FUTURE WORKSPACE ENVISIONER

A visioning and research tool to trigger people to think and speak about the future workplace

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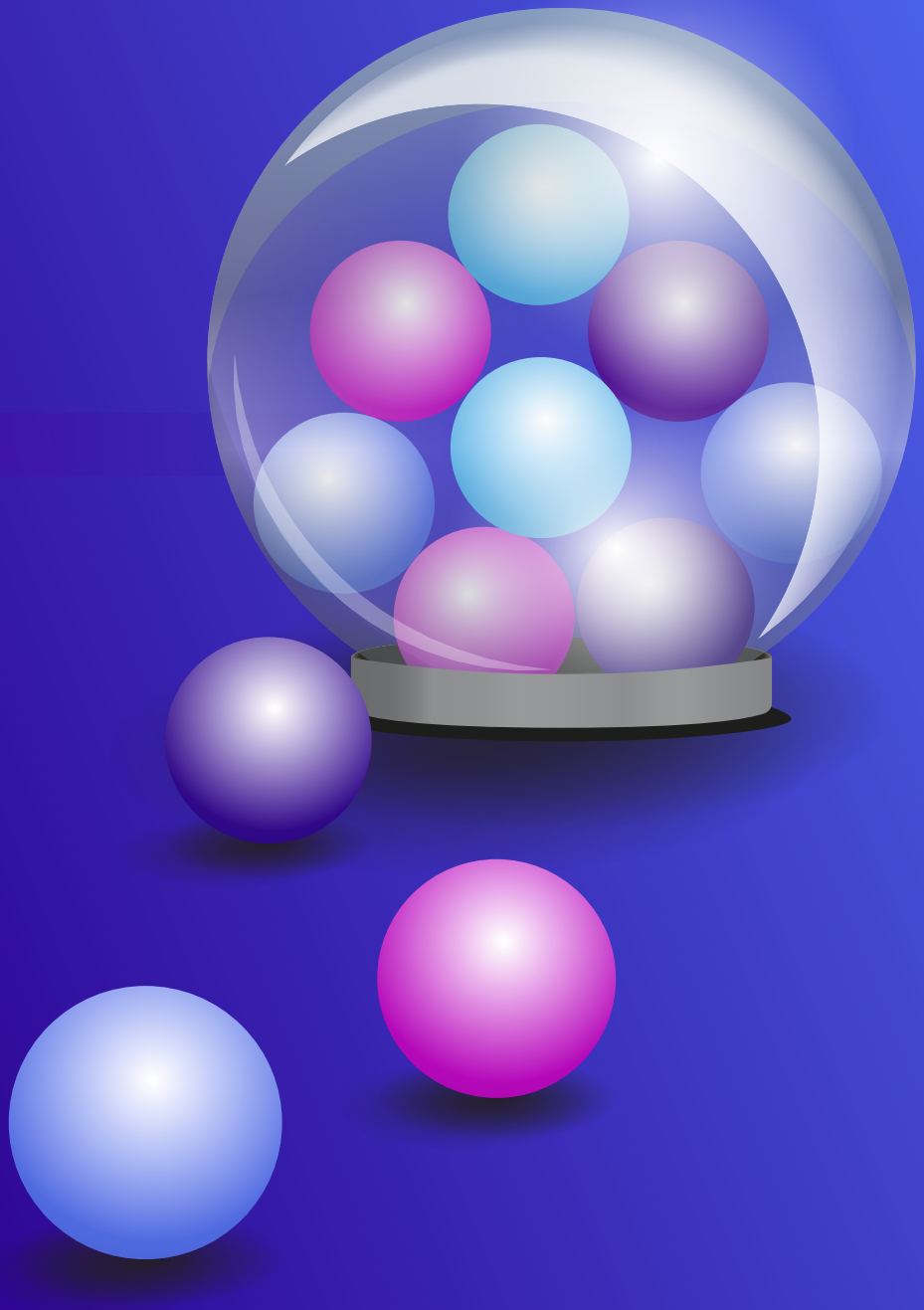

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July 2022

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ACKNOWLEDGMENTS

This project was done in collaboration with Drees & Sommer Netherlands. Special gratitude to my sponsors: Bancolombia and Colfuturo. In addition, my sincere appreciation to my mentors, who supported me during this thesis, and to all the professors, family, and friends who made this academic and personal journey possible.

