Expanding the Design Research Toolkit to Include Futures Thinking

An exploration into how those who conduct design research may encounter futures thinking questions in their practice, and how they might incorporate futures thinking methods into their work.

by

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Abstract

The world in which we design for is rapidly changing around us, design researchers need new methods to be able to make sense of the changing context of users, and to help inform decisions or de-risk uncertainties for organizations. Futures thinking offers a set of methods that may help design researchers inform strategic decisions about the possible futures of a product, service, industry, or experience.

The purpose of this research is to contribute to the growth of the design research practice by inquiring if and how futures thinking methods may benefit design researchers and/or design thinkers. This research project follows a design thinking approach to explore the area of focus, empathize with key users, and co-create how design researchers may apply futures thinking methods.

In this major research project, I will: compare the design research and futures thinking toolkits, develop an argument for what is driving design researchers towards integrating futures thinking methods, uncover how design researchers and design thinkers are currently encountering futures in their work, and co-create an expanded toolkit with futures thinkers.

The result of this research is an understanding of the potential value futures thinking may contribute to design research practice. As well as a framework for how design researchers (and/or designers who conduct research) may apply futures thinking methods as forms of research methods, throughout the design thinking process.

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Table of Contents

List of Tables

List of Figures

Glossary of Terms

Term	Explanation
Affinity Mapping	Grouping something (like notes, stickies, words, quotes) based on shared similarities or themes.
Design Fiction	The use of storytelling to imagine unrealized artifacts and futures in action.
Design Research	A wide variety of methods used to add context and insight to the design thinking process through gathering and synthesizing data. Also known as User Experience Research, UX Research, or User Research.
Design Strategy	A design approach focused on bridging user needs with business needs through research, synthesis, and visioning.
Design Thinking	A school of thought that approaches problem-solving by employing various methods that keep the user at the center. Sub-disciplines in design thinking: product design, user experience design, user interface decision, user experience and user interface designs, service design, design research, and design strategy.
Dominant Paradigms	A widely held standard, value, or belief in society, often considered "business as usual".
Double Dimond Design Thinking Process	A process of divergent and convergent thinking that involves the steps of discover, define, develop, deliver. The process helps explore a problem space to define and scope the problem area and then ideate solutions to select the most viable solution.
Empathy Map	A tool used in design thinking that helps the designer empathize with the target user by exploring what the user is hearing, seeing, thinking, and doing.
Evaluative Research	Research to assess or evaluate the success of a solution or idea in the design thinking process.
Exploratory Research	Research to investigate an unclear problem space in the design thinking process.
Futures Thinking	A school of thought which imagines alternative futures through a creative and exploratory process to reduce uncertainty. Includes other terms such as: futures research, futures studies, futures analyst, futurism, futurology, futurist, and strategic foresight. For this Major Research Project (MRP) futures thinking may be referred to as futures for short.
Generative Research	A term used to describe the area in the design thinking process where methods to understand the user, and actors and inform potential solutions.

Jobs to Be Done	Something a user is trying to achieve through using a product/service.
Minimum Viable Product (MVP)	A term used to describe a product/offering that has the minimum number of features to be valuable to the end user, to quickly get a product into the market for feedback before iterating.
Mixed Methods Research	A mix of quantitative and qualitative methods used to focus on both "What" and "Why" something is happening during the same study.
Neilson Norman Group	Jakob Nielson and Don Norman are world leaders in user experience and pioneers of the practice. The founded the Neilson Norman Group which has thought leadership on user experience including articles and guides.
Normative	What many people would consider the standard or consider to be normal.
Qualitative Research	Focuses on "Why" something is happening. Through the process of observing, collecting, and analyzing non-numerical data.
Quantitative Research	Focuses on "What" is happening. Through a process of collecting and analyzing numerical data.
Semi-Structured User Interview	A type of user interview in which the interviewer leaves room in the discussion guide/interview to explore paths of conversation that come up naturally.
Strategic Foresight	A process to better prepare for change through systematically exploring multiple alternative futures and their impacts on an organization. For this Major Research Project (MRP) Strategic Foresight may be referred to as Foresight for short.
Thematic Analysis	Analyze information through coding and tagging data based on themes.
Top Findings	The most important and/or impactful findings that come from a research study and seek to answer the main research question and objectives.
User Profile	A framework that is filled in to indicate a user's pains, gains and jobs to be done in a certain context.
Value Proposition Canvas	A framework that helps ensure there is a value fit between a product/service and the targeted user. It does this by examining the user profile their needs, pains, and jobs to be done then how a product or service may help meet those needs, relieve pains, and help them achieve their jobs to be done.

TABLE 1. GLOSSARY OF TERMS

Section 1: Context and Rationale

Context

I have spent my career specializing in design research, working across various industries and team sizes. Throughout my career, I noticed I was being asked questions about the future of a product, service, experience, or industry.

> *"What is the future of this industry?"*
> *"What do users expect from us in the next five years?"*
> *"What should our future vision for this product be?"*

So, I did what any 21st-century worker would do and turned to Google. I googled things like "*how do I research the future of X*" or "*what are futures research methods*" expecting to find a Neilson Norman webpage that would give me methods and how-to guides to investigate these future-facing challenges. However, it wasn't that simple.

Instead of a quick how-to, I found articles about futures thinking, that talked about a practice dedicated to exploring possible futures and many methods to do so. It sparked a curiosity in me to learn about these methods and understand if or how I could apply them to my work. It also led me to pursue my Master of Design in Strategic Foresight and Innovation.

But as I began applying some futures methods to my work, I was left wondering:

> *"How might other design researchers or design thinkers encounter or employ futures in their work?*
> *"What questions about the future are design researchers and design thinkers asked?"*
> *"What challenges do design researchers and design thinkers face when it comes to the futures?"*
> *"How might futures thinking be valuable to design research or design thinking?"*
> *"Should we expand the design research toolkit to include futures methods?"*

My passion for design research and curiosity has led me to investigate some of these challenges through my Major Research Project (MRP).

Rationale

Design research is a practice that has borrowed and adapted methods from various social sciences (Robinson et al., 2018) (Ollenburg, 2019). These methods are used to explore and evaluate questions to inform design decisions and strategic decisions within an organization (Sanders & Stappers, 2014). As the practice evolves in its disciplines and its role within an organization becomes greater, the methods being used should be examined to identify gaps and opportunity areas.

Today, decision-makers are leaning on the combination of design and futures to be an integral part of their decision-making process to inform their strategies and thrive in the uncertainty of the future (Buehring & Bishop, 2020). This is because we live in an era shaped by profound digital acceleration, where we increasingly experience change in shorter periods (Buehring & Bishop, 2020) (Balagtas, 2019). Design thinking offers organizations a way to explore messy problems and ideate potential ideas, while futures thinking helps organizations de-risk uncertainty and gain agency in times of change (Roumiantseva, 2016).

Design researchers who work in organizations with a mature design research practice may find themselves being called upon by decision-makers to inform strategies and make decisions for the near future. In this era of continuous change, uncertainty, and the combination of design and futures during decision-making, design researchers need “new design foresight relevant research approaches” (Buehring et al., 2019). Expanding the design research toolkit to include futures thinking methods may help design researchers more confidently conduct research that can be used to inform strategic decisions about the possible futures of a product, service, industry, or experience.

Section 2: Research Purpose and Methodology

Research Purpose

This research aims to contribute to the growth of the design research practice by investigating how futures thinking methods may be beneficial to design researchers and design thinkers. Furthermore, looking at how we might incorporate futures research into the design research toolkit so that practitioners can more confidently employ futures thinking research methods in their work. Throughout this report, we will gain a deeper understanding of the push to incorporate futures thinking in design research. As well as the common questions, wants, or barriers design researchers and design thinkers face when it comes to currently encountering and exploring the future. Lastly, a futures thinking lens will then be applied to the questions and barriers design researchers face, to inform an expanded design research toolkit that includes futures. The expanded design research toolkit that includes futures thinking can be found in the appendix of this paper.

Major Research Question

- ***How might futures thinking methods be valuable to design research?***

Secondary Research Questions:

- *What might be the current design research toolkit limitations when it comes to futures-facing questions?*
- *How might design researchers currently encounter and employ futures (questions or thinking) in their practice?*
- *What is the potential value of expanding the design research toolkit to include futures methods?*
- *Why might design researchers want to expand their toolkit to include futures methods?*
- *How might futures research fit into the design thinking process?*
- *How might we expand the Design Researchers toolkit to include futures thinking methods?*

Research Methodology & Approach

This Major Research Project (MRP) follows a design thinking process to understand the problem space, iterate ideas, and develop an innovative solution. The iterative approach, and flow of information from one phase to another can be seen in Figure 1.

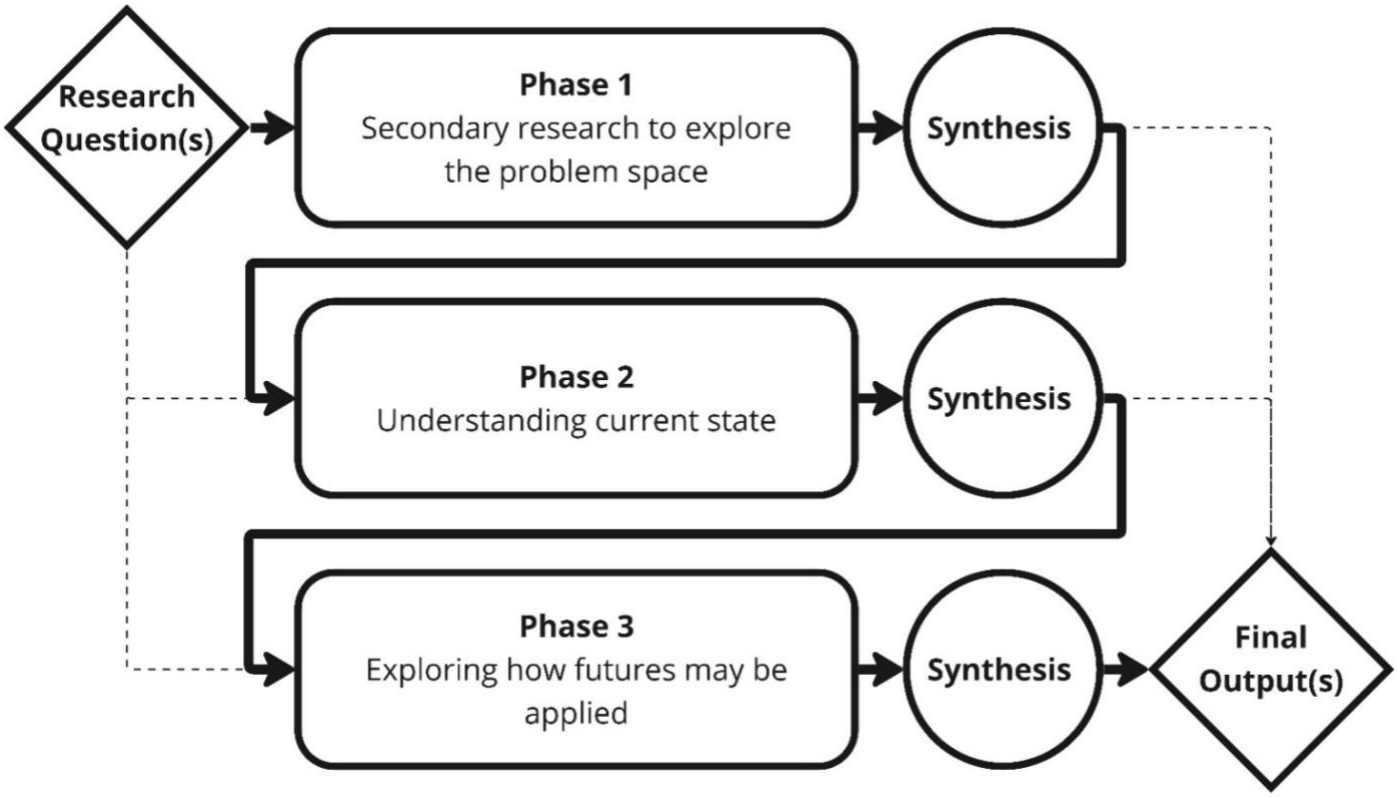

FIGURE 1. THREE PHASED RESEARCH APPROACH

The research question was investigated in three phases of research, where each phase influenced the next phase seen in Figure 1. I began by conducting secondary research to help scope and define the problem space. Then I empathized with design researchers and design thinkers to define the challenges and opportunity areas. Lastly, I spoke with futures thinkers to co-create potential ideas for the challenges and opportunities faced by design researchers and design thinkers. This work was then concluded by rigorous analysis and synthesis of data to produce a guide that illustrates when and how futures may applied to conduct research throughout the design thinking process.

Phase 1 – Secondary Research to Explore the Problem Space

I began with secondary research, conducting a literature review on design research and futures thinking to explore the history and possible intersections of these two practices. The literature review produced themes of similarities, differences, and gaps that helped inform the primary research questions to be asked in Phase 2.

Questions in focus:

- *How might futures thinking methods be valuable to design research?*
- *What might be the current design research toolkit limitations when it comes to futures-facing questions?*
- ~~*How might design researchers currently encounter and employ futures (questions or thinking) in their practice?*~~
- ~~*What is the potential value of expanding the design research toolkit to include futures methods?*~~
- ~~*Why might design researchers want to expand their toolkit to include futures methods?*~~
- *How might futures research fit into the design thinking process?*
- *How might we expand the Design Researchers toolkit to include futures thinking methods?*

Phase 2 – Understanding Current State

The first step in primary research was understanding how design researchers and design thinkers may currently encounter and employ futures (questions or thinking) in their practice. I conducted semi-structured user interviews with co-creation to uncover common questions, wants, or barriers. As well as collecting feedback on the concept of an expanded design research toolkit to include futures thinking. The data collected from these interviews was affinity mapped to form observations and insights. In addition, empathy maps were created to better understand the person I am designing an expanded design research toolkit for.

Questions in focus:

- *How might futures thinking methods be valuable to design research?*
- *What might be the current design research toolkit limitations when it comes to futures-facing questions?*
- *How might design researchers currently encounter and employ futures (questions or thinking) in their practice?*
- *What is the potential value of expanding the design research toolkit to include futures methods?*
- *Why might design researchers want to expand their toolkit to include futures methods?*
- *How might futures research fit into the design thinking process?*
- ~~*How might we expand the Design Researchers toolkit to include futures thinking methods?*~~

Phase 3 – Exploring How Futures May Be Applied

I then spoke with futures thinking subject matter experts by conducting semi-structured interviews with co-creation. The questions and challenges collected in Phase 2 were given to futures practitioners in this phase (Phase 3) to learn how they would apply a futures lens. Data collected from the interviews was processed using affinity mapping and used to inform the first minimum viable product (MVP) of the expanded design research toolkit that includes futures thinking methods.

Questions in focus:

- *How might futures thinking methods be valuable to design research?*
- ~~*What might be the current design research toolkit limitations when it comes to futures-facing questions?*~~
- ~~*How might design researchers currently encounter and employ futures (questions or thinking) in their practice?*~~
- *What is the potential value of expanding the design research toolkit to include futures methods?*
- ~~*Why might design researchers want to expand their toolkit to include futures methods?*~~
- *How might futures research fit into the design thinking process?*
- *How might we expand the Design Researchers toolkit to include futures thinking methods?*

Section 3: Unboxing the Design Research Toolkit

What is Design Research?

Design research is an evolving design practice that employs many investigative methods throughout the design thinking process to understand "the people for whom we're designing for" (Hall & Stark, 2019) (Nathasha, 2022). The discipline focuses on understanding users by observing what they do and say to uncover "their needs, desires, habits and perceptions" (Suri, 2008) to inform design decisions or strategic decisions. Through focusing on understanding and empathizing with users, it allows designers to shift away from designing for people (making decisions based on assumptions), to designing with people (making decisions based on insights) (Sanders & Stappers, 2014). By having a better understanding of end users and their context, designers can, in turn, create innovative design solutions.

> *"Discovering how and why people behave as they do and what opportunities that presents for your organization will open the way to more innovation and appropriate design solutions" (Hall & Stark, 2019)*

A Brief History of Design Research

In the 1980s research was often done after the product had been created by market researchers who sought to understand people's interest in and price point of the product (Sanders & Stappers, 2014). This era of research has been described by Sanders and Stappers as designing for people, as designers were making their decisions based on the assumptions of the user, and research was retroactively done to assess its market capability (Sanders & Stappers, 2014).

However, the rise of Personal Computers (PCs) brought a new wave of research that focused on making products "useful, usable, and desirable" (Buehring & Bishop, 2020). This was because the usability of the computer had a direct impact on the user's purchase decision, so companies became incentivized to understand and improve the user experience (Neilsen, 2017). The PC revolution brought the term "user experience" to fruition which was coined by Don Norman in 1993 (Nielsen, 2017). It was during the PC revolution that social scientists began entering the design practice to assist with making products centered around users and applying their methods to the design process.

From 1982 to 2017 the number of people practicing UX grew from a small 1,000 to an estimated 1 million (Neilsen, 2017). While today in 2022 we can still see the design research field growing steadily as "the average number of people doing user research within any given company is growing and the

market for UX Researchers is strong (a very quick LinkedIn Search for "User research" yields almost 84,00 results worldwide)" (Balboni et al., 2022). This is not surprising as many executives surveyed (81%) believe user research can not only make their company more efficient but also improve the quality of their offerings (uxplanet.org, 2018).

Where Did the Design Research Toolkit Originate From?

Design research employs methods "imported from other disciplines rather than being native to UX" (Robinson et al., 2018). Most commonly, design research has adapted and borrowed methods from the social sciences and the humanities (Ollenburg, 2019). This allows design researchers to handpick one or more methods from their toolkit depending on the purpose and challenge at hand.

> *"Research is a set of tools. We want to make sure we can find the right one fast, but we aren't too concerned with the philosophy of how the toolbox is* organized" (Hall & Stark, 2019)

However, due to the borrowing of methods, it's important for design researchers to challenge these methods and their applications. When selecting a method from your tool kit it is important to ask two questions. Firstly: is this the right method given the context and problem at hand? Secondly: Has this been adapted "thoughtfully and carefully" (Robinson et al, 2018) from its' original discipline? (Robinson et al, 2018) (Hall & Stark, 2019). Lastly, design researchers may challenge the current toolbox and wonder: What else might we adapt from other disciplines? (Grand & Wiedmer, 2010).

> *"We must be willing to complement, challenge, and evolve many of the approaches and practices that traditionally prevail." (Suri, 2008)*

Exploring What's in the Design Research Toolkit and Different Ways to View the Toolkit?

The design research toolbox is often sorted into three main methods of tools, quantitative methods, qualitative methods, or mixed methods that can be applied throughout the design thinking process.

Viewing the Design Research Toolkit through Quantitative, Qualitative & Mixed Method Tools

Quantitative Methods

Focuses on "What" is happening. These methods look to large numbers of people to quantify what is happening and evaluate areas that may be performing well or underperforming. Many quantitative methods originated from psychology (Creswell, 2014)

- Benchmarking
- Card Sorting

- Click Stream Analysis
- Competitive Analysis
- Customer satisfaction surveys
- Tree Testing
- Eye-tracking
- Heuristic Evaluation
- Live a/b testing
- Metrics analysis
- Web Analytics

Qualitative Methods

Focuses on "Why" something is happening. These methods look to smaller groups of people to explore why something is happening and focus on understanding the context, needs, behaviors, and opportunities to draw insights. Qualitative methods are rooted in anthropology, sociology, and the humanities (Creswell, 2014).

- Concept testing
- Contextual inquiries
- Diary study
- Ethnography
- Field study
- Focus groups
- Interviews
- Stakeholder interviews

Mixed Methods

Focuses on the "What" and "Why" during the same research study. This is done through the combining or "mixing" of qualitative and quantitative research throughout a research study. There has been an increase in mixed-methods research since 2010 (Robinson et al, 2018).

Viewing the Design Research Toolkit through Generative, Explorative and Evaluative Methods

Another way to look at the toolkit is by understanding which research methods may be applied during the different stages of the design thinking process. In the early stage of the design thinking process (discover and define) generative and explorative methods are used, while in the later stage of the design thinking process (develop and deliver) evaluative methods are used.

Generative & Explorative Research Methods

Focuses on exploring and generating and deeper understanding of the problem area, including the target user's needs, pains, and gains. Some generative & explorative methods in design research are:

- Contextual inquiries
- Diary studies
- Ethnography
- Focus groups
- Observations
- Stakeholder interviews
- User interviews

Evaluative Research Methods

Focuses on testing an idea, concept, or belief with the target users. Some evaluative methods in design research are:

- Card sorting
- Customer satisfaction surveys
- Tree testing
- Eye-tracking
- Heuristic evaluation
- Live a/b testing
- Metrics analysis

Section 4: Unboxing the Futures Thinking Toolkit

What is Futures Thinking?

Futures Thinking is not a prediction but rather a discipline that systemically explores potential futures and helps users to reclaim agency over the future (Gonzales, 2021) (Fowles, 1979). The term futures thinking is sometimes referred to as futures and future studies. No matter the name used, the discipline of futures goes by three common laws "(1) the future is not predetermined, (2) the future is not predictable, (3) the future outcomes can be influenced by our choices in the present" (Voros, 2022). The purpose of futures thinking is to help explore possible futures, encourage preferable futures, and counteract non-preferable futures to not only inspire others but to inform strategic decision-making (Stein & Chandler, 2021).

Futures thinking can also be thought of as an umbrella term that houses smaller schools of thought, much like how design thinking houses product design, service design, design research and more. Futures thinking has a prominent sub-discipline foresight also referred to as strategic foresight. This sub-discipline uses the same methods as futures but is often applied as more of a management and planning tool, whereas futures is applied more broadly (Fergnani, 2020).

Many organizations use futures thinking to inform their "strategy for tomorrow and make it more robust for the uncertainty that lies ahead" (Roumiantseva, 2016). In addition to helping plan strategy, it can allow teams to identify blind spots and recognize opportunities (Gordon et al, 2019) (Egger, 2018). Futures thinking is participatory and should be conducted with the key stakeholders, decision-makers, or users to build shared ownership of the futures (Government Office for Science, 2014).

