which shows satisfaction that people feel in their life. Nomura developed a model of the elderlies' ikigai (Figure 16) composed of antecedents, attributes, influential factors and results. This seems a comprehensive model even including the loss of ikigai that often happens at old-age as one of the consequences.

On the other hand, Figure 17 is a more simplified model developed by Hasegawa, Fujiwara, and Hoshi (2001). This model places subjects at the intersection between resources for ikigai and feelings by which it is accompanied. Additionally, a unique point is an integration of the time-scale. In the thesis, this model is used to structure the research from simplicity and perspective of the time-scale as a project aims to imagine futures.
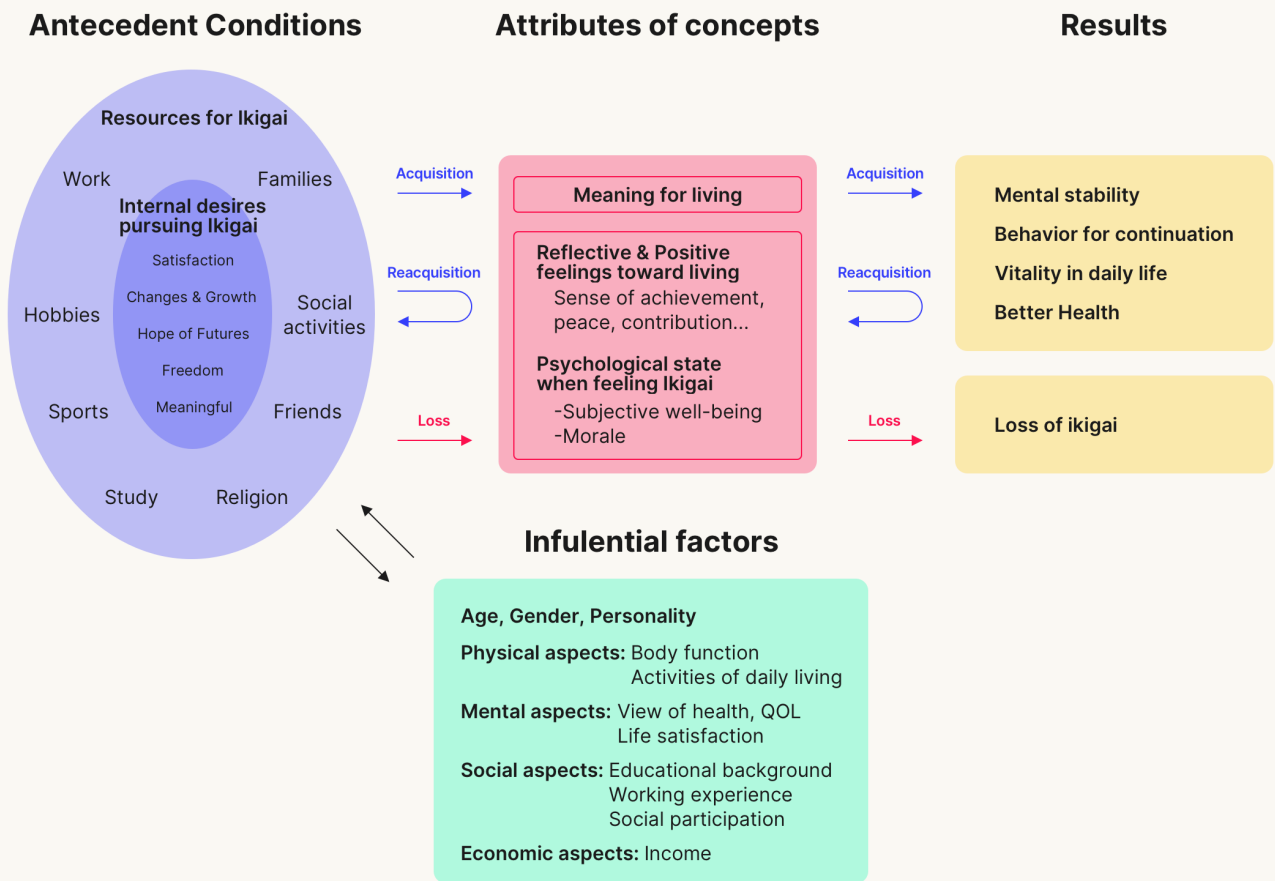
Antecedent Conditions

Resources for Ikigai

Work Families

Internal desires pursuing Ikigai

Satisfaction

Changes & Growth

Hope of Futures

Freedom

Meaningful

Hobbies Social activities

Sports Friends

Study Religion

Attributes of concepts

Acquisition →

Reacquisition ↩

Loss →

Meaning for living

Reflective & Positive feelings toward living
Sense of achievement, peace, contribution...

Psychological state when feeling Ikigai
-Subjective well-being
-Morale

Results

Acquisition →

Reacquisition ↩

Loss →

Mental stability

Behavior for continuation

Vitality in daily life

Better Health

Loss of ikigai

Infulential factors

Age, Gender, Personality

Physical aspects: Body function
Activities of daily living

Mental aspects: View of health, QOL
Life satisfaction

Social aspects: Educational background
Working experience
Social participation

Economic aspects: Income

Figure 16. The concept model of the Elderly's Ikigai (Adapted from Nomura, 2005)

Resources for Ikigai

Past	Present	Future
Roles	Roles	Friends
Friends	Friends	Families
Families	Families	Matured self
Education	Health	Events
Experiences	Hobbies	
Memories	Animals/Plants	
	Incomes	

Subject

Feelings attached to resources for Ikigai

Self-actualization

Motivation

Life-Satisfaction

Sense of Presense

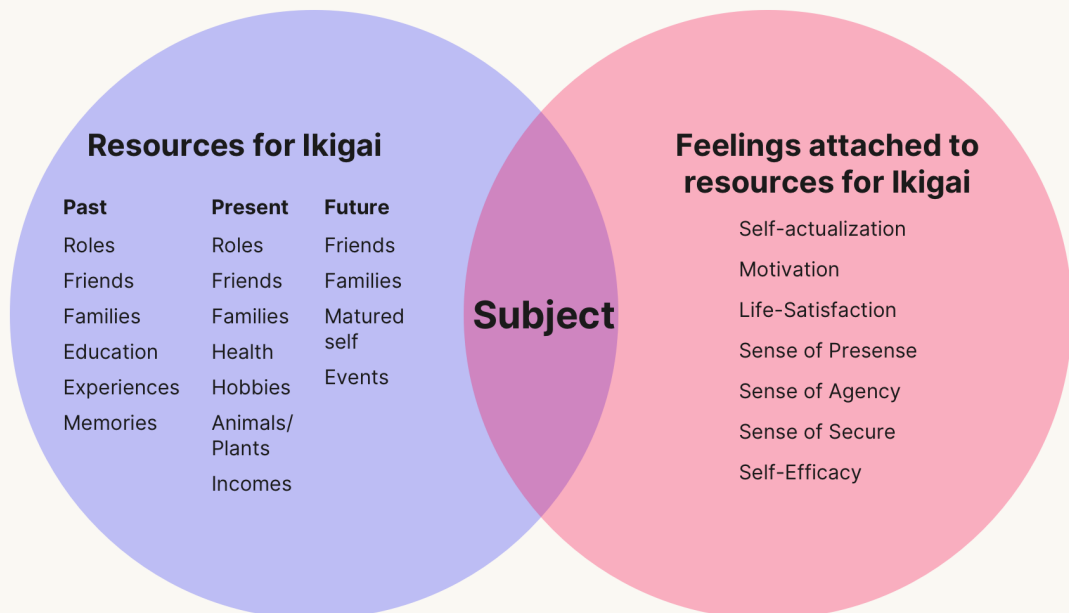Sense of Agency

Sense of Secure

Self-Efficacy

Figure17. The structure of Ikigai (Adapted from Hasegawa, Fujiwara and Hoshi, 2001)

4.1.3 Ikigai Work project in Takarazuka, Japan

Takarazuka, located in the west part of Japan, is a city with roughly 225,101 people (The City of Takarazuka, 2019). However, this population has been declining. By 2060, it will be reduced to 168,000 people (The City of Takarazuka, 2017). On the other hand, the elderly population rate will keep on the rise from 26.7% in 2015 to 29.7% in 2025 to 38.8% in 2060. In 2015, the city was certified as the second 'Age-friendly City' in Japan. 'Age-friendly City' was initiated by WHO, with the aim to facilitate "active ageing by optimizing opportunities for health, participation and security in order to enhance quality of life as people age" (World Health Organization, 2007, p. 1). The city of Takarazuka is trying to build a city where people help each other based on the idea that the city caring for elderlies results in caring for all. Toward this vision, the city promotes citizen engagement in the city planning to provide more local connections and opportunities for activities to live meaningfully.

After the city was certified, they started to work on the action plan. Community Link, a non-profit organization connecting citizens concerned with the local issues and empowering them to build a sustainable city by using ICT, supported the municipality to develop the plan. In 2017, they organized a series of workshops to envision what is necessary for the city to be age-friendly with civil servants and citizens. Throughout the process, they built a foundation for moving the project forward. In 2018, some action and intervention plans were made and examined. Eventually, three themes were decided to implement; public place-making for all generations to connect and get help, create job matching for seniors' ikigai, and promotion to raise awareness.

Specific focus in this context is to provide job matching for seniors' ikigai, called 'Ikigai Work' project. This project was developed around the concern of the 100 year-life and it intends to offer the working opportunity and support for elderlies to live with ikigai and have meaningful roles in society. As a first trial, the initiative addresses the labor shortage in the care industry and tries to match elderlies who are eager to work with nursing care centers that lack workforces. Mainly elderlies from 60 to 80 years old are targeted. This starts with a job trial of three months at first and those who wish to continue can keep working.

4.1.4 Set up the research project

Project set-up

Speculative future of 'ikigai' workshop, as an empirical case study, was a part of the 'Ikigai Work' project. When I organized the first meeting with the main partner Community Link via Skype, the 'Ikigai Work' project already started to be tried out, and it was difficult to apply the experimental methods to the ongoing work as the collaborator concerned that this might confuse active citizens involving in the project as they are in the middle of taking action following the agreed plan. This is understandable as the nature of speculative design is explorative, and not operative, making it difficult to apply to this context. One of the members also discussed with some civil servants in the municipality to ask for collaboration though it did not work out due to the bureaucratic procedure and the lack of understanding of the potential impact of the approach. However, the partner organization acquired permission from the city to engage citizen-project members in this research. Therefore, the main stakeholders in this research project are; Community Link and active citizens who are members of 'Ikigai Work' project, also with a few external participants (Figure 18).

Project Goal & Target

After several discussions with the collaborator, it turned out that they wanted to explore how people can live a meaningful life after retirement beyond the work context.
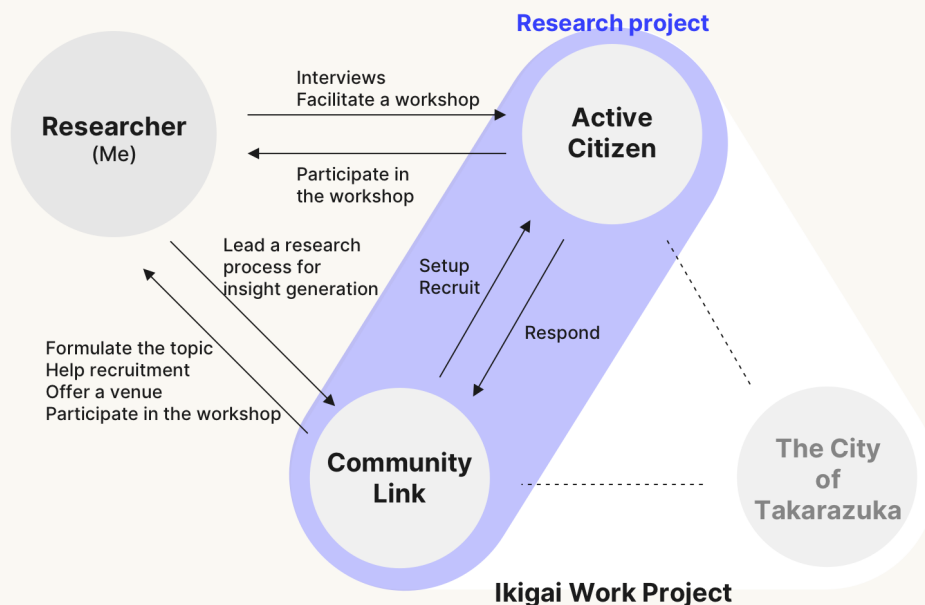

Figure 18. The stakeholders' relation in the thesis and Ikigai Work project

Currently, the focus of the ongoing project is work life. Yet, the notion of ikigai does not only relate to work, rather it is associated with more varied areas of our lives as literature illustrates. For this reason, the exploration of future implications from this wider point of view could benefit from the development of future projects. Thus, the research project was positioned as an experimental trial under the 'Ikigai Work' project in the context of the age-friendly city and it made possible that I could use the intended method to gather necessary data for the research.

With this focus in our minds, together with the collaborator, I decided to target younger generations roughly from 20 to 45 years old, instead of present elderlies. This target group was set for three reasons. First, the rapid developments of emerging technology could potentially have more impacts on this generation, especially in relation to the notable notion of Singularity in 2045 where machines will become smarter than humans. (Kurzweil, 2005). Second, the younger generation feels massive anxiety about their retirement life in many respects. The survey (Japan Association For Financial Planners, 2018) illustrates that almost 85% of people in their 30s and 40s are strongly anxious about life after retirement, in terms of future life plans, the health of themselves and family members, savings and so on. Even 77% of young people in their 20s are worried. Third, contrary to this concern, not many of them actually try to prepare for the future life plan. The research (Government Public Relations in Cabinet Office, 2019) shows 32% of people in their 20s, 58% in their 30s, and 69% in their 40s have planned for retirement life. In short, technology will change the landscape and create more uncertainty, which could lead to more anxiety. This brought us to focus on facilitating reflection upon their future life taking emerging technologies into consideration.

From these discussions, the research project was created in an attempt to achieve three goals; the partner's goal, workshop goal, and research goals.

The partner goal: **To gather insights on what retirement life and ikigai could be in futures**

The workshop goal: **To encourage reflection and promote new perceptions of how participants can rethink their retirement life.**

The research goal: **To engage ordinary citizens and support them to collectively envision speculative futures by testing the Co-Speculation method**

The project was designed around the use of speculative design with a participatory approach. This originally came from my research need as mentioned, however, it fits in the project goals to explore future possibilities for insights and catalyze reflection.

Initially, two workshops were scheduled in the initial plan, but it was reduced to the only one due to the difficulty of schedule arrangement and recruitment. The one full day workshop with 8 participants was organized, and it was designed around three main themes, 'Loneliness & Relationship', 'Work, Leisure & Money', and 'Healthcare & Nursing' under the concept of ikigai in relation to technologies. During the process, I played an active role as a designer, a researcher, and a process facilitator while the partner supported the topic formulation, participant recruitment, interview opportunities, workshop venues, and working space (Figure 18).

Timeline

The project was started in April. At this point, the discussions were done with an online video communication tool as I was still based in Finland. In parallel, I conducted literature reviews and prototyped an initial workshop plan to test out the method. As I did not have much experience relevant to speculative design, this prototyping was aimed to deepen my understanding of how a potential method works. In June, I flew back to Japan and started with signal scanning and researching the concept of ikigai. Simultaneously, mainly my collaborator recruited some participants. Pre-interviews were performed to understand their feelings toward futures and to identify narrowed workshop topics. After the three main topics were determined based on gathered information, a design fiction was created along with the workshop planning. The detailed workshop plan was designed by the end of June, and a pilot workshop was arranged to test it out a week before the actual workshop. The final one-day workshop for all the topics was organized on the 11th of July 2019.

Afterward, I conducted evaluative interviews with the participants. The interviews were carried out within a week after the workshop. Then, collected data were analyzed from August to October, and the analysis was finalized at the end of December 2019.

4.2 Developing the Co-Speculation method

This section describes the entire process to develop a participatory speculation method in the project. The process is grounded on the combination of the 'Double Diamond' process and 'Ethnographic Experiential Futures' (EXF) (See 3.3). Then, the final workshop plan and methods used within the workshop are presented, followed by the final outcome of the workshop.