EXECUTIVE SUMMARY

The purpose of the workplace has changed. Employees proved that they could be productive while working remotely, and they do not want to lose the flexibility they gained (Dahik et al., 2021). In addition, many companies are struggling to bring back employees to the office, and a lot of empty office space is becoming available (Gujral et al., 2021). In consequence, a new concept of the workplace is required. However, to design a future-proof workplace, it is necessary to understand what employees will need in the future and how they will work, have a clear vision of the company, and envision futures without the present's constraints. Unfortunately, the traditional research tools used in workplace studies fall short in this task, and some companies find these types of studies time-consuming. Therefore, this thesis aims to design a time-efficient tool to trigger users and clients to think and speak about the future workplace.

This project starts by understanding the evolution of the workplace and its trends and condensing this information into a development map divided into five workplace dimensions (Work model, location, space, services, and technology) and organized in three timelines (past, present, and future). Then, it develops a tool using future studies and co-design methods and incorporating the investigated workplace development map to trigger clients and users to think and speak about the future workplace. Finally, the tool was prototyped, tested with users, and iterated two times. The test results were positive, proving that incorporating futures studies and co-design is a potent combination that incites future thinking and provokes conversations about the future workspace. The tool was designed for a workshop setting of five participants and can be summarized in eight steps (Figure 1).

The main contribution of this thesis can be condensed into five principles offering possible new applications of the tool to other domains where triggering people to think and speak about the future is required. The five principles are: Start with a multiperspective trend analysis on the specific topic, organize the information into timelines and dimensions, include random future predictions, enable open conversations in a workshop setting, and keep the outcome strategic and tangible. Moreover, this thesis also explores the potential combination of futures studies and co-design methods, enabling further research opportunities.

This project was done in collaboration with Drees & Sommer, a real estate consulting firm with headquarters in Germany and offices in the Netherlands.

Keywords: Workplace study, Future workplace, Workplace visioning, Futures studies, Co-design.