The "s" in Futures indicates that there is no one predetermined future but many alternative futures. This allows the user to move away from normative futures and explore many possible futures to define those futures that are preferable (Fowles, 1979) (Miemis, 2010) (Gonzales, 2021). In *The Handbook of Futures Research*, Fowles describes the role of the futures thinker as an advisor to Pandora to inspire what could be inside the box, and what to do if the box is opened (Fowles, 1979).

> *"They (futurists) portray their role as that of an expert advisor to Pandora: telling her what is likely to be in the box which so intrigues her, and what contingency plans are necessary if she insists on opening it" (Fowles, 1979)*

A Brief History of Future's Thinking

Humans have been thinking about the future for decades, we as a species are "wired to think about tomorrow daily and try to plan, envision and influence it" (Egger, 2018). Maybe you have anxiety over the future, goals or aspirations for the future that take up space in your mind, in which you have considered a plan to achieve your desired future state.

> *Example: I had a goal to do a Master's. I imagined myself in various master's and once I found a preferable master's program, I began to plan out how I would achieve the Master's. This is a water-downed version of futures thinking, something we humans engage in daily without knowing it.*

Futures thinking has deep roots in literary expression. If we look back over human history, we can see futures thinking develop from the oral storytelling of Shamans and mystics to the observation of patterns by Nostradamus (Santer, 2019) (Milojevic, 2002). Then throughout the 19th to 20th-century science fiction literature became widespread with authors such as Thomas Moore and HG Wells writing about utopian and dystopian futures (Santer, 2021).

The shift from thinking about the futures in a literary sense to planning, happened during the late 19th to early 20th century. This is when "futures thinking…moved from a focus on utopianism to one of 'scientific' predication" (Milojevic, 2002). This shift in futures thinking was heavily influenced by the need for strategy during World War Two (Santer, 2019). This brought "a golden age of futures studies" (Milojevic, 2002) where futures thinking grew to become organized, global, and institutional.

Today we have forecasters, planners, strategists, storytellers, creatives, and politicians who engage in futures thinking by considering possible futures and making decisions to moves towards those futures. As well, futures is practiced on a global scale, is taught in academic institutions, and has organizations in addition to journals dedicated to advancing the practice (Ollenburg, 2019) (Gordon et al., 2019).

Where Did the Futures Thinking Toolkit Originate From?

Futures thinking has adapted and borrowed methods from others disciplines such as "mathematics, sociology, biology, psychology, management science, and philosophy" (Fowles, 1979). Futures methods are selected based on "a multi-factor process and needs to be considered as such" (Popper, 2008) looking at the aim of the project and scale of the project (Government Office for Science, 2014).

> *"Every futures project is different. Some are large-scale, involving extensive consultation, detailed research, and stakeholder workshops to identify and advise on future policy challenges. Others are small-scale, perhaps requiring only a single workshop with an internal policy or strategy" (Government Office for Science, 2014).*

Furthermore, futures thinking is a process, where each stage has its own unique methods and tools which can be applied to solve the problem as you move it from one end of the process to the other.

Exploring What's in the Futures Thinking Toolkit?

A widely accepted way to look at the futures thinking process is through *Sohail Inayatullah's six pillars: futures thinking for transforming*. Which states there are six pillars of futures thinking, each with its own methods and tools: mapping, anticipation, timing, deepening, creating alternatives, and transforming (MATDCT) (Inayatullah, 2008). This provides a structured approach to make sense of and systemically explore possible futures. However, this list is not extensive, and as the practice grows each organization may adopt its own futures thinking process. For example, the UK government has a futures thinking toolkit, which is divided into the following four pillars: gathering intelligence about the future, exploring the dynamics of change, describing what the future might be like and developing and testing strategy (Government Office for Science, 2014).

Viewing the Futures Toolkit through Sohail Inayatulah's Six Pillars of Futures Thinking:

Pillar 1: Mapping

Map the past, present, and future to understand where we have come from and where we may go. Some methods in this pillar are:

- Shared history to capture trends
- Futures triangle
- Futures landscape
- Trends & drivers
- Horizon scanning

Pillar 2: Anticipation

Explore possible opportunities, issues, and disruptions. Some methods in this pillar are:

- Emerging issues analysis
- Futures wheel
- Delphi
- 7 Questions

Pillar 3: Timing

Identify patterns of change. Some methods in this pillar are:

- Four patterns of history (linear, cyclical, spiral, pendulum)

Pillar 4: Deepening

Narrative foresight to understand the changing stories of the future. Some methods in this pillar are:

- Casual layered analysis (CLA)
- Metaphors

Pillar 5: Creative Alternatives

Exploring possible alternative futures to define probable, plausible, and preferable. Some methods in this pillar are:

- Scenario mapping
- Scenario archetypes (continued growth, collapse, steady state, transformation)
- Best case, worst case, outlier, business as usual
- Futures cone

Pillar 6: Transforming

Exploring which future is preferred and how we may get there. Some methods in this pillar are:

- Backcasting
- Road-mapping
- Visioning

Section 5: Comparing the Design Research and Futures Thinking Toolkit's

While unboxing the design research and futures thinking toolkit, I noticed similarities and differences in the toolkits and how they were used. The purpose of this section is to compare the toolkits as a basis to understand the current overlaps of the practices before exploring how and if the toolkits may be combined to expand the design research toolkit.

Similarities

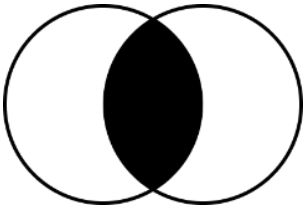

FIGURE 2. VENN DIAGRAM TO ILLUSTRATE SIMILARITIES

Design research and futures thinking share many similarities in how the toolkit is used. Both disciplines are inherently future-focused and work to be an advisory role that can influence decision-making. The disciplines focus on tackling complex problems through empathy, rigor, and the participation of others.

Inherently Future Focused

Futures thinking is future-focused, but it may be a surprise to think of design research and design thinking as future focused. However, "doing design and doing design research are both activities that are aimed at a better future" (Sanders & Stappers, 2014). The practice of design uses "research to inform the creation of products, and interventions that are intended to change the future" (Helgason & Smyth, 2020). Design as a practice focuses on what the world could be, looking to unearth possibilities and opportunities to change the status quo (Dunne & Raby, 2014). As well the things we create through design will "influence the future as we would like to have it" (Egger, 2016), as "we shape our tools and thereafter they shape us" (Culkin, 1967). Both practices use the "creative imagination to formulate visions of what the future could be like" (Fowles, 1979) to solve problems.

Inform Decision Making

Design research and futures thinking are both used to inform decision-making. Design research focuses on conducting research that may help inform or de-risk both design decisions and strategic decisions about a product, service, or roadmap. In a similar sense, futures thinking allows organizations to "make better decisions in the face of uncertainty"

(Roumiantseva, 2016). Where research is used to help organizations “identify risk and transform complexity into opportunity” (Egger, 2016).

Advisor Role

Design researchers are advisors to stakeholders as they advocate for the users' needs throughout the design thinking process (Nguyen, 2020). Through the advisory role, the design researcher attempts to leave behind their bias, and approach it from the lens of what the user needs and wants. Futures thinkers also act in an advisory role where they leave behind their bias to inform decision-making. In *The Handbook of Futures Research*, Fowles describes the futurist role as the “Advisor to pandora: telling her what is likely to be in the box…and what contingency plans are necessary if she insists on opening it" (Fowles, 1979).

Tackles Wicked Problems

A wicked problem is a term many design thinkers are familiar with. It characterizes a complex problem with interconnected parts making it difficult to solve, for example, climate change, housing crisis, or health care (Interaction Design Foundation, n.d). Both “Future thinkers and design thinkers typically face... complex situations” (Gordon et al, 2019) meaning both design researchers and futures thinkers encounter and explore wicked problems in their field of work.

Practices Empathy

Design researchers and futures thinkers both practice empathy towards others throughout their work. Design researchers focus on understanding their users and empathizing with their situation, as “the ultimate purpose of our field is to significantly improve the user experience provided by the technology we create” (Rohrer et al, 2008). Which in turn means design researchers “focuses largely on understanding the people for whom we’re designing for “(Hall & Stark, 2019). Future thinkers share a similar view of empathizing with their users, as future thinkers will “wear other people’s heads and look at the world from their point of view” (Fowles, 1979). To empathize with their users and understand their needs and wants by asking questions like “what do they feel? What do they want today? What are they going to want in the future?” (Fowles, 1979).

Participatory

Both design research and futures thinking are participatory in nature. Design research involves the target users of a product or service to understand their needs, wants, pains, and gains (Sanders & Stappers, 2014). In addition, design researchers may involve other stakeholders such as designers, product managers, product owners, or business partners along the research journey to not only gain their input but develop stakeholder buy-in. Futures thinking often brings stakeholders along the journey through workshops, meetings, interviews, and surveys to help “share knowledge and experiences either to inform or to co-create a set of future scenarios” (Johansson, 2021). By involving stakeholders in either

practice we can create a shared sense of ownership and enable champions of change throughout an organization to further our work.

Similar Process – Research, Build, Test

There are similarities and overlaps between the design thinking process, which design research informs, and the futures thinking process. Both processes have a research, build, and test phase. Design research discovers through user research while futures thinking discovers through mapping and scanning. Both practices will then build a prototype of the future state which they test with others to generate feedback and select a preferable prototype to continue developing.

Research Rigor & Stakeholder Buy-in

The disciplines of design research and futures thinking are heavy in conducting research with rigor to ensure validity in the outcomes. The practices often face push-back from others who question the accuracy of the work, and the rigor behind the work. This leads to a shared challenge of generating stakeholder buy-in, many design researchers and future thinkers face push-back from stakeholders who don't understand the value of the practice or believe the outcomes are grounded in theory.

Borrows Methods from Other Disciplines

Both disciplines of design research and futures thinking have borrowed and adapted methods from different disciplines. Design research most notably borrows methods from the social sciences such as cognitive psychology, ethnography, and anthropology (Beckman,2020). While futures thinking has borrowed methods from social sciences, math, and science such as sociology, psychology, and management science (Fowles, 1979). Since both disciplines borrow methods, we must look at how methods are being borrowed and adapted to ensure it is thoughtfully and carefully done (Robinson et al, 2018).

Differences

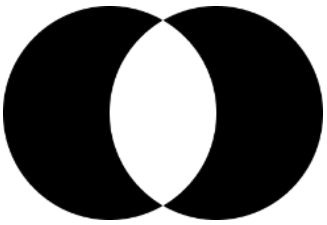

FIGURE 3. VENN DIAGRAM TO ILLUSTRATE DIFFERENCES

The main differences between the toolkits are the aims and scope of the research conducted. Design research focuses on the user, the near future, and tangible outcomes while futures thinking focuses on the context of the user, the long-term future, and sometimes intangible outcomes.

Timeline of Research

Design research often focuses on the near future looking to support immediate design decisions or inform strategic product roadmaps that look 3-5 years into the future (Buehring et al., 2019). While futures thinking focuses on a more long-term future which can be anywhere from 50 years to "10-15 years out" (Hubraum, 2020).

Focus of the Research

Design research places focus on "user-centered design, while futures studies focus on the context of the user" (Des Vos et al., 2018). This indicates the primary focus of the research for each field is different but somewhat complementary to each other, as it either focuses on the user or the context of said user.

Tangible vs Intangible

Design research often works with design to produce tangible outcomes at the end of the design thinking process, such as a product or service. While futures thinking produces imaginable alternatives such as scenarios or narratives (Ollenburg, 2019).

Level in Organization is Often Performed

Design research is often performed on product teams daily to support design decisions and strategic product decisions. While futures thinking is often done at higher levels of an organization to help "generate long term policies, strategies and plans" (Malhorta et al., 2014).

Section 6: The Push for New Tools

In this section, we will explore the forces of change which suggest the design research toolkit should be expanded to include futures thinking methods. We will examine this argument for change through two lenses. Firstly, by looking at the forces of change in the practice, examining what is happening in the practice to indicate the need for futures methods. Secondly, we will look at the forces of change in academia, to understand the literature on the intersection of design research and futures thinking.

Internal Forces of Change

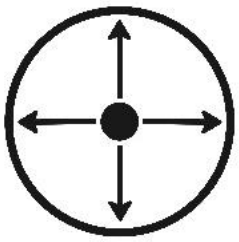

FIGURE 4. INTERNAL FORCES OF CHANGE ICON

Several internal forces are potentially driving the need for design researchers to expand their methods to include futures thinking methods. We will explore these forces throughout the following paragraphs. Covering the topics of how the design research role can shift to become more strategic in nature and help deal with increased uncertainty. While also exploring how design research and futures already overlap in certain practices.

Force 1 – Acceleration of Change

We live in an era shaped by profound digital acceleration, where we increasingly experience change in shorter periods (Buehring & Bishop, 2020) (Balagtas, 2019). Although the world has always been changing, the difference today is that "shifts are happening faster than ever before" (Egger, 2016). These changes are also more complex, they are not isolated events of change but a system of change that is interconnected and complex (Egger, 2016) (Buehring & Bishop, 2020). Although there is a high degree of change and uncertainty, people, and companies "feel the urge, more than ever before, to know what lies ahead" (Malhorta et al., 2014). In these uncertain times the ability to explore complex problems and "frame and reframe is increasingly critical" (Beckman, 2020). Decision-makers are leaning on the combination of design and futures to be an integral part of their decision-making process to inform their strategies and thrive in the uncertainty of the future (Buehring & Bishop, 2020).

Many organizations will establish design research programs to support their decision-making process and inform their decisions of where to put their time and effort (Suri, 2008).

To inform strategies during uncertain times, design researchers need new research approaches that equip them to examine the changing context of the world (Buehring et al., 2019). This is because "consumer observation alone is brittle and vulnerable to significant sudden change" (Gordon et al., 2019). As the context around the user can change suddenly or rapidly (Gordon et al., 2019). Design Researchers can adopt futures thinking methods to research the context of the user, meaning they can make more holistic recommendations to the team with user observations (design research) and context observation (futures thinking).

Design researchers can provide organizations with the data needed to make informed decisions, which go beyond the observation of users and examines unforeseen contextual changes (Gordon et al., 2019). Through an expanded design research toolkit, practitioners can analyze inbound signals of change from both the user and the users' context, to make informed recommendations, allowing companies to anticipate and influence change, before they are forced to change (Buehring & Bishop, 2020) (Hamel & Valikangas, 2003).

Force 2 – Towards a Mature Design Research Practice

In mature design research practices, the design researcher is being called upon to provide research to make not only informed design decisions but also strategic decisions. In this position, the design researcher needs methods and approaches to help them inform future thinking decisions for products, services, and strategies.

The maturity of the design research practice influences the role a design researcher plays in informing decisions. Organizations with low maturity in design research will focus on micro problems that are often reactive and on the operational day-to-day level (Anderson, 2022). In this environment, the design researcher must convince others of the value of their work, focuses on operational or tactical research, and deals with skepticism from other practices (Suthar, n.d). Design research is considered a box that they must check off when building a product, instead of an integrated part of the process to inform what to build and how to build it.

However, as the design research practice grows in maturity research becomes an integral part of the design and product development process. In this environment, design research is seen as more valuable to the "innovation process than as an external activity" (Suri, 2008). Meaning not only is design research conducted as part of the innovation process, but it is also being conducted proactively to help "de-risk key decisions that inform product and design" (Suthar, n.d).

In mature design research practices, design researchers are proactively collecting data to help inform strategic decisions. The research conducted by design researchers helps organizations determine their priorities, mitigate risks, inspire strategy, and inform where

the company should put its time and effort (Harshbarger et al., 2022). An expanded design research toolkit with futures thinking methods would create an “effective tool for current decision-making and strategic planning” (Tonby et al., 2021). Through the expansion of the design research toolkit, the design researcher will be able to help organizations gather context about possible futures, anticipate change, open minds to consider these possible futures, and empower organizations to develop strategies to create their preferred futures (Young, 2021) (Malhorta et al., 2014) (Farrington et al., 2012). Bringing together recommendations to make informed decisions based on the user and context of the user in possible futures.

Force 3 – Designing for Future Users

Design researchers observe and interact with today's users, in hopes to build products they will use with in the future (Eller et al., 2020). However, users' needs change over time, and we cannot observe the customers of the future only anticipate them (Gordon et al., 2019). Futures thinking may offer methods to help “better understand what that user might want and need in the future” (Roumiantseva, 2016).

Currently, design research is focused on capturing the needs of users at present. Design researchers observe users and interact with them to understand what their needs are, but “no amount of consumer observation prepares the design thinker for end-users in reshaped or disrupted sectors” (Gordon et al., 2019). As well, design researchers can not solely rely on asking users what they want in the future, as users are often tied to their current mental models of what is, instead of what could be. Taking into consideration the quote attributed to Henry Ford “If I had asked them what they wanted, they would have said faster horses” (Gordon et al., 2019) illustrates how users are tied to their current context. In the article *Escaping the ‘Faster Horses’ Trap: bridging Strategic Foresight and Design-based Innovation* the authors indicated that “solving the fast horse's problem, therefore, means anticipating leaps and discontinuities as well as continuities and evolutions in this contextual environment” (Gordon et al., 2019).

Expanding the design research toolkit with futures thinking, allows design researchers to capture the present needs while anticipating the possible future needs for tomorrow’s products and services (Eller et al., 2020).

Force 4 – Current Design x Futures Thinking Practices

Perhaps one of the most interesting forces of change in the field is to learn that design thinking and futures thinking have already been merged in multiple other disciplines known as: speculative design, design fiction, design futures, experimental futures, transition design, science fiction, and strategic design (Angheloiu, 2019). Elliot Montgomery illustrates the overlap of the different disciplines in their *work An Unresolved Mapping of Speculative Design V*

2.0 referenced in figure 5. In these practices seen in figure 5, varying elements of design thinking, and futures thinking are used to create windows into possible futures.

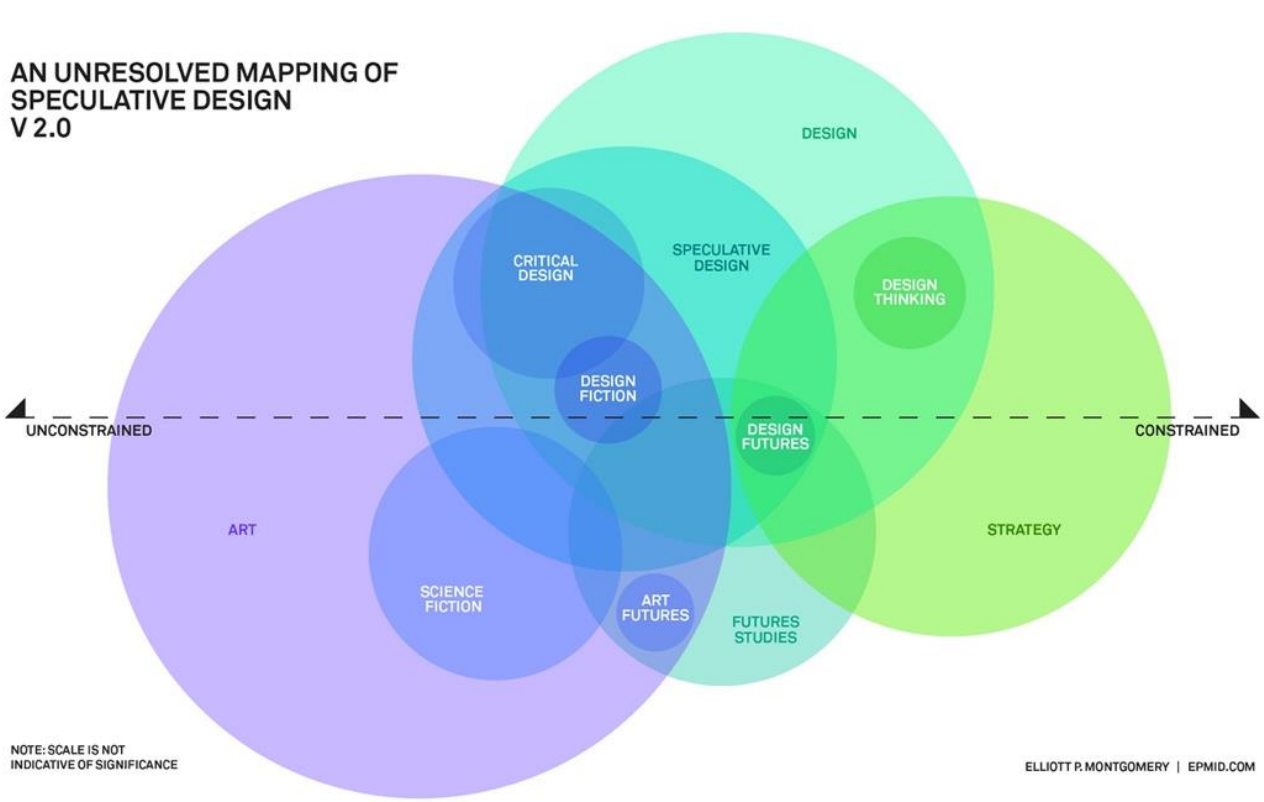

FIGURE 5. MONTGOMERY, AN UNRESOLVED MAPPING OF SPECULATIVE DESIGN V 2.0, N.D

In speculative design, present constraints are removed to imagine alternative futures (Buehring & Bishop, 2020). Design research methods such as interviews, co-creation, and storytelling are used to "co-create fictional life stories that reveal details about the events and emotion attached to them" (Helgason and Smyth, 2020).

While in design fiction, researchers will practice "fiction as a way to involve diverse stakeholders" (Cheon et al., 2019). Through methods such as: fictional prompts, fictional inquiry, group storytelling, or future autobiographies. These methods are participatory and allow participants to engage with open-ended futures and imagine unrealized futures or objects in use which can inform design decisions and strategic decisions (Cheon et al., 2019). Notable methods being used in these practices are storytelling, what-if prompts, user interviews, futures cone, futures triangle, fictional inquiry, future autobiographies, scenario creation, prototyping, and co-creation.

Through these practices, we can see glimpses of how the design research toolkit may be expanded to include futures methods. Where researchers are engaging with future thinking by asking what-if questions and providing opportunities for users or stakeholders to write fictional stories about possible futures.