4.2.1 Design process overview

The process was structured around the EXF and the Double Diamond model (Figure 19). The EXF provided the process with a more interrogative perspective and the Double Diamond offered a basic process to create deliverables, as described more in detail in subchapter 3.3.
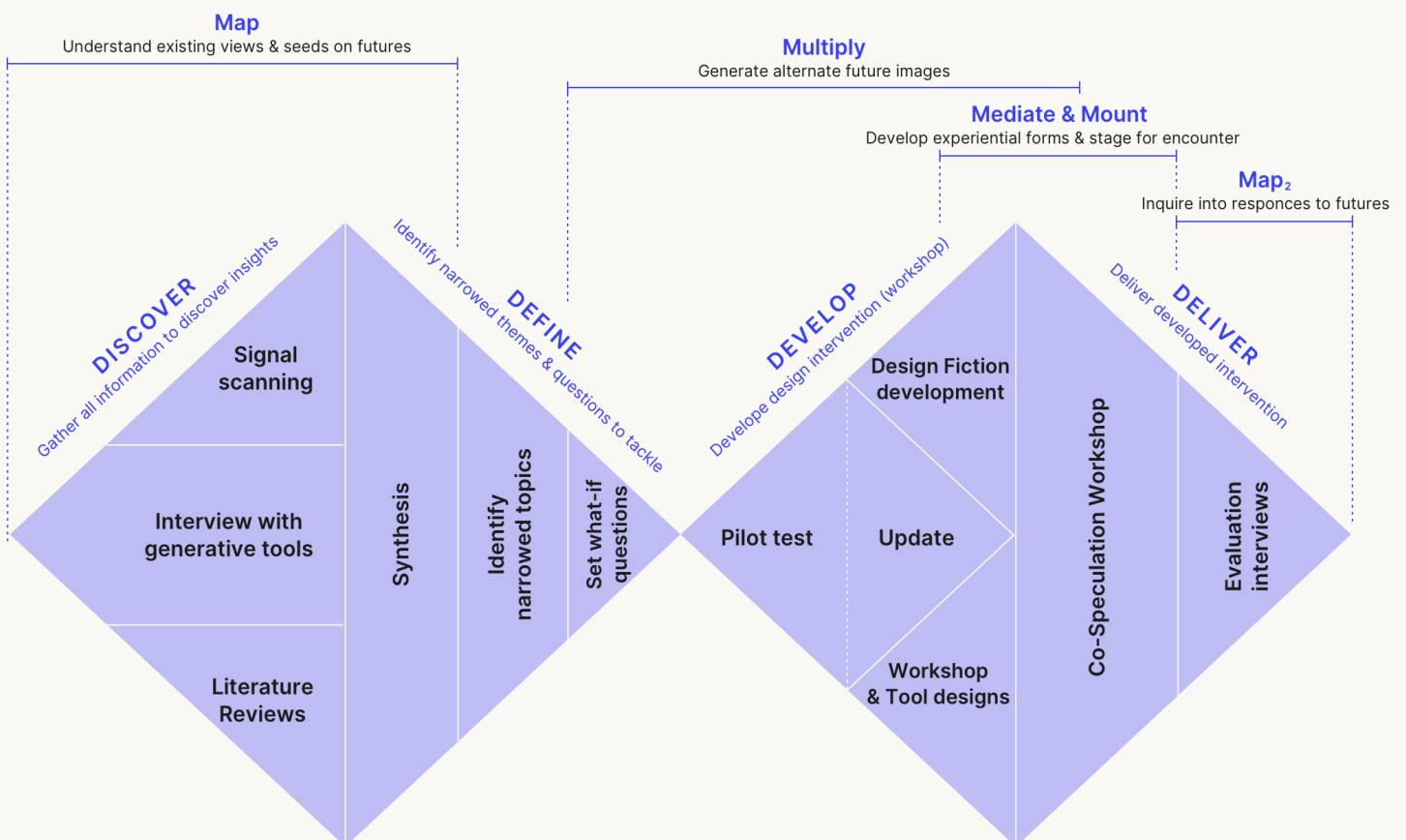

Map
Understand existing views & seeds on futures

Multiply
Generate alternate future images

Mediate & Mount
Develop experiential forms & stage for encounter

Map₂
Inquire into responces to futures

DISCOVER
Gather all information to discover insights

DEFINE
Identify narrowed themes & questions to tackle

DEVELOP
Develope design intervention (workshop)

DELIVER
Deliver developed intervention

Signal scanning

Interview with generative tools

Literature Reviews

Synthesis

Identify narrowed topics

Set what-if questions

Pilot test

Design Fiction development

Update

Workshop & Tool designs

Co-Speculation Workshop

Evaluation interviews

Figure 19. The design process for the method in the thesis project

4.2.2 Discover

The goal of this discovery phase was to gather all the necessary information to identify narrowed themes and questions to tackle in the workshop. The overall topic is futures of ikigai, but after the literature reviews on the concept, it turned out that this notion is too subjective and abstract to speculate. Therefore, I decided to set more manageable topics under the notion of ikigai. This phase mainly includes signal scanning, pre-interviews for the workshop participants, literature reviews on the elderly's ikigai and participant' recruitment.

Literature Review

As noted earlier, a literature review on ikigai was conducted. Based on the above-mentioned reviews, I summarize important findings for narrowing down the focus.

1. Elderlies' ikigai can be broken down into several components that interrelate each other; antecedent conditions, attributes, influential factors and results (Nomura, 2005). Influential factors (age, genders, work/education experiences, income...) and resources for ikigai (families, friends, work, hobbies...) influence each other, leading to the acquisition of the meaning of life. As a result, one achieves mental peace, vitality in life and so on.
2. In a more simplified structure (Hasegawa et al., 2001), resources of ikigai generate positive feelings towards ikigai. Yet, different timescale from pasts, presents and futures are interrelated.
3. The resources of ikigai can be lost at any time, and it especially happens in the elderlies' life. The main losses are poor health, loss of the economic base, death of surrounding people, and loss of connections. (Watanuki, 2014)

These insights led me to focus on how resources of ikigai could be changing futures, which will lead to the change of its attached feelings. For instance, if relationships between people, or health conditions significantly transform in the future, this could radically change the form of ikigai.

Semi-structured interviews

The semi-structured interviews with workshop participants were done for the topic formulation of the workshop as well as mutual trust building. According to the EXF process, the very first step is an inquiry into people's existing image of futures. Hence, the main objective was to understand participant's hope/fear for futures, their perceptions of their retirement life, and anticipation of how future society can look like.

The interview was structured around 'the path of expression' model proposed by Sanders and Stappers (2012, p. 55). This model is useful to explore present, past and future experiences and scaffold participants' capability to articulate their dream and hope. Therefore, the interview started with reflecting upon their day in their life and then sharing recent experiences that they felt worth living. Finally, they were asked to imagine how society could change when they become elderly, what kind of their ideal life would be and what kind of fears they have. Collage making, one of the Make Tools methods, was used to elicit participants to express their "feelings, dreams, fears, and aspirations" (Sanders, 2002, p. 5). These tools are effective to get access to latent needs and emotions. In each session, participants were tasked to make a collage to represent their dream future retirement life (Figure 20).

Signal scanning

Inspired by Extrapolation Factory's approach (Montgomery & Woebken, 2016), I started gathering weak signals around the world, in parallel with pre-interviews. This trend or signal scanning is often the first step of the normative foresight process (Voros, 2003). Signals were collected mainly from trend reports and online media articles, such as 'Futures of Ageing Population' from UK Government Office for Science and 'Forum for the Future'. In total, I gathered 50 weak signals. In total, I gathered 50 weak signals.

In future studies, one of the growing agendas is a participatory approach for the foresight method. Throughout the process, who needs to be involved is the question especially as this step provides raw materials for extrapolation and speculation. However, in the project, both my partner and workshop participants could not engage due to the lack of time. For this reason, I conducted scanning by myself, and it was inevitable that my own biases and perspectives were projected into the scanning process.

Figure 20. Created collage illustrating dream retirement life

4.2.3 Define

The goal of this phase was to synthesize all the information and insights collected in the discovery phase. According to the EXF, understanding current perceptions is an important step leading to the creation of alternatives. Specific topics and provoking questions under each topic were identified, which would be later developed into design fiction as initiators of speculation.

Findings of future hope/fear

Out of the interview data, several interesting insights were discovered. Hope for futures varied from person to person, however, there were some common themes. Most mentioned staying healthy, building trustful relationships with family and friends, and trying something new. In the analysis, fear for futures was closely connected with those hopes. The most frequent three topics connected to fear were; loneliness, financial instability, health diseases, and care.

First, many of them who were married and built family were worried to be left alone by their partner and children passing away before them. One participant described that she actually started to get involved in the 'Ikigai Work' project as she wanted to connect with the local community to prepare for this concern. Meanwhile, one interviewee told that she was afraid of being solitary since she had not married yet.

> *"I don't want my partner or children to leave me alone. I'm worried that they pass away before I do."* [A2]

> *"Because I don't have any child, I am not involved in any community through children. This makes me worried of being lonely"* [A5]

Second, the anxiety of finance was recognized especially relevant to the collapse of the national pension system. The recent report titled 'Asset building and management in an aging society' (Financial System Council, 2019) states that people need 20 million yen savings as a retirement fund, which is equal to about 150,000 euros. This statement stoke public fear and some other interviewees also expressed the same concern.

> *"I want to save money to deal with pension problem so I will not worry about it in the future."* [A2]

Lastly, the healthcare problem was often noted. On the premise, they thought that elderlies have a lot of difficulty in everyday life due to physical decline. Beside, dementia is a huge problem. One of the participants was afraid of bothering her family with the necessity of care.

> *"I live with my grandfather and when I see him taking many medicines, this often scares me." [A3]*

Findings of signals

Literature reviews combined with these findings, the above-mentioned three themes were set as sub-themes to explore under futures of ikigai. Then, to create speculative what-if questions, I merged some insights of interviews and signal scanning.

Regarding the question about emerging technologies in the interviews, artificial intelligence was the most frequent theme. Some positive interpretations of AI were such as the increase of efficiency and decrease of human's burden, while more negative implications were also highlighted, including the decrease of human autonomy, less human-to-human interaction, and human replacement through automation. However, they had never considered the topic deeply. I assume this AI topic is one of the hottest topics and mass-media brings it up sometimes, thus it caught their attention. Other mentioned topics were relevant to healthcare technology to overcome dementia.

The scope of signal scanning was based on the identified three topics from the interviews and literature reviews. For example, relevant to human relationships, a quarter of millennials in the UK agreed that they could have a romantic relationship with a robot in the future, according to the report (Havas, 2017). This questions the boundary between humans and robots, how robots could change human-to-human relationships, and so on. Regarding work, 'the future restaurant' located in Jimbocho in Tokyo, Japan offers a free meal for customers who help the owner's work for 50 minutes. The signal represents an alternative service without the exchange of currencies. Also, Chinese artist Jingyi Wang invented 'post-capitalism auction' where everyone can use three means to get artworks; opportunity, understanding, and exchange as alternatives to currency (Wang, 2018). For instance, 'opportunity' offers working opportunities to artists as payment. Under the topic of healthcare, a brain implant succeeded to enhance human memory which can be potentially applied to dementia and Alzheimer's diseases (Houser, 2017).

Collected signals were synthesized (Figure 21). With scanned trends signals, pre-identified three topics were slightly reframed. In conclusion, the final three topics were; (1) Loneliness & Relationship, (2) Work, Leisure & Money, and (3) Health & Nursing.

Set what-if questions

I turned all the gathered information into three what-if questions to be explored in the workshop (Table 3). All what-if questions are designed to encourage reflection upon emerging technologies in regard to important factors for the elderly's ikigai. These were developed basically to encourage reframing participants' assumptions that shape their fear for futures.

The first question is "What if people had at least one 'programmable' AI robot per household?". Loneliness is a big concern among participants. Solitary death has been on the rise in Japan (The Small Amount & Short Term Insurance Association of Japan, 2019). I decided to focus on the human relationship affected by humanized AI robots which have programmable personality.

The second question is "What if time and trust replaced currency as a central economic value?". Finance for retirement life is a serious issue. Money has been a materialized form of trust among people while alternatives are emerging. Thinking about alternatives to a currency-based economy pushes us to reconsider what finance, work and leisure mean in futures.

The third question is "What if we became nearly immortal by overcoming getting old and diseases?". We get closer to death as we get old. Health is the cornerstone of our life, and this biological limitation invisibly shapes our social structure. Assumably, the retirement age was decided based on the average life expectancy. Emerging trends such as gene editing, human augmentation, and bioprinting could enable human beings to overcome this biological constraint.

Figure 21. Synthesizing signals

What if	Topic	Concerns (from interviews)	Signals/Trends (glimpses, from signal scanning)
What if people had at least one 'programmable' AI robot per household?	Loneliness & Relationship	Fear of being left/alone	-Rise of solitary death -Rise of unmarried rate -Invention of pet-like robot -Evolution of AI
What if time and trust replaced currency as a central economic value?	Work, Leisure & Money	Finance after retirement	-Automation -Social credit score -Post-capitalistic services
What if we became nearly immortal by overcoming getting old and diseases?	Health & Nursing	-Getting ill -Nursing care burden for family	-Increase of life expectancy -Human augmentation -Bio-printing

Table 3. What if questions relevant to participants' concerns & signals

4.2.4 Develop

This phase aimed to develop the workshop plan and design fiction. The section introduces a workshop plan, design fiction, and iterated workshops through two pilot tests.

Inspiration for designing a workshop

In parallel with creating design fiction, I started to build a workshop structured around the research purpose. The three topics (1) Loneliness & Relationship, (2) Work, Leisure & Money, and (3) Health & Nursing were set.

To design workshop tasks and structures, I explored existing cases and frameworks as inspirations and identified two main resources as the basis of the co-speculation approach. The first is the 'Experiential Futures Ladder', proposed by Candy & Dunagan (2017) to structure the workshops. Together with the framework, I decided to draw from the practice led by a design-based research studio 'Extrapolation Factory'. (see also subchapter 2.4.2 and 2.4.4)

Workshop design-1st pilot test

The very first pilot workshop was conducted with two main objectives prior to even set up the project. Firstly, it aimed to understand how speculative design can turn into participatory formats in practice. Secondly, it was crucial to identify the appropriate level of openness so non-designers can flourish their imagination. The first pilot workshop was organized at Aalto University inviting 5 participants; 3 non-designers and 2 designers studying at the International Design Business Management program. The workshop was running for two hours.

As this pilot session was organized before futures of ikigai with three sub-themes were identified, the focus at this point was futures of work. The participants were divided into 2 groups, and each group was tasked to imagine possible futures of work. The workshop process did not include the prop-making step as the focus of the test was speculation from signals. See Figure 22 for the details of the workshop tasks and Figure 23 as the image of participants developing what-if questions.

| Time	Phase	Task
8min	**Introduction**	-Introduce today's aim & goal -Give a background knowledge about aging society, speculative design, future thinking
16min	**Warm-up**	-Individually write down current perception of future of work -Share with everyone and mapp them out on future cone
43min	**Identify signals**	-Individually scan future signals on the wall -Choose 3 signals as a team to develop -Extract implications from each signals **Key questions** Positive/Negative effects How the work could change if the signal grow?
30min	**Develop What-if world**	-Turn implications into what-if questions with brain writing method -Decide one what-if question to speculate -Future wheel exercise to write down what could happen
10min	**Break**	
48min	**Speculative Fiction building**	-Give an introduction of the story structure -Choose prtagonist -Develop speculative fiction -Presentation
12min	**Feedback sheet**	-Fill out a feedback sheet

Figure 22.Pilot workshop design
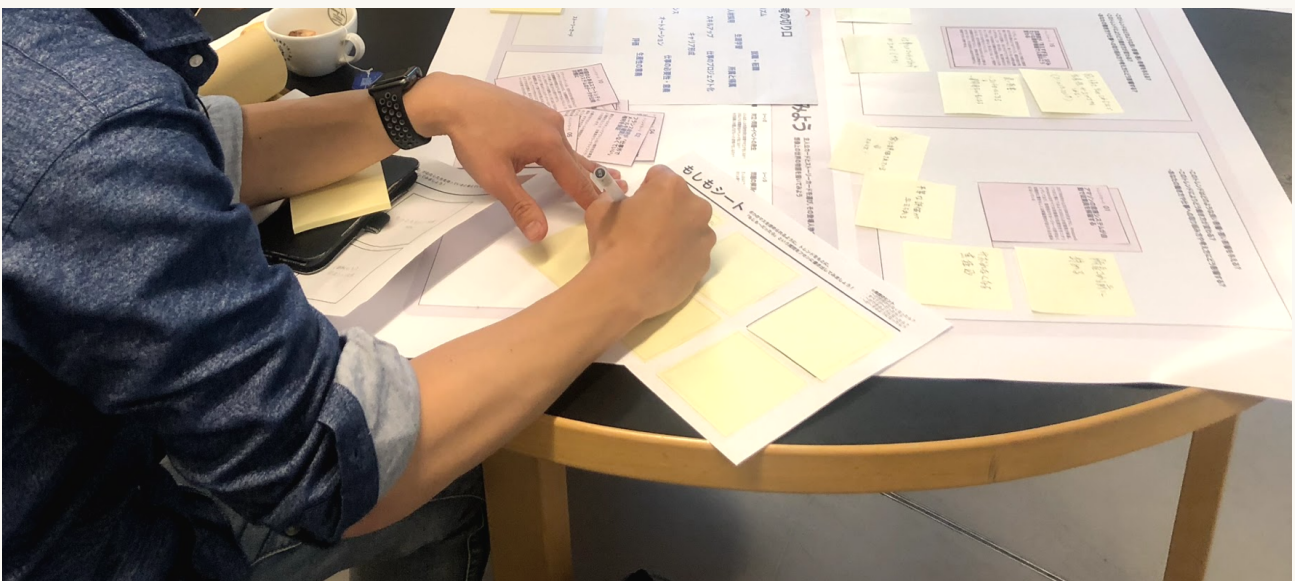
Figure 23. Participants developing what-if questions

The test provided me with valuable insights. The workshop was designed to create enough room for imagination, but this degree of looseness turned out to be too open. The observed challenge was the difficulty in speculation and deep reflection. The main causes of this were the lack of focus and scope for speculation and reflection. For instance, developing and choosing what-if questions were up to participants but futures of work as the topic was quite open and brought confusion. In contrast, persona cards and a simple storyboarding framework worked very well. Personas helped them to come up with the storyline.