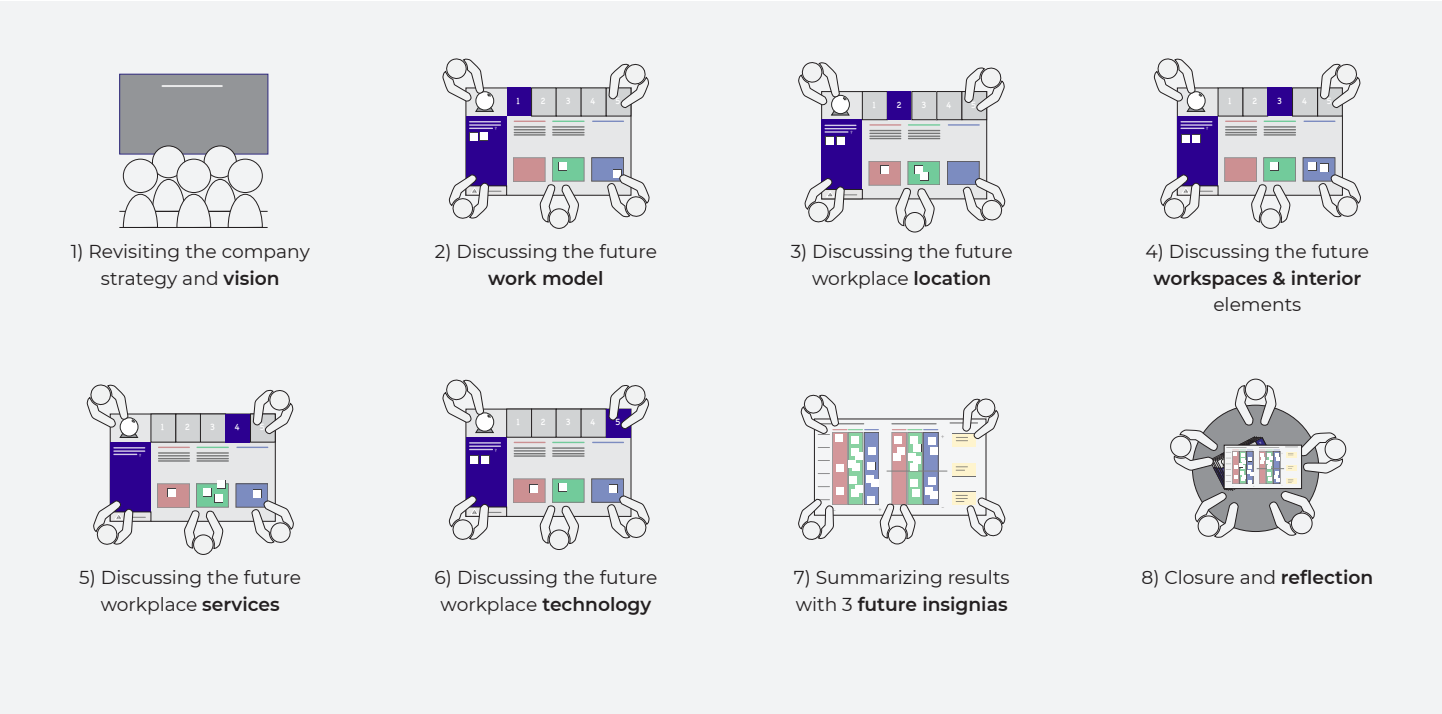


Figure 1: Future Workspace Envisioner in 8 steps

HOW TO READ THIS REPORT

The report is structured in three sections with different chapters.

If you are interested in learning the main results of this project rapidly, only read **section A.**

If you are interested in having the overall picture of the project process, just read the **takeaways** from each chapter of **section B.**

Read the **entire section B** to dive deeper into the design process and find the evidence for the results.

If you are mainly interested in the academic contribution and implications of the thesis, read **section C**

SECTION A

Section A summarizes the central insights of the project, including the context, the definition of the problem, a short theory recap, the design process, and the results.

Number of pages: 19
Reading time: 35 minutes

SECTION B

Section B details the development of the six phases of this project's design process, which led to the final results. Each phase corresponds to a chapter in this section. Each chapter starts with a summary of key takeaways.

Number of pages: 59
Reading time: 2 hours

SECTION C

Section C presents the implementation plan, the discussion and reflections on the results and the process, and the general conclusions of the project.

Number of pages: 13
Reading time: 25 minutes

SECTION A: THE PROJECT IN BRIEF

SECTION B: THE DETAILED DESIGN PROCESS

SECTION C: IMPLEMENTATION & DISCUSSION

SECTION A

THE PROJECT IN BRIEF

In this section, you can find the project's central insights, including the context, the definition of the problem, a short theory recap, the design process, and the results.

1 INTRODUCTION

1.1 THE WORKPLACE OF THE FUTURE AS THE MAIN DOMAIN

The discussion about the future workplace has been on the table for some years. The workplace has evolved from enclosed offices to cubicles and open plan designs; to remote working, activity-based, and distributed workplaces (Faccio et al., 2020). Nevertheless, the Covid19 pandemic has accelerated the remote and hybrid working trend (Figure 2). It also enabled a big-scale experiment proving that some preconceptions of work and offices, such as the need for all employees to be in one physical place with supervision to be productive, were obsolete (Evans-Greenwood et al., 2021). Furthermore, it opened up a new path to redefine the workplace (Figure 2).