External Forces of Change

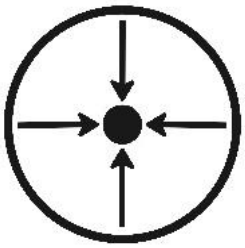

FIGURE 6. EXTERNAL FORCES OF CHANGE ICON

In academia, there is growing literature around the intersection of design thinking and futures thinking, which has brought about conferences, journals, and professional groups, dedicated to connecting design thinking and futures thinking. However, there is little literature that explores how design research, a discipline in design thinking may interact with futures thinking. For that reason, we will explore the forces of change in academia through the design thinking lens and extrapolate the impact it may have on design research.

Force 5 – Literature

There is growing literature on the intersection of design thinking and futures thinking, which explores how one discipline may be used to improve the other discipline (Gordon et al., 2019).

Entering *"Design Thinking and Futures Thinking"* into Google Scholar yields over one million results with article titles such as:

- *Blending Design Thinking and Design Futures*
- *Facing the Complexity of Uncertain Futures*
- *A Design for Life: Futures Thinking in the Design Curriculum*
- *Developing a Transformative Business Strategy Through the Combination of Design Thinking and Future Literacy*
- *Design Thinking for Future Schools*

Even a generic Google search of *"Design Thinking and Futures Thinking"* will yield articles such as:

- *The Fourth Way: Design Thinking Meets Futures Thinking*
- *Futures Thinking and Design Thinking Simple Explained*

- *Ways of thinking – Design thinking vs Future Thinking*
- *Futures Thinking & Design Thinking (Future Human by Design)*
- *Design Thinking Must be Futures Empowered (the future school)*

This growing body of literature suggests ways in which the practices can be combined to better the other. Some practitioners suggest that futures thinking can lead into the design thinking process, or that futures thinking may be the bookends of the design thinking process (Hubraum, 2020) (Santer, 2019) (Slander, 2018). While others suggest new frameworks that combine the two disciplines into one process, such as the LaFutura Process by Koskelo M. Nousiainen A.K or the Futures Design Process Model by Ollenburg (Koskelo & Nousiainen, 2013) (Ollenburg, 2019).

Overall, the literature suggests synergy between the two disciplines and indicates that there is a strong interconnection between design thinking and futures thinking. However, the differences in opinion of how and when the discipline should be applied indicates that this literature space is still young and requires further investigation to arrive at a shared consensus.

Force 6 – Conferences and Professional Groups

The intersection of design thinking, and futures thinking has gained the attention of global conferences and created organizations solely dedicated to furthering this research (Gordon et al., 2019).

In 2015, futures thinking, and design thinking was the subject of the special issues of the Future Journals (Gordon et al., 2019). While in 2017 it was the theme of the Hong Kong Design Management Academy Conference (Buehring et al., 2017). Today there are some publications that "deal with why and how design thinking improves strategic foresight" (Gordon et al., 2019). Professional groups have also emerged dedicated to advancing this topic such as The Design Futures Initiative, and Speculative Futures which has chapters across the globe.

The exposure to the combination of design thinking and futures thinking has created more opportunities for academics to examine the intersection, debate ideology, and produce opinions on how and when these practices should be combined.

Force 7 – Programs & Education

The final force in academia is the emergence of futures thinking in design thinking education. Graduate programs through OCAD University, California College of Arts, and New York University offer master's programs that expose graduate to design and futures thinking (Ollenburg, 2019). This enables a future workforce of professionals who can apply various methods from both design thinking, and futures thinking to tackle complex challenges.

Analyzing the Forces of Change

To better understand the forces of change concerning the research question *How might futures thinking research methods be valuable to design research?* Sohail Inayatullah's Futures Triangle has been applied. The futures triangle is a method that explores a plausible future by mapping the past, the present, and the possible future seen in figure 7 (Riedy, 2012). By examining all three forces the Weight of History, the Push of the Present and the Pull of the Future, plausible futures can emerge (Inayatullah, 2008).

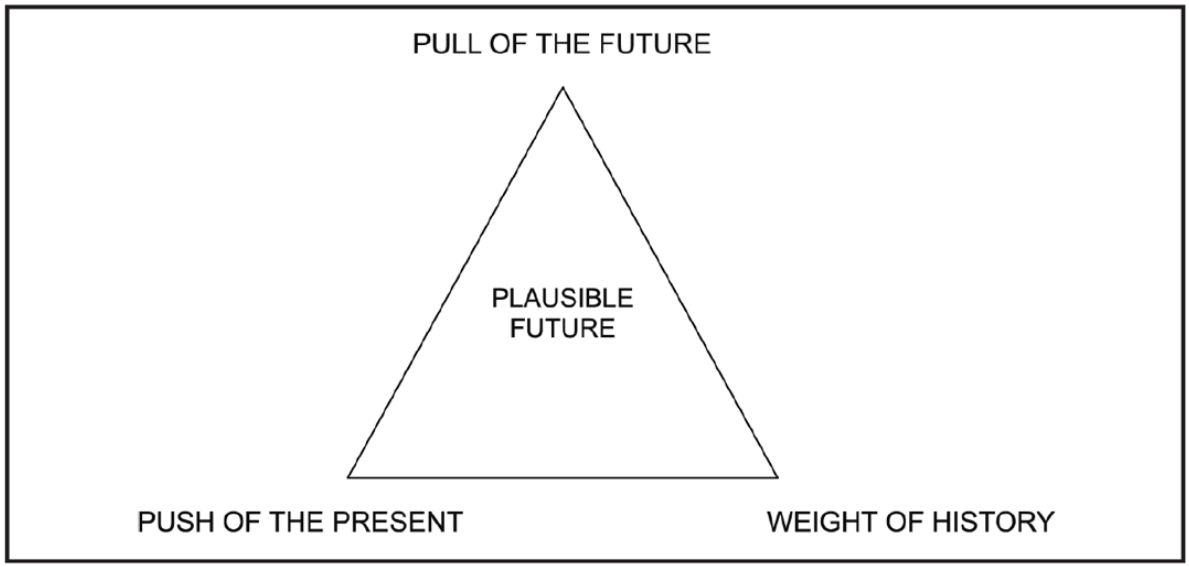

FIGURE 7. INAYATULLAH, THE FUTURES TRIANGLE, PG. 8, 2008

The Weight of History examines any barriers to change or resistance that may hold us back or slow us down (Inayatullah, 2008). While the Push of the Present focuses on what is happening today, and any drivers or trends that may shape the future (Inayatullah, 2008). Lastly, the Pull of the Future explores images of possible futures and pulls toward particular futures (Inayatullah, 2008). The literature will be synthesized into these three categories to better understand if it is plausible to have a future where the design research toolkit is expanded to include futures thinking methods.

Weight of History

The forces of change deal less with history, and more with the pushes of today and the pull of the future. For this section, I will refer to the analysis of the two toolkits from the previous section.

- Both toolkits borrow methods from other disciplines
- Both design research and futures thinking requires stakeholder buy-in and often deal with questions about the accuracy and validity of their work

- Different uses in the past, one for observing the user (design research) and the other for observing the context (futures thinking)

The Push of the Present

Force 1 – Acceleration of Change
The speed of change is accelerating, and challenges today are more complex and interconnected.

Force 2 – Towards a Mature Design Research Practice
Mature design research practices utilize design research to inform design decisions and strategic decisions.

Force 3 – Designing for Future Users
Design researchers are using data gathered today to make inferences about tomorrow's users and design products/services to be used in the future.

Force 6 – Conference and Professional Groups
Emerging conferences and progression groups are pushing forward the conversation around the intersection of design thinking and futures thinking.

Force 7 – Programs & Education
Some education programs teach practitioners how and when to use the various methods of design thinking and futures thinking, causing some to explore their intersection and usage.

Pull of the Future

Force 4 – Current Design x Futures Thinking Practices
Many other disciplines exist today that combine futures thinking and design thinking such as design fiction, design futures, speculative design, and strategic design.

Force 5 – Literature
There is a growing body of literature examining the intersection of design thinking and futures which suggests when and how to combine the two disciplines, these also offer competing images of the future.

Summary of the Forces of Change from the Design Research Practice and Academia

The Futures Triangle demonstrates there are many forces pushing us to a new future such as the acceleration of change, maturity of design research, and designing for future users. Furthermore, through the pull of the future, we can begin to see glimpses of plausible futures where design thinking, and futures thinking are being combined. Through this examination, it is plausible that there is a future where futures thinking methods are valuable to design research. In which, we may expand the design research toolkit to include elements of futures thinking.

Section 7: Observing the Current Design Research Toolkit in Action

Overview

This section summarizes insights and findings from facilitated conversations with design researchers and design thinkers who sometimes get asked questions about the future of a product, service, experience, or industry.

The individuals spoken with worked across various industries, in different design thinking roles, and in different geographic locations. Furthermore, the participants represented extreme user groups, meaning the users were either unfamiliar with futures thinking methods or familiar with futures thinking methods. Extreme user groups are individuals where "their needs are amplified and their workarounds are often more notable" (d. school, n.d).

Purpose:
The purpose of these conversations was to understand how others in the practice of design research and design thinking encounter and explore futures. This was done by identifying the types of futures questions practitioners get asked. Exploring the possible gains, pains, and needs experienced by design researchers or design thinkers when facing these futures questions in their workplace. Then mapping the questions and methods to the four phases of the Design Councils Double Dimond framework: discover, define, develop, and deliver (Design Council, 2019). The outputs from these conversations are used to inform the questions for the next phase of research and help define the criteria for the expanded design research toolkit.

Demographics:
Overall, there were eight participants which contributed to the following demographic breakdown:

- Exposure to Futures:
    - 5/8 had learned about futures thinking through higher education and could more accurately define futures thinking
    - 2/8 had learned about futures through work colleagues and could somewhat define futures thinking
    - 1/8 had heard of futures but were unsure how to define futures thinking
- Occupation:
    - 5/8 would consider themselves in a design research role
    - 3/8 would consider themselves in a designer role
- Geographic Location:
    - 6/8 were in North America
    - 2/8 were in Europe
- Size of Company:

    - 3/8 work at a large size company
    - 1/8 work at a medium-sized company
    - 2/8 work at a small-sized company
    - 2/8 are currently unemployed or between jobs
- Type of Work:
    - 6/8 spoke about doing work in-house for internal stakeholders
    - 2/8 spoke about consulting work for clients

Top Findings:

- There are five main themes of questions that design researchers and design thinkers get asked about the future of a product, service, industry, or experience. These are: *What is the future of X industry? What should we invest in now to be ready for the future? How might we learn more about our future users (needs, behaviors, habits, goals)? How might X trend impact our company or our users or the industry? What might be our company's role in the future of X?*
- Questions such as: *What is the future of X industry? What should we invest in now to be ready for the future? How might we learn more about our future users (needs, behaviors, habits, goals)?* are more commonly asked than *What is the future of X industry? What should we invest in now to be ready for the future? Or how might we learn more about our future users (needs, behaviors, habits, goals)?*
- Design researchers and design thinkers who have been exposed to futures thinking methods in the past often through higher education would attempt to apply these methods throughout the design thinking process to explore futures questions.
- Some of those who have attempted to explore questions about the future in their work have expressed the difficulty of running co-creation sessions with others, since it was hard to get others thinking about possible futures beyond their present-day mindset.
- When asked about futures thinking, most design researchers and design thinkers expressed that design is inherently futures facing as exploring the future is something design researchers and designers naturally do.
- Most participants reacted positively to the concept of expanding the design research toolkit to include futures thinking as they think it would help them generate stakeholder buy-in for futures thinking and help articulate the value of futures thinking.

The Five Common Questions Design Researchers and Design Thinkers May Get Asked About Possible Futures

Analyzing the questions design researchers and design thinkers get asked about the future of a product, service, industry, or experience revealed five themes of futures questions that those who conduct design research may encounter.

What are the Five Common Questions?

The five common question themes are:

1. *What is the future of X industry?*
2. *What should we invest in now to be ready for the future?*
3. *How might we learn more about our future users (needs, behaviors, habits, goals)?*
4. *How might X trend impact our company or our users or the industry?*
5. *What might be our company's role in the future of X?*

Each of the five common question's themes are made up of a grouping of sub questions that embody the larger question. The main question, sub questions and commonality can be seen in Table 2 below.

Main Question Asked	Sub Questions	Commonality
What is the future of X industry?	• What is the future of X industry? • What might X industry look like in the future? • How might the industry/landscape change in the next several years? • How might the X industry change with the increased use of technology? • How might the industry be changing? • How might the industry change with X trend or disruption? • What disruptions are on the horizon? How might new entrants in the industry affect the industry? • What new tech or startups should we be aware of?	Very Common
What should we invest in now to be ready for the future?	• What should we invest in now to be ready for the future? Such as tech, capabilities, etc.? • What should our product roadmap look like? • What should our roadmap prioritize in 2023 & beyond? • Is the vision for our product future-proof? • Is it worth pursuing this project or investing more in it? • Are we missing anything in our roadmap/timeline? • Do we have any blind spots for the future?	Common
How might we learn more about our future users (needs, behaviors, habits, goals)?	• How might future users behave? • What do people want to use the app for in the future? • What should the future user experience be? • How might our current users evolve into future users? • What might get someone excited in the future? • What might be most important to users now vs in the future? • What product improvements would be most valuable to users? • What do future users need to get out of our product/service? • What future user segment should we target?	Common
How might X trend impact our company or our users or the industry?	• What trends will impact our industry in 5-10 years? • How might trends impact this space? • How might a certain technology impact a certain industry?	Less Common
What might be our company's role in the future of X?	• What role should we play in our industry in the future?	Least Common

TABLE 2. FIVE COMMON QUESTIONS DESIGN RESEARCHERS GET ASKED ABOUT THE POSSIBLE FUTURES

When are the Five Common Questions Asked During the Double Diamond Design Thinking Process?

The questions being asked about the possible future of a product, service, industry, or experience were mapped on the double diamond design thinking process, which is visualized in figure 8. This was done to understand the commonality of the questions being asked and which methods are currently being used to explore those questions.

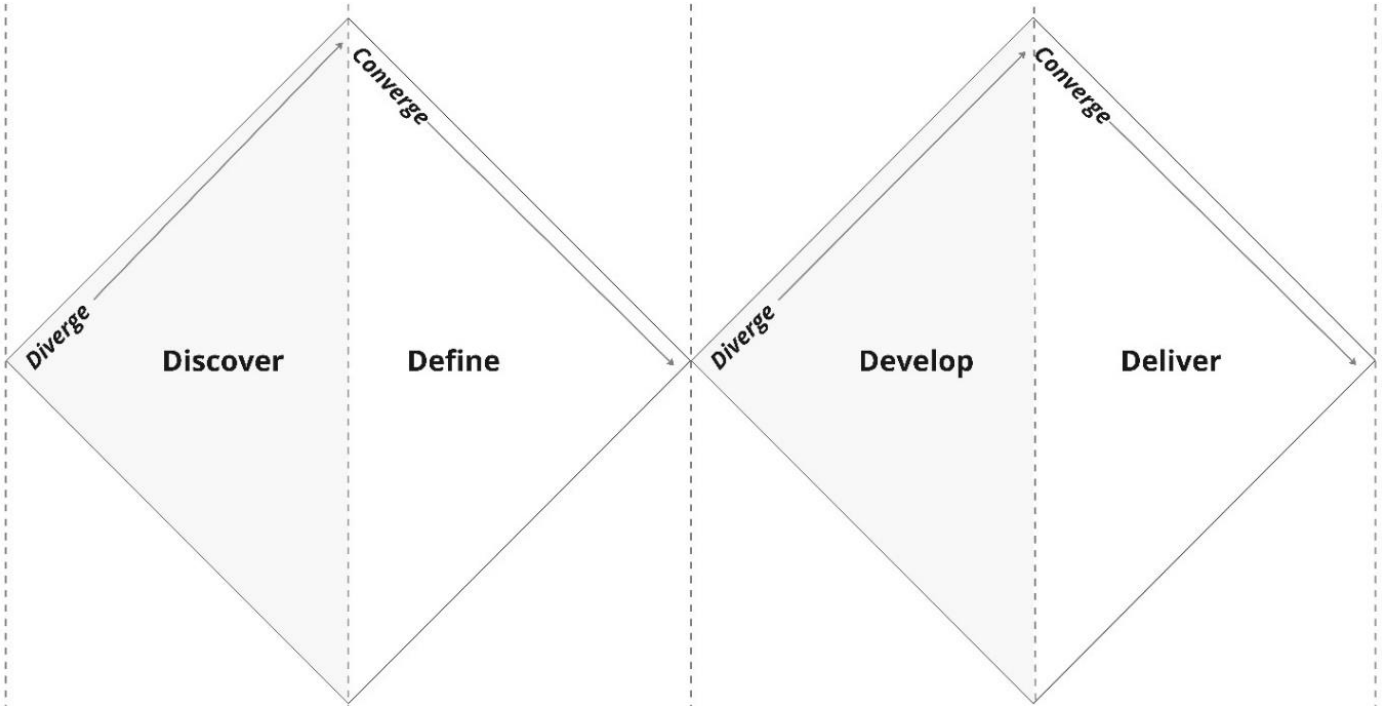

FIGURE 8. THE DOUBLE DIAMOND DESIGN THINKING PROCESS

Table 3 indicates the commonality of the question being asked in each phase of the double diamond. From this, we can see that the more commonly asked questions are: *What is the future of X industry? What should we invest in now to be ready for the future? How might we learn more about our future users (needs, behaviors, habits, goals)?* These questions appear frequently throughout the design thinking process and at a high volume, meaning more questions are being asked around these themes. While a less common question was *How might X trend impact our company or our users or the industry? and the least common question was: What might be our company's role in the future of X?*

Main Question Asked	Discover	Define	Develop	Deliver
What is the future of X industry?	Often	sometimes	Often	Often
What should we invest in now to be ready for the future?	Sometimes		Rarely	Sometimes
How might we learn more about our future users (needs, behaviors, habits, goals)?	Sometimes	Sometimes		Sometimes
How might X trend impact our company or our users or the industry?	Sometimes			Sometimes
What might be our company's role in the future of X?		Rarely		

TABLE 3. A MAP OF WHEN AND HOW OFTEN THE QUESTIONS ARE BEING ASKED

What Methods are Currently Being Applied?

As well in Table 4 many design research methods are being applied throughout the design thinking process to investigate these common future facing questions, as seen in the column labeled Design Research Methods. However, we learned that although the design research methods are most commonly used to investigate these questions, practitioners who had been previously exposed to futures thinking often through higher education, attempted to apply futures thinking methods such as trends, historical timelines, scenarios, or backcasting methods to investigate the future facing questions, as seen in Table 4 column Futures Thinking Methods.

Method	Design Research Methods	Futures Thinking Methods
Discover	• Assumption Slam • Interviews • Co-Creation Workshops • Secondary Research	• Industry Mapping • Historical Timeline • What Do You Dream Question • Trends
Define	• Interviews • Customer Intercepts • Surveys • Analytics • Observations • Site Visits	• Trends • Historical Timeline • Future Person

	• Co-Creation	
Develop	• Concept Testing • Usability Testing • Card Sorting • Journey Mapping • Interviews • Surveys • Co-Creation	• Scenarios • Role Playing
Deliver	• Recommendations • Value Proposition Creation • How Might We's	• Backcasting • Visioning

TABLE 4. A LIST OF METHODS APPLIED BY DESIGN RESEARCHERS IN EACH STAGE OF THE DOUBLE DIAMOND DESIGN THINKING PROCESS

Exploring the Potential Value Proposition of Incorporating Futures Thinking by Examining Design Researchers and Designer's Needs, Pains, and Gains When it Comes to Futures Thinking

The conversations with design researchers and design thinkers uncovered some common needs, pains and gains experienced when getting asked questions about and/or exploring the future of a product, service, industry, or experience.

These needs, pains, and gains have been synthesized using Strategyzers Value Proposition Canvas which is made up of the Customer Profile and Value Map as seen in Figure 9. The Customer Profile allows for clarification of the target user while the Value Map describes "how you intend to create value" (Osterwalder et al., 2015) for the intended user (Osterwalder et al., 2015).

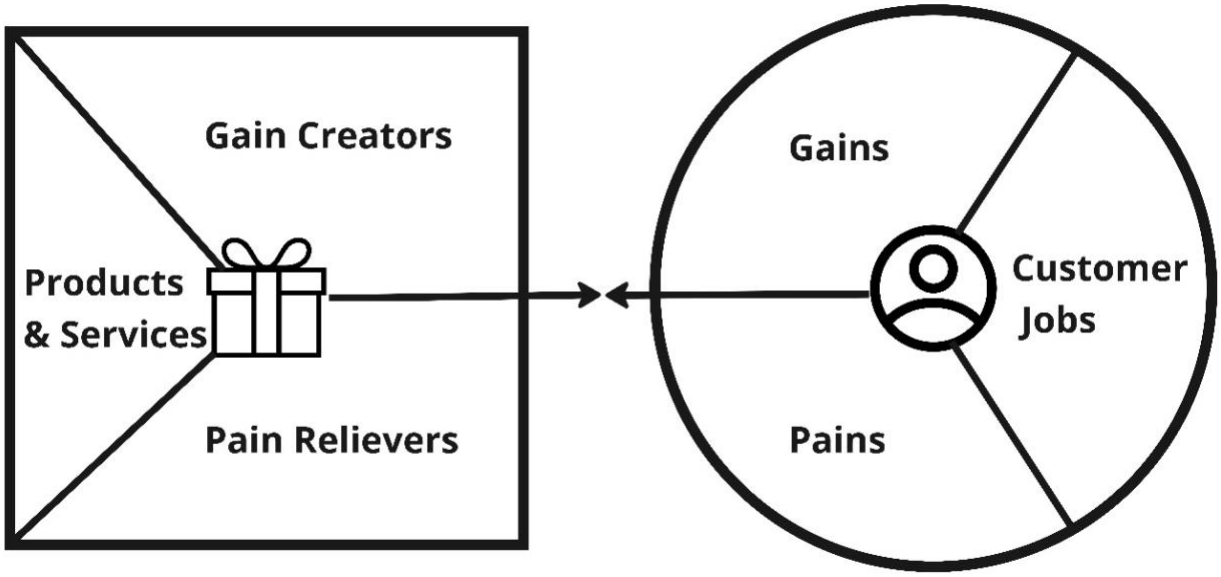

FIGURE 9. VALUE PROPOSITION CANVAS

Through synthesizing the data in the Value Proposition Canvas, the needs of the target user of the expanded design research toolkit became clear, along with the target users' pains, and gains when it comes to exploring futures facing questions. This information is used to create an outline of what the expanded design research toolkit might offer to relive pains and create gains in order to provide a value fit.