These insights set a direction for designing the co-speculation workshop further (Figure 24). I made a decision to develop a starting point for speculation rather than letting participants do from scratch under the broad topics. The reflective topic is embedded in this starting point and it will function as a catalyst for both reflection and further speculation. To this aim, design fiction was created in each theme.
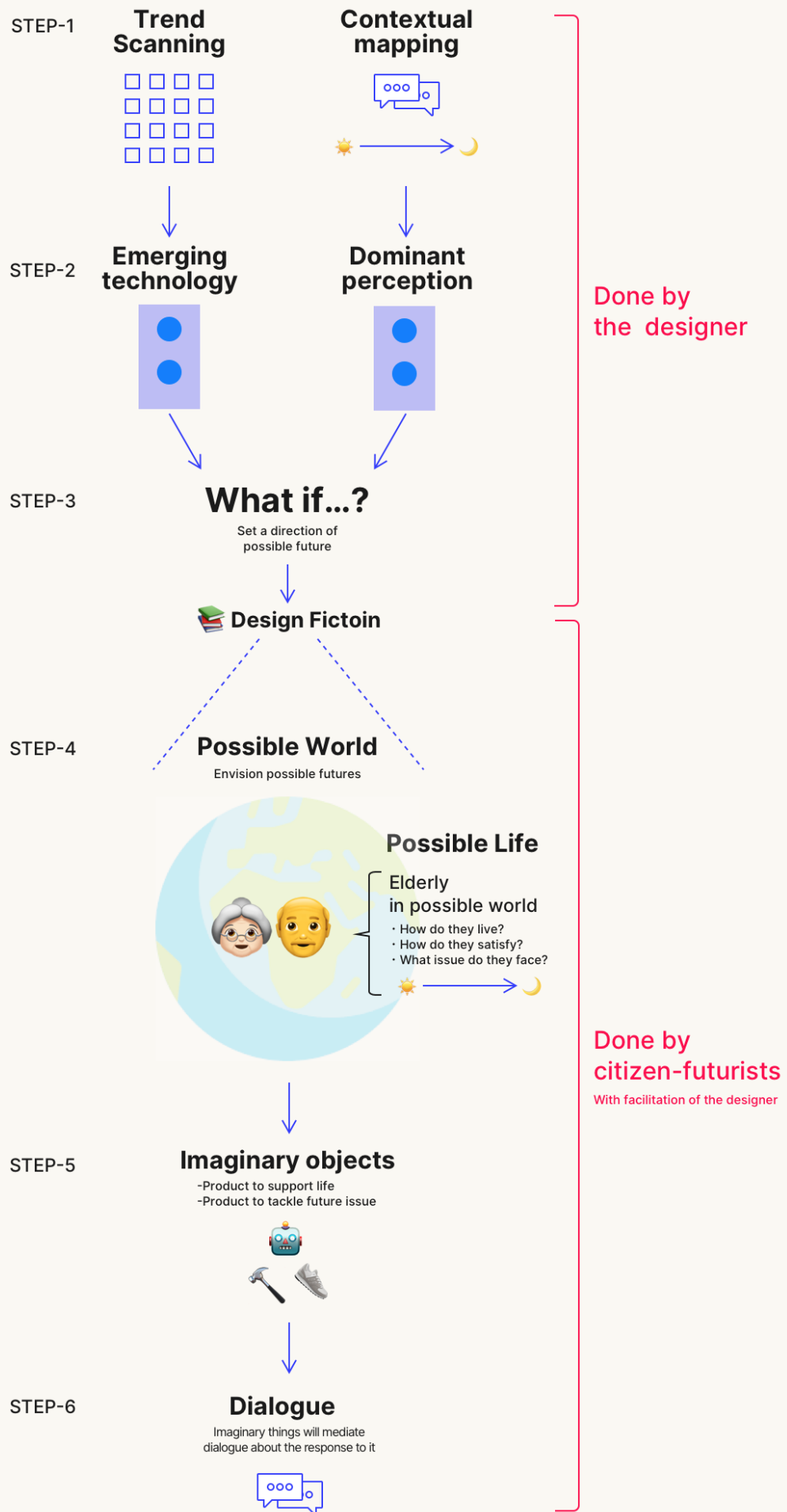
STEP-1 **Trend Scanning** **Contextual mapping**

Emerging technology STEP-2 **Dominant perception**

STEP-3 **What if...?**

Set a direction of
possible future

📚 **Design Fictoin**

STEP-4 **Possible World**

Envision possible futures

Possible Life

**Elderly
in possible world**

· How do they live?
· How do they satisfy?
· What issue do they face?

STEP-5 **Imaginary objects**

-Product to support life
-Product to tackle future issue

STEP-6 **Dialogue**

Imaginary things will mediate
dialogue about the response to it

Done by
the designer

Done by
citizen-futurists

With facilitation of the designer

Figure 24. The overall process for the workshop

Creating the Design Fictions

As the first test provided me with an insight that a specific focus for reflection and discussion was necessary, I developed three design fictions based on what-if questions. The source of these fictions were interview insights, literature review on ikigai, and signal scanning. Design fiction can play several roles in the workshop setting. In this context, it was employed to set the scene by "establishing and presenting the context of a workshop" (Huusko, 2018, p. 57). Thus, design fiction was not the final outcome, rather it is a starting point. Additionally, as Dunne & Raby describe the role of designers "as catalysts for public debate and discussion about the kinds of futures people really want" (2013, p. 6), the aim was to function as a stimulus for imagination and discussion initiator.

It was essential to figure out how much structure and details were required, and several iterations were conducted to reach the right balance. The first prototype included text-based scenarios and fictional comments from the speculated world (Figure 25). Through a brief evaluation session with two volunteers, they struggled with speculation. I learned that the guiding question and images were probably needed since the what-if question was too open and text-base design fiction was not intuitive for them. In the second iteration, I also added future signals that fed into design fiction with the aim to build an understanding of what is currently happening. These signals could also broaden participant's perspectives. This worked better than the first version.

Figure 25. Initial prototype of design fiction

The finalized design fictions were turned into small booklets, covering the what-if question, speculative and fictional scenarios, future online news, a glimpse of future including images of fictional magazines or websites (Figure 26). Corresponding to the definition, provocative future scenarios created a story world while future online news and future magazines/websites are glimpses of the world to bring a sense of realism to speculative worlds, with the aim to open up discourse and possibility. Fictional magazines/websites represent 'Side-shows'. They are "the parallel-but-related developments" (Lockton, 2016). The intention of these materialized side-shows was to facilitate imagination more holistically.

I intended not only to encourage reflection but also to support participants to speculate possible futures. Hence, it was designed to leave enough room for interpretation and it set the direction and specified certain themes to reflect upon. For instance, the fictional scenario based on the question of "what if people had at least one 'programmable' AI robot per household?" under the topic of 'Loneliness & Relationship' is below.

What if people had at least one 'programmable' AI robot per household?

—

"In 2040, robots became widely available for general households as its price went down. One of the serious issues at this age is to deal with mental illness arising from loneliness in hyper-aging society. Due to this trend, solitary death has been growing, and thus the government cooperated with the emerging startup to distribute programmable robots to all seniors who are over 70-years old living alone. Two years after this initiative, some elderlies use it as an alternative for passed wives and others by installing good friend's programs. This is how they handle loneliness in 2040."

孤独と生きがい

— もしもの世界

もしも
あらゆる人格をインストール
できる人型ロボットが
一家に一台、普及したら？

2040年、ロボットは人間社会に溶け込みつつある。政府は深刻化したひとり暮らしによる孤独死の問題に対応すべく、70歳以上1人暮らし世帯に「人格のプログラムが可能なロボット」を配布した。一人暮らしの高齢者はロボットを亡き妻の代わり、あるいは親しい友人として、ロボットに自分の描く人格をインストールして、日々を過ごしている。

— 想像しよう

"人のつながり"や生活は
その世界でどう変わりうる？

それは、どう人々の老後の
孤独を変えうるだろう？

ニュース

ロボット専門マガジン

"お金"と"労働"

— もしもの世界

もしも
"お金"ではなく、
信用や時間が経済の中心的な
価値になったら？

2040年AIは高度な判断を可能にし人の仕事を肩代わりしている。労働の必要は減り"貨幣"の価値は下がる一方信用や時間を切り売りする経済モデルも出てきた。日々の行動データ及び互いの評価レビューから成り立つ全国共通の「AI信用スコア」が人々の信頼を担保している。例えば、料理をふるまう代わりに無料で医療診察を受けられ、互いに満足すればスコアがあがる。勿論まだ貨幣は必要ではあるものの、個人の評価/信頼が重要性を増している。

— 想像しよう

労働・活動・人の関係性は
その世界でどう変わりうる？

それは、どう人々の老後の
生活を変えうるだろう？

ニュース

2040年のまとめ記事

Figure 26. Finalized design fictions

Finalizing the workshop

The workshop structure and tasks were designed in close association with the development of design fictions. The level of detail was tightly linked with the rest of the tasks and supporting tools used in the workshop. Following the creation of design fictions, the overall structure of the workshop was finalized.

After finalization, I conducted another pilot session. I especially wanted to understand how well the developed tools can scaffold in practice and whether the overall flow of tasks is smooth enough. Aside from focuses, I checked the allocated time for each task. The second pilot test was run a week before the actual workshop. 3 participants were gathered from the non-profit organization supporting university students, which helped me to recruit the workshop participants (See 3.2.2). The length of the test was 2 hours including the discussion for feedback.

According to the feedback, they enjoyed the workshop and found it playful. The most difficult task was the speculation of future possibilities within the provided fictional world. All participants were not used to seeing the implications of futures and could not radically imagine. They did not have enough time to deepen discussion and each participant focused on writing down on post-its individually. From reflection, I learned that I should have encouraged participants to use more 'inspiration cards'. These are the cards with inspirational ideas about futures. The cards were supposed to be used optionally and provided from the beginning, however, they did not pay careful attention to them. More active encouragement might be necessary when participants get stuck with

Workshop program and tools

The final program of the workshop is shown (Figure 27). Along with the workshop, I developed design tools for the workshop with playfulness. I tried to make the visuals element simple but playful (Figure 28).

One of the core principles in participatory design is the development of tools and techniques (van der Velden & Mörtberg, 2014). To achieve democratic principle in participatory design, tools that enable stakeholders as co-designers to express their voices are essential. They play a central role in enacting participatory space, and a "major strength of participatory design is that there is a robust connection between ethical

Time	Phase	Detail/Task	Tools
09:30-09:45	**Introduction**	-Introduce today's aim & goal -Give a background knowledge about aging society and retirement life -Introduce speculative design and the concept of futures	
09:45-10:10	**Warm-up**	-Participant's introduction (Name/job/the moment of ikigai) -Speculative Dice Game	Speculative dice game
10:10-11:25	**Speculate what-if worlds**	-Scan trends & signals magazine individually and share thoughts -Each team choose one design fiction and read individually -Extrapolate possibilities within fictional world with future wheel -Crystallize what-if question	Design Fiction Fictional Quote Cards Inspiration Cards Future Wheel
11:25-11:35	**Break**		
11:35-12:30	**Build scenarios**	-Choose protagonist -Develop chosen protagonist further -Build scenario describing how the protagonist live in possible world	Future Protagonists Kishotenketsu- Speculative Scenario
13:30-15:00	**Materialize speculation**	-Reintroduce some cases of speculative design -Ideate imaginary objects individually -Prototype objects with physical materials	Experiential Futures by prototyping
15:00-15:15	**Break**		
15:15-16:35	**Presentation & Dialogue session**	-Presentation & Questions -Dialogue for 20min and share for 5min in each theme	
16:35-17:00	**Reflection**	-Individually reflect upon the workshop and write down desirable futures that comes to mind -Share for all	

Figure 27. Final workshop design

Figure 28. Workshop tools

practice and the choice of methods, tools, and techniques" (Robertson and Wagner, 2012, p. 78). In the following, I summarize and introduce created tools for the workshop.

Tool1. Speculative Dice Game: As a warming-up, I developed a mini-game exercise. A dice was developed with the image and description of the speculative tools from a famous sci-fi anime, Doraemon, in Japan on each. In each round, one person rolls a dice and everyone answers if they want to use it or not with reasons. The game familiarizes participants with speculative design and builds mutual understanding of personal views as well as creates a playful atmosphere.

Tool2. Design Fiction: Design fiction was used to give a context and build a scaffold for imagination. Three design fictions were developed in advance by the researcher, and what-if questions were embedded in them as prompts (Figure 26).

Tool3. Fictional Quote Cards: Fictional quote cards were developed for offering everyday perspectives and supporting the imagination of fictional worlds. There are three to five quotes to propose different points of views of the future. The cards were mainly used in the speculation phase where participants diverge future possibilities (Figure 29).

Tool4. Inspiration Cards: Inspiration card brings a wider point of view from the public and gives inspiration for speculation. In each fiction, about 10 cards were prepared. I used an online crowdsourcing service to gather ideas. I gathered around 30 ideas for each theme and selected 10 diverse ideas (Figure 30).

Tool5. Future Wheel: This is a structured framework for ideation to extrapolate possible implications on a specific topic. It is helpful in mapping out connections and effect-cause relationships in a visualized way (Government Office for Science, 2017). In the workshop, what-if question is placed in the middle of the wheel, and then the first consequences of the placed event are written down on the circles surrounding the middle part. In the most outer circle, the second consequence led by the first one is put. For instance, the provided example places 'If VR spreads, how could it change senior's life?' and one of the possible first consequence could be 'addiction to VR world makes seniors stay at home'. The consequence of this could be lack of exercise (Figure 31).
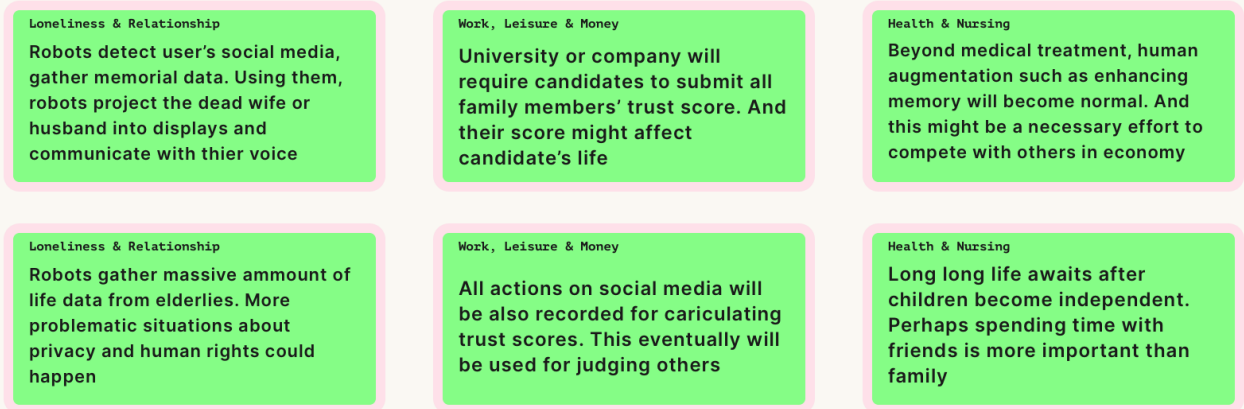
Figure 29. Future Quote Cards
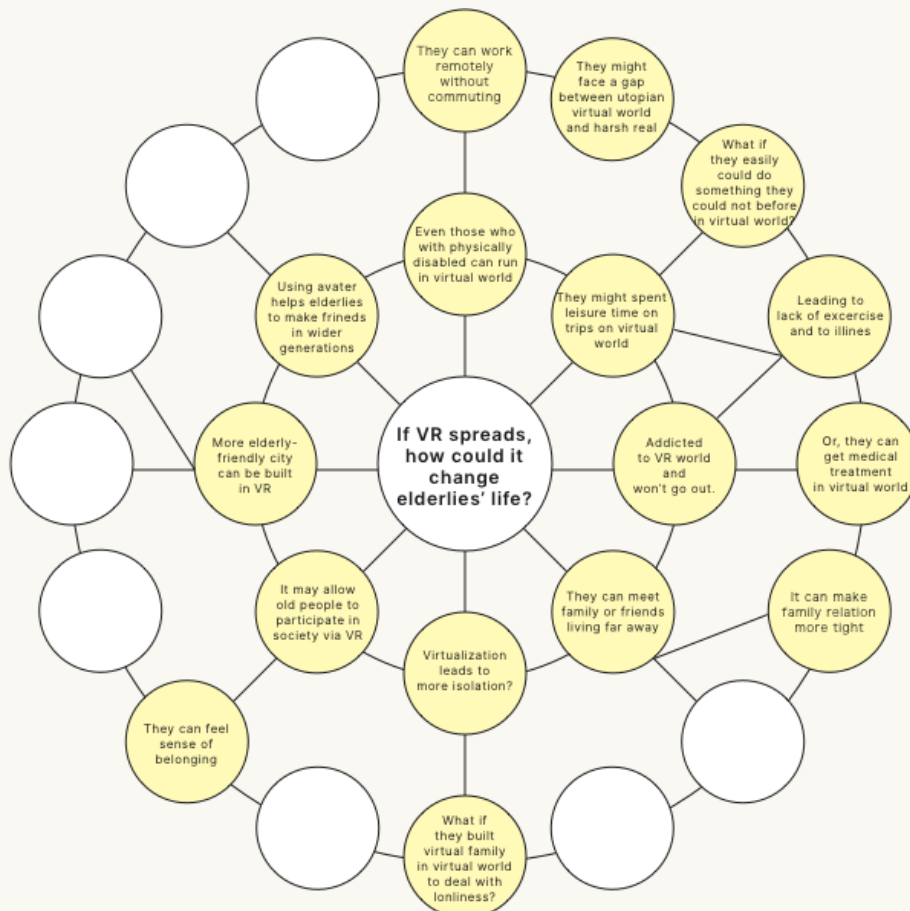

Figure 30. Inspiration Cards

Figure 31. Future Wheel Example

Tool6. **Future Protagonists:** Inspired by persona (Cooper, 1999) and 'Design Alter Ego' (Triantafyllakos et al., 2010), I developed Future Protagonists to explore imaginative and future narratives from a fictional character's point of view. Unlike the persona technique, it is not grounded on real user data from field research but developed based on speculation by a researcher. For instance, under the topic of 'loneliness and relationship', one protagonist could be an old woman who refuses to use programmable robots and maintain human-relationship while another protagonist could positively use the robot in their own way. I created several protagonists and turned them into cards as prompts (Figure 32). The protagonist sheet was also provided for participants to develop characters further, drawing from 'Design Alter Ego' techniques. As targeted participants were young generation but who will turn elderlies in several decades, this creation of future protagonists intends to facilitate them to take elderlies' perspective in the possible futures. This method is supposedly situated in the transition point from 'scenario' to 'situation' to bridge an experiential gulf.