Currently, many companies are planning to return to their offices (Harfoush, 2021). A Hybrid workplace has become the default strategy for many companies (Keane & Heiser, 2021; Neeley, 2021; Vaduganathan et al., 2021). In a hybrid workplace, employees can work from different locations during the week. These locations include the home, central or satellite offices, client offices, coworking spaces, cafes, or other external places (Faccio et al., 2020). Many companies have defined rigid binary hybrid models where employees have to go two or three days to the office and work the rest of the days remotely (Jervis-Heath, 2021). A recent study that analyzed

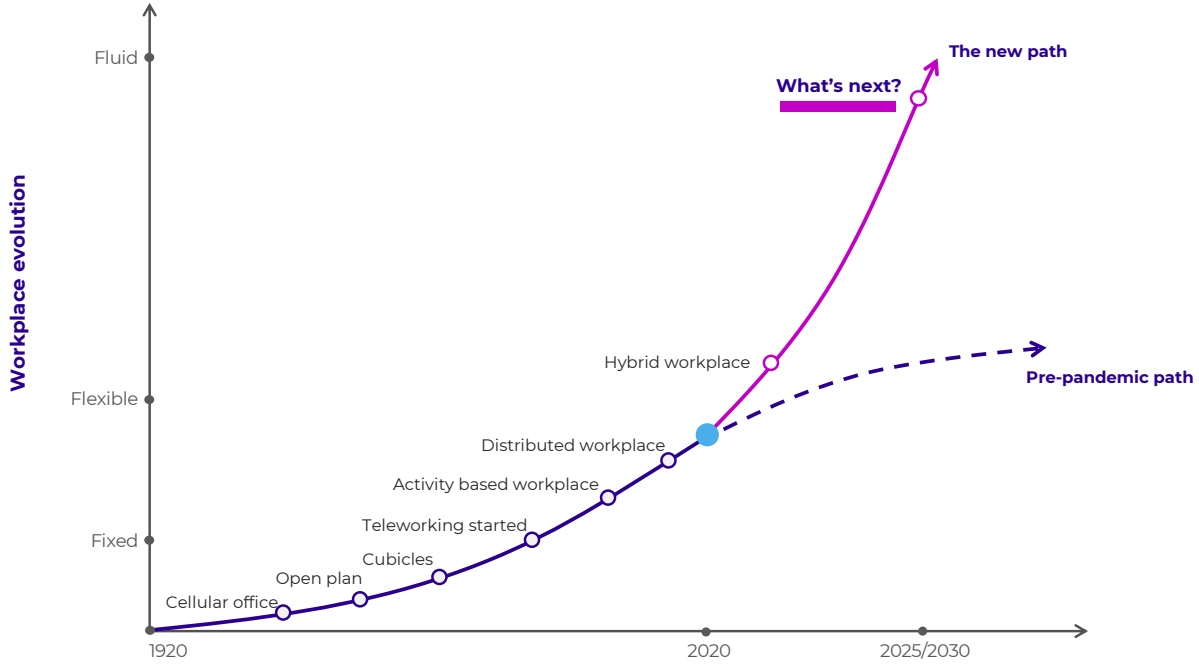


Figure 2: Evolution of the workplace, based on Faccio et al. (2020)

2000 tasks and 800 jobs in nine different countries found that more than half of the workforce has limited opportunities to work from home or in a hybrid way. The numbers vary depending on the type of work, industry, geography, and personal conditions of employees (Lund et al., 2021). Thus, these hybrid models must follow a clear strategy and support different users' needs (Neeley, 2021, Oldman, 2021). Even though there is not yet a direct approach to the future of work, many experts agree that the office is far from disappearing and that the flexibility and quality of the space will be more relevant than the amount of space or location (Faccio et al., 2020; Oldman, 2021; Szumilo & Wiegelmann, 2021).

In this context, the company Drees & Sommer wants to learn what is the next step in the evolution of the workplace and investigate how to design the office of the future. Drees & Sommer is a consultancy firm in real estate with 46 international locations. This project will be developed in collaboration with their UX business unit. The UX team develops and designs buildings adapted to user needs, thinking beyond the building's technical, economic, or aesthetic requirements. Therefore, during this report, I will use the term "the company" and "UX team" to refer to Drees & Sommer and its UX business line.