User Needs

Needs are considered the things users are trying to accomplish or get done when getting asked questions/exploring questions about the future of a product, service, industry, or experience.

Need 1 - Shifting Mindsets to Futures

- I need participants to think beyond the present day when running future co-creation sessions

Need 2 – Confidence in the Method

- I need to feel confident in the methods I use, as I must explain it to others
- I need examples and use cases of futures methods to feel confident
- I need to ensure I am using a valid method to do proper work

User Pains

Pains or pain points are the barriers and challenges experienced by practitioners when attempting to accomplish their goal when getting asked questions/exploring questions about the future of a product, service, industry, or experience.

Pain 1 – Difficulty Getting Stakeholder Buy-In

- Many participants need stakeholder buy-in, to get resources and support but found it difficult to explain or demonstrate the value of futures work
- Many participants want to do near-term futures work as they don't have the buy-in to do futures work over 10+ years

Pain 2 – Limited Time

- Many participants think time is their biggest barrier to doing futures work, as they have quick turnarounds and project timelines
- Many do futures work in a shorter time frame of 3-10 years, as often product roadmap visions are 1 - 5 years

Pain 3 – Present Day Mindset and Bias

- Some participants want to run co-creation sessions about the future with users/stakeholders/subject matter experts but struggled to get participants to think beyond the present day

Pain 4 – Choosing A Future Method

- Some participants want to use futures methods but find choosing a method difficult as they don't know what methods to apply when
- A few participants who do futures struggle to find a futures method or rationale for using that method
- Futures thinking feels more academic than tangible

Pain 5 – Acting on Insights about the Future

- A few participants struggle to turn futures research into actionable insights

Pain 6 – Lower Design Research Maturity

- Organizations with lower design research maturity are often more reactive to near-term projects making it more difficult to do futures work

User Gains

Gains are the positive outcomes or benefits practitioners want to achieve when getting asked questions/exploring questions about the future of a product, service, industry, or experience.

Gain 1 – Learning Additional Tools

- Some participants want templates and use cases, so they know how and when to apply future methods
- Some participants want to use future methods to complement but not replace their current design research methods

Gain 2 – More Influence & Strategic Work

- Many participants want to conduct more research that informs strategic work, and work with c-suite level stakeholders, so they can help inform large business decisions
- A few participants want to do more futures work, because they think talking about the future helps to better inform their work

Gain 3 – Increase Futures Literacy

- A few participants were trying to teach others around them about futures methods
- A few participants hope futures literacy is taught-in design studies because design is futures-facing

Gain 4 – Practicing Futures Methods

- A few participants were exploring how to incorporate futures into their design practice such as trend scanning, timeline creations and scenario generating
- Some participants learned about futures thinking during their higher education and continued to explore and use it in their practice
- Some stakeholders or clients will ask questions that entail futures thinking, without knowing what futures thinking is or its value

Gain 5 – Design is Naturally Futures-facing

- Exploring the future is something designers naturally do, futures is happening unofficially all the time in design work

Recommendations for an Expanded Design Research Toolkit

The findings collected from the conversations with design researchers and design thinkers have been used to define the questions practitioners get asked about the future of a product, service, industry, or experience. In addition, it has defined the target user for the expanded design research toolkit and their needs, pains, and gains. This provides the scaffolding for developing an expanded design research toolkit that includes futures thinking methods. The following is a set of recommendations to consider when developing the expanded design research toolkit.

Recommendation 1:

Provide Futures Thinking Methods that Help Answer the Five Common Questions Design Researchers Get Asked About Possible Futures

The toolkit should help indicate futures thinking methods that may be used to investigate the five common questions design researchers and design thinkers get asked about the future of a product, service, experience, or industry which are:

Five Common Questions Design Researchers and Design Thinkers Get Asked About Possible Futures

- *What is the future of X industry?*
- *What should we invest in now to be ready for the future?*
- *How might we learn more about our future users (needs, behaviors, habits, goals)?*
- *How might X trend impact our company or our users or the industry?*
- *What might be our company's role in the future of X?*

-

Recommendation 2:

Provide a Strong Value Fit for Design Researchers

The toolkit should provide a strong value fit with the user profile by offering gain creators, and pain relievers. These are examples of what participants would find valuable in an expanded design research toolkit and were collected by participants while reacting to the concept.

Suggested Pain Relievers

- A simple way to choose a futures method
- Warm-up activity to get people thinking beyond present day
- Information on how to get stakeholder buy-in for futures thinking
- Methods that can be applied to tight timelines
- Futures methods described in tangible and actionable ways
- Rational of when and how to use futures methods
- Explanation of how to use outputs from futures methods to create insights

Suggested Gain Creators

- Futures methods that are good for beginners of futures thinking
- Futures methods that help build confidence in how, when, and why to use futures methods
- Helps the user to clearly communicate the value of futures work to others
- Gives design researchers and design thinkers additional tools
- Helps the user better inform decisions
- Helps to advance the design research practice and tools to contribute to more strategic work

Recommendation 3:

Design Principles for the Expanded Design Research Toolkit

Through conducting conversations with design researchers and design thinkers, a set of design principles has been established. The purpose of the design principles is to describe a unique "set of values that act as a compass for your product" (InVision, n.d). When applied, the design principles will help inform the decision-making progress when designing the minimum viable product, which in this case is an expanded design research toolkit that includes futures thinking (Eismann, 2019). Overall, these design principles can be applied when expanding the design research toolkit to include futures thinking that keeps the user at the center.

Guiding Design Principles:

- We prioritize future methods that are flexible and can be adapted to shorter time frames to fit the needs and timelines of design researchers and design thinkers

- We ensure future methods borrowed from futures thinking discipline always maintain their rigor
- The toolkit is an add on, and should always complement design research methods while never replacing the role of a futures thinker
- We communicate clearly and concisely so users can quickly learn how, when, and why to use future methods
- We always give users the knowledge needed to explain or advocate for futures research

Section 8: Expanding the Design Research Toolkit to Include Futures Methods

Overview:

This section discusses the insights and findings from facilitated conversations with professional futures thinkers who were asked to apply a futures thinking lens to the common questions and challenges design researchers and design thinkers face when it comes to futures. In addition, futures thinkers were asked about their thoughts on design researchers using future thinking methods, to gather their initial reactions, fears, and wishes of the proposed expanded design research toolkit.

The future thinkers who participated in this research all had master's degrees, in which they learned about futures thinking and how to apply futures methods. Many now work in roles where futures thinking is incorporated into their job description or job title, only a few did not have futures explicitly in their job title.

Purpose:

The purpose of these conversations was to apply a futures lens to the understanding gained from the previous section where I spoke with design researchers and design thinkers. In doing so futurists were asked what futures methods they might apply to the five common questions design researchers and design thinkers get asked about the future. In addition, futures thinkers were shown the pain points encountered by design researchers and design thinkers around futures and were asked to consider ways to address them. Lastly, future thinkers were asked their thoughts on expanding the design research toolkit to include futures thinking.

Demographics:

Overall, there were six participants who contributed to the following demographic breakdown:

- Master's degree related to futures thinking
    - 5/6 have a degree with a title that relates to futures
    - 1/6 has a business degree in which they took a course on futures
- Occupation
    - 4/6 have occupational titles that indicate futures thinking
    - 2/6 have occupational titles that indicate strategy or design, with no mention of futures thinking
- Type of Work
    - 4/6 spoke about doing work in-house for internal stakeholders
    - 2/6 spoke about consulting for clients

Top Findings

- Some future thinkers began by reframing the five common questions to indicate the plurality of multiple futures. Suggesting that questions asked by non-futurists should be rephrased to open the question up to futures thinking and multiple possible futures, before determining the methods to use.
- Future thinkers were able to suggest futures thinking methods for all five common questions design researchers and design thinkers encounter with many methods suggested in the discover and define stage while only a few in the develop and deliver stage of the design thinking double diamond.
- It was observed that futures thinking methods may span more than one phase of the double diamond. For example, the method scenarios can be found in the Discover, Define and Develop stages.
- Futurists described futures thinking as a creative and collaborative practice that brings to gather diverse perspectives to sense change as well as have conversations about the potential implications of change to better inform strategies. Providing the value of creative problem-solving, long-term futures vision to build strategies, increased capacity to sense change, autonomy over the future, and ability to differentiate compared to competitors.
- Some futurists think the common barriers to stakeholder buy-in is that futures may feel inaccessible to most people due to the jargon and buzzwords. As well, it may feel risky or silly to think about the future or bring up existential worries. These factors can make generating buy-in for futures difficult.
- Some futurists generate buy-in by finding sponsors and champions for futures thinking throughout their organization. They may also curate educational materials to share with others or do future thinking activities without telling people its futures thinking.
- Six futures thinking co-creation warm-up/icebreaker activities were recommended by futures thinkers. These are: *Look Back/Look Around/Look Forward, Change Line, The Polak Game, 100 Ways Anything Can Be Different in The Future, and Dominant Paradigms*
- Many futures thinkers suggest having “future fuel” prompts to encourage conversation around possible futures and help keep a conversation flowing when you meet resistance from participants. These prompts are meant to ask questions that open the possibility of various futures.

How Futurists Approach the Five Common Questions Encountered by Design Researchers and Design Thinkers

Futures thinkers were presented with the five common futures questions design researchers and design thinkers encounter, which were identified in *Section 7: Observing the Current Design Research Toolkit in Action*. These questions which can be seen in Table 5 were: *What is the future of X industry? What should we invest in now to be ready for the future? How might we learn more about our future users (needs, behaviors, habits, goals)? How might X trend impact our company or our users or the industry? What might be our company's role in the future of X?* The futurists were presented with each question one at a time and asked how they might apply futures thinking methods to investigate the questions.

Reframing the Five Common Questions

A few futures thinkers began by rephrasing the question to indicate plural futures. For example, the question *"What is the future of x industry?"* was reframed to *"what might be the possible futures of X industry?".* It was observed that reframing the questions you get asked about the future is important because it helps open the conversation to multiple futures and the idea that there is no one future. Table 5 presents each original question and their reframing into a plural futures perspective.

Original Question Asked	The Question Reframed to be Futures Facing
What is the future of X industry?	What might be the possible futures of X industry?
What should we invest in now to be ready for the future?	What might we invest in now to be resilient for the possible futures?
How might we learn more about our future users (needs, behaviors, habits, goals)?	How might we learn more about our users' potential futures needs, behaviors, habits, and goals?
How might X trend impact our company or our users or the industry?	How might X trend impact our company or our users or the industry?
What might be our company's role in the future of X?	What might be our company's role in the futures of X?

TABLE 5. REFRAMED QUESTIONS TO BE FUTURES-FACING

Suggested Futures Methods for the Five Common Questions

Futurists suggested many methods for each reframed question as can be seen in Table 6.

Questions Reframed to be Futures Facing	Futures Thinking Methods Recommended	
What might be the possible futures of X industry?	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Futures Cone • Scenarios	• Three Horizons • Future Narratives • Wind tunneling • Future Artifacts • Backcasting • Futures Wheel
What might we invest in now to be resilient for the possible futures?	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Futures Cone • Futures Wheel • Futures Triangle	• Scenarios • Future Artifacts • Wind Tunneling • Future Artifacts • Backcasting
How might we learn more about our users' potential futures needs, behaviors, habits, and goals?	• Horizon Scan • Four Feelings • Historical Timeline • Experiential Futures • Future Artifacts • Future Personas	• Scenarios • Wind Tunneling • Backcasting • Plausibility Ranking
How might X trend impact our company or our users or the industry?	• Trends & Trend Implications • Drivers of Change • Futures Wheel	• Futures Cone • Scenarios • Future Prototypes
What might be our company's role in the futures of X?	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Futures Wheel	• Three horizons • Scenarios • Backcasting

TABLE 6. REFRAMED QUESTIONS AND SUGGESTED FUTURES THINKING METHODS

When Might the Suggested Futures Thinking Methods be Applied During the Design Thinking Process

This section will take the reframed questions from Table 5 and the suggested futures methods from Table 6 to showcase when the futures thinking methods may be applied throughout the design thinking double diamond according to futurists.

Futurists were asked what futures thinking methods they would use to explore the common questions during the different phases of the double diamond design thinking process. This included questions about what methods they would use to: explore futures thinking questions and sense change (Discover), determine implications of change, and have conversations about possibilities (Define), test potential futures and the resilience of strategies (Develop), and determine a preferred future or a final strategy (Deliver). All responses were collected and synthesized to illustrate when each method may be used Table 7 below.

	Discover *Methods to explore futures thinking questions and sense change*	**Define** *Determine implications of change and have conversations about possibilities*	**Develop** *Test potential futures and the resilience of your strategies*	**Deliver** *Determine your preferred futures or final strategy*
What might be the possible futures of X industry?	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Futures Cone • Scenarios	• Three Horizons • Future Narratives • Scenarios • Futures Wheels	• Wind tunneling • Future Artifacts • Backcasting • Scenarios	• Plausibility Ranking
What might we invest in now to be resilient for the possible futures?	• Horizon Scan • Trends & Trend Implications • Historical Timeline	• Futures Wheel • Futures Cone • Futures Triangle • Scenarios	• Wind Tunneling • Future Artifacts • Backcasting • Scenarios	
How might we learn more about our users' potential futures needs, behaviors, habits, and goals?	• Horizon Scan • Historical Timeline • Four Feelings • Experiential Futures • Scenarios	• Future Personas	• Wind tunneling • Future Artifacts • Backcasting • Scenarios	• Plausibility Ranking
How might X trend impact our company or our users or the industry?	• Trends & Trend Implications • Scenarios • Futures Wheel • Futures Cone	• Drivers of Change	• Future Prototypes	
What might be our company's role in the futures of X?	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Scenarios	• Three Horizons • Future Wheel • Scenarios	• Scenarios	• Backcasting

TABLE 7. WHICH FUTURES THINKING METHODS TO USE AND WHEN DURING THE DESIGN THINKING DOUBLE DIAMOND BASED ON THE COMMON QUESTION

Futures Methods Suggested for Each Stage of the Design Thinking Process

The section showcases a synthesized view of Table 7 to illustrate an overall view of how futures thinking methods might be commonly applied to the double diamond design thinking process seen Table 8.

In doing so it was observed that some futures thinking methods may span more than one phase of the double diamond such as the futures methods scenarios which can be found in the Discover, Define and Develop stages.

As well, many methods were suggested for the early stage of the double diamond Discover and Define, while only some were suggested for Develop and one for Deliver. However, it's important to note that there may be other future thinking methods that do fit into the later stage of the double diamond, develop, and deliver that was not mentioned during the conversations with futurists as those methods may not have helped investigate the five common questions design researchers and design thinkers get asked.

How Might Futures Thinking Methods Fit into the Design Thinking Process		
	Futures Thinking Methods	
Discover *Methods to explore futures thinking questions and sense change*	• Horizon Scan • Trends & Trend Implications • Historical Timeline • Futures Wheel • Futures Cone	• Four Feelings • Future Artifacts • Experiential Futures • Scenarios
Define *Determine implications of change and have conversations about possibilities*	• Scenarios • Future Narratives • Future Personas • Futures Wheel • Futures Cone	• Futures Triangle • Three Horizons • Drivers of Change
Develop *Test potential futures and the resilience of your strategies*	• Wind tunneling • Back Casting • Scenarios	• Future Artifacts • Future Prototypes
Deliver *Determine your preferred futures or final strategy*	• Plausibility Ranking (plausible, possible, probable)	

TABLE 8. HOW MIGHT FUTURES THINKING METHODS FIT INTO THE DESIGN THINKING PROCESS

Exploring How Futurist Define Futures Thinking and its Potential Value

How do futurists describe futures thinking?

Futurists described futures thinking as a creative and collaborative practice that brings together diverse perspectives to sense change as well as have conversations about the potential implications of change to better inform strategies.

"We are sensing the change; we are not predicting"
– Futures Thinking Participant, 2023

Potential value of futures thinking

Creative Problem Solving
Enables creative and flexible ways of thinking that can be used to inform strategies.

Envision Long Term Futures to Build Strategies
Increases ability to envision their preferred future and inform long-term strategies.

Capacity to Sense Change and Ability to Act Proactively
Creates organizational capacity to sense environmental changes and process the changes to make informed decisions which make for a resilient organization.

Empower Organizations to Act
Give organizations the tools and resources they need to create a future that they want, rather than passively waiting for events to unfold.

Differentiation of Offerings
For consulting organizations, it provides a new offering to sell clients and core capacity to differentiate in the market.

Discovering Barriers to Futures and How to Generate Buy-in

Common Barriers to Generating Buy-In

A common challenge identified in *Section 7: Observing the Current Design Research Toolkit in Action* was "Difficulty Getting Stakeholder Buy-In". Many participants mentioned needing this to secure necessary resources and support but found it difficult to explain or demonstrate the value of futures work. Similarly, some future thinkers expressed the same challenge of demonstrating the value of futures work to non-futurists. These barriers to buy-in described by futurists were:

Barrier – Futures is Inaccessible to Many
For some futurists, futures thinking is inaccessible to many because of the jargon, buzzwords, and various interpretations of the futures thinking practice, which creates confusion and makes the topic feel unapproachable.

Barrier – Futures Feels Risky & Silly
Many futurists discussed how they have encountered stakeholders or participants who are hesitant to embrace futures thinking because the practice felt risky or silly to imagine alternative futures.

Barrier – Futures Brings up Existential Worries
A few futurists mentioned that when collaborating with others on futures thinking, participants brought up existential worries of utopian or dystopian futures that often dominated the conversation and made it hard to understand the value of the discussion.

Suggested Ways to Generate Futures Buy-In

Futures thinkers suggested several ways to overcome the barriers and help generate buy-in for futures thinking. These were:

Find Sponsors and Champions
Many future thinkers suggested finding individuals in the organizations who can help champion and sponsor futures thinking efforts, to encourage others to participate in futures thinking, as well as share and promote its value.

Champions are "people who enthusiastically support the growth of an idea within an organization" (Yacco, 2021). Often champions are individuals who are "in the position to influence leadership and culture over time" (Yacco, 2021). This can help overcome some of the "social and political barriers" (Yacco, 2021) new ideas face in organizations. Finding

champions is commonly embraced in design research and design thinking practices to grow the maturity of the practice and overcome barriers. However, to make champions effective you must educate them on the value of futures thinking and provide materials about futures thinking.

"Think about how to design an experience up front for buy-in, have someone internally who is a sponsor of the work, someone who gets it and can influence others, so much harder as grassroots since organizations have ways of working built-in"
– Futures Thinking Participant, 2023

Provide Supportive Materials
To help educate potential champions and increase futures capacity/literacy some future thinkers recommend developing tangible and actionable materials around futures thinking that explains the value and concept in layman's terms making it more accessible to others.

Don't Call it Futures or Ask for Permission
Some participants recommend doing futures thinking without asking for permission or explicitly stating its futures method. This is because they view futures as a method that enables conversation, not a method everyone needs to know.

"People think they need to convince people of it, to do the thing, but you don't come in and say is it okay if we PowerPoint now. It (futures thinking) is just a tool or a method to think in certain ways. There is no need to convince people… just say 'hey we want to talk with you and do this'"
– Futures Thinking Participant, 2023

Suggested Warm-Up Activities, Safe Space Creation and Prompts for Futures Thinking with Non-futurists

Six Warm-up and Icebreaker Activities for non-futurists

In *Section 7: Observing the Design Research Toolkit in Action* it was identified that design researchers and design thinkers who had attempted to run futures thinking activities with stakeholders or users struggled to get their participants to think beyond the present day. This challenge was presented to futurists by asking them how they get participants to engage in co-creation sessions and think beyond their present-day mindset. Many futurists mentioned icebreaker activities they have run with stakeholders and/or users to encourage thinking about possible futures and implications.

These icebreaker activities are listed below with a description of what they are and how to execute them. In addition to using an icebreaker, futurists also mentioned the importance of priming the user for futures conversations and creating a safe space for the user to explore future ideas that may feel silly or risky at first.

Activity 1: Look Back, Look Around, Look Forward

What:
Facilitates a discussion of change by looking at the past, present, and possible futures. In which participants may unknowingly talk about trends, signals, and drivers of change.

How:
In this activity, individuals are asked to first reflect on the past of their organization or product with questions such as: Where were we before? What was it like X years ago? What was happening at that time? Then, individuals are asked to look around today at what is happening and where their company or product is currently using questions such as: Where are we today? What is happening today? What is different today than the past? How much has changed from the past to get to the present state? Lastly, individuals are asked to speculate about the potential futures of their company or product by looking forward through questions such as: What is changing around us and what could that mean for us? What may be different in X years? Considering how much things changed from past to present, how might things change from present to future?

Activity 2: Change Line

What:
An activity where individuals are asked to identify what is changing around them and elicit a conversation about trends and their implications.

How:
This activity is done by drawing a vertical line, then asking people to write on one side how things were, then on the other side how things are changing. After participants have populated the change line, facilitate a conversation about these changes and their possible implications.

Activity 3: The Polak Game or Where Do You Stand?

What:
This activity is based on the text "Image of The Future" by Frederik Lodewijk Polak (Candy & Hayward, 2017). The activity assesses how everyone thinks about the course of the future (optimistic vs pessimistic) and their ability to influence the future (influence vs no influence).

How:
A two by two matrix is used in which there is a Y-axis and X-axis. The Y-axis maps if the individual feels pessimistic or optimistic about the future. Where the X-axis maps if a person thinks they can make a little difference or a big difference. Have participants answer the following two questions to determine their Y-axis and X-axis. In the next 10 years, do you see the world as getting better or worse? How capable do you feel of personally affecting the future? Then have the participants place a sticky note on the quadrant they fall into. Once everyone has placed their sticky notes, facilitate a conversation as to why each person falls into the quadrant.

Activity 4: 100 Ways Anything Can Be Different in The Future

What:
An activity by Jane McGonigal that helps build the capacity of participants to "anticipate hard-to-predict futures and avoid being blindsided by surprising events" (Institute for the Futures, 2021).