Tool7. **Kishotenketsu Speculative Scenario:** Speculative design often takes the form of scenarios (Dunne & Raby, 2013). It is not about how things should be, but how futures could be. In the participatory design field, the scenario has been used as a prevailing method (Robertson and Simonsen, 2012). According to Carroll (1999), scenarios are stories about people and their activities including settings, actors with objectives, plots, and given goals. In Japan, the well-known terms and framework, Kishotenketsu, is the dramatic structure of a narrative composed of four parts; Introduction (ki), development (sho), twist (ten), and conclusion (ketsu). I incorporated this narrative structure into the scenario format with some trigger questions in each part. This was provided with an example (Figure 33).

Tool8. **Experiential Futures by prototyping:** In the last step, future scenarios are turned into tangible artifacts with provided materials. The step draws from the notion of Experiential Future and co-creation session. Random materials bought at a dollar store in Japan were prepared with careful selection to build tangible prototypes for experiencing possible futurest.

Figure 32.Future Protagonists & development sheet

Protagonist sheets Topic of the team ☐ Loneliness & Relationship ☐ Work, Leisure & Money ☐ Health & Nursing

Our protagonist is...

Stick a chosen
protagonist card here

Develop the protagonist further

Age：

Personality：

Human relationship：

Adaptability of the future： ☐ Positive ☐ In-between ☐ Negative

How to spend free time：

Dream, ideal：

Concerns：

Values：

Other：

Yukiko
—
**A single woman who lost
her husband earliy**

She has lived alone for 10 years, since she lost her husband due to the ill. Sometimes she talks to her son and his family online, but feels alone.

Yuika
—
**A 140-year-old women
taking full use of technology**

She is striving to live lone by using every medical technologies she can use, such as gene editing. She wants to avoid getting old.

Nobuo
—
**Lifetime single man
marrying with his job**

He devoted his life to working and never married. However, he feels that his relationship is being lost.

Hiroki
—
**A man refusing to live long
with technologies**

His motto is "Naturally aging and die as human". He sometimes helds talk events to raise awareness of this importance and refuses to human editing.
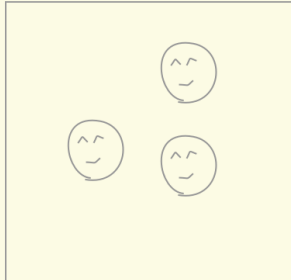
Kishotenketsu Scenario sheet

**Scene1 | Setting situation
Introduce protagonit**

· What situation is the protagonist in?
· What does this world look like?
· How is life in this world different from now?
· What does the protagonist aim in this scenario?

**Scene2 | Conflicts, issues
events happening**

· What kind of conflict or challenge is happening?
· How does it affect protagonist's purpose?
· How does the protagonist feel?

**Scene3 | Dealing with challenge
& conseuqences**

· What will happen as a result?
· How is the issue solved/worse?
  —What if the worst thinc happened?

Scene4 | Ending

· As a result of scene3, what happens to
  protagonist's objective?

After Nobuo retired his work, he lost the means to fulfill his desire for social recognition. He does not have any partner or children who rely on him··· He belongs to a VR community about his favorite commic book. When he speaks in an avatar of his favorite character, he feels he obtained a new self and confident. Recently, he has opened himself to community members and started to talk about something besides commic books.

On day, when he set up VR and logged in, he realized that he got notification. The user which he talks most is 'kiyo34', a user with female avatar. He is not sure if the user is male or femal in real world, but they sometimes go on a date. They like to go to the park for a date. He has not gone for a date in daily life since he got old. The notification was from her, and in her message, it said "Shall we become VR family?"

Nobuo did not understand what it was, but he approved it. He looked up for it and understood that it is to have a virtual family in virtual world. He played a role of 'father' and kiyo34 became his wife. Beside them, one son and daughter joined as family members. They set the rule that they spend time together in a built house from 6:00 to 10:00 pm everyday. Each were required to behave as expected. Nobuo was a bit confused at first, but gradually enjoying it.

One month has passed since they united a virtual family. Nobuo is feeling hapiness that he's never felt before. He got someone who rely one him as a father. Surely he doesn't know them well. Users can project their real figures instead of avatars actually, but no family memers suggested to do so. Yet, everyone feels like keeping this relationship. Nobuo thought, "this is real family, and I'm not alone anymore."

Figure 33.Scenario example

4.2.5 Deliver

Finally, I conducted the workshop in the middle of July 2019. The collaborator arranged a co-working space as a workshop venue, located in Takarazuka city. In total, 10 participants were recruited through the partner's network and the help of two non-profit organizations supporting university students (See subchapter 3.2.2). But 2 of them canceled, so 8 participants took part in the workshop. Among them, two participants had the background of design, but more importantly, they had no experience of speculative design. The one is an active community member working as a freelance web designer, and the other is an industrial design bachelor's student. The age of participants was between 22 to 44. I worked as a workshop facilitator as well as a documenter with photo shooting and voice recorders. The research consent forms for documentation, data, and photo use were signed by participants before the workshop (See Appendix5).

The room was arranged with two working tables. Two groups were formed in advance of the workshop to make sure that each group had one participant with a design background and one member from the partner organization. Students were also split into different groups because it can spark dialogue with differences between generations in each group. After they sat down, they were asked to create a name tag with post-its.

The workshop started with a short introduction to the background of the project and the comment from the member of Community Link. The participants were educated about the City's initiative, age-friendly city project, and the Ikigai work project. Then, the elderly's ikigai, aging society, and the notion of speculative design with some examples were introduced.

After the introduction, we moved on to two warm-up exercises to build trust, create a playful atmosphere, and deepen the understanding of discursive aspects that speculative design can bring. It started with one-by-one self-introduction using the following questions: "What is your name?", "What do you do?", and "What would you bring with you if you traveled to the future?" A ping pong ball was bounced to the next participant when one person finished introducing and passed. This visible material helped to bring playfulness and also visualized who has the right to talk. The next exercise, the dice game, aimed to warm up their imaginative thinking, share personal views, and let all participants get used to telling their own opinions without fear. The participants were

divided into the groups and one person rolled a dice that had the image and description of the secret tools from Doraemon, the sci-fi animation that is familiar to every Japanese. According to the tool, they individually imagined how they wanted or did not want to use it, wrote it down within a minute and shared with others.

Following the warm-up, they moved on to the main tasks. Each group was given the opportunity to choose one topic to work among the three. As a result, group A decided to tackle 'Loneliness & Relationship' and group B tackled 'Work, Leisure & Money'. I was planning to form three groups, however, due to cancellation, it ended up with two teams.

The booklet of weak signals and design fiction were handed to each participant. They were told to read it through individually and discuss it for a short while to digest information. After they were immersed in fictional worlds, they were tasked to speculate what could happen and map their speculation out with as many post-its as possible. The Future Wheel framework was used to structure their ideas. A1 paper was stuck on the wall and participants wrote down their ideas on post-its to put on it (Figure 34). Some trigger questions, such as "What if everyone embraced this situation?" and "What if the world went toward the worst/best direction?" were posed for provocation by the researcher/facilitator. Additionally, Fictional Quote Cards and Inspiration Cards, as well as an example sheet of the Future Wheel, were presented to support their ideation. As an example, I speculated possibilities of 'elderly's life in the world where virtual reality has become spread' to help participants understand what to do.

Next, the group was asked to look through all the ideas and put a mark on the ideas that they wanted to explore further. During the discussion, they were also told to come up with some questions. For instance, in my example of VR for the elderly's life, the provocative question "What if 'virtual family' was formed? Could we embrace it?" was introduced. The formulation of the question allowed participants to take critical and philosophical perspectives. Based on marked ideas and questions, the groups finally crystalized their speculative concept.

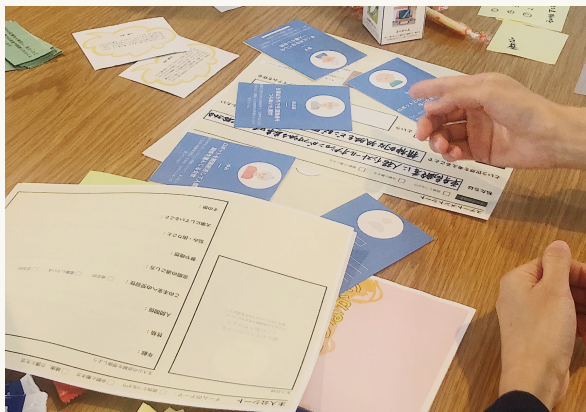Figure 34. Participants speculating future possibilities
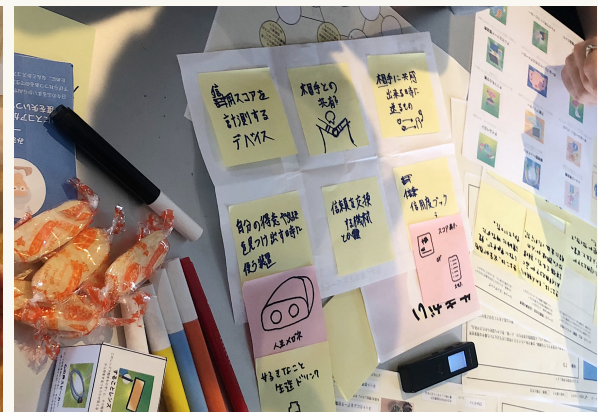

Figure 35. Participants discussing a protagonist

Figure 36. Participants ideating future objects

Figure 37. Participants making future objects

After the speculation phase and break, I asked participants to pick up one Future Protagonist card or create a protagonist from scratch (Figure 35). Both groups picked up one card, and then they developed the chosen protagonist further using the provided protagonist sheet. The sheet included information such as age, personality, personal relationship, how to spend leisure time, dream, and concern. With developed protagonists, they started to create fictional stories. A narrative structure, Kishotenketsu, was introduced beforehand. Then, they were asked to make a story based on the structure with the concept and protagonist in their minds.

The third step was the creation of speculative artifacts that could exist within the envisioned future scenarios. First, I gave a short presentation about how speculative objects or diegetic prototypes (Kirby, 2010) relate to scenarios and wider world views with examples. The next step was rapid ideation using the Crazy 8 method ("Design Sprint", n.d.). This is one of the major methods in Design Sprint invented by Google to facilitate fast sketching for eight ideas within eight minutes. Many of the participants were not used to the ideation of design products and prototyping, so my aim was to make starting points for further idea building. The benefit of this method was the use of a tight time frame, forcing participants to come up with any silly ideas without deep thinking (Figure 36).

Before the participants finalized ideas, they were told to move on to making with random materials (Figure 37). Materials included, for instance, balloons, air pumps, wires, colorful papers, goggles, yarns, water guns, straws, play-doh, ping pong balls, etc. The materials were chosen to enable flexible development according to their concepts. The overall aim of this materializing futures was to facilitate discussion through making. This is based on the thinking that both making processes and created artifacts are discursive acts (DiSalvo et al., 2008). Therefore, the process itself catalyzed reflection and dialogue, and the tangible artifacts played a role as a mediator for it in the next step.

Finally, the participants finished designing speculative scenarios and artifacts. To share the outcome with each other's team, the presentation was arranged before diving into the dialogue. From the presentation session, one elderly who is the leader of 'Ikigai Work' project participated. As he was strongly interested in the topic and I wanted to facilitate exchanging perspectives among different generations. Each team had

10 minutes to present their provocative question, protagonist, scenario, and objects. After each presentation, the other group posed some questions to clarify what they did not understand.

In the final phase, participants had a dialogue about the scenarios under each topic. The groups were shuffled to make sure that one group had members from both working groups A and B. The dialogue session had two rounds. In the first round, the scenario under 'Loneliness & Relationship' was discussed and in the second round, the scenario under 'Work, Leisure & Money' was debated. Each round was guided by four question-cards: "What do you like or dislike about this future?", "What is ideal retirement life if this scenario was realized in your future?", "What would you like the city of Takarazuka or private companies to do if the scenario came true? ", and "Do you want this future or not? What can you do for it?". I encouraged the groups to write down discussed ideas and thoughts. This guided further discussions as the visualized ideas enabled deeper reflection and further thinking, and it was useful for documentation from a research perspective. Participants deeply discussed the topics and built interesting insights towards the futures of ikigai in an aging society.

The workshop ended with a short reflection of the day and each participant remarked what was a key learning for them. Before they left, we arranged the date for evaluative interviews.

Evaluative Interview

After the workshop, evaluative interviews were organized with five participants out of eight (See also Chapter 3). The aim of the interviews was to understand what worked or did not work in the workshop and what kind of reflection on the topic they made. To activate the participants' memory, I prepared a sheet of paper describing the overall workshop process and tools used in each step.

4.3 Outputs of the workshop

The workshop produced two possible future scenarios and several artifacts within them as outputs.Mediated by these discursive practices, participants had fruitful dialogue and yielded interesting insights. These insights will be presented in the Chapter 5.

4.3.1 Future of 'Loneliness & Relationship'

Core question: How well could robots care for isolated elderlies mentally?

Protagonist

Nobuo, a 73-year-old man, who is a lifelong single and dedicated life to work at the megabank. He is poor at socializing and does not have many friends because most of his relationships were at work and he already retired. However, he actually has the desire to be a person relied on by others. He is not confident to make new friends at the age of now. His hobby is stamp-collecting and rail travel by himself. He has recently started to feel the concern about being lonely without any friends.

Scenario

To deal with rising solitary death, the government has started to provide loneliness checker devices to all elderlies to detect how lonely they feel. Additionally, programmable AI robots were provided in each household. Nobuo, who has been feeling lonely, thought that he could get rid of the feeling of loneliness with the robot. He decided to give it a try and bought a whimsy candy to install more complex emotions for the robot.

However, after a while, he started feeling that something is wrong with this situation. He realized that he still had the feeling he could not satisfy. Finally, he stopped using the robot and went out in search of a real connection. Nonetheless, the local community that used to be highly active could not be found. It turned out that many elderlies depend on programmable robots and enjoyed life with them. Sadly, it tore down the local community.

Nobuo got very shocked by this situation, but after overcoming this feeling, he decided to confront this issue. To rebuild the community and connections among the locals, he hacked the water infrastructure and invented a systematic device to control the water supply. Due to this new system, people in this area can only access water when several people collaborate. As water is a lifeline, the locals start to communicate and cooperate together, and gradually their connections become tight again.

Artifacts1. Loneliness Checker

This is a wearable device to detect how lonely the wearer is feeling in real-time (Figure 38). The device was invented and provided by the government to deal with rising numbers of solitary deaths. One of the agendas to be tackled under this issue was measures to detect who needs help. The device is designed to put on your arm, and the balloon will swear up depending on the feeling of loneliness. It physically allows people around elderlies to see their condition and handle it before the situation gets worse.

Artifacts2. Whimsy Candy

This candy was invented to tackle the issue that programmed AI robots have only a pre-determined personality (Figure 39). Also, as AI robots are based on the behavioral data of the users, it will be more and more optimized for them, which creates monotony and makes them less-human. Human beings are complex species with over 2,000 emotions according to one theory. Our emotion is ambivalent and always up and down. The whimsy candy can decide what kind of emotion robots represent. Each color allows different personalities including, for instance, comforting person, caring person, humorous, preachy and so on. If you mix different types, you can make original combinations, and make robots own more complex emotions and personalities.

Artifacts3. 'With' Water

This system was developed by Nobuo, the main protagonist in the fictional story (Figure 40). This controls the water supply in the local area in a collaborative way. There are a number of wires attached to the system, and only by holding each wire at the same time, water will be supplied to each household properly. The amount of supplied water is dependent on how many people hold wires cooperatively. The system brings people to work together and facilitates man-to-man interaction for rebuilding the local community again.