1.2 CONTEXT OF THE PROBLEM

The UX business line at Drees & Sommer applies an end-to-end approach to developing user-centered workplace strategies and office interiors. The first steps in workplace development are to create visions with clients and do user research to inspire and guide the rest of the design and construction process. This process is known as workplace studies, and it has four stages: visioning, research, conceptualizing, and delivery. This thesis will focus on the first two stages of visioning and research. Chapter 7.2 provides the evidence for this decision.

An essential goal for Drees & Sommer is to design future-proof workplaces that can last ten or more years. Traditionally, considering current user needs and recent architecture trends, understanding the client vision, and estimating the workforce growth was enough to develop a future-proof workplace concept. However, this is not enough in the current changing context. It is then necessary to look ahead to the future users' needs. Unfortunately, users are unaware of their future needs (Sanders & Stappers, 2018). Thus, when we ask employees about their needs and requirements in the future workplace with surveys or interviews, the usual point of reference is what they already know.

In addition, clients usually have limited time when developing workplace projects. There is often time pressure due to soon-to-expire leasing contracts or low budgets where clients cannot afford the cost of two or three months of research. Therefore, we need to find a balance between a method that triggers people to think and talk about the future needs of the workplace while keeping time under control. Hence, the central question of this thesis is: *How to design a time-efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?*

A literature analysis guided by the central question led to two additional sub-questions for this thesis. Chapter 2 explains the origin of these two sub-questions from the literature. Moreover, chapter 7 explains in more detail the origin and evolution of the problem frame.

Sub-question 1: *How can future workplace predictions and trends be used to help people openly think and speak about the future workplace?*

Sub-question 2: *How to develop a co-design tool that provides visions and insights about the future workplace efficiently?*

How to design a time-efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?

2

THEORETICAL BACKGROUND IN BRIEF

Literature analysis and expert interviews were performed to answer the central research question. As a result, two theoretical concepts that support the problem-solution space were found: 'Futures studies' and 'Co-design

2.1 FUTURES STUDIES

Futures studies refer to the systemic exploration of probable, possible, and preferable futures (Bell, 1996; Inayatullah, 2013). During more than 70 years of evolution, the futurist role has evolved from making future mathematical predictions and exploring the future as multiple outcomes to a more activist and participatory role in which the future is envisioned and created in the present (Amara, 1981; Inayatullah, 2013; Masini, 1983; Medina, 2006). Combined with design elements, futures studies can open conversations, raise questions, and inspire users to identify future needs (Auger, 2013; Bleecker, 2009; Noortma, 2019). This definition aligns with the aspect of the problem of triggering people to think and speak about the future workplace. In addition, one characteristic of futures studies is their ability to provide sources of knowledge about the future and use them as inspiration, conversation triggers, research objects, or tools for decision-making processes (Kuosa, 2011). This led to the definition of the first sub-question of this project:

How can future workplace predictions and trends be used to help people openly think and speak about the future workplace?

2.2 CO-DESIGN

On the other hand, co-design involves designers, users, researchers and other stakeholders in the different phases of the design process (Chun et al., 2015; Sanders & Stappers, 2018; van Boeijen et al., 2020). In contrast to user-centered design, users are considered 'partners' who actively participate in the design process and not mere informants or research subjects. Thus, by having participants make things instead of saying what they think, designers and researchers can access latent user needs that would be difficult for participants to articulate otherwise (Sanders & Stappers, 2018). Furthermore, integrating key stakeholders into the design process allows for efficiencies, such as having access to knowledge instantly in the team, having research and design simultaneously, and avoiding the loss of information between external actors (Gardien et al., 2016; Sanders & Stappers, 2018). Therefore, co-design addresses both aspects of the problem: triggering users to speak about their future needs and an efficient research tool. The selection of co-design as a methodological approach for this project led to the second sub-question of this project:

How to develop a co-design tool that provides visions and insights about the future workplace efficiently?

2.3 ACADEMIC RELEVANCE

Futures studies and co-design are fields that have been studied separately but have considerable potential to integrate. If we look at the latest evolution of futures studies, there is a need for more participatory approaches to capture the views of different stakeholders and co-create impactful visions and solutions together (Inayatullah, 2013; Medina, 2006). In addition, there is limited development of future studies and co-design methods in workplace studies. Therefore, the potential academic relevance of this thesis lies in combining the two methodological approaches in a new application area: workplace studies.