How:
To run this activity first pick a topic you want participants to focus on. Then ask participants to write 100 things that are true about the topic today. After the 100 things have been written, then ask participants to flip those 100 things "into the opposite of what it is today or offer a new alternative" (institute for the Futures, 2021). Lastly, ask participants to imagine a world in which any of these flipped facts are now true. Then ask them what happened to get here. What is this future like? What is possible in this future world? Describe a world where this becomes possible.

Activity 5: The 200-Year Present

What:
This activity created by Elise Boulding that helps participants think about constant change. It asks participants to consider what it was like 100 years into the past from the current day, then to consider 100 years into the future from the current day.

How:
Participants are asked to think about what life was like for a person 100 years ago, and what it may be like for someone else 100 years from now. Another way to run this activity is to modify the time and make it more personal to the participants by asking them to think about the oldest person they know today, then consider their life however many years ago and what it was like. Then think about the youngest person they know and imagine what their life may be like 80 years from now.

Activity 6: Waves of Change

What:
This activity aims to expose participants to how dominant paradigms, things that are considered business as usual today, change over time. Participants will be asked to reflect on their organization, industry, product, or service and identify the past and current "business as usual" paradigms. Then analyze how these paradigms have changed over time or are changing now, looking at when the paradigm may have first risen, reached its peak or fallen from being dominant.

How:
Introduce dominant paradigms, and the idea that paradigms, like waves, will rise, crest, and fall over time. Show an example of a dominant paradigm and explore what dominant paradigms may have come before it (I.e., landline telephone to cellphone). Then, ask participants to reflect on their organization, industry, product, or service and identify the current "business as usual" paradigms. Encourage them to consider the previous paradigms that may have risen and fallen before the current dominant one and identify any emerging paradigms that could impact the future. Encourage a conversation amongst participants around the changing status quo of business as usual.

Creating A Safe Environment to Do Futures

In addition to co-creation activities, it is important to prime participants and create an environment to explore futures. Some futurists think priming the participant allows them to be prepared for the co-creation activity so that they can think more easily about potential implications and futures. Futurists described priming participants by sending out materials before the workshop that included tools such as trends, implications of trends, or scenarios. A few futurists also engaged participants in a pre-workshop co-creation activity by inviting them to contribute signals of change in their environment to a shared repository (online or in person).

Additionally, a few futurists mentioned the importance of creating a safe space for futures co-creation, as it creates an environment for participants to explore seemingly ridiculous ideas about the future without the risk of being judged. This is important, as many significant ideas about the future may appear ridiculous or silly at first. However, creating a safe space to have these conversations and ask, "what if?" is critical. Futurists created safe spaces by showing examples of what they were looking for from participants or by showing examples of past predictions about the future that seem ridiculous to us today. In both cases, the examples are used to break the ice and start a conversation about the future, and ultimately to make others feel comfortable sharing their ideas with the group.

> *"Show people past visions of the future. We laugh about it. But what did they get wrong (about the future)? What did they get right (about the future)? What does tell us of our current futures visions and cognitive bias"*
> *– Futures Thinking Participant, 2023*

Future Fuel Prompts

Many of the future thinkers interviewed suggested that when facilitating a conversation about futures with non-futurists, it is important to be prepared to have "future fuel" prompts to keep the conversation flowing when you meet resistance from participants. These "future fuel" prompts are questions that can be used to encourage conversation and challenge resistance around futures thinking.

Future Fuel Prompts for Sensing Change to Find Trends or Signals

- What is changing around us?
- What has changed in the past x number of years?
- What is happening now?

Future Fuel Prompts for Trends

- What does this trend mean for us?
- How might this trend change in the next few years?

- What does this trend mean for the industry?

Future Fuel Prompts for World Building and Scenarios

- What does this world look like?
- What must be true for this world to exist?
- How might we have gotten to this world?
- What does this mean for our organization?
- How do we exist in this world?

Future Fuel What-if Questions

- What if that was possible?
- What if that happened?
- What if it was real?

Reaction of Futures Thinkers to Expanding the Design Research Toolkit to Include Futures Methods

During the conversations with future thinkers, they were asked their thoughts on expanding the design research toolkit to include futures thinking methods. Most participants reacted positively to the idea of design research using some futures thinking methods as needed since they think it can provide additional value to design researchers when it comes to informing long-term strategy or imagining how they may shape the future. However, futurists believe that to be able to effectively apply futures thinking methods and explain their value to others, it is important to first understand the purpose and value of futures thinking. In addition, futurists underline the importance of carefully considering if futures thinking is an appropriate approach for a given research question before exploring the application of futures thinking methods and deciding which futures thinking method is best suited to the circumstances.

Summary

Futures thinkers applied a futures lens to the common questions and challenges design researchers and design thinkers encountered when it came to applying futures thinking methods in their work. Through conversations, future thinkers illustrated which futures thinking method may be used throughout the design thinking double diamond to investigate the five common questions design researchers and design thinkers get asked about the future. In addition to providing their perspective on the five common questions, futurists also spoke about generating buy-in for futures thinking, and how to run futures sessions with participants through using warmups and future fuels prompts. Lastly, although future thinkers are in support of others using futures thinking methods and have illustrated how futures methods can be used in an expanded design research toolkit, many futures thinkers suggest that those using futures methods should first understand futures

thinking to apply futures thinking thoughtfully and carefully in their work. Overall speaking to futures thinkers has provided the necessary information to expand the design research toolkit with futures thinking methods through creating a guide that can teach design researchers what is futures thinking, how to apply futures methods and provide warmups and prompts.

Section 9: A Five Step Process to Apply Futures Thinking Methods in Design Research

This section proposes a five-step process that may assist design researchers or design thinkers in addressing futures-facing questions about a product, service, industry, or experience. The five-step approach was designed through translating the key findings from the primary research into an actionable process. The emphasis of this section is not on the content, as it echoes the sections above, but rather on the proposed sequence of events.

The proposed five step process is a component of a larger comprehensive guide titled *Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research* which can be found in the appendix of this research paper. The entire guide will not be talked about here, as it is meant to be a stand-alone artifact that design researchers and design thinkers may engage with to help explain the value of futures thinking to others, pick an appropriate futures thinking method, or run futures co-creation activities.

The 5-Step Process

Step 1 – Reframe to be Futures Facing
Begin by reframing the question you have been asked by stakeholders to be futures facing by ensuring the question allows for the exploration of multiple futures and possibilities.

Step 2 – Is it a Common Question
Determine if the question asked by stakeholders falls into one of the five common questions design researchers and design thinkers get asked about the possible futures of a product, service, industry, or experience.

Step 3 – Determine the Stage in the Design Thinking Process
Determine what stage of the design thinking process you may be in and look for a suggested futures thinking method in that phase.

Step 4 – Select a Method or Methods
Explore which method or methods you may want to try applying to your research and consider if any prework is needed to use this method or methods.

Step 5 - Prepare with Warm-ups and Prompts
Now that you have chosen futures methods, consider preparing for co-creation sessions with participants by selecting a warm-up activity or prepping some future fuel prompts.

Step 1: Reframe to Be Futures Facing

Reframe the question to be futures facing, in order to indicate the multiple possible futures. This can be done by changing the word "future" to "futures", and by using "what might" or "how might" to encourage open ended responses.

See the table below of the Five Common Questions reframed to be futures-facing.

Main Question Asked	Reframed Question
What is the future of X industry?	What might be the possible futures of X industry?
What should we invest in now to be ready for the future?	What might we invest in now to be resilient for the possible futures?
How might we learn more about our future users (needs, behaviors, habits, goals)?	How might we learn more about our users' potential futures needs, behaviors, habits, goals?
How might X trend impact our company or our users or the industry?	How might X trend impact our company or our users or the industry?
What might be our company's role in the future of X?	What might be our company's role in the futures of X?

TABLE 9. REFRAMED QUESTIONS TO BE FUTURES-FACING

Step 2: Is it a Common Question

After the question has been rephrased, then determine if the question falls into one of the five common questions design researchers and design thinkers get asked by using table 10 below.

Main Question Asked	Reframed Question	Sub Questions
What is the future of X industry?	What might be the possible futures of X industry?	• What is the future of X industry? • What might X industry look like in the future? • How might the industry/landscape change in the next several years? • How might the X industry change with the increased use of technology? • How might the industry be changing? • How might the industry change with X trend or disruption? • What disruptions are on the horizon? How might new entrants in the industry affect the industry?

		• What new tech or startups should we be aware of?
What should we invest in now to be ready for the future?	What might we invest in now to be resilient for the possible futures?	• What should we invest in now to be ready for the future? Such as tech, capabilities, etc.? • What should our product roadmap look like? • What should our roadmap prioritize in 2023 & beyond? • Is the vision for our product future-proof? • Is it worth pursuing this project or investing more in it? • Are we missing anything in our roadmap/timeline? • Do we have any blind spots of the future?
How might we learn more about our future users (needs, behaviors, habits, goals)?	How might we learn more about our users' potential futures needs, behaviors, habits, goals?	• How might future users behave? • What do people want to use the app for in the future? • What should the future user experience be? • How might our current users evolve into future users? • What might get someone excited in the future? • What might be most important to users now vs in the future? • What product improvements would be most valuable to users? • What do future users need to get out of our product/service? • What future user segment should we target?
How might X trend impact our company or our users or the industry?	How might X trend impact our company or our users or the industry?	• What trends will impact our industry in 5-10 years? • How might trends impact this space? • How might a certain technology impact a certain industry?
What might be our company's role in the future of X?	What might be our company's role in the futures of X?	• What role should we play in our industry in the future?

TABLE 10. FIVE COMMON QUESTIONS DESIGN RESEARCHERS GET ASKED ABOUT THE POSSIBLE FUTURES

Step 3: Determine the Stage in the Design Thinking Process

The next step is determining what stage of the design thinking process you are currently in. Use the double diamond map below in Figure 10 to determine your stage in the design thinking process.

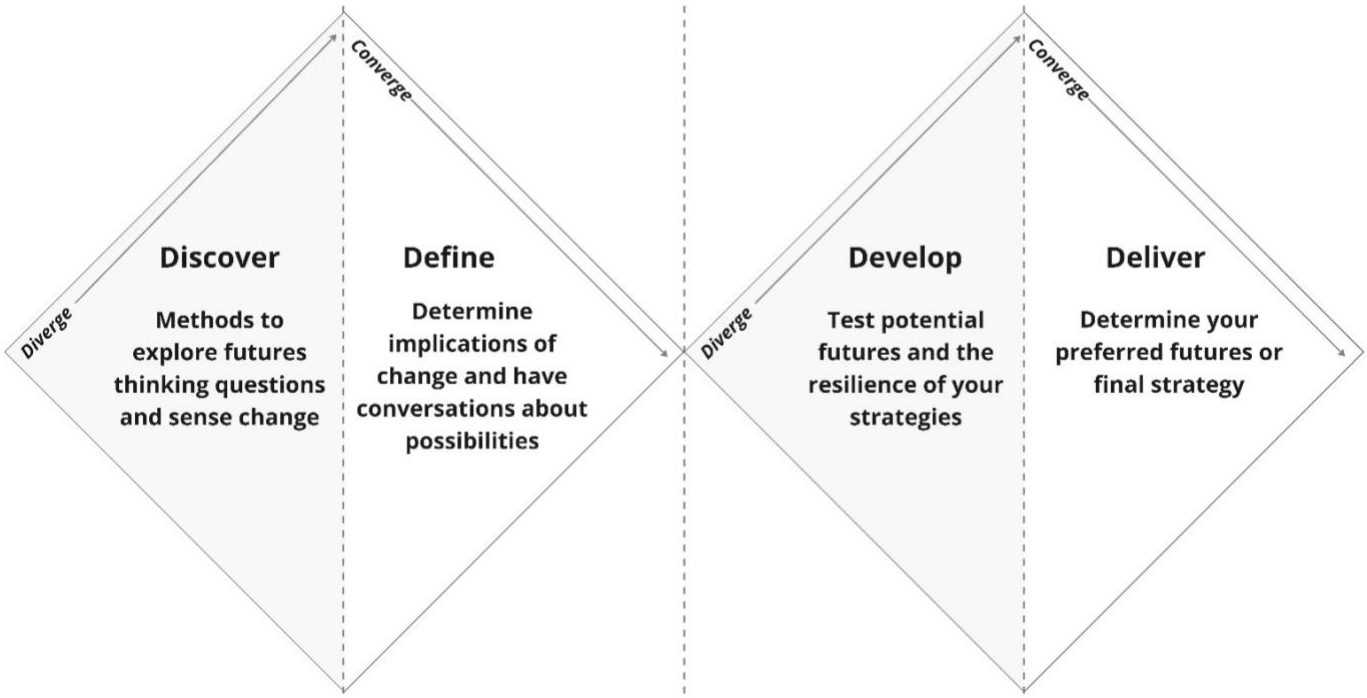

FIGURE 10. DOUBLE DIAMOND DESIGN THINKING PROCESS WITH FUTURES THINKING

Step 4: Select a Method or Methods

Select a method by navigating to the appropriate guide that relates to the question you are being asked, then using the double diamond on that guide to narrow in on possible futures methods you might consider.

If you are asked a question about:

- What might be the possible futures of X industry? Click here
- What might we invest in now to be resilient for the possible futures? Click here
- How might we learn more about our users' potential futures needs, behaviors, habits, goals? Click here
- How might X trend impact our company or our users or the industry? Click here
- What might be our company's role in the futures of X? Click here
- For any other questions, Click here

Use this visual to find a futures method for: What might be the possible futures of X industry?

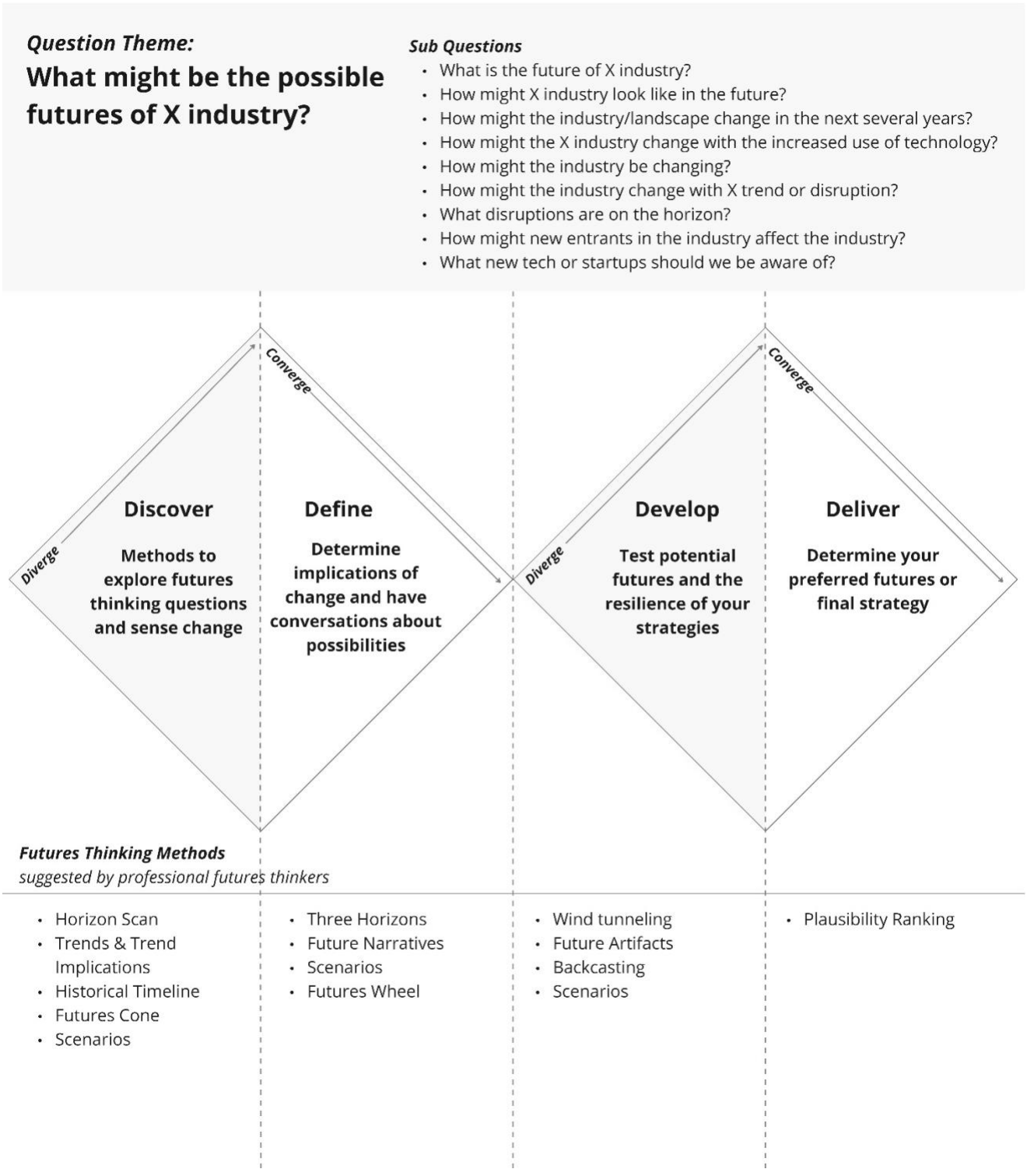

FIGURE 11. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT BE THE POSSIBLE FUTURES OF X INDUSTRY?

Use this visual to find a futures method for: What might we invest in now to be resilient for the possible futures?

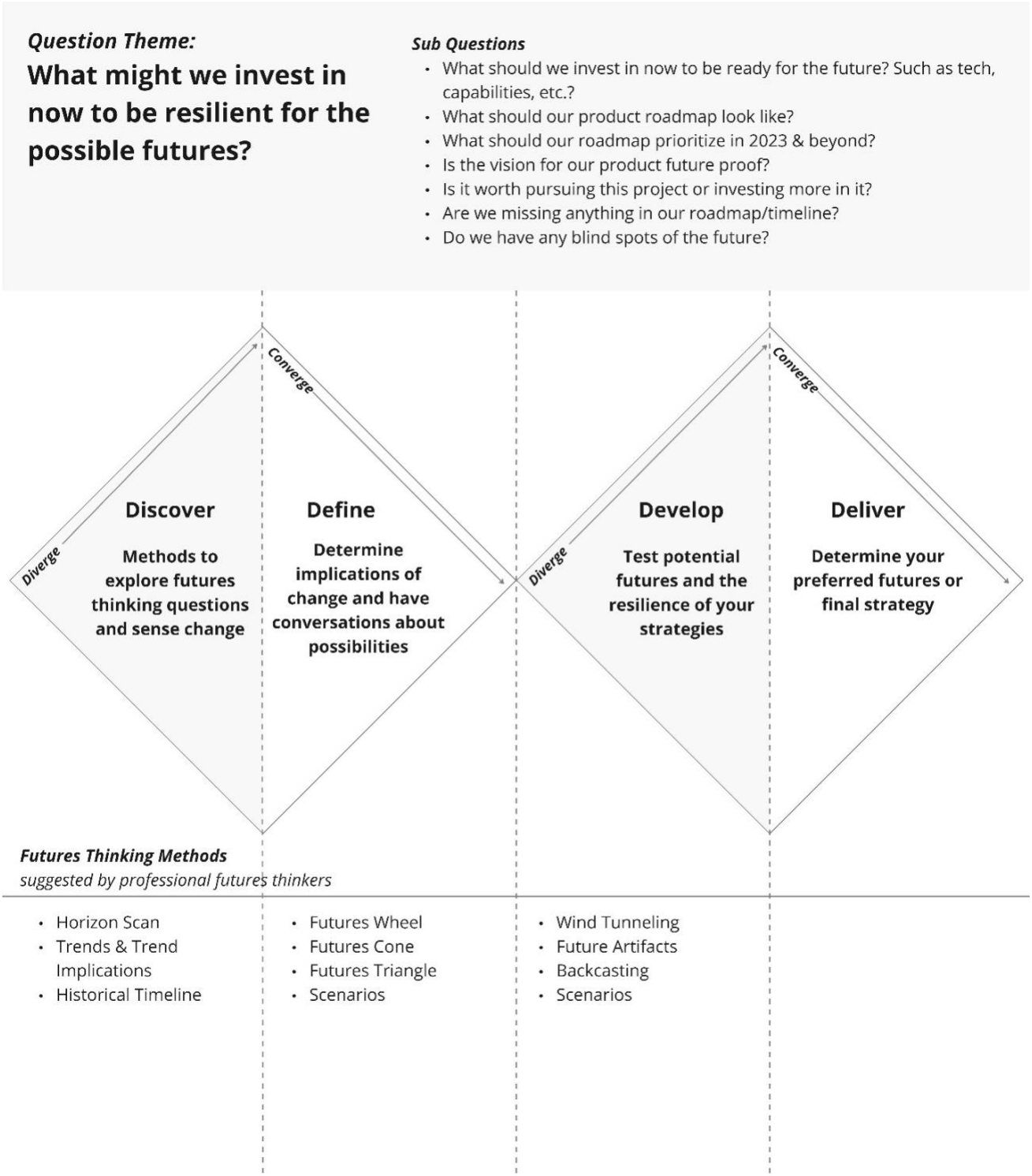

FIGURE 12. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT WE INVEST IN NOW TO BE RESILIENT FOR THE POSSIBLE FUTURES

Use this visual to find a futures method for: How might we learn more about our user's potential futures needs, behaviors, habits, goals?