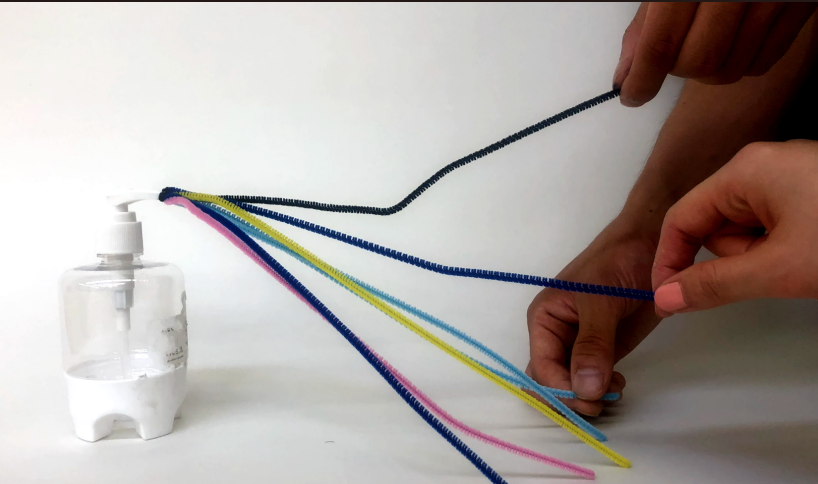Figure 38. Loneliness checker

Figure 39. Whimsy candy

Figure 40.'With' water

4.3.2 Future of 'Work, Leisure & Money'

Core question: If trust became the source of economic value, could we make a living only with something we like?

Protagonist

Kiyoko, 65 years old. She is an innocent and warm person who gets along with her husband. She also builds a good relationship with her neighbors and has many hobby friends. She likes to do handicrafts and cooking with vegetables grown by her husband at the farm. She is good at socializing and making close connections with people, for instance, often shares cooled meals with her neighbors.

Satoko, also 65 years old. She has never married and is a lifelong single. She was working very hard and worked at a big company earning a lot of income. However, she recently has retired from her job.

Scenario

Kiyoko and Satoko have known each other since they were children. Kiyoko, a housewife, is good at cooking and handicrafts but does not earn much family income. On the other hand, Satoko, a career-minded woman, took an elite course working at the big company and earned a high income. However, the government recently decided to introduce an AI trust score, and this score is replacing money as economic means by the trust.

For instance, if you have enough trust score, you might be able to go to the local restaurant and eat without paying. The philosophy of this system is that people can contribute to something they are good at. In the case of Kiyoko, she has a lot of close connections and is good at cooking, so her score increased easily, for example, by sharing meals with neighbors. In contrast, Satoko, who has dedicated her life only to work, does not have many friends and stays away from any relationship besides work. So, she has no friends and no hobby or passionate thing that can help others for the increasing scores.

Due to the AI trust score, the societal value is shifting from economic value pursuing profit to increase trust among people. This also brought the radical transformation of what money means. Currency used to work as money, however, nowadays trust score is becoming 'money'. People are thus required to raise trust scores for a rich life, and to

increase, they need to find what they like. Satoko does not know what she likes and how she wants to live and used 'Trust Score Brush' to figure it out.

Artifacts1. Trust Score Brush

When you brush your scalp massage with this brush, the device reads your brain wave and memory (Figure 41). Then, the balloon attached to the brush will swear up and data about what users are good at, scanned from brain waves, will be monitored on the balloon to help users increase trust scores. For instance, in the case of Kiyoko, she is good at cooking, so others can rely on this data that she is trustable when they ask her to cook.

Artifacts2. Passion Detection

In connection with users, the device will project the past memory and experience that impressed users on the projector (Figure 42). Then, the ring attached to the device will respond to what users like most and it helps users to understand what they are passionate about.
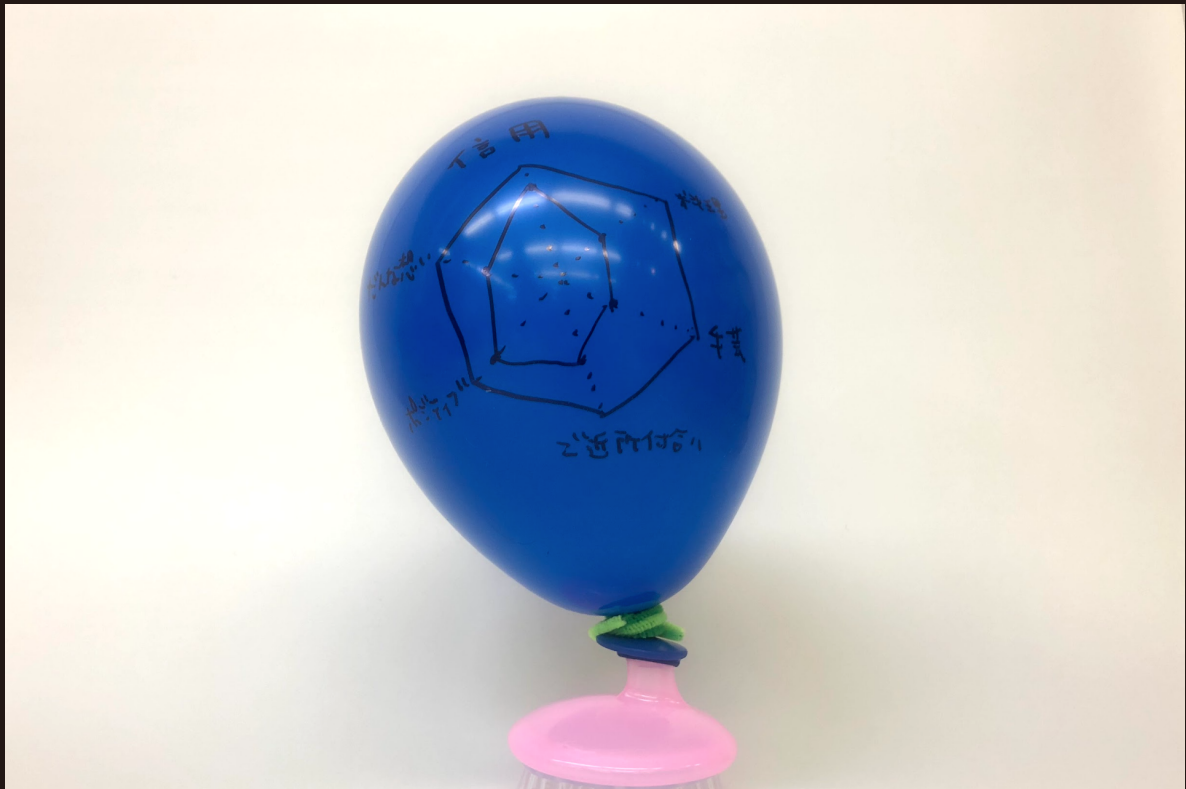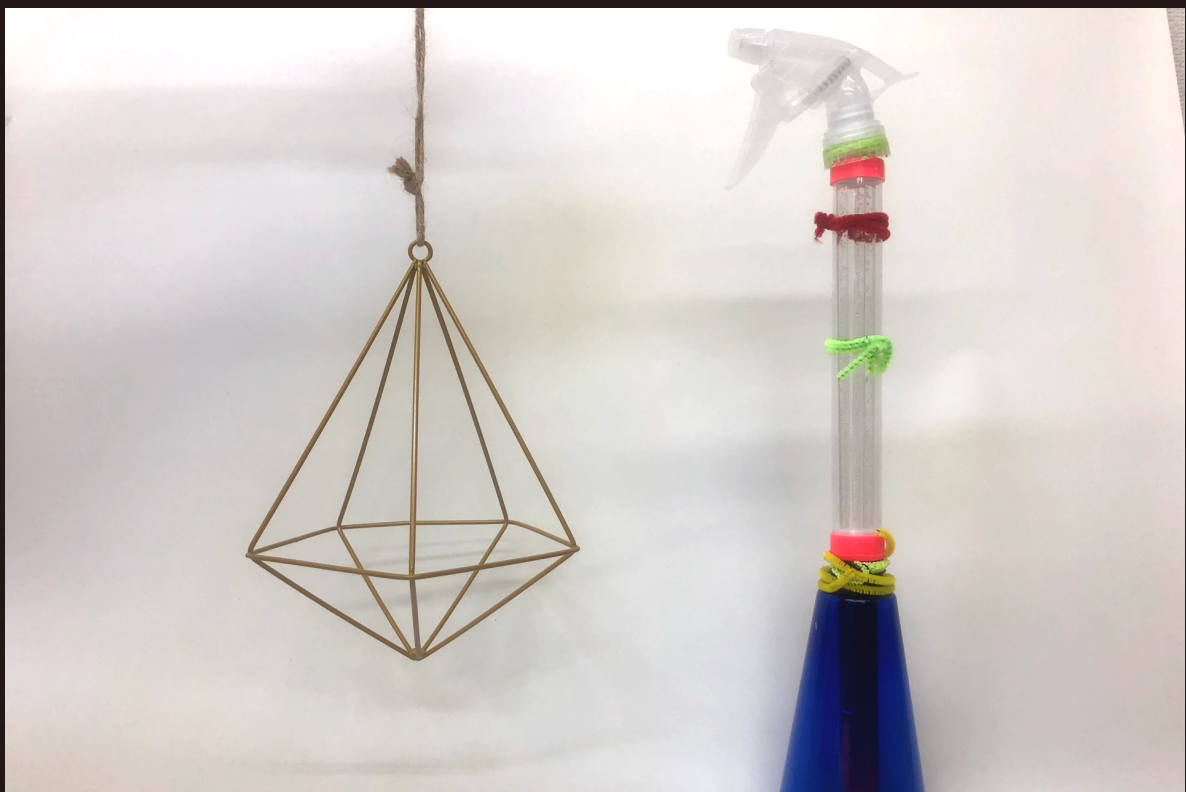
Figure 41. Trust score brush

Figure 42. Passion detection

05 /

RESEARCH ANALYSIS AND FINDINGS

The chapter introduces the results of the analysis of the empirical case and its findings. The analysis was conducted from two perspectives. The first and second sections respond to the research question: how the method of Co-Speculation performs as well as what enables and challenges for non-expert citizens to collectively imagine possible futures. The first section deals with workshop settings and tools in the method based on the researcher's reflection while the second section presents findings of enablers and blockers. These findings come from the analysis of the workshop audios and evaluation interviews. The third section covers the research question: what are possible effects of the method. The evaluation interviews were used for this analysis. Finally, a brief summary of these findings will be presented.

5.1 Analysis of the method performance from designer views

After analyzing the data from the experimental workshop, the evaluation interviews, and my reflection by using the affinity diagram method, the results showed how the method performed from several perspectives. The reflection is made from the viewpoint of the designer/researcher who played a role as a toolmaker and facilitator of the process.

5.1.1 Reflection on the process and workshop design

Taking a deeper look at the entire design process, one of the lessons is to dig into participants' dominant perceptions and biases on the topic. In this case, the initial participant interviews were conducted to set the topic as the notion of ikigai was too broad. Grasping their presumptions beforehand could have a significant effect on how I developed what-if questions and design fiction to embed critical thoughts on them which eventually affected how participants speculated. This corresponds to 'Map' phase in the EXF framework. Within the framework of EXF, 'Map' stage sets all the basis for the following steps in the empirical case because the workshop itself included 'Multiply', 'Mediate', and 'Mount' phases. In light of this, the researcher/designer exerted his/her most power on participants at this stage.

Overall, the workshop went smoothly and participants successfully imagined possible futures and deepened their reflection. Although it was a long whole-day work, all participants kept their motivation and high engagement throughout the day. Participants who engage in the local community commented that this work was a lot of fun and there should be more opportunities to have a discourse about future possibilities with others.

Regarding the workshop setting, one difficulty was a lack of resources for facilitation. As I failed to get any assistant, I had to do documentation and facilitation all by myself. In general, I went back and forth between the two groups. This was definitely not an ideal setting as the task was challenging and engaging facilitation was needed.

The balance between individual tasks and collaborative tasks was also the key. I basically set the individual tasks when participants reflected on personal views and developed ideas, and for the rest of the tasks, participants worked in collaboration in the group. The baseline was to collectively develop speculative scenarios. The potential value of speculative design lies in the use of imagination, which comes from diverse perspectives on futures. Collectively exploration and speculation at the first step diverged ideas on possible futures and such many ideas could not have come up if this was individually done. However, as remarked in more detail later, the meaningful conflict of personal values and views was lacking from the initial participants' setting and this reduced the effectiveness of the method. The less agonistic setting and group decision-making resulted that some interesting personal viewpoints and values were left out. Individual expression of futures as the projection of personal values might lead to different results potentially enabling more plural futures to emerge and deepen reflections upon their own assumptions.

Briefly reviewing the power balance in the process, the researcher led the entire process and gradually gave control and power to participants. At the beginning of the process, participants played a role as informants but the topics of focus were decided by the researcher and the partner. In the workshop, the researcher facilitated the session and delegated power to participants to decide a focus under the topic and envision possible futures by themselves.

5.1.2 Reflection on designed tools

Diverse selected tools scaffolding for imagination and creativity of participants were employed and played an essential role. These tools mediated participant's thinking and expression in a visual and playful way.

Speculative Dice Game: The tool was used in the warm-up exercise with an intention to create a psychologically safe environment and a playful atmosphere. A form of dice was meant to trigger playfulness. This worked quite well and conversations in the groups were intensely sparked. Another aim was to reflect on their own values towards technologies and imagine how they would like to use them. In my analysis, this tool successfully met the purpose, however, given the relation to the whole, I probably should have reframed the initial objective of the warming-up. The next step tasked

participants to speculate based on provided design fiction, and they could not radically unleash their imagination. I assume creating a playful atmosphere and giving a chance for articulating own views need to be a part of a workshop, still, the warm-up should have challenged more participants' imagination so they could think out-of-the-box. For instance, I could have used what-if questions to keep it more abstract and set the rule that the one who gives the most radical idea will win.

Design Fiction: The initially provided design fictions acted as starting points. It set the context and guided the participants to focus on the topic. Instead of giving a topic, questions to be discussed were already translated into design fiction. The intention behind this was to build an imaginative mode with fiction and set the frame for speculation. One participant gave feedback:

> *"The initial setting was a bit concrete and it trapped my thought. For instance, the image of a robot in the fiction created a static view. But, I also think this frame made it possible for us to respond and think about what could happen in a more concrete way." [D2]*

This feedback points out that the initial level of openness matters a lot. The setting a focus was essential otherwise participants could loose where they need to head for, yet how it is communicated should be carefully crafted as it affects people's imagination.

Future Wheel, Fictional Quote Cards & Inspiration Cards: The Future Wheel helped them to think of both positive and negative implications from many angles as well as further possibilities. Still, this step was the most difficult one and participants seemed to struggle. To scaffold their imagination, 'Fictional Quote Cards' and 'Inspiration Cards' were provided. Regarding 'Inspiration Cards', some people made use of them as a starting point for ideations. Almost no one used them at the beginning, rather it was effective when groups got stuck and had difficulty in coming up with new ideas. 'Fictional Quote Cards' were effective to imagine abstract future settings from living people's point of view, yet it did not directly bring new ideas.

Despite these support tools, many participants commented that they had a struggle. It could have been better if the warm-up task had successfully prepared for this. Or the entire task could have been more structured to give a frame for speculation.

Future Protagonists Cards & Kishotenketsu Speculative Scenario: These tools were the most effective in bringing empathy and vivid imagination, situated in daily life, to the process. Participants commented that they felt that 'what-if' ideas were fictional but suddenly became able to take them seriously and realistically with 'Future Protagonists Cards'. Moreover, cards as provided options certainly helped to make decisions on who would be most suitable for their speculative ideas. The scenario format was composed of four scenes, and each scene has a clear role related to the whole story. This made it easier for participants to develop it. Similar to these tools, persona and storyboarding are widely used in user-centered design and thus very familiar to designers as well. In this context, these intimate tools were redesigned to have more future-orientation.

Experiential Future Prototyping: The random but pre-selected materials mediated an imagination of participants, and making-activity served as prototyping of futures created an engagement in an experiential way. In the process of making, participants created a lot of prototypes besides the finally presented ones. They made trial and error in this experimentation. The abstract idea became concretized by playing around with materials. Through making, debates were also sparked (See 5.2.3). However, a few participants seemed to struggle with making as they were not used to and did not feel confident.

5.2 Analysis of enablers and blockers

5.2.1 The difference of perspectives scaffold collective imagination

The workshop participants were composed of local community members, students living in near areas, and members from the partner organization. I intended to encourage an exchange of views by bringing in participants from different generations. Each participant had a diverse personality, background perspectives, ways of thinking and knowledge. This caused both positive and negative effects.

Participants complemented each way of thinking in collaboration. One participant, who is into sci-fi, extrapolated radical possibilities that might not happen in reality, such as "what if we could install the dead person's personality? Then, deceased personality

buying and selling could happen" [B1]. Another participant ideated with a more realistic view, thinking about how the current healthcare system could be different in 30 years. The focus varied and it led to new imaginaries among participants.

> *"We each imagined futures differently, and it made up what I could not imagine." [D4]*

Different views enabled the workshop participants to inspire each other and pluralize possibilities in the speculation phase. Collaborative discussion in speculation allowed new ideas to emerge. In the following, participants had a conversation to explore possible robots-humans interaction and, one of them came up with a new idea, deepening its meaning together with others:

Citizen A *"If 'personal data' for the installation into robots is purchased and sold, how about human trade?"*

Citizen B *"Well, people who get pissed off at robots-only relationships will go backward and the value of human-to-human interaction will rise again.*

Citizen A *"On the other hand, if this trend went extreme, this importance of human touch might lead to 'human-trade' due to the much-less population in an aging society… That's deep." [B2]*

As another example from the other group under the topic of 'Work, Leisure & Money', participants discussed what could happen with the social credit score.