Chapter 6 develops futures studies and co-design theory in more detail. It also explains how these approaches were selected and provides insights from some experts about the two topics. Finally, chapters 11 and 12 dive deeper into the implications of this work for the academy and the real estate industry.

3 METHOD

3.1 DESIGN PROCESS

The solution to the two sub-questions of this project led to the development of two components in parallel: tool and content. The tool component responds directly to the second sub-question of this thesis about how to develop a co-design tool that provides visions and insights about the future workplace efficiently. It is the end goal of the thesis and also connects directly to the main research question about developing a time-efficient tool to trigger users and clients to think and speak about the future. On the other hand, the content component is associated with the first sub-question about how to use future workplace predictions and trends to help people think and speak about the future workplace. The content component develops an understanding of the future workplace trends and developments and uses this information as triggers in the tool. Therefore, it is the back-end part of the tool, and it integrates with the tool component in the last phase of the project (Figure 3). The tool incorporates the content component; however, the content results will be presented separately to facilitate the understanding of the process and also because the company can use it in other situations.

Three design theories inspired the design process for this project. First is the creative problem-solving theory, also known as the creative double diamond, in which different moments of divergence and convergence occur between the problem definition and the solution development (Parnes, 1967). This project had four moments of divergence and convergence (Figure 3). Second is the co-evolution of the problem-solution space, which spurs the incorporation of ideas from the design process's early stages and acknowledges that the problem and the solution evolve together instead of linearly (Dorst & Cross, 2001). Finally, research through design enabled the application of quick tool prototypes to test hypotheses and gain user knowledge during different stages of the design process (Stappers & Giaccardi, 2017).

The design process can be divided into six phases corresponding to the previously explained two components. Phases 1, 2, 3, and 6 correspond to the tool component. Phases 4 and 5 correspond to the content component. Finally, in phase 6, the tool and content components integrate (Figure 3).

Phase 1: An internal analysis of the UX business line of Drees & Sommer was made to understand how their processes work, define the project's scope and identify areas of improvement.

Phase 2: A method mapping, expert interviews, and theory research were performed to inspire and support the problem-solution development.

Phase 3: The problem was iterated until a final problem frame was defined and a design direction selected. It incorporated the insights from phases 1 and 2, combined with some solution ideas from the early stages of the process.

Phase 4: Multiple signals, trends, and developments about the future workplace from different information sources were gathered and grouped into 76 factors.

Phase 5: Four iteration cycles of content creation and testing were executed. Each iteration created a new content layer and tested if it worked as a possible trigger for users to speak about the future. The last content iteration was then incorporated into the end solution. The particular outcome of this phase was the workplace development map.

Phase 6: Different ideas were explored, combined, and evaluated. Then a concept was selected, prototyped, tested, and iterated two times until the final solution was developed.

3.2 SPECIFIC METHODS AND TOOLS

Specific methods such as interviews, process analysis, case studies, trend mapping, methods search, literature review, ideation workshops, prototyping, and testing sessions were used in the different phases. Each phase has a dedicated chapter in section 2 of this report, elaborating on the specific methods and results obtained.