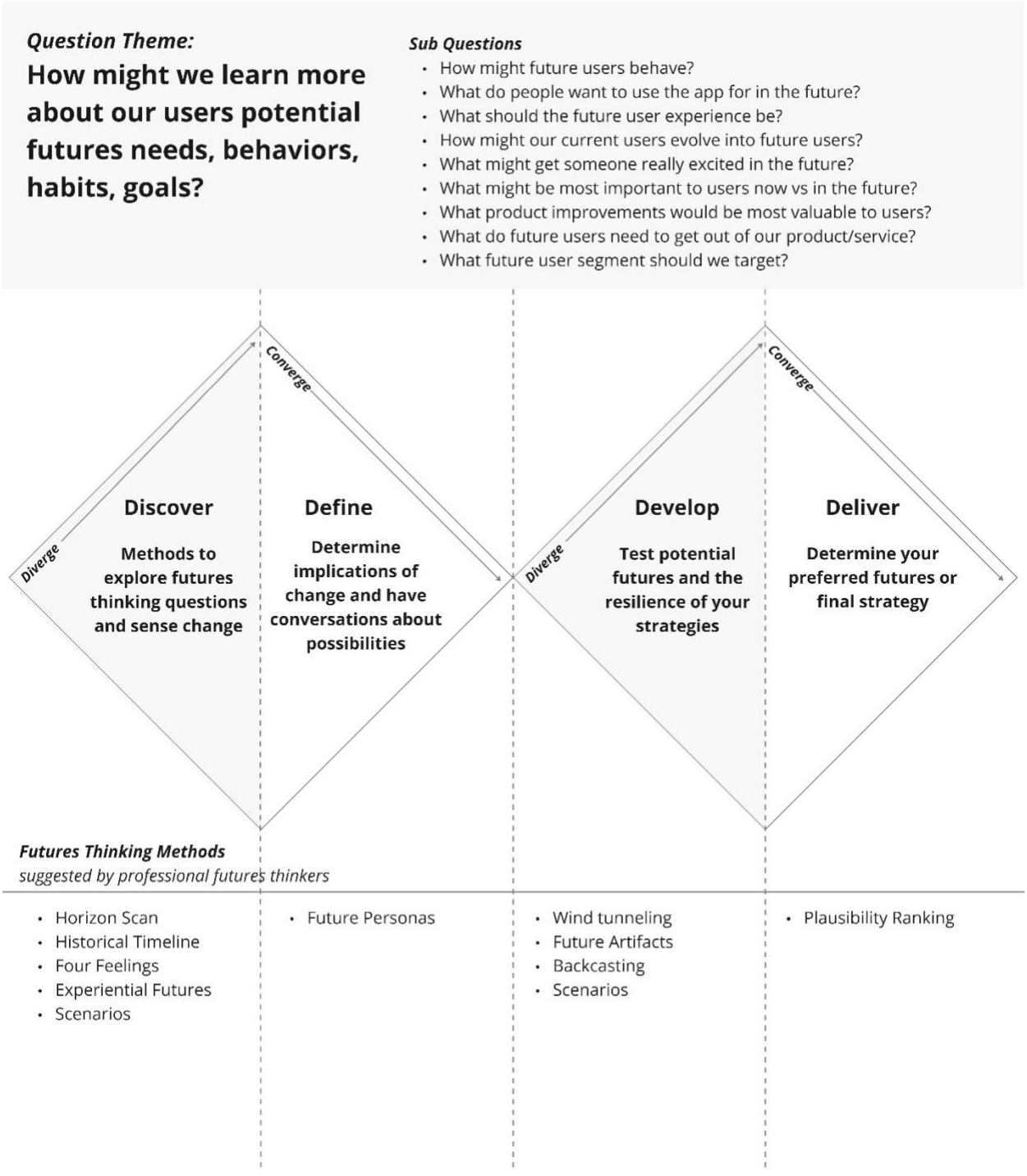

FIGURE 13. DOUBLE DIAMOND WITH METHODS FOR: HOW MIGHT WE LEARN MORE ABOUT OUR USER'S POTENTIAL FUTURES NEEDS, BEHAVIORS, HABITS, GOALS?

Use this visual to find a futures method for: How might X trend impact our company or our users or the industry?

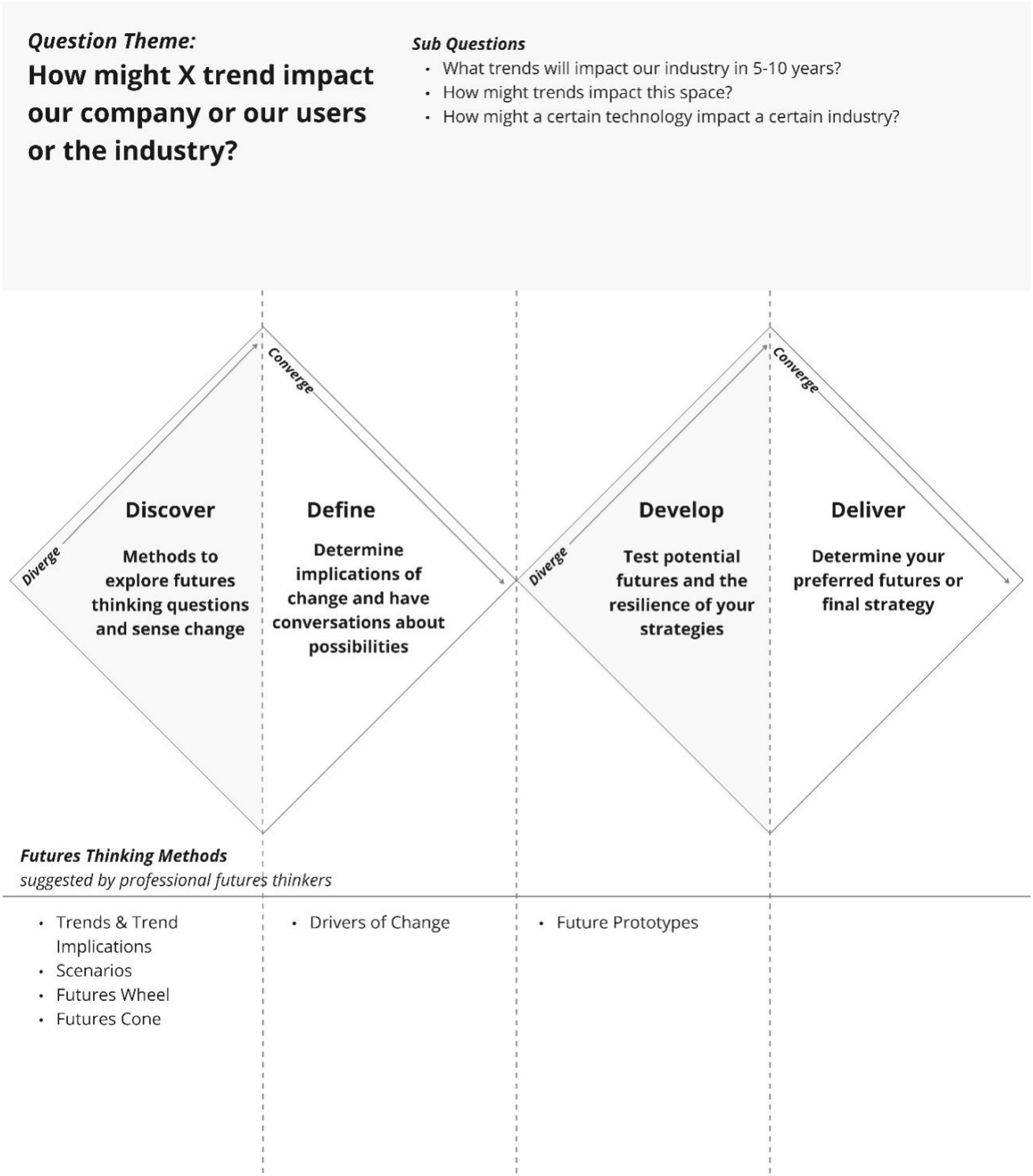

FIGURE 14. DOUBLE DIAMOND WITH METHODS FOR: HOW MIGHT X TREND IMPACT OUR COMPANY OR OUR USERS OR THE INDUSTRY?

Use this visual to find a futures method for: What might be our company's role in the futures of X industry?

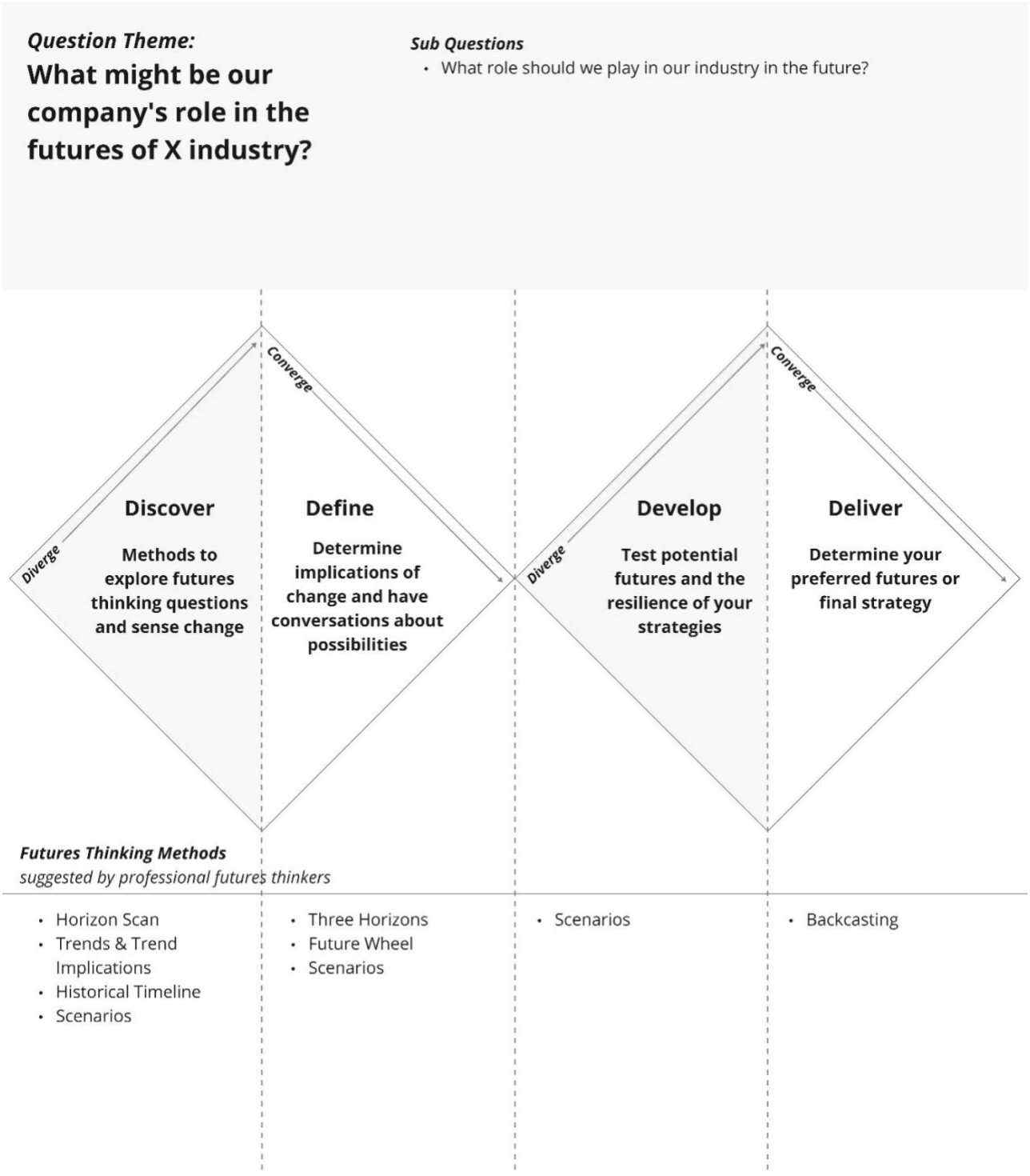

FIGURE 15. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT BE OUR COMPANY'S ROLE IN THE FUTURE OF X INDUSTRY?

Use this visual to find a futures method for: Any futures thinking question about the possible futures of a product, service, industry, or experience.

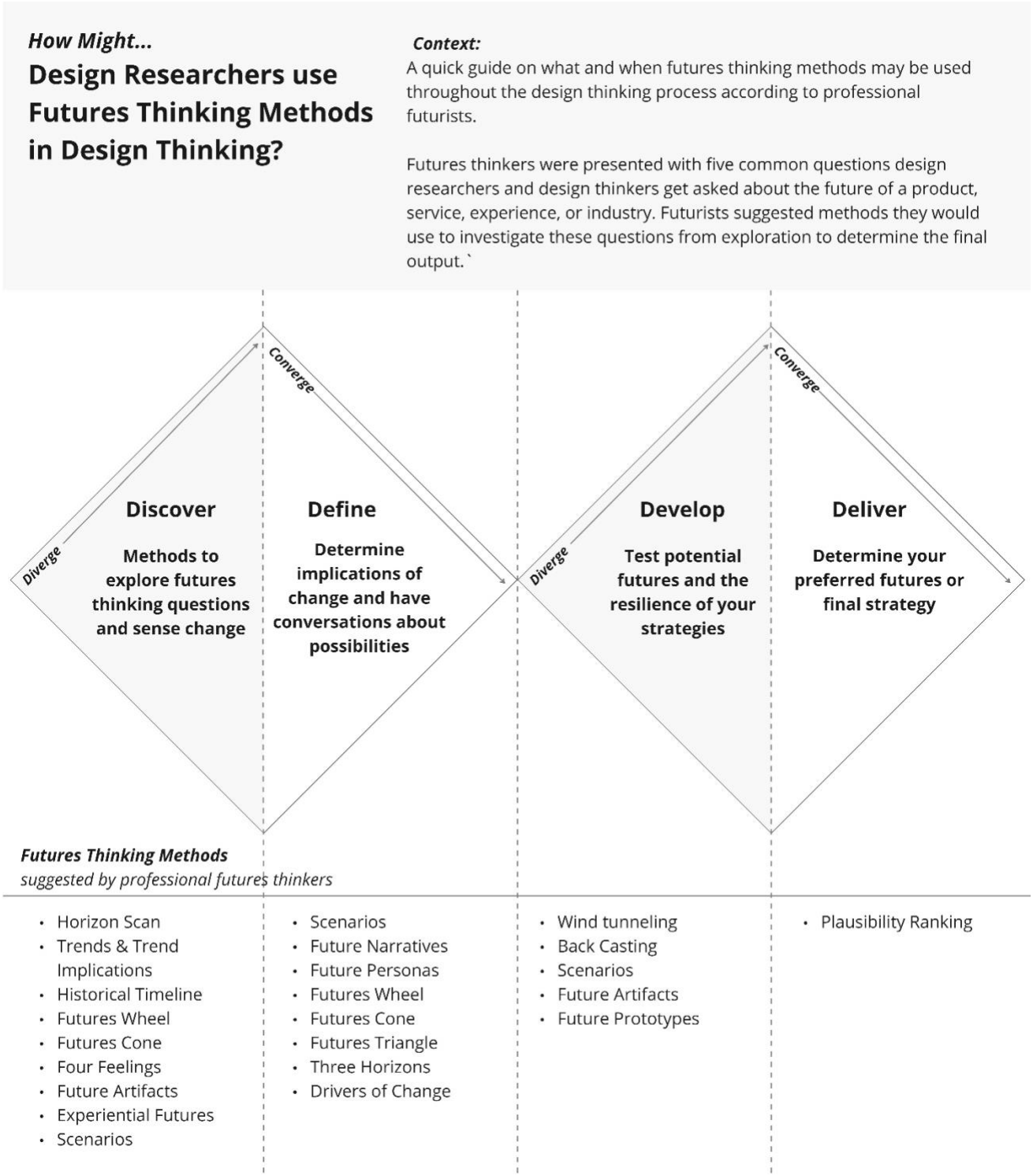

FIGURE 16. DOUBLE DIAMOND WITH METHODS FOR: ANY FUTURES THINKING QUESTION ABOUT THE POSSIBLE FUTURES OF A PRODUCT, SERVICE, INDUSTRY, OR EXPERIENCE

Step 5: Prepare with Warm-ups and Prompts

In this step, you can select potential warm-up or prompts. The warm-up activities will provide ways to get your participating in a futures thinking mindset. While the prompts will help prepare you to facilitate futures thinking conversations.

Future Fuel Prompts

Look Back, Look Around, Look Forward

What: Have a conversation about change, and begin sensing change by talking about signals, trends, and drivers in a conversational manner.

How: Ask participants to reflect on the past (where were we? what was happening at that time?), then reflect on the present (where are we today? what is different today? what is changing?) then imagine what the future may be like (what may be different tomorrow? how might things change?)

Change Line

What: Focus on sensing change and having a conversation about the potential implications of change with participants.

How: Draw a vertical line in the center of a page. On one side ask participants to fill in how things were before, on the other side ask participants to fill in how things are changing. After both sides have been populated, facilitate a conversation about the potential implications of these changes.

The Polak Game, or Where Do You Stand? By Peter Hayward

What: A game designed to showcase how different people view the direction of the future and their agency over the potential futures, to have a conversation about why each person feels that way towards the possible futures.

How: Draw a quadrant with an X-axis and Y-axis and have people plot where they fall. Ask people in the next 10 years do they see the world getting better or worse (this is the Y-axis) once they have mapped on the Y-axis ask, how capable do you feel of personally affecting the future (this is the X-axis). Once everyone has a XY coordinate on the quadrant, facilitate a conversation about why each person is there.

100 Ways Anything Can Be Different in The Future by Jane McGonigal

What: Facilitate a conversation about how things may be different from today.

How: Ask people to write down 100 facts that are true about something today. Once those are done ask them to flip those 100 things to the opposite of what they are today (ex. Today the internet is public to all, the opposite could be the internet becomes private). Then facilitate a conversation about what this world looks like. What would have to happen to get here? What is possible in a world like this?

The 200-Year Present by Elise Boulding

What: Help people imagine how much can change over time.

How: Ask people to think of the oldest person they know today and imagine what their life was like when they were young, what was happening, what was normal, and what was the world like for them. Then ask people to think of the youngest person they know today and imagine what their life will be like when they are old, what might change, what might be normal, and what might this world look like? Then facilitate a conversation about how much can change over time.

Waves of Change

What: Explore how "business as usual" also known as dominant paradigms change over time.

How: Showcase an example of a paradigm that has risen, been dominant and now fallen - for example, talking on a landline telephone compared to talking on a cellphone. Ask participants to reflect on their organization, industry, product, or service and list the current "business as usual" paradigms and if they are rising, have peaked, or are falling in dominance. Then ask participants to consider any paradigms that came before this, and any emerging paradigms that may replace or affect the current business as usual. Lastly facilitate a conversation around the changing status quo of business as usual.

Future Fuel Prompts:

Category	Prompts to Ask Participants
Sensing Change to find Trends or Signals	• What is changing around us? • What has changed in the past X years? • What is happening now?
Trends	• What does this trend mean for us? • How might this trend change in the next few years? • What does this trend mean for the industry?
World Building for Scenarios	• What does this world look like? • What must be true for this world to exist? • How might we have gotten to this world? • What does this mean for us? • How do we exist in this world?
What If Questions	• What if that was possible? • What if that happened? • What if it was real?

TABLE 11. FUTURE FUEL PROMPTS

Section 10: Limitations of Research

Participant Segmentation and Bias

Participants both design researchers, design thinkers along with futures thinkers held similarities to their peers making for a less diverse group of participants, which can affect the outcomes of the research.

Many of the design researchers and design thinkers interviewed had some awareness of futures thinking. This meant some had done masters in a field that covered futures thinking, and a few were actively trying to apply it to their practice. This creates a limitation of the research due to having a participant pool that was aware of futures thinking, rather than having a diverse group of participants with some on one extreme of knowing futures and the other extreme of no exposure to futures. In the future, speaking with people who have little exposure to futures thinking may be beneficial to inform how they encounter the futures in their work.

Additionally, many participants interviewed during futures thinking Section 8 had a masters in futures thinking many from the Strategic Foresight and Innovation program. Their similarities may influence how they approach and view futures thinking. In the future, involving futures thinkers who have other socio-demographics will help create a diverse perspective on how and when futures thinking methods can be applied.

Number of Participants

The original intent was to speak with twelve to fifteen design researchers and or design thinkers, then twelve to fifteen futures thinkers. However, it was challenging to meet these quotes due to the time constraints of the project. Resulting in only speaking with half the intended sample size.

I spoke with eight participants who either had design research and design thinking roles, then six participants who held futures thinking roles. When it came to speaking with design researchers and design thinkers, I reached the point of saturation around six people, when similar questions and pains were recurring in most conversations. However, it would still be beneficial to speak with design researchers and thinkers who have little to no exposure to futures to see if they get asked similar questions or experience similar challenges. It was harder to reach the point of saturation when speaking with futures thinkers, as I learned each practitioner had their preferred methods to use, and many suggested various methods for each challenge and stage of the design thinking process. Adding more participants would help to reach a point of saturation and a clearer understanding of when to use each futures thinking method.

Missing the How

The Guidebook *Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research* which includes the five-step process showcases when and which futures thinking methods may be applied throughout the design thinking process. However, it does not showcase how to apply the methods, instead participants currently must look to other resources to determine how a futures thinking method suggested by the guide is applied.

Non-Exhaustive Futures Methods

A variety of futures thinking methods are suggested throughout the guidebook *Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research* and five-step process. These methods were suggested by futures thinkers interviewed. However, this list of methods is not exhaustive and there are more futures thinking methods that can be applied which have not been captured in this research.

Section 11: Conclusion

We live in an era of rapid change, where the world we design for is constantly changing around us. Design researchers and design thinkers who conduct design research are being called upon to make sense of the change and help inform strategic decisions. When these questions are futures-facing in nature about a product, service, industry, or experience, design researchers should expand their toolkit to include futures thinking methods. Futures thinking offers methods to help sense and make sense of change, to de-risk uncertainty, and provide organizations with agency over their future.

The purpose of this research was to contribute to the growth of the design research practice by exploring how futures thinking methods might be valuable for design researchers and or design thinkers who conduct research. Following a design thinking process of diverging and converging the research was conducted in multiple phases where each phase fed data into the next (phase 1 secondary research to explore the problem space, phase 2 understanding current state, phase 3 exploring how futures may be applied). In phase 1 the problem area was explored in which the design research and futures thinking toolkit were compared, and we uncovered the internal and external forces driving design researchers to adopt futures methods. In phase 2 we journeyed into the wild and explored how design researchers and design thinkers who conduct research may encounter futures thinking in their practice during research engagements. After learning the types of future-facing questions design researchers or design thinkers face, we explored possible futures thinking methods alongside future thinkers, so that we could co-create how futures thinking methods may be incorporated into the design research practice. The cumulation of this research is a guidebook titled “Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research”. The purpose of the guidebook is to help cultivate futures literacy so design researchers or design thinkers can better navigate complex and uncertain futures. The guidebook achieves this through providing clear futures methods design researchers or design thinkers may apply to specific scenarios.