Citizen C *"What if people tried to make friends only to enhance their own score? Like, getting along with this person can increase my score."*

Citizen D *"Well, this will bring both positive and negative effects. On the bad side, this could create hierarchy, and people start to flatter others."*

Citizen E *"But, it also could break the hierarchy built by the old currency-based system. Hmm, some overnight 'score millionaires' might appear." [C2]*

While some ideation was done individually, most of the tasks in the workshop required collaboration. This collective imagining enabled ideas to converge, contributing to future speculation. In contrast, the differences in prior knowledge and literacy about emerging technologies and societal issues between participants affected the process. A

middle-aged participant mentioned that a student in the same group was not quite familiar with technology trends and this lack of common language caused the slow-down of discussion sometimes in the process [D2]. In the principle of participatory design, this can be seen as the opportunity for mutual learning. In mutual learning, participants share their knowledge and values with each other (van der Velden & Mörtberg, 2014). In this case, a student reflected on learning afterwards and realized the pre-assumption towards emerging technologies.

Still, it should be noted that participatory design projects often last much longer, and thus mutual learning could happen effectively. However, the empirical case only consists of one workshop. Given the short time-span, I might have needed to give sufficient input to align the levels of knowledge. In the workshop, participants were tasked to look through technological and social trends that fed into provided design fictions and discuss their thoughts, yet time was too constrained to deepen their understanding.

5.2.2 Empathy drives vivid imagination

The main part of the workshop was the development of fictional future stories and artifacts within the developed speculative fiction. In my observation, the participants struggled with speculating future possibilities, and once they moved on to the story-making step, their discussion suddenly sparked. The scenario development step can be understood as a way to bridge the experiential gulf to sensing and feeling imagined futures in the case study. With the tools of Future Protagonist and scenario development, participants were scaffolded to imagine more daily-based speculative futures and envision what could happen within possible worlds.

> *"Thinking about the protagonist and his/her life, I got vivid and real images of possible futures." [D1]*

> *"The what-if world seemed unrealistic and abstract, but I became able to take it real as soon as we started to use the protagonist." [D6]*

When people try to think about futures in decades, it is often difficult for them to project themselves into this image of futures. In the initial interviews which I conducted before the workshop, I asked "What do you imagine your future life could be when you became elderly?". The question seemed to be tough for all of the interviewees to

answer. Putting future protagonists at the center triggered participants to dive into futures with high resolution at the level of daily life situations.

It is also important to point out that perspective-taking brought empathy to the table. Empathy has been important in the design field and many design tools and methods to support an empathic process are developed (Kouprie & Sleeswijk Visser, 2009). The various definitions are proposed, but empathy can be described as "an imaginative projection into another person's situation" (Koskinen and Battarbee, 2003, p. 45).

> *"Although this setting and characters were fictional, this task positively allowed me to put on this protagonist's shoes. I took her perspective while we were developing the story to help out her situation." [D4]*

Empathy allows people to take others' perspectives to understand how others perceive the world, and eventually to imagine the situation from their own view (Mead, 1934). The emphasis on empathy is handled within the approach called 'empathic design' (Koskinen et al., 2003). In empathic design, designers closely investigate end-users to build an understanding of what and how they experience and feel in the situation. Hence, the focus is on how designers can build empathy towards targeted people in a certain context for better design outcomes. Unlike this, the case study illustrates that everyday citizens empathized with fictional characters living in fictional futures in the course of its development and dialogue. It fostered a capacity to take characters' perspectives and thus participants were able to understand how they could feel in future situations. As a result, it enabled them to temporarily live in the future, enhancing imagination and deepening reflection. In short, empathy for people living in futures arouses our emotional capacity and vivid imagination.

5.2.3 Making as an embodied act for imagination

One of the biggest differences in this method from conventional speculative design is the embodied dimension. Participants actively made provocative scenarios and materialized envisioned futures into artifacts. This making practice is at the core of design discipline as a mediated and embodied activity (Groth et al., 2017). As Ingold (2013, p. 6) remarks "the one makes through thinking and the other thinks through making", participants were catalyzed for speculative and future thinking through making.

It also creates participants' engagement at an experiential level. Elsden et al. (2017) describe several speculative methods that attempt to be more participants-based, compared with conventional speculative design, such as 'User Enactment' (Odom et al., 2012), 'Anticipatory Ethnography' (Lindley et al., 2014) and so on. Then, they discuss that in these methods participants are still in a reactive mode which could reduce their stake and possible actions. 'User Enactment', for instance, invites participants to enact scenarios with scripted design fiction, however, this limits openness and spaces for speculation, though bodily experience mediates discourse. Thus, it calls for a more ambitious direction for the involvement in speculation. In 'Speculative Enactment' (Elsden et al., 2017), it redefines the actors' role from passive audiences to participants. In line with these views, I position the method of Co-Speculation as a more radical method for deeper engagement with an attempt to enable everyday citizens to speculate as co-futurists with the scaffold of designers.

While most of the speculative design approach is closely connected with proposed materials and physical artifact design by experts, participatory design deals with wider experiential methods, especially with a focus on making, as represented by MakeTool (Sanders, 2002) to empower people to express their dreams and desires. In participatory design, design objects are one of the important actors considered as boundary objects (Ehn, 2008). Likewise, created artifacts in the Co-Speculation still play an important role as prompts for dialogue. Below, 'Loneliness checker' triggered dialogue between participants and one senior joining from this dialogue step.

> **Citizen A** *"So, you guys don't want to wear this device?"*
>
> **Senior** *"I feel like it's none of your business!"*
>
> **Facilitator** *"Do those who have fallen into isolation want to be detected?"*
>
> **Citizen B** *"They might start wearing them after they see others do?"*
>
> **Citizen A** *"I'd be shocked to know I'm a lonely person while I don't think I am."*
>
> **Citizen C** *"That's the thing. Not everyone is aware of their condition. If they become aware, it could be solved."*
>
> **Citizen B** *"I agree that making the condition visible somehow is good because it can reveal this as social issues in a compelling way."*
>
> **Senior** *"Hmm, have you discussed the difference between loneliness and isolation? I guess some people like to be lonely." [B5]*

Yet, the Co-Speculation also places more emphasis on the process of making than developed artifacts. The entire process of making serves as a discursive activity for participants to yield insights and encourage reflection. Unlike speculative design, it is not an aesthetic quality, but what is communicated and reflected through making that counts. For instance, participants were making the fictional story and reflecting upon how interactions between AI robots and humans could be like as well as how it could affect humans' emotions.

> **Citizen A** "How about like, he has wanted just friends who can understand his hobby and installed a personality like that into the robot, but the robot only empathizes with him. Then he could feel a bit bored."

> **Citizen B** "He is a serious person, so perhaps he learned that sometimes scolding his subordinates is also an important part to build a relationship. I mean, this kind of agonistic dialogue or complexity of human relationship can actually satisfy his desire. AI robots might fail to create complex interactions." [B3]

In the step of prototyping speculative artifacts, participants also had a dialogue and speculated the detailed future while they were concretizing ideas. The materials and making activity sparked their imagination in a more concrete way. In making, everyday people can reveal their knowledge and insights, eliciting discourse as the materialized phenomena are visibly presented (Sanders & Stappers, 2014). The following is the conversation while they were exploring various materials and making random objects.

> **Citizen B** "How about the appearance of the object' is changing as people feel lonely?"

> **Citizen C** (Touching balloon)"Like, a balloon would swear up?"

> **Citizen B** "Hm, and it will burst when they reach the maximum level of loneliness"

> **Citizen D** "Or it won't break, then it will be very annoying until they handle their lonely conditions…"

> **Citizen A** "haha, they should make it small as it is embarrassing when they go shopping" [B4]

5.2.4 Difficulty in the suspension of disbelief

In the ordinary speculative design approach, various techniques are utilized to design conditions for discourse creation. For instance, Auger (2012) introduces the concept of "perceptual bridge". As speculative design handles fictional and future possibilities, audiences might not be able to relate it to their life in some cases. With a well-established perceptual bridge, speculative concepts are situated in daily life and thus designers could successfully convey their critical massage. Speculative designers are required to carefully propose their concepts to maximize the possibility that promotes the viewer's reflection.

One of the difficulties seen in the case study was that some participants properly could not suspend their disbelief. The suspension of disbelief is a highly important characteristic in speculative design. It differs from asking people to believe that it is real, rather it invites them to agree to believe (Dunne & Raby, 2013).

The proposed scenario in the topic of 'Work, Leisure & Money' envisioned a world where people can build trust and increase social credit score by offering what they love to do and make a living with the score. In this world, people can go to supermarkets and get groceries without payment. However, some participants from the other group were left with questions. Why has trust replaced currency in the world? This transition was not clarified in the scenario, and it blocked some members from the suspension of disbelief, probably reducing effective engagement. Surely, this is not all because of the participant's capabilities, but designers or researchers who set the environment affect how participants are speculating. In this case, what-if question and design fiction provided as a prompt was too complex and limits the capacity for imagination to some extent. Still, it is important to note that the quality of crafted speculations in terms of persuasiveness can be exposed to the risk as it depends on participants' ability, knowledge, and value.

5.2.5 Dealing with pre-assumption for radical imagination

Although both groups managed to envision possible futures in the form of stories and artifacts, it ended up being not very radical and failed to speculate beyond imagination.

Many participants reflected that they did well but created outputs were not quite radical enough.

> *"Our group members are basically very active compared to ordinary citizens, and we easily came to the conclusion that rebuilding human connection without dependence on AI is important. But in a sense, this was not an eye-opening idea for me." [D3]*

One of the biggest causes in my analysis is that pre-assumptions and biases blocked participants from imagining and futures that they had not expected. From evaluation interviews, one participant reflected and commented:

> *"I was thinking that AI robots cannot care about humans' mentally but at the same time, I thought it could be possible in the near future. The consensus in our group was that the robot taking care of human mental health is difficult." [D2]*

The quote implies that the group crashed one of the future possibilities due to the pre-assumption which they originally held. They stuck to their own assumptions and could not explore futures that robots can take care of mental healthcare without any help from humans and what could happen in this world. Dunne & Raby argue that "all design is ideological, the design process is informed by values based on a specific world view or way of seeing and understanding reality" (2001, p. 58) . This can be interpreted that all speculative design work is biased in nature. In line with this view, all the scenarios and artifacts developed by everyday citizens also reflected on what they value and thus they are biased, too.

As discussed in the subchapter 2.3.2, what could be possible or desirable is affected by our past and present experience. In this case, for instance, many participants are active local community members who value physical interaction between people. They already owned the shared singular view to some extent that influenced how they speculated and made decisions. It could be better to embed some mechanisms to get over pre-assumptions. This treatment of bias and group dynamics might be the biggest risk in the method of co-speculation and thus it will be tackled in the later section of 'further development' in Chapter 6.

5.2.6 Agonistic view, capability, and group dynamics

Who is involved in speculation affects how speculation could be enacted. Although participants' bias became problematic, the proponent of 'Adversarial design', DiSalvo (2012) demonstrates that bias in visualized expression is appropriate from an agonistic point of view to represent contestation. The core belief behind this is that diverse views and positions which are inherently biased are necessary for agonistic pluralism. In a participatory design setting, conflicts and disagreements are valued as a resource (Gregory, 2003). Therefore, to bring different views leading to conflict is necessary for fruitful discussion and generating plural future visions. In this sense, a biased opinion itself might not be problematic, rather it should answer how different views on futures could be raised on the table. It poses a question about who to involve in participatory speculation. The lack of agonistic views and meaningful conflict could have led to more plural possibilities for futures. In the empirical study, the group lacked the controversial views and ended up crashing some possible ideas through homogeneous group dynamics.

Besides this concern, several feedback comments from participants were critically addressing who can participate.

> *"As this workshop and dialogue handle social and technological topics, I was wondering how to involve those who have a negative impression over technologies in the speculation process." [D4]*

> *"This workshop might be difficult for some people. I assume participants this time possessed enough capability, but for instance, students at my school might not be able to do this." [D3]*

Many participants this time were already actively engaged in city-making, and they were used to planning and discussions with a strong interest in societal issues that they were facing in the local area. This can be interpreted that the level of capability affects the speculation process. It poses a question of who could be capable of speculation among everyday citizens, and eventually who are 'everyday citizens'? On the other hand, participatory design is built on a mindset that "all people are creative" (Sanders & Stappers, 2008, p. 9). Probably, one student was the less experienced participant in the workshop, however, many nice ideas emerged through a collective exploration of future possibilities. In this sense, the capability potentially could affect, however, it can be covered by the way the method is designed.

5.3 Analysis of effects generated by the method

This section analyses what effects the method of co-speculation achieved. The applied framework was built on the evaluation criteria of discursive design proposed by Thurp & Thurp (2019). The case study handled two goals besides my own research, which were to encourage participant's reflection and gather insights on what the future of 'ikigai' could be. Considering these goals, the project can be considered as 'Practical Application' and 'Basic Research' among the four applicable domains.

5.3.1 Construction of design & dialogical space about futures as the basis

The Co-Speculation method created a discursive space to deeply think about what futures could be possible and desirable as well as potential issues in near-futures with regard to emerging technologies. Designed tools and each task within the work played an important role in setting a playful and inspiring tone. Over half of the participants are active members of the local community and they are involved in the city planning in collaboration with the municipality. They reflected that they did not take technologies, societal issues, and future visions into consideration in the usual planning, thus they did not have enough opportunity to think beyond the present issues. Robinson (2003) notes the importance of thinking about futures among citizens as eventually any interventions from politicians and companies need to be embraced by them. In other words, it requires citizens' engagement in future conversations to shape desirable futures.

> *"I usually do not think about futures in relation to how technologies such as AI, are relevant to societal issues." [D4]*

> *"I rarely think about the future and do not actively gather information on what is happening, so this was a great trigger for me to reflect. I wish there could be more chance to discuss this kind of serious topic in such a casual atmosphere." [D5]*

As pointed out in the subchapter 2.1.1, the objective of speculative design was to create discourse and catalyze critical reflection for desirable futures. Without sufficient discourse, it will not achieve intended effects and eventually could end up just aesthetically excellent work. Taking it into consideration, the co-speculation method created a fruitful space for deep engagement in future conversations.

Candy and Dunagan compare speculative design with experiential futures, describing the latter as a "more accommodating and relevant canvas than the design space of future artifacts alone" with a focus on better engagement and insights for change (2017, p. 138). Likewise, The Co-Speculation method created a dialogical and design space where collective imagination flows and possible futures emerge. Although the thesis aims to explore the method enabling everyday citizens to collectively imagine possible futures as co-futurists with the scaffold of designers, the case study did not focus on developing an agreed future vision to actively pursue. Rather it intended to open up many possibilities for futures through this method, and the dialogue creation is the baseline for the purpose. Co-Speculation as the construction of the dialogical space inviting ordinary citizens is highly valuable leading to the following positive effects introduced below.

5.3.2 Deepening reflection on futures through making

Through the speculation and discourses on futures, participants were ignited for deep reflection about their future images and emerging technologies. One of the highlighted findings is that the act of speculation on their own, specifically imagining a daily scene in futures created a 'vivid and real' image and helped participants to grasp their internal feelings.

> *"I always had just an ambiguous image of futures, but this work gave me a chance to get a more concrete glimpse of futures. I could imagine what positive and negative things could happen" [D5]*

> *"Thinking about futures with my own head enabled me to understand what my anxieties are."[D6]*

With vivid images, participants reflected upon how they want to live at present and in the future. For some, they were able to make certain of what a desirable future is for them, while others were critically posed questions for their value and became more aware of the necessity to prepare for diverse futures.

> *"I again realized what I had thought was on the right track through the workshop. In the group work, our opinion once leaned toward the scenarios that we do not need human-to-human interaction if we have AI robots with perfect human personality. Eventually, we kept a discussion and got back to where we were. So this thinking of other possibilities was valuable." [D3]*

> *"Our group developed a world where we can make a living only with what we love. I always tell myself I love making things, but sometimes I feel I don't know if I truly love it. This work made me think why I think I love making and I'd like to look for the core." [D6]*

> *"I found there is also a possibility that futures I do not want might come. I realized the importance of thinking about how I want to live if that kind of future comes." [D5]*

Moreover, participants fully realized the risk of extreme change in futures. Before the workshop, they only had an unclear image of what the future could be like and then, concretized futures played a role as a 'standard' to look far ahead beyond what they had imagined. Participants became aware that more radical futures could happen by making futures visible.

> *"By materializing our imagination into the future scenarios and objects, it made me feel that more drastic transformation could happen than what we created." [D2]*

> *"In the course of making a story, I thought we might face more tough situations than I had imagined." [D4]*

5.3.3 Insights creation on futures

The partner's goal to be achieved in the project was to generate insights on futures of 'ikigai'. From the entire speculating and making process, dialogue session, and participant's personal reflections, various interesting insights about futures of ikigai were generated. They examined negative side-effects and their impacts of technologies while considering the positive benefits deriving from them. At the same time, participants raised moral and ethical questions that arise from technologies. I will not describe all, but some of them are introduced as examples.

The literacy education for co-living with AI and robots: If we started to live with AI robots, one of the possible issues would be to cause a dependence on them. This could result in an ignorance of real people's relationships. Governments, municipalities and private companies might be required to offer educational programs as a social responsibility to enhance our literacy about co-living between humans and AI robots. Although the Finnish government has started to offer a free AI program, it would be necessary for us to understand how we manage co-existence with machines with the right balance and prevent people from too much dependence on them.