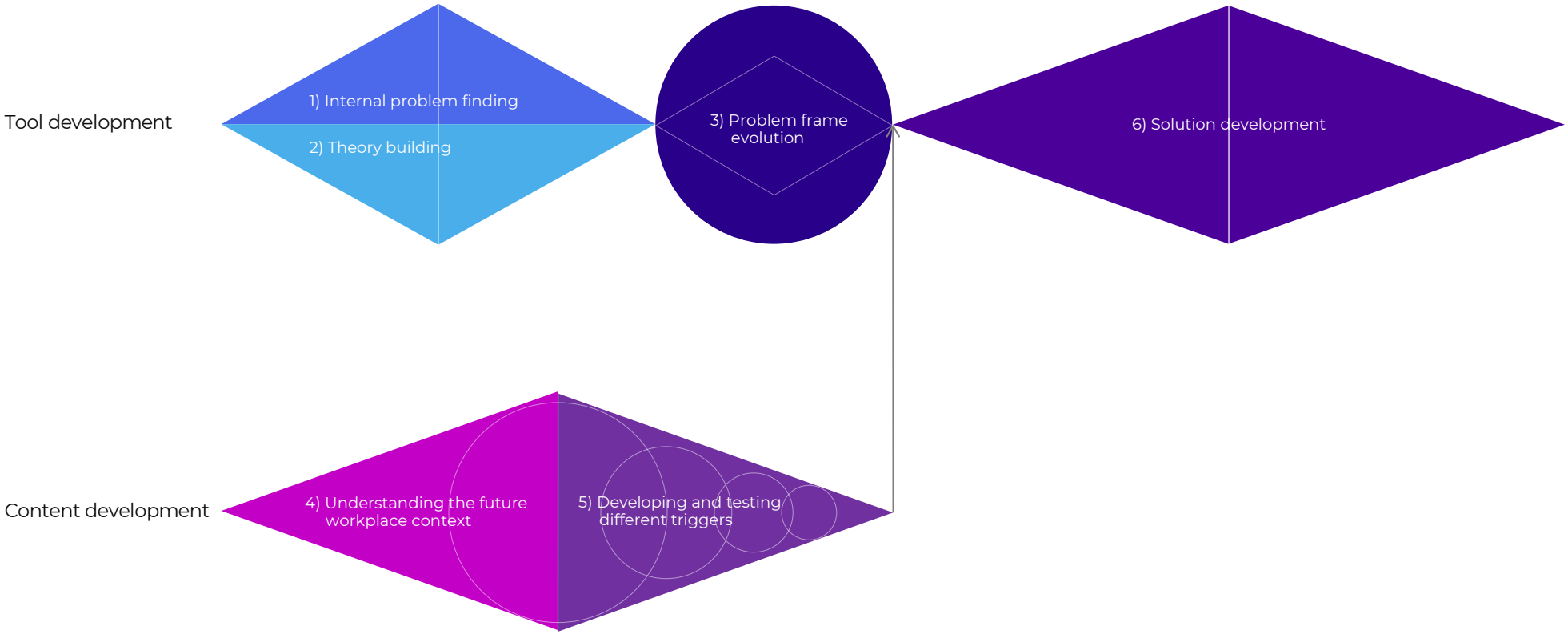


Figure 3. Design process for this project

4 RESULTS

This project produces two outputs connected directly to the two sub-questions, and the design process explained before. The result of the first sub-question is the content output (Chapter 4.1). The result of the second sub-question is the definition of the tool itself. The tool output integrates the output of the content, and in turn, it addresses this project's central problem: to design a time-efficient tool to trigger clients and users to speak and think about the future workplace. This chapter presents the tool output in two ways: First, as a descriptive explanation of how it works and how it was designed (Chapter 4.2). Second, the tool is presented in practice using one of the testing cases (Chapter 4.3).

4.1 CONTENT OUTPUT: WORKPLACE DEVELOPMENT MAP

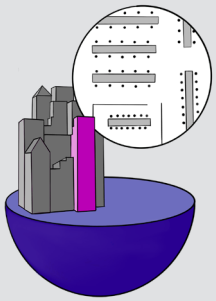
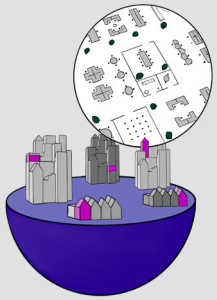
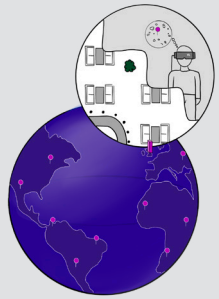
PAST: STATUS QUO	PRESENT: CURRENT CHANGES	FUTURE: UPCOMING TRENDS
THE WORKPLACE AS A UTILITY	THE WORKPLACE AS A CHOICE	EVERYWHERE IS A WORKPLACE
		