Phase 1 consisted of a literature review to unpack the two toolkits and then uncover forces that may be driving design researchers to adopt futures thinking methods. Comparing the design research and futures thinking toolkit revealed that the two practices share many similarities in how the toolkit is used and the types of challenges the toolkit is applied to. Both practices seek to position themselves in an advisory role to help inform decision-making for complex problems often by involving others throughout the process. The difference between the two practices is the aim, scope of research conducted, and level in the organization the practice is conducted. When it comes to design research, the scope is often shorter in time, focuses on empathizing with the end user and is often done at many levels of the organization. However, futures thinking focuses on longer periods and explores the context around the user, often taking place at more c-suite or strategic decisions making parts of an organization. Through the literature review, we also discovered the forces that

are driving the potential push for why design researchers may want to adopt futures thinking methods. These forces are the high acceleration of change, how mature design research practices are being asked to inform more strategic and long-term decisions, as well as witnessing an emergence of professional groups and literature dedicated to exploring the intersection of design thinking and futures thinking. These forces indicate that there is a need for design researchers to adopt new methods, while the similarities of the toolkits uncovered when comparing them indicate that there is a strong synergy between the two practices.

Phase 2 explored how design researchers and design thinkers may encounter and explore futures in their practice. The purpose of speaking with design researchers and design thinkers was to uncover if there was a need and gap in methods to explore futures facing questions. Through speaking with eight participants, we learned that there are five common questions design researchers encounter about futures. These five common questions are: What is the future of X industry? What should we invest in now to be ready for the future? How might we learn more about our future users (needs, behaviors, habits, goals)? How might X trend impact our company or our users or the industry? What might be our company's role in the future of X? Furthermore, the data from these interviews were analyzed to create a clear set of guidelines and potential value fit when it comes to incorporating futures thinking methods into the design research toolkit. Overall speaking with design researchers, and designers who conduct research highlighted they do encounter futures thinking questions, and there is a need for methods to help explore these questions.

Phase 3 took the five common questions design researchers and design thinkers get asked in Phase 2 and explored how futures thinking methods might be applied to investigate these questions. Six futures thinking experts were presented with the five common questions design researchers and design thinkers get asked about the future and were asked which futures methods they may use to explore those questions. In analyzing the responses, we were able to produce a list of futures thinking methods that can be used for the common questions, or any futures-facing question. We also observed the first step before even choosing a method for many futures thinkers was reframing the question to be futures-facing. As reframing the question allows for the exploration of multiple futures and possibilities. Lastly, we spoke with future thinkers about the common barriers they encounter in their practice to learn how they generate futures buy-in and conduct warm-up activities with non-futurists. This taught us that building buy-in is similar to developing buy-in for design research. Since both practices seek to find champions, and sponsors, and curate educational materials on the topic for their champions. In addition, futures thinkers suggested warm-up activities and prompts that can be used in co-creation sessions with non-futurists. These warm-up activities can be used with participants to sense change, talk about the implications of change, or grapple with their biases of the potential futures. In summary, this chapter provided us with tangible futures thinking methods that can be used by design researchers and design thinkers who encounter questions about the possible future of a product, service, industry, or experience,

providing the framework of how the design research toolkit may be expanded to include futures thinking.

The Five-Step Process, *which is part of the guidebook* found in the appendix titled "*Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research*", is a key output of this major research project, as it offers a way to expand the design research toolkit to include futures thinking methods. Both the five-step process, and the guide are meant to act as a standalone artifact to be consumed and used by those actively practicing design research and encountering future facing questions. The guide aims to introduce futures thinking methods to design researchers to enhance their futures literacy but is not meant to create experts as the toolkit provides a limited scope of futures methods that are recommended for specific scenarios. Within the guide, you will find the value of futures thinking, steps on how to select a futures method, and lastly, futures warm-up activities and future fuel prompts. The guide is designed to help practitioners select futures thinking methods through the following a five-step process, but the methods are limited to what was recommended during the interview process. The five steps are: Step 1 – Reframe the question to be futures facing, Step 2 – determine if it's one of the five common questions design researchers and design thinkers get asked, Step 3 – determine what stage of the design thinking process you are in when asked the question, Step 4 – select a futures method, then Step 5 – prepare with either futures warm-ups or prompts. In conclusion, this guide is meant to be used by practitioners and encompass the key learnings from this major research project to provide an actionable way for design researchers who encounter questions about the possible futures of a product, service, industry, or experience, to apply futures methods.

Section 12: Next Steps

Evaluation of The Guide and Five-Step Process

One of the next steps would be to evaluate the guide with potential users to determine what works, what doesn't work, and opportunities to improve the guide. This can be done through conducting a workshop where design researchers and some design thinkers would be given the guide *Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research* and asked to use it to determine which methods, they might use to solve certain future-facing questions. This evaluation of the guide can be done multiple times to continue to iterate until the guide is useful, useable, and desirable for design researchers and design thinkers who encounter futures-facing challenges.

Growing the Guide to Showcase How to Use the Futures Methods

The guide currently indicates which futures thinking methods may be applied. The next step would be to iterate the guide to include information about each method and how the method can be used. This would allow potential users of the guide to find all the information in one source rather than having to locate how to use methods on their own.

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Appendix

Guidebook - Designing for Tomorrow: A Guide to Incorporating Futures Thinking in Design Research

Chapter 1: Guidebook Introduction

1.1 Introduction and Intended Audience

What is this guide?

Design researchers may encounter questions about the possible futures of a product, service, experience, or industry in their practice, but the current design research toolkit is limited in methods and approaches to investigate future-facing challenges. This guide aims to help design research practitioners enhance their research toolkit by incorporating futures thinking methods, which foster futures literacy. The guide covers the importance of futures thinking, the selection of suitable futures thinking techniques for typical futures inquiries, and the facilitation of futures co-creation sessions. Through providing clear explanations and actionable steps allowing design researchers and design thinkers to tackle future-facing challenges more confidently.

Who is this guide for?

The intended audience for this guide is design researchers or design thinkers who are currently encountering a future-facing question or challenge in their practice and may need help explaining the values of futures thinking, picking an appropriate futures thinking method, or running a futures thinking co-creation activity.

How was this guide created?

This guide is an output from this Master of Design Major Research Project that investigated how futures thinking research methods may be beneficial to design researchers and design thinkers. The contents of this guide were formed through two phases of primary research. The first phase focused on understanding how design researchers and design thinkers may encounter or currently explore futures thinking questions about the future of a product, service, industry, or experience. The second phase involved co-creation with future thinking professionals to elicit how they would tackle the common questions and challenges design researchers and design thinkers are facing around futures. This guide takes the outputs from the two phases of research and translates them into steps that design researchers or design thinkers may use to incorporate futures thinking methods in their practice as needed.

Chapter 2: The value of futures thinking for design researchers.

2.1 Why Futures Thinking

Design researchers or design thinkers may find themselves being asked questions about the possible futures of a product, service, industry, or experience. These questions can arise from stakeholders when looking to inform key decisions about a product or service that is often more futures facing, such as ideating future offerings, needs, or a roadmap forward. Especially when the world in which we are undertaking design seems to be in an era of rapid change and uncertainty, organizations seek to de-risk their decisions and chart resilient paths forward.

If you find yourself being asked questions such as:

- What will our users expect from us in the future?
- How will our industry change?
- What should our product roadmap look like?
- How will this trend impact our product?

Then it may be time to consider expanding your design research toolkit to include futures thinking methodologies.

Futures thinking is a discipline that can provide design researchers and design thinkers methods to help tackle futures-facing questions, by exposing potential futures and regaining agency in the era of rapid change.

2.2 What is Futures Thinking and its Potential Value?

Futures Thinking Defined:

Futures thinking is a practice that uses creativity, collaboration, and divergent thinking to help inform decisions, create strategies, or expose potential blind spots. This is done through sensing change and systemically reflecting on the past and present to explore possible futures.

A Brief History:

From the early days of oral storytelling to the observation of patterns, and the emergence of speculative fiction, humans have been imagining and sharing stories about possible futures. It was during World War Two when futures thinking transitioned from literary expressions to strategic planning in the West. Futures thinking also has similar roots to design research borrowing methods and principles from social science such as sociology, psychology, ethnography, and philosophy.

How Futurists Explain and Define the Value of Futures Thinking:

Futures thinking was described by futurists, as a creative and collaborative practice that brings

together diverse perspectives to sense change as well as explore potential implications of change, to better inform strategies or decisions.

Many of the futures thinkers interviewed indicated futures thinking may provide the following value:

Creative Problem Solving
Enables creative and flexible ways of thinking that can be used to inform strategies.

Envision Long Term Futures to Build Strategies
Increases ability to envision preferred futures and inform long-term strategies to help reach preferred futures.

Capacity to Sense Change and Ability to React
Creates organizational capacity to sense environmental changes and think about the potential implications of these changes, to determine their strategies to act and be resilient in the face of change.

Fosters Autonomy Over Future
Supports organizational autonomy or agency over their possible futures, rather than waiting for the future to happen.

Differentiation of Offerings
For consulting organizations, it provides a new offering to sell clients and core capacity to differentiate in the market.

2.3 How to Generate Stakeholder Buy-in

Generating Stakeholder Buy-in For Futures

Generate futures buy-in through finding champions, providing materials and showing the value of the methods.

Find Champions & Sponsors
Find individuals in the organization who can help support the growth of futures thinking and encourage others to participate or provide the space for futures thinking to take place. Focus on identifying those who may be potential champions and educating them on futures thinking.

Provide Materials on Futures Thinking
To help educate stakeholders or potential champions, craft tangible and actionable materials around futures thinking to explain its potential value. Focus on making futures thinking

accessible to all by removing barriers like jargon, and buzzwords and setting a shared standard for what futures thinking looks like at your organization.

Use the Method then Show the Value

Rather than trying to convince teams to use futures thinking, futurists recommend introducing futures thinking methods by saying: we are going to do this activity, to achieve this outcome. This will help minimize resistance to the ideas of futures thinking and bring the value of the method to life.

Chapter 3: How to Apply Futures Thinking Methods in Design Research

3.1 - The 5-Step Process

So, you have been asked a question about the potential futures of a product, service, industry, or experience, but are unsure which futures thinking method may be most beneficial given the question and stage of the design thinking process.

Follow these five steps that will walk you through how to reframe your question(s) to be futures facing, how to select a method, and how to prepare to run futures thinking activities with participants.

Step 1 – Reframe to be Futures Facing.
Begin by reframing the question you have been asked by stakeholders to be futures facing by ensuring the question allows for the exploration of multiple futures and possibilities.

Step 2 – Is it a Common Question
Determine if the question asked by stakeholders falls into one of the five common questions design researchers and design thinkers get asked about the possible futures of a product, service, industry, or experience.

Step 3 – Determine the Stage in the Design Thinking Process
Determine what stage of the design thinking process you may be in and look for a suggested futures thinking method in that phase.

Step 4 – Select a Method or Methods
Explore which method or methods you may want to try applying to your research and consider if any prework is needed to use this method or methods.

Step 5 - Prepare with Warm-ups and Prompts
Now that you have chosen futures methods, consider preparing for co-creation sessions with participants by selecting a warm-up activity or prepping some future fuel prompts.

3.2 - Step 1: Reframe to Be Futures Facing

Why Reframe:

When I presented future thinkers with the five common questions design researchers or design thinkers get asked about the possible futures of a product, service, industry, or experience, they began by reframing those questions to be futures facing. As they reframed them, many mentioned that before choosing a method, practitioners must first open questions to be futures facing, by indicating the multiple possible futures.

Question Asked: What is the future of our industry?
Question Reframed: What might be the possible futures of our industry?

Tips:

- Any time you get a question, and the word “future” is said, rephrase it to say “futures” to indicate multiple possibilities.
- Use “what might” or “how might” to encourage open-ended responses.

Reframed Questions to Be Futures Facing		
Main Question Asked	**Sub Questions Asked**	**Reframed Question**
What is the future of X industry?	• What is the future of X industry? • What might X industry look like in the future? • How might the industry/landscape change in the next several years? • How might the X industry change with the increased use of technology? • How might the industry be changing? • How might the industry change with X trend or disruption? • What disruptions are on the horizon? How might new entrants in the industry affect the industry? • What new tech or startups should we be aware of? •	**What might be the possible futures of X industry?**
What should we invest in now to be ready for the future?	• What should we invest in now to be ready for the future? Such as tech, capabilities, etc.? • What should our product roadmap look like? • What should our roadmap prioritize in 2023 & beyond? • Is the vision for our product future-proof? • Is it worth pursuing this project or investing more in it? • Are we missing anything in our roadmap/timeline? • Do we have any blind spots of the future?	**What might we invest in now to be resilient for the possible futures?**
How might we learn more about our future users (needs, behaviors, habits, goals)?	• How might future users behave? • What do people want to use the app for in the future? • What should the future user experience be? • How might our current users evolve into future users?	**How might we learn more about our users' potential futures needs, behaviors, habits, goals?**

	• What might get someone excited in the future? • What might be most important to users now vs in the future? • What product improvements would be most valuable to users? • What do future users need to get out of our product/service? • What future user segment should we target?	
How might X trend impact our company or our users or the industry?	• What trends will impact our industry in 5-10 years? • How might trends impact this space? • How might a certain technology impact a certain industry?	**How might X trend impact our company or our users or the industry?**
What might be our company's role in the future of X?	• What role should we play in our industry in the future?	**What might be our company's role in the futures of X?**

APPENDIX TABLE 1. FIVE COMMON QUESTIONS AND SUB QUESTIONS REPHRASED

3.3 Step 2: Is it a Common Question

Now that the question has been rephrased from step one, the next step is to determine if this question falls into the five common questions design researchers and design thinkers get asked, or if it's a new question.

What are the five common questions?

Through interviews with design researchers and design thinkers, I discovered that throughout the design thinking process, there are five common questions practitioners encounter about the futures of a product, service, industry, or experience.

How do I know if it's a common question?

Check the list below to see if your question may fall into one of the following common questions asked.

- **If it is a common question**, seen listed below, **then refer to that specific question in the next step** to select a method suggested by futures thinkers for that specific question.
- **If it is not a common question**, **then refer to the general double diamond in the next step** to select a futures thinking method.

Main Question Asked	Reframed Question	Sub Questions	Commonality
What is the future of X industry?	What might be the possible futures of X industry?	• What is the future of X industry? • What might X industry look like in the future? • How might the industry/landscape change in the next several years? • How might the X industry change with the increased use of technology? • How might the industry be changing? • How might the industry change with X trend or disruption? • What disruptions are on the horizon? How might new entrants in the industry affect the industry? • What new tech or startups should we be aware of?	Very Common

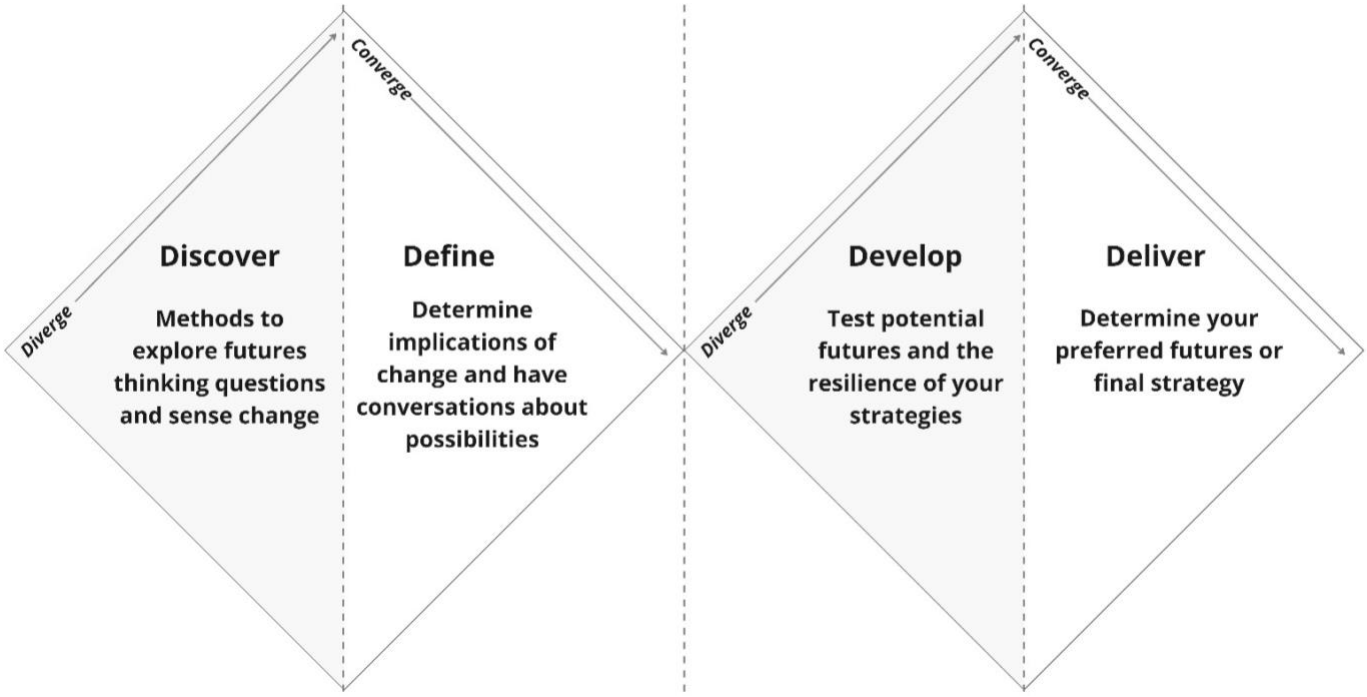
What should we invest in now to be ready for the future?	What might we invest in now to be resilient for the possible futures?	• What should we invest in now to be ready for the future? Such as tech, capabilities, etc.? • What should our product roadmap look like? • What should our roadmap prioritize in 2023 & beyond? • Is the vision for our product future-proof? • Is it worth pursuing this project or investing more in it? • Are we missing anything in our roadmap/timeline? • Do we have any blind spots of the future?	Common
How might we learn more about our future users (needs, behaviors, habits, goals)?	How might we learn more about our users' potential futures needs, behaviors, habits, goals?	• How might future users behave? • What do people want to use the app for in the future? • What should the future user experience be? • How might our current users evolve into future users? • What might get someone excited in the future? • What might be most important to users now vs in the future? • What product improvements would be most valuable to users? • What do future users need to get out of our product/service? • What future user segment should we target?	Common
How might X trend impact our company or our users or the industry?	How might X trend impact our company or our users or the industry?	• What trends will impact our industry in 5-10 years? • How might trends impact this space? • How might a certain technology impact a certain industry?	Less Common
What might be our company's	What might be our company's	• What role should we play in our industry in the future?	Least Common

role in the future of X?	role in the futures of X?		

APPENDIX TABLE 2. FIVE COMMON QUESTIONS DESIGN RESEARCHERS GET ASKED ABOUT THE POSSIBLE FUTURES

3.4 Step 3: Determine the Stage in the Design Thinking Process

The next step is determining what stage of the design thinking process you are in while considering what you are looking to learn or do when it comes to futures. Use the map below to consider where you are in the design thinking process by using the labels and descriptions.



APPENDIX FIGURE 1. DOUBLE DIAMOND DESIGN THINKING PROCESS WITH A FUTURES LENS

3.5 - Step 4: Select a Method or Methods

Now that you know both the futures question and the stage you are in, it's time to select a futures thinking method or methods. Do this by navigating to the appropriate guide that relates to the question you are being asked, then using the double diamond on that guide, narrow in on which method or methods are suggested by futures thinkers to investigate that challenge.