Being lonely is negative? How could we identify who needs help?: During the discussion, one participant argued that being lonely was not negative all the time and some people preferred loneliness. The comment raised awareness that many other participants hold an unconscious bias. One of them responded, "I was thinking that elderlies living alone need help and care, but there are actually many who are not like that" [D3]. It led to a discussion about how we could identify the socially vulnerable who need help and how we could identify them to offer help.

Social pressure to be a passionate person: Many participants initially hold a positive feeling towards the society where people can make a living with what they like to do. In Japan, a lot of media creates discourses that we have to be unique and have something that we are passionate about. However, the current social system and education do not work to support this direction at all as we are still evaluated by just exam scores which internalize the norm to be homogeneous. Thus, this narrative gives a lot of pressure to people like Satoko. In the created fiction, Satoko struggled with figuring out what she wanted to do and this difficulty came from a career-minded life without

caring for her own passion. Although many people might think that the society where you make a living doing what you love, there should be more social support for them, and AI actually has potential in this area as presented. Though, it could provoke another discussion that dependence on AI could lead to the future where we leave the decision to it.

5.3.4 Shifting perceptions

Based on the analysis of evaluative interview sessions, participants transformed their perspectives, thinkings, and mental states. Their change of views varied depending on each participant. With regard to emerging technologies, some participants positively reframed what technologies could mean to oneself. The speculation on future possibilities from both positive and negative points could enable participants to see the other side of technologies that is overlooked. Another participant who basically had a negative opinion about introducing robots also pluralized its perception by exploring various possibilities, and found it hopeful. Speculative design work often appears in the form of dystopian futures, and this led to the feeling of fear (Ward, 2019). This calls for creating a hopeful view instead of negative emotions towards futures.

> *"I had an antipathy towards digitalization and technologies, with vague anxiety for futures. I was worried about what could happen while the mass media say many jobs will be replaced in 30 years. But, I learned that this can also bring positive effects on our futures by thinking about what is possible." [D5]*

> *"The discussion within a group led me to the realization that AI robots could even take care of dementia patients. For instance, robots will never be tired and keep doing storytelling for patients as therapy. I have a big concern that people caring for patients are exhausted and burnt out, this is great." [D3]*

Several participants realized their own assumptions relevant to the topic by making activities and dialogues. The notion of loneliness was taken as inherently negative and this view was refreshed.

> *"I was initially thinking of loneliness as something negative and I did not want to be lonely, but this was my biased opinion. Through the dialogue, I could rethink my assumption and got a new perception." [D5]*

These perception shifts might lead to their change of behaviors at present to prepare for futures, although this cannot certainly be investigated within the limited time-frame and the interview method. Still, the positive attitude toward new actions was observed.

> *"This made me think I should put more effort into getting to know about technologies. I was afraid of futures and hated to think about it, but thinking about it is needed for a better life in this era." [D5]*

> *"Unlike foreign countries, we don't make physical contact as communication and communicate clearly what we think. But this assumption that they could understand what I think without clearly saying might lead to a lack of communication. Given the development of AI, I thought I should actively communicate to build a better relationship." [D4]*

5.3.5 Raising awareness of technologies

Many participants working on the second topic, 'Work, Leisure & Money' could deepen an understanding of the implications of AI. In the context of social credit scores, critical and ethical questions, such as who decides algorithms, how trust is scored, what trust is, were raised up. Although these questions cannot be answered easily, participants realized the importance of these questions. The co-speculation method in the case study raises awareness of this black-box aspect of AI in this respect.

> *"I assume that in any AI system, it is a human being that will eventually decide how algorithms work. Given this, there is even a possibility that someone who would like to take control will appear. If so, the world would not be changed as it is now in capitalism where those with power kind of control the society." [D6]*

The work also led to a realization of the risk of technologies and how we consciously deal with them. Any technology could radically transform our lifestyle, the way we relate to people, how we think both in a positive and negative way. Thus, the hidden natures and implications of technologies is highly important as a necessary literacy.

> *"When we developed an AI tool that tells and recommends us what we are good at and love, I felt like using it right now. I assume a hidden risk lies in this kind of tool but did not consider it at all at the moment. It made me realize that, like this, technologies are put into reality without sufficient debates." [D6]*

> *"I guess there are many people like our protagonist, Nobuo. I was worried about how they could use them effectively without falling within the dependence. And we need something to prevent it." [D3]*

06 /

DISCUSSION

This thesis explored how the method of the Co-Speculation enables non-expert citizens to imagine and materialize possible futures. The literature review theorized the foundation for the method by answering why speculative design needs to be more participatory. The empirical study explored what in the method enabled or challenged citizens to speculate futures and what possible effects are created for rethinking futures, under the topic of ikigai.

The following sections firstly discuss how the findings answer the empirical parts of the research questions. Secondly, the recommendations for the improvement of the methods and their possible uses are presented. Following them, the limitations of the study as well as future areas for exploration are outlined.

6.1 Discussion

The comprehensive research composed of both a theoretical review and an empirical case analysis leads to conclusions that enable constructing sufficient answers to the research questions. The theoretical part of the study was summarized in the literature review chapter and this section mainly presents discussion on empirical research questions.

6.1.1 Discussion on the method performance

In the Co-speculation method, non-expert citizens did speculation on their own with the help of facilitation by the researcher. In comparison to expert-led speculative design where designers develop futures for audiences to encourage debates and reflections, I positioned the method as 'speculate with' drawing inspiration from Liz Sanders's work and design participation typology (See Table 2 & Figure 12). Candy & Dunagan's challenge of "designing circumstances or situations in which the collective intelligence and imagination of a community can come forth" is aligned with the view (2017, p.150). As a designer and researcher, I created a situation where people can speculate, reflect and discuss possible futures by giving them power with the aids of a set of tools.

In the method, collaborative, empathic, and embodied dimensions scaffolded everyday people's imagination of futures in various ways. The use of Future Protagonist allowed participants to get in fictional characters' shoes living in the future, and it helped them to imagine how possible future life under the topic of 'Loneliness & Relationship' and 'Work, Leisure & Money' could look like. The collective ideations and making catalyzed them for further envisioning and reflection. If imagination can be interpreted as the capacity to envision things that do not exist yet in the real world (Folkmann, 2010), it can be said that the method allowed participants to unleash their imagination. However, the envisioned futures seemed to lack radical visions in the sense that they were not 'beyond the participants' expectation' as reflected. Although the workshop did not necessarily emphasize envisioning radical futures, it is important to discuss that several factors affected speculation in a negative way.

Figure 43 illustrates the structure of enablers and blockers. First, researcher/designers' influence on how participants speculated was inevitable. As the researcher, I hold power

especially at the beginning of the process. I embedded the insights, the intentions, and the value into the form of a set of artifacts and tools. While participants were involved in the process to set agendas as informants, the final decisions were made by the researcher. The tools scaffolded participants to speculate in many ways as argued, however, they also limited their imagination to some extent. Design fictions that were provided to participants were such a tool. Limited understanding of how participants understand the world can reduce the effect of the method. For instance, overall, the group tackling the topic under the theme 'Work, Leisure & Money' seemed to have more struggle and they mentioned that the question of "What if time and trust replaced money as a central economic value?" was a bit complex. It required a bigger jump away from the dominant currency-based society. Thus, the effect of researchers' power, understanding, and assumptions should be carefully recognized.
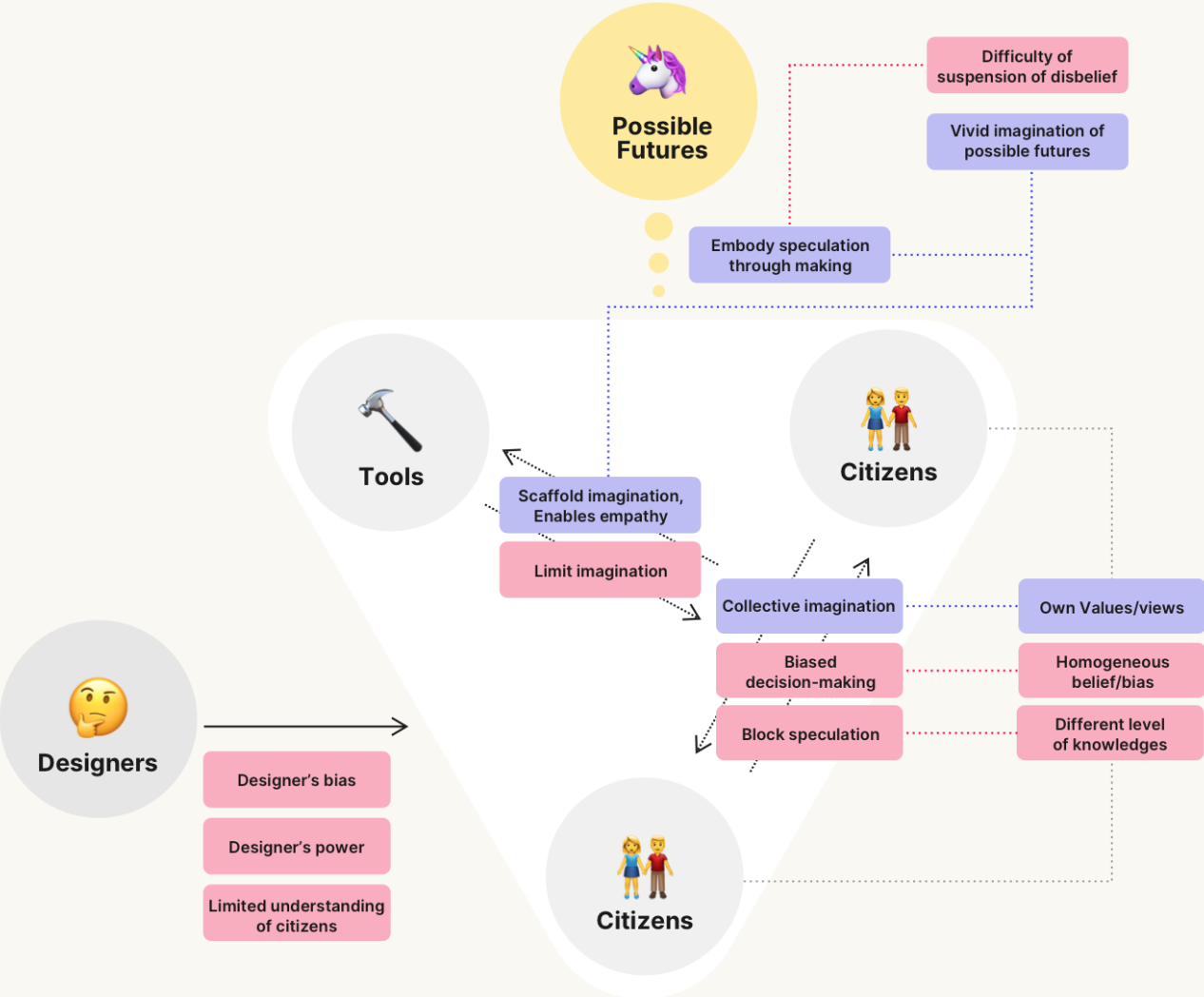
Figure 43. The structure of what enabled and challenged citizens' speculation

Second, methods create different results depending not only on contexts but 'who' uses it. As remarked in Chapter 5, the participants' views, knowledge, and stances have a significant influence on how speculation is enacted. I failed to gather participants with more controversial views, and sometimes homogenous opinions are stressed without purposeful conflicts. The question here is who needs to participate. More plural visions of futures could have been envisioned with more polemic views causing meaningful conflicts. Apart from this practical sense, it brings up political meaning in speculation. Although no single answer exists to the question of who to involve, it is also highly essential for designers/researchers to be aware of the political implications. In the empirical study, main participants were active local members. However, this could have led to exclusion of the less-active locals if the objective were policy-making.

In the context of participatory design, one way of capturing meaningful participation is the equal representation of interest (Uittenbroek et al., 2019), describing the necessity to reveal current power balance and guarantee diverse views on the discussion. Thus, meeting this requirement can result in both more ethical participatory settings and plural futures.

Third, as a nature of speculation, biases affect final outcomes. Combined with the first issue of homogenous views, the pre-assumptions blocked participants from exploring new possibilities that they had not seen before (See subchapter 6.2). The issue around dealing with biases could cause two challenges in the participatory speculation. The final outcome is just one of many speculated possibilities, and it is up to participants to choose which one will be the one. It can not necessarily guarantee that a future that is worth thinking will be chosen (Candy & Dunagan, 2017). This is a highly political question. Although this is a common issue in conventional speculative design, it could be more problematic as the Co-speculation method takes participatory form and partic- ipants might make a decision based on biases coming from today's reality. Furthermore, the current desirability might not necessarily lead to radical futures and a new normal in futures. This is due to the idea that "what-we-know-now about them does not always translate to an effective guess of what the future could, or should, be" and thus, the emergence of new technologies can alter people's values as they do not fit in the exist- ing paradigms (Odom et al., 2012, p.1). In other words, even though participants specu- late possible and desirable futures, this could be totally reshaped in response to technol- ogies and new desires will emerge. Speculative design by expert designers can propose

futures that can go beyond existing values and social beliefs while the Co-Speculation has the risk of being constrained with the given framework and biases.

In short, the findings imply that the method scaffolded everyday citizens to speculate in collaborative, empathic and embodied ways, still the performance also depends on who are participants and how to address pre-assumptions.

6.1.2 Discussion on effects generated by the method

Evaluation interviews after the workshop gathered and brought comments, feedback, and reflections. As a result of the analysis, several effects were identified beyond dialogue creations and reflections. These were the construction of physical space for dialogue, deepening reflections, generating insights, shifting perceptions, and raising awareness of technologies. As Figure 44 illustrates, observed effects are interrelated with each other, but hierarchical relationships also exist. Insights creation, raising awareness of technologies and perceptions shifts are only built upon successful reflection. This proved that in general, critical enough reflections among participants were catalyzed through the act of collective speculation.

Besides the final dialogue session in the workshop, participants kept dialogues on the topic while they were developing their future visions. The making practices enacted as a discursive activity and potentially this embodied experience allowed them to have a more active dialogue.
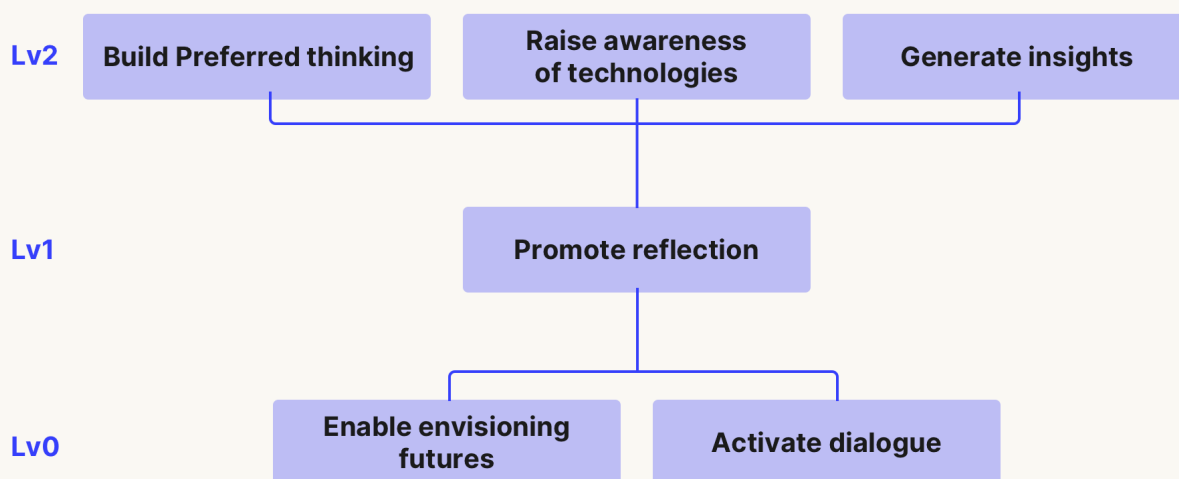
Figure 44. The hierarchy of effects

This dialogue and making facilitated constant reflection on the preset topic. The thoughts that emerged from reflection depended on the participants. Some of them were more technology-related thoughts and others dealt with more personal points of view. Also, some revisited their initial thoughts after the process and others totally got new perceptions. The depth of reflection varied depending on participants as well. Compared to local community members, both student's participants from the outside of the community seemed to develop deeper reflections and transform their views. Thus, similar to the speculation process, attributes of participants significantly affect the final effects of the method.

Beyond critical reflections, some participants acquired preferred thinking, such as reframing the overall relationship between humans and technologies or rethinking the perception of loneliness. Generated insights could feed into further applications to technologies or potentially to local policymaking. For instance, the necessity for offering learning opportunities for citizens to understand how to build a relationship with robots and AI to prevent excessive dependence. Moreover, the methods raised participants' awareness and literacy of emerging technologies.

6.1.3 Summary of key points for further developments

Some of the findings above could be useful materials for further development of the method, thus the brief summary of findings that can contribute to improvements is presented below. Some of the findings can be directly used as guiding principles for planning future speculation in a participatory way. Below, findings are organized based on the EXF process.