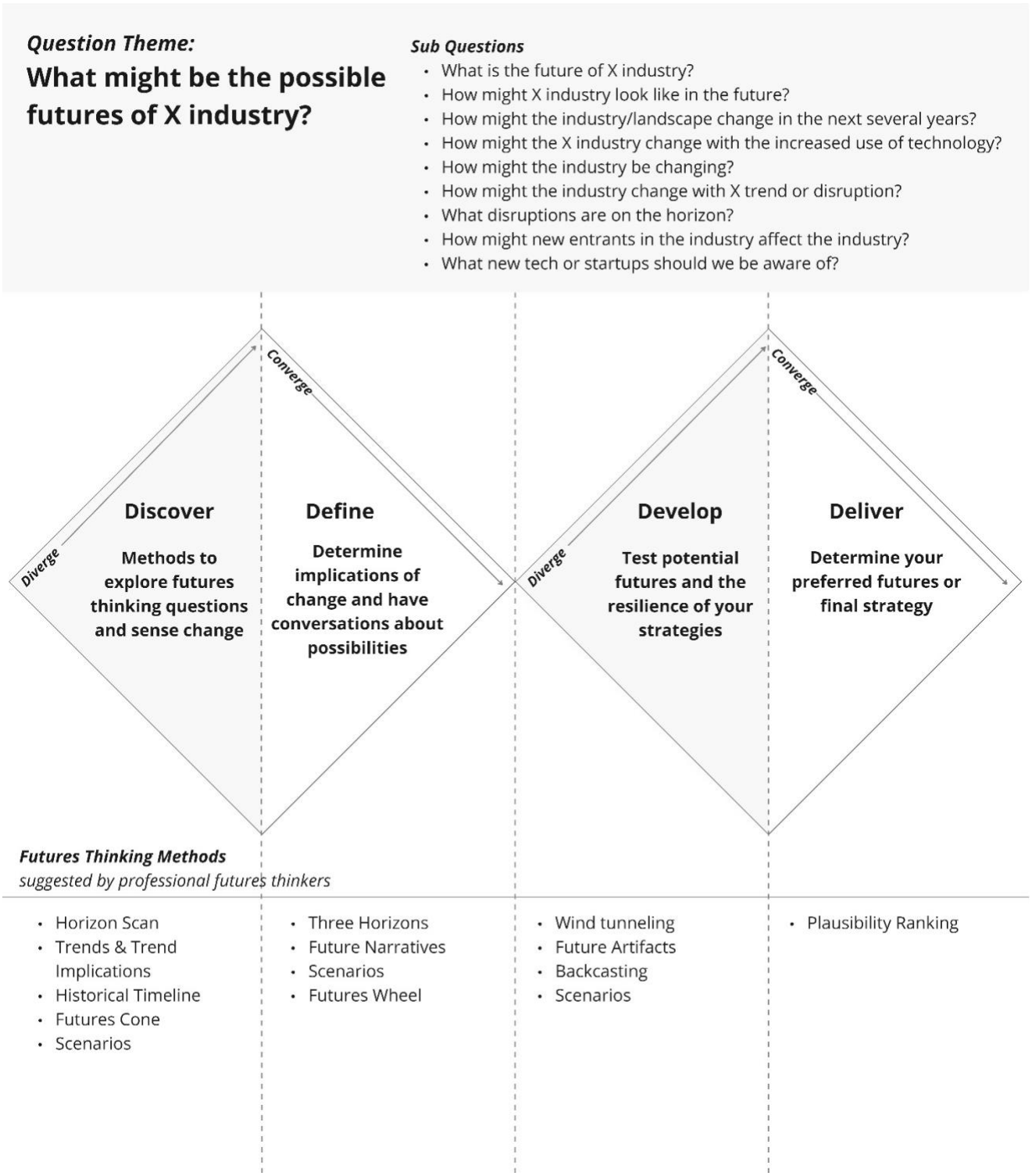
If you are asked a question about:

- What might be the possible futures of X industry? Click here
- What might we invest in now to be resilient for the possible futures? Click here
- How might we learn more about our users' potential futures needs, behaviors, habits, goals? Click here
- How might X trend impact our company or our users or the industry? Click here
- What might be our company's role in the futures of X? Click here
- For any other questions, Click here

Tips:

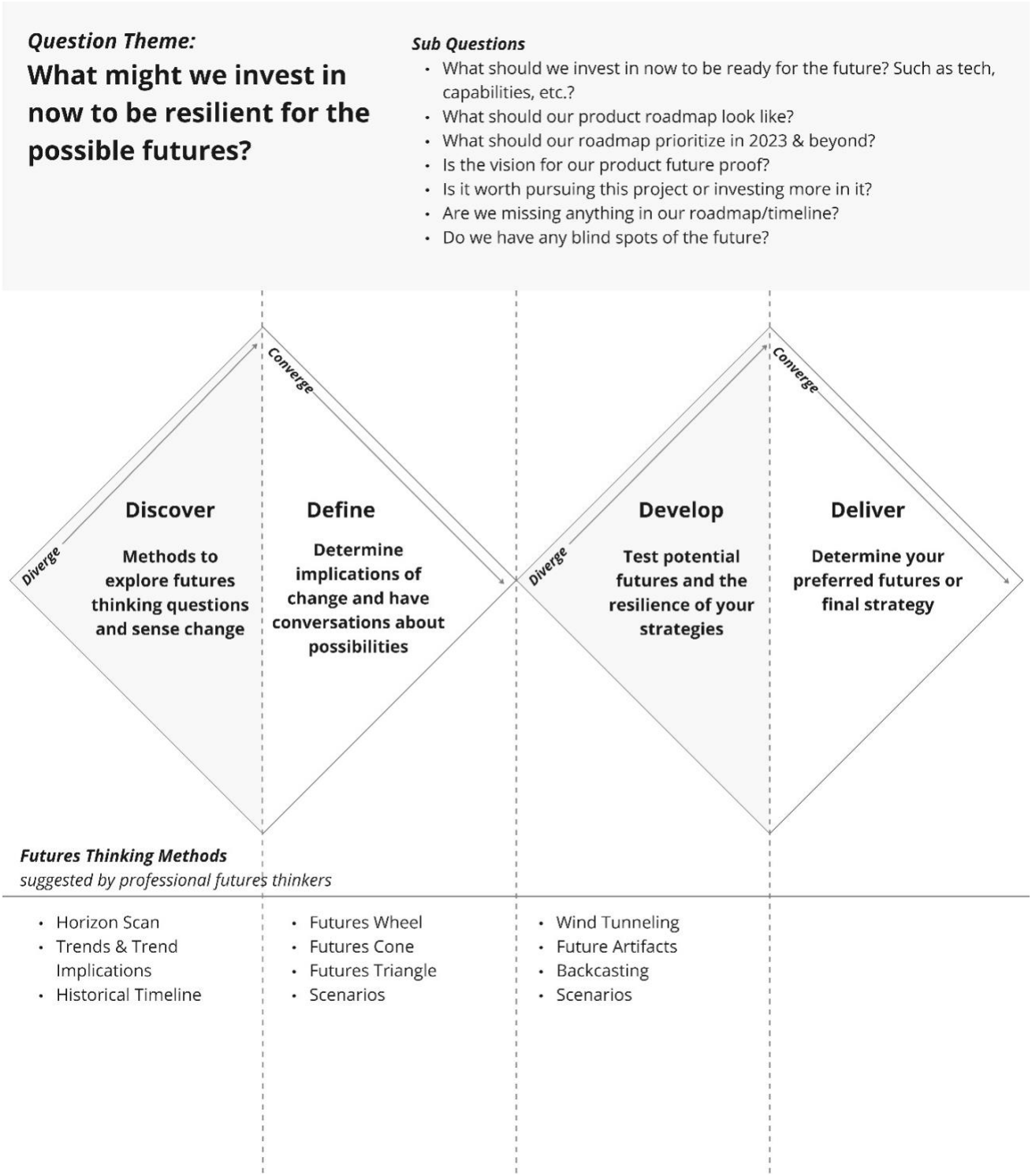
- When selecting the method, determine if there is any pre-work that must be done to use those methods. For example, before you can do scenarios you should have done trends.
- This guide is meant to show you which methods you may use. To learn how to apply that specific method please use another resource.

Use this visual to find a futures method for: What might be the possible futures of X industry?



APPENDIX FIGURE 2. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT BE THE POSSIBLE FUTURES OF X INDUSTRY?

Use this visual to find a futures method for: What might we invest in now to be resilient for the possible futures?

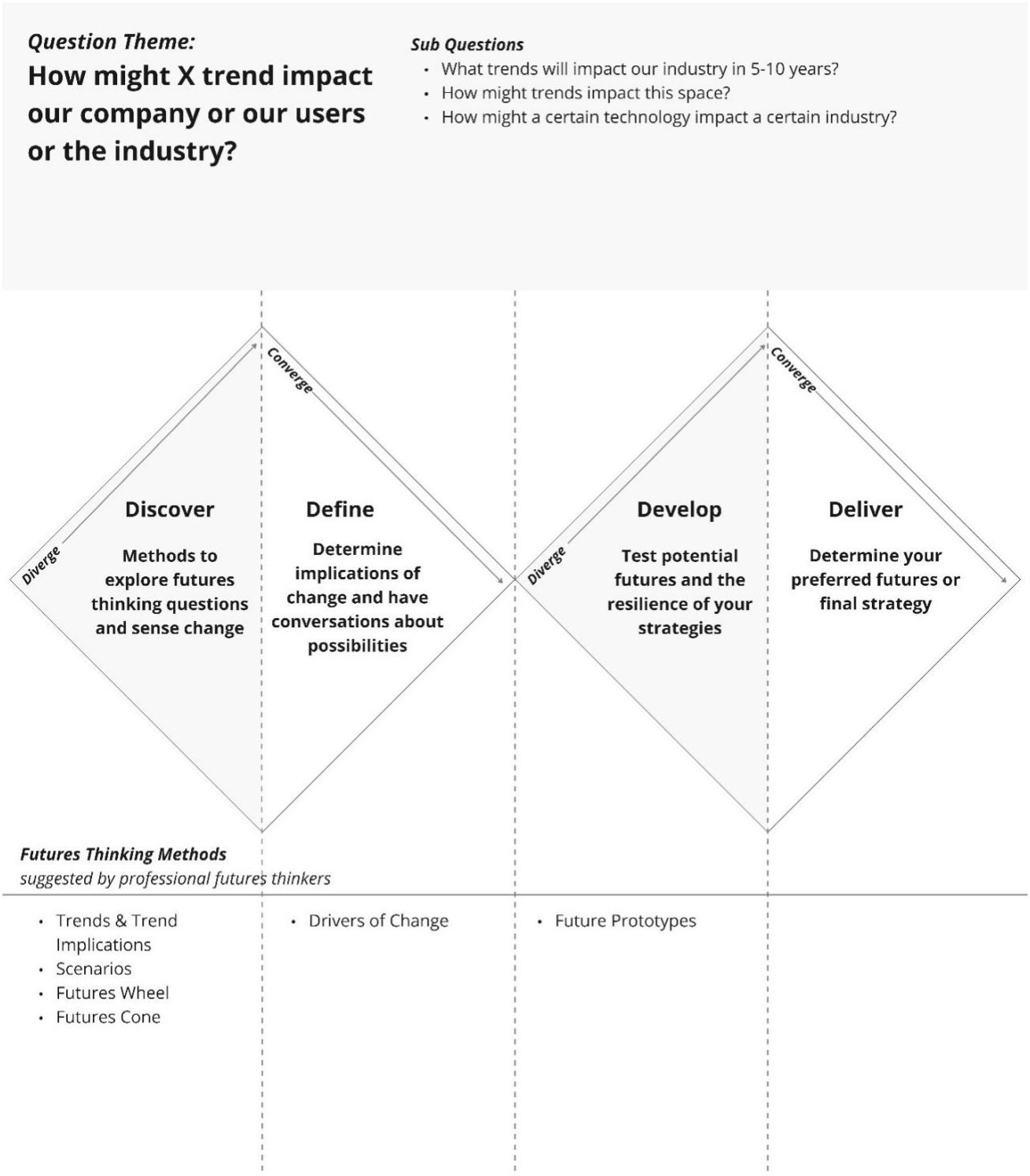


APPENDIX FIGURE 3. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT WE INVEST IN NOW TO BE RESILIENT FOR THE POSSIBLE FUTURES

Use this visual to find a futures method for: How might we learn more about our user's potential futures needs, behaviors, habits, goals?

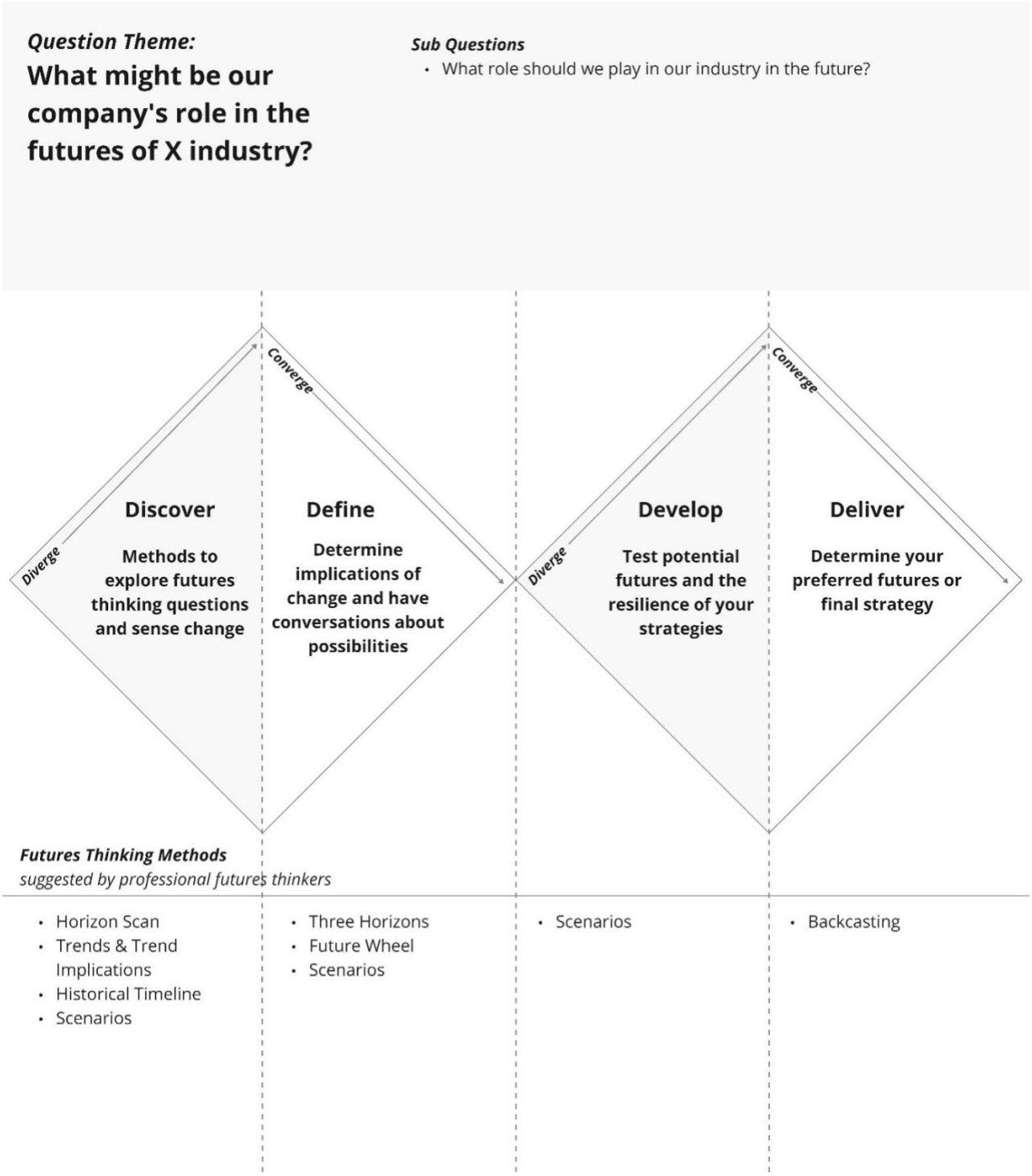
APPENDIX FIGURE 4. DOUBLE DIAMOND WITH METHODS FOR: HOW MIGHT WE LEARN MORE ABOUT OUR USER'S POTENTIAL FUTURES NEEDS, BEHAVIORS, HABITS, GOALS?

Use this visual to find a futures method for: How might X trend impact our company or our users or the industry?



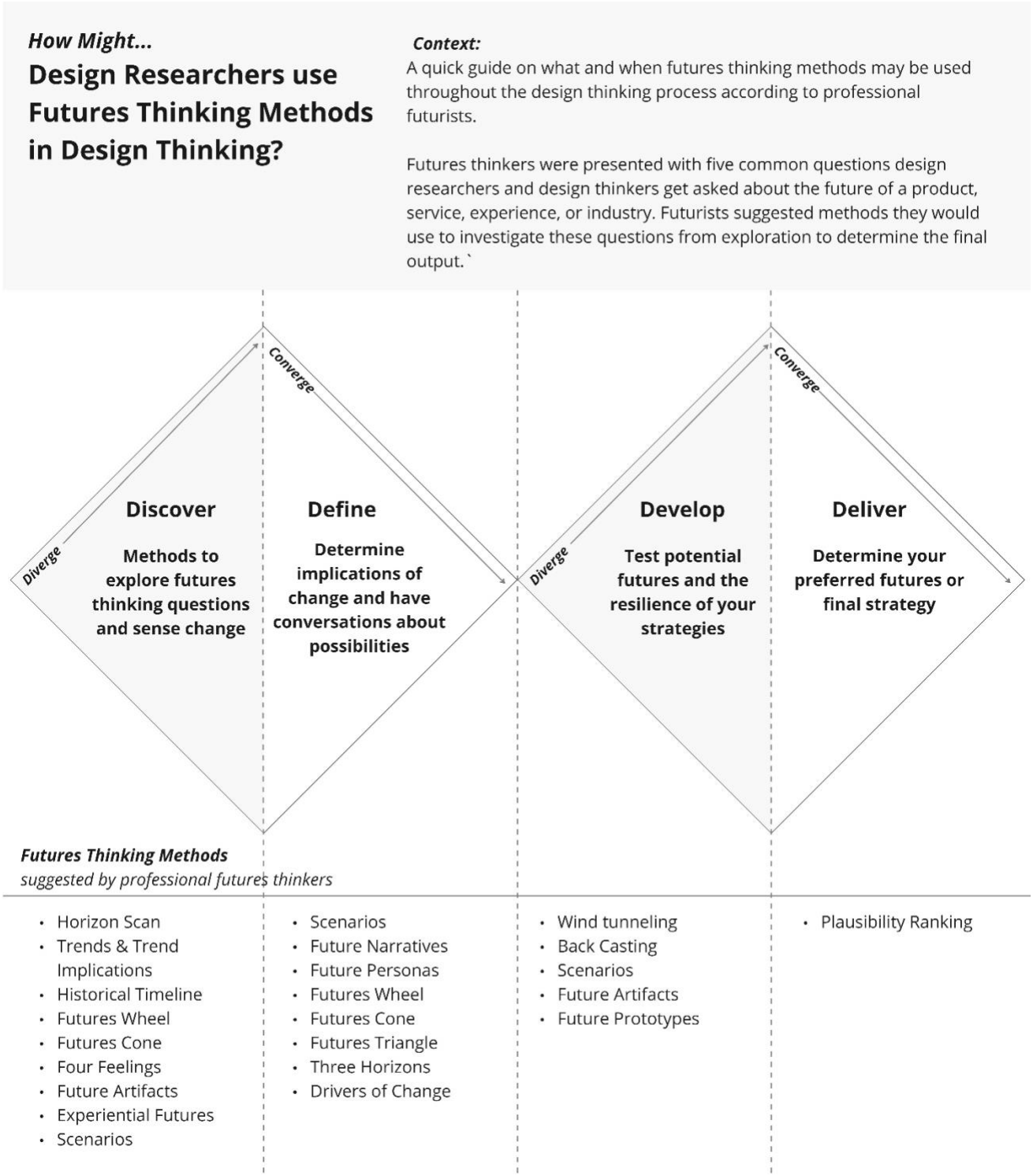
APPENDIX FIGURE 5. DOUBLE DIAMOND WITH METHODS FOR: HOW MIGHT X TREND IMPACT OUR COMPANY OR OUR USERS OR THE INDUSTRY?

Use this visual to find a futures method for: What might be our company's role in the futures of X industry?



APPENDIX FIGURE 6. DOUBLE DIAMOND WITH METHODS FOR: WHAT MIGHT BE OUR COMPANY'S ROLE IN THE FUTURE OF X INDUSTRY?

Use this visual to find a futures method for: Any futures thinking question about the possible futures of a product, service, industry, or experience.



APPENDIX FIGURE 7. DOUBLE DIAMOND WITH METHODS FOR: ANY FUTURES THINKING QUESTION ABOUT THE POSSIBLE FUTURES OF A PRODUCT, SERVICE, INDUSTRY, OR EXPERIENCE

3. 6 - Step 5: Prepare with Warm-ups and Prompts

This last step is optional but recommended if you are using a method that involves co-creation with participants. A common barrier experienced by those running futures co-creation sessions with non-futurists is that participants may have a hard time leaving their present-day mindset to imagine possible futures, or that there might be resistance to conversations around futures. To help overcome these challenges futurists have provided a series of warm-up activities and prompts they use to help participants have a conversation about possible futures.

Warm-Up Activities:

Look Back, Look Around, Look Forward
What: Have a conversation about change, and begin sensing change by talking about signals, trends, and drivers in a conversational manner.
How: Ask participants to reflect on the past (where were we? what was happening at that time?), then reflect on the present (where are we today? what is different today? what is changing?) then imagine what the future may be like (what may be different tomorrow? how might things change?)

Change Line
What: Focus on sensing change and having a conversation about the potential implications of change with participants.
How: Draw a vertical line in the center of a page. On one side ask participants to fill in how things were before, on the other side ask participants to fill in how things are changing. After both sides have been populated facilitate a conversation about the potential implications of these changes.

The Polak Game, aka Where Do You Stand? By Peter Hayward
What: A game designed to showcase how different people view the direction of the future and their agency over the potential futures, to have a conversation about why each person feels that way towards the possible futures.
How: Draw a quadrant with an X-axis and Y-axis and have people plot where they fall. Ask people in the next 10 years do they see the world getting better or worse (this is the Y-axis) once they have mapped on the Y-axis ask, how capable do you feel of personally affecting the future (this is the X-axis). Once everyone has a XY coordinate on the quadrant, facilitate a conversation about why each person is there.

100 Ways Anything Can Be Different in The Future by Jane McGonigal
What: Facilitate a conversation about how things may be different from today.
How: Ask people to write down 100 facts that are true about something today. Once those are done ask them to flip those 100 things to the opposite of what they are today (ex. Today the internet is public to all, the opposite could be the internet becomes private). Then

facilitate a conversation about what this world looks like. What would have to happen to get here? What is possible in a world like this?

The 200-Year Present by Elise Boulding
What: Help people imagine how much can change over time.
How: Ask people to think of the oldest person they know today and imagine what their life was like when they were young, what was happening, what was normal, and what was the world like for them. Then ask people to think of the youngest person they know today and imagine what their life will be like when they are old, what might change, what might be normal, and what might this world look like? Then facilitate a conversation about how much can change over time.

Waves of Change
What: Explore how "business as usual" also known as dominant paradigms change over time.
How: Showcase an example of a paradigm that has risen, been dominant and now fallen - for example, talking on a landline telephone compared to talking on a cellphone. Ask participants to reflect on their organization, industry, product, or service and list the current "business as usual" paradigms and if they are rising, have peaked, or are falling in dominance. Then ask participants to consider any paradigms that came before this, and any emerging paradigms that may replace or affect the current business as usual. Lastly facilitate a conversation around the changing status quo of business as usual.

Future Fuel Prompts:
Questions suggested by futures thinkers, that can be used to encourage conversation and challenge resistance around futures when speaking about futures thinking with non-futurists.

Category	Prompts to Ask Participants
Sensing Change to find Trends or Signals	• What is changing around us? • What has changed in the past X years? • What is happening now?
Trends	• What does this trend mean for us? • How might this trend change in the next few years? • What does this trend mean for the industry?
World Building for Scenarios	• What does this world look like? • What must be true for this world to exist? • How might we have gotten to this world? • What does this mean for us?

	• How do we exist in this world?
What If Questions	• What if that was possible? • What if that happened? • What if it was real?

APPENDIX TABLE 3. FUTURE FUEL PROMPTS