Map1: Recruitment & Research

1. *Sufficient understanding of the participants assumption and worldviews about the specific topic*

2. *Create a polemic setting in the extrapolation phase for more plural futures in guiding the recruitment of participants*

Multiply: Researcher set direction for speculation & provide scaffolds

3. *The level of openness of the provided starting point should be carefully planned, which also depends on who participants are*

4. Warm-up for radical imagination is essential

5. Alignment of the participants' knowledge enables more fruitful discussion

Multiply: Participants generate alternative futures

6. A mechanism for dealing with pre-assumption besides polemic assemblages could lead to more plural futures.

7. Structural support for speculation could potentially enable better ideations

8. Value individual viewpoints over collective decisions for pluralistic futures given group dynamics

Mediate: Participants turn futures into experiential forms

9. The empathic tool can ignite future imagination

10. Making as the embodied practice can facilitate higher engagements and discursive activities

6.2 Recommendations for further improvements

Based on the findings risen from the research, three improvement areas are highlighted as a reference for the next iteration in the future. In each area, possible interventions are introduced while these are also hypothetical proposals for further research.

Dealing with biases: In breaking predetermined perceptions, role-playing is a possible strategy. The method of role-playing has been common in participatory design and it is often used for bridging the gap between designers and users through bodily approach (Brandt & Grunnet, 2000; Boess & Boess, 2006). The role-playing can be also used for making controversial space by letting participants act as others, which can "expose the negotiation between self and other, a fundamental dimension to initiate agonistic behavior" (Willis, 2019, p. 30). Playing the role of a fictional person with conflicting views to one's own belief acts as a catalyst for altering existing perceptions to that of adversaries and eventually it pluralizes one's thinking towards futures.

In another way, the speculation phase can become more elaborated by dividing it into several steps. First, participants could openly ideate and extrapolate futures, and then the ideas could be categorized into several clusters. Then, they could try to identify what hidden assumptions they project into generated ideas. Based on identified views, the next step could be to speculate again to break these biases. This requires longer time-frame than the workshop in the case study.

Structural support for speculation: In the workshop, the task structure of speculation step was fairly open, and the researcher facilitated each group if necessary while the lack of resources for facilitation was a concern. Many participants ideated, however, sometimes they struggled. The more structured support might enable them to ideate in a better way. For instance, design game can be a tool for staging the speculation. It is interpreted as "tools for codesign that purposefully emphasize play-qualities such as playful mindset and structure, which are supported by tangible game materials and rules" (Vaajakallio, 2012, p. 218). It enables people to share their experiences and trigger imagination for envisioning future dreams (Vaajakallio & Mattelmäki, 2014). One of the core functions of design game, facilitating the players in envisioning and enacting 'what could be, is common with the Co-Speculation method. Furthermore, 'the magic circle', a temporary space where real rules are suspended (Huizinga, 1950, cited in Vaajakallio, 2012), encourages participants to envision new normals while rules in the design game help designers structuring the process. This also complements the limitation of facilitation when there is not enough resources.

The setting for plural futures: Finally, I present a suggestion for a fundamental change in how and to what extent participants collaborate. Individual ideation has its limits and the findings suggest that collectively participants speculated and explored future possibilities that were not imagined individually. However, without carefully designed controversial assemblages, they might fall within pre-assumptions or conformity through group dynamics. If the researchers want to achieve the creation of more plural futures, individual or pair work could be preferable. In that case, participants could collectively speculate at first and diverge possibility as much as possible and only then, each person or pair would get to choose which possibility to elaborate further while ensuring they are not overlapped. By doing so, each person could embody his/her value and ideology in the form of future scenarios and objects. This naturally shapes pluralism and possible controversial space where more futures will emerge in the end and diverse futures activate effective dialogue.

6.3 Potential application areas

In the thesis, the main objective was to investigate how the Co-Speculation enables everyday citizens to speculate. As the case study was positioned as an empirical research to test the method, it did not intend to enact social change. Still, the Co-Speculation potentially can be applied in several ways. This section suggests the potential application areas of the method.

As a visioning method for transition design: 'Transition Design' is a comprehensive design framework with for societal transition to more sustainable futures proposed at CMU (Irwin et al., 2015). Transition Design is seen as design of and with a new paradigm with a radical social and mental change in response to the climate emergency. It requires radical, long-term, and compelling future imagining and suggests some design approaches such as speculative design to be used (Irwin et al., 2015). It also highlights the local community and the importance of everyday practice as a context for design. Nevertheless, empirical research has not sufficiently been conducted yet. Specifically, the proponents do not indicate how radical and sustainable futures are envisioned apart from listing potential visioning methods. If transition design places an emphasis on the local initiatives, the 'Vision for Transitions' needs to involve local citizens (Irwin et al., 2015). But as yet, communities lack methods for envisioning radical transformation (Angheloiu et al., 2017). The Co-Speculation method enables citizens to envision futures situated in the local area. It could serve as such a method and be positioned within the Transition Design Framework, yet carefully addressing pre-assumptions is required.

Insights generation for participatory policy-making: Designing for policies is an emerging area in the field of design, and some researchers have examined how design can contribute to policy-making, such as 'prototyping' in policy-making processes (Kimbell & Bailey, 2017). The use of speculative design in policy-making is not common yet, but there are a few cases. The most prominent case is the application to policy-making regarding an aging society in the UK government. The project was set up by the UK government foresight unit in collaboration with a design-based research agency, Strange Telemetry in 2015. The aim was to investigate the impacts of new trends, systems, and technologies on an aging society from participants' points of view through diegetic prototypes (Voss et al., 2015). In practice, the project members organ-

trends, systems, and technologies on an aging society from participants' points of view through diegetic prototypes (Voss et al., 2015). In practice, the project members organized three workshops with the themes of future work, future services, and future transport. They created visual images of futures in each topic and prepared question cards to prompt discussion. Participants were asked to respond to created artifacts.

Similarly, the Co-Speculation potentially can serve as a method to explore insights in the policy-making process in a more engaging way to elicit participants' discourses and responses. In the summer of 2019 after my empirical study, I participated in a summer school 'Speculative and Critical Design – Special Programs Think Tank' in Tallinn, Estonia. We collaborated with the Foresight Center at the Parliament of Estonia and worked as a part of the 'Labor Market 2035' project where they developed future scenarios of future labor markets in Estonia from macro trends to feed into policy-making. We were tasked to speculate alternative scenarios and speculative jobs existing in scenarios and in the end we discussed how this method could benefit insights generation with the involvement of the public. The most important reflection from the members of the Foresight Center was that macro future-scenarios were not accessible enough for the public and thus, it is difficult to get implications at daily life scale. By situating futures at the scale of everyday life, it can scaffold imagination. This reflection also can be applied to the Co-Speculation method. As everyday citizens themselves embody possible futures, they deepen reflections and generate insights for policy-making.

Learning/teaching method for fostering future literacy: Future literacy is "the capacity to think about the potential of the present to give rise to the future by developing and interpreting stories about possible, probable and desirable futures" (Miller, 2007, p. 347). The importance of the capability is increasing to deal with constant changes in the complex and uncertain world and people must be aware of how one's own anticipations of futures affect present perceptions and behaviors (Miller, 2018; Pouru & Wilenius, 2018). As our images of futures can limit our actions for change, fostering future literacy to speculate alternative possibilities over dominant futures can help individuals to open up different ways to act. Co-Speculation could be potentially a method to enhance future literacy. In the workshop, one student's participant reflected that the method helped to make future images more tangible and negative images of technological futures were removed. Likewise some of the participants

more tangible they were facilitated to have discourse to change their views. Thus, it shows the potential to be employed as an educational method in an engaging and embodied way. Nevertheless, the method was not developed for growing such literacy and more research is required.

6.4 Limitations of the study

As all the research has limitations, there are several limitations to be acknowledged in the thesis. The limitations are connected to both the literature review and the case study.

As theoretical limitations, the literature review could have covered more existing research on the method of speculative design in a participatory approach. Although not many methods have been done yet, more in-depth investigation could have enabled a more rigid foundation for the method. A more comprehensive comparison among different methods would have strengthened the position of the method.

Regarding the empirical study, a small number of participants and the method for effects evaluation, and the type of participants are limitations. First, the only one work-shop was organized and I had less participants than I had initially planned. As a result, the number of participants that provided research materials was only 6 people. Thus, acquired data were limited and this decreased the reliability of the results, and in the future, the development of a more vigorous understanding of the research topic is necessary.

Second, the evaluation of the effect is the limitation. Mainly perceived effects were analyzed through data collected from interviews. However, reflections and perceptions are inherently internal and intellectual processes and thus they are tricky to assess if it is truly achieved (Tharp & Tharp, 2019). Plus, in the research, only the immediate effects were explored. The effect also could change depending on the time-scale although this could not be done in the project due to the limited timespan.

Lastly, the type of participants is limited in respect that many of them were involved in city-planning in the local area, and have a strong motivation to learn new methods. If participants had not been used to planning activities, for instance, the result could have

been different. Then, the structure of the workshop and scaffold should be adjusted. The target was 'everyday citizens who are not expert in design or future study', and it was relatively broad. Therefore, tests with more variety of participants are required.

6.5 Future exploration

Finally, a few ideas for future explorations will be elaborated in this section. First, to develop a more robust understanding, inviting more variety of participants with different backgrounds and interests will be the first step for further investigation. Insights acquired from this experimentation will be useful for both examining how controversial settings can affect in practice and how different participants are enabled to imagine futures with the method. The research results highlight the importance of an empathic and embodied aspect of the method. Comparing this with another method would be interesting in the light of how and what components of scaffolding are effective for catalyzing imagination of envisioning.

Furthermore, the research employed a case study method although the case itself was a pilot project as the experimentation. Thus the research did not directly feed into social implementation. Using the method in the real case, for instance as the method for developing futures vision in the local area, will be quite beneficial. Since sufficient research cannot be found with regard to how developed possible futures through speculative design can be effectively utilized, the new questions will emerge with this type of practical applications, such as how we can use pluralized futures images to weave them into desirable visions or how we deal with various possible futures that are related or conflicted each other.

Lastly, as discussed, the way to deal with bias is essential in the method. This requires to improve the method and to carry out further research. Plus, participants were encouraged to develop any possible futures and reflect upon them. Each individual reflected and some participants commented that they were made to rethink what is desirable, yet there was no time to ultimately agree upon what a preferable future is for all in the workshop. In line with the objective of speculative design and collective dreaming, speculating alternative possibilities in the Co-Speculation method is to explore desirable future images. I have not tried to focus on this point in the research, however, the exploration is necessary. How can the Co-Speculation method change people's perception of desirable futures and how can it lead to a collective agreement on them?

07 /

CONCLUSION

The thesis investigated how the Co-Speculation method can scaffold non-expert citizens for collectively envisioning possible futures and what effects it can create in the project context of 'ikigai' in an aging society.

The theoretical part of the thesis established synergies between speculative design and participatory design and clarified why participation is necessary for futures speculation. The practical contribution of the thesis was to propose the participatory method imagining alternative futures as a modest step toward the Collective Dreaming world. The tangible outcomes of the research were toolkits used in the method as well as the detailed description of the method and the development process in the project. Furthermore, as proposed tools were mostly developed and adapted from prevailing design tools, such as persona or storyboard, they are perhaps familiar to many designers who have never worked on speculative design. This allows young practitioners to easily try out and build their own practices in participatory speculation.

Overall, the method of Co-Speculation performed well and successfully engaged everyday citizens to generate their own speculative narratives and artifacts. The method aimed at empowering non-experts to speculate, catalyzing reflections and dialogue for a new perception. It also decreased the abstractness of debates about futures through an experiential way. It is a promising method and differs profoundly from simply exposing audiences to futures objects developed by designers beforehand. The findings of the empirical study show that collective making facilitated diverse views to cast on futures and enabled citizens to envision in an empathic, experiential and embodied way, leading to deep reflection and activated dialogue. Yet, several challenges to be overcome were identified, such as designer's influence, participants' bias, and different levels of knowledge. The thesis has also presented potential improvements for these challenges and possible application areas.

Without a doubt, more research at both theoretical and empirical levels is necessary, still, this research has taken the first step toward further development of the method for collectively envisioning futures. I conclude that the method offers a lot of potential for future visioning in a participatory way. In a complex time, designers are required to tackle wicked problems while involving diverse actors. In response to the demand, I hope that this method can be used to empower non-experts to collaboratively reframe problems and envision possible futures.

Acknowledgements

Appendix

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1. Materials coding

Pre-interviews

A1 female, 44 years old, a citizen on June 26th, 2019

A2 female, 30 years old, a citizen on June 28th, 2019

A3 male, 25 years old, a student on June 1st, 2019

A4 female, 33 years old, a partner member on July 2th, 2019

A5 female, 40 years old, citizen at July 3th, 2019

Workshop recordings-Loneliness & Relationship

B1 60min: Warming & Speculation

B2 60min: Speculation & What-if

B3 60min: Protagonist & Story

B4 60min: Making

B5 60min: Dialogue

Workshop recordings-Work, Leisure & Money

C1 60min: Warming & Speculation

C2 60min: Speculation & What-if

C3 60min: Protagonist & Story

C4 60min: Making

C5 60min: Dialogue

Evaluation Interviews

D1 female, 40 years old, a citizen on July 12th, 2019

D2 male, 35 years old, a partner member at July 12th, 2019

D3 female, 44 years old, a citizen on July 13th, 2019

D4 female, 30 years old, a citizen on July 16th, 2019

D5 female, 21 years old, a student on July 16th, 2019

D6 male, 25 years old, a student on July 17th, 2019

2. Pre-interview questions

1.Basic information

1. What do you expect for the workshop?
2. Can you tell me how you spend a day in general?
3. What is the most quality time/moment in a day?
4. Can you tell me an episode that you've experienced 'ikigai' recently?

2.Understanding the perception of aging

1. From which age do you think people can be perceived as seniors?
2. What images do you have over elderlies? Pick up associated words from the sheet.
3. Can you tell me any experience that you recently felt becoming aged?

3.Hope/Fear

1. How do you think your life could change when you become elderly?
2. What do you think about future society then?
3. Imagine you became aged and you could use magic wander.
   If any of your dreams came true, what dream life would you want to live?
   Express it by making a collage.
4. Do you act or prepare for this dream? If so, how?
5. What do you think about your ikigai in this future?
6. Please tell me three fearful futures you do not want to happen.
   What is your concern and why?
   What technological trend do you concern relevant to your fear?

3. Evaluation interview questions

1. Overall thoughts

1. What did you think of the overall workshop?
2. What was particularly impressive?

2.Reflection on each step

Reflecting on a workshop process, tell me how each tool helped you to imagine futures.
(Providing a visual aid illsutrating the workshop process and tools)

3.Perception and learning

1. Through making speculative futures, how did your understanding of the topic grow?
2. What kind of new concerns or hopes did you get through the workshop?
3. Did collaboration with others provide you with something interesting?
4. Regarding technologies, did you get any insights?
5. How did the workshop help you to reflect on your desirable futures?
   What in the workshop led you to the findings?
6. What kind of preparation did you feel you need for futures after the workshop?
7. Do you think new ideas or perspectives from the workshop
   or the method can be used for futures in any form?

4. Affinity Diagram

An image of clusters of data1

An image of clusters of data2
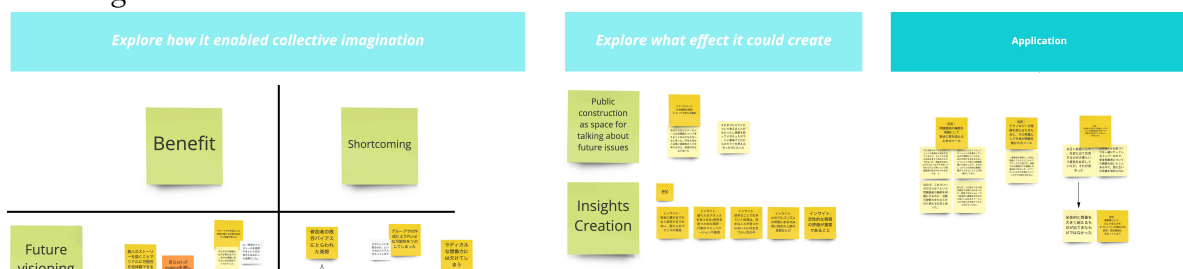
5. Consent form

The original form was Japanese, thus this is the translated version.

Consent form for the research project: futures of ikigai in an aging society

Description

The participants are invited to the research project: **Futures of ikigai in an aging society and the use of a participatory speculative method**, conducted by Masafumi Kawachi, a MA student of Collaborative and Industrial Design at Aalto University.
The document explains what and how data will be used. Please sign the document after you carefully read this, although participation and being studied is voluntary.

Research method & Date

Method	Date
The pre-interview	Between 20,June and 06,July (60min)
The workshop	09:30-18:00 on 11, July
The evaluative interview	Between 12,July and 18,July(60min)

The purpose of the research

The aim of the research is to understand how the method performs for citizens to envision possible futures of ikigai in an aging society. To this aim, data such as how participants are thinking about retirement life, the image of being elderlies, the experience of the workshop, and so on are gathered.
The gathered data will be used for the evaluation of the methods as well as narrowing down the topic of the workshop.

Detail

1. Participation in the study is voluntary. By signing, it's seen as an agreement with your will.

2. During the interviews and the workshop, voice and photo recording will be conducted.

3. During the interviews and the workshop, memos will be written down by the researcher.

4. You have the right to refuse to answer questions to which you do not want to respond.

Confirmation

1. The use of my information, quatation, voice recording to the research.   Yes・No

2. The publication of my name to the research   Yes・No

3. Photos and videos taken to the research for the publication.   Yes・No

Participant's Signature   Date
-------------------------------------   ----------------------

Researcher's Signature   Date
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List of tables and figures

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Tables

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Figures

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