The workplace is a utility where people go to work and execute most of their activities in one place. Being in the business district represents the success of companies. Employees get access to what they need to keep productivity up. Services are limited to food and transportation and complemented by nearby business areas' amenities.	A hybrid model of work, an activity-based workplace, and a high focus on employees' experience and wellbeing influence most of the changes that are happening now in the workplace. Employees can work from the home, office, or in some cases, third-party locations. It is also the end of designated workstations and binary choices between desks or meeting rooms. Variety in workspaces and inside amenities are the measure of success. Employees book the type of space that suits them best for the day in advance.	This is the era of total flexibility in work models and workplaces. The workplace can be anywhere. Physical location is not a restriction to developing any work. VR and digital advancements allow people to feel like in a physical meeting or collaboration session, even if they are thousands of miles away. Existing workplaces become social and knowledge clubs. They are open areas with smart materials and furniture that adapt to any need in a second. People visit these locations several times a year to nourish their relationships and connect with the brand, strategy, and company culture. These spaces are also more connected to the community. They are brand showrooms and co-creation spaces.

Figure 4, part a. Workplace development map

The first output of this project is a workplace development map that summarizes the evolution of the workplace in three timelines. The first one presents the status quo of the workplace. It is a synopsis of what most companies currently have. However, these definitions are outdated compared to what trends show, so they can also be referred to as the past. The second timeline highlights the current trends and changes happening in the workplace and adopted by early leaders. It is the current state of the workplace, even though not all companies have those developments in place. Finally, the last timeline provides ideas of future trends and developments inspired by other areas and industries. A vision summary and a sketch complement each timeline (Figure 4, part a). In addition to the three timelines, the workplace development map is divided into five dimensions: Work model, location, space, services, and technology (Figure 4, part b).

	PAST: STATUS QUO THE WORKPLACE AS A UTILITY	PRESENT: CURRENT CHANGES THE WORKPLACE AS A CHOICE	FUTURE: UPCOMING TRENDS EVERYWHERE IS A WORKPLACE
WORK MODEL	Activities for the office · Do all types of work activities in one place. · Have access to essential resources in one place. · Supervise teams. · Routine tasks (emails, surfing, calls, administrative.) · Internal meetings or presentations. · Activities or jobs that require privacy. · Concentrating (read, write, analyze, program) · External meetings (clients, stakeholders, etc.). Ways of working · Hierarchical command organizations.	Activities for the office · A physical destination for 2 or 3 days a week. · Creating (Designing, developing, innovating). · Informal encounters/unplanned meetings. · Socializing or networking. · Constant learning, up-skilling, re-skilling for new roles. · Collaborate with colleagues or external stakeholders to innovate and solve problems. · An option for those who can not work from home. Ways of working · Hybrid (some days from home, some from the office). · Agile work: Multidisciplinary teams solve specific problems in short cycles.	Activities for the office · A physical destination to keep social interaction, networking, knowledge, strategy, and culture sharing several times a year. · A multipurpose space that adapts to any situation when you visit it Ways of working · Work anywhere at any time – results-based. · Mass crowdsourcing and freelancing. · Intrapreneurship. · The decentralized autonomous organization. No management, bottom-up decision with smart contracts.
LOCATION	· One central office in the business district or city center.	· Multiple satellite offices in key city areas, close to where different employees live. · Satellite offices complemented with 3rd party places (cafes, coworking, client offices, etc.) to offer as much convenience as possible.	· One central space like a social club in cool districts with access to trendy venues and parks. · Anywhere can be an office (No physical office at all). · Entire virtual office on the metaverse. · Mixed buildings where people live and work.
SPACE	Workspaces · Enclosed private spaces or cubicles · Enclosed meeting rooms of different sizes.	Workspaces · Especial spaces for focus work. · Especial spaces for collaboration. · Informal meeting spots. · Hybrid meeting rooms. · Relaxing/cozy lounges. · Phone/video call booths. · Agile/scrum meeting rooms.	Workspaces · Multipurpose modular rooms, furniture and walls. · Special places for learning. · Outdoor spaces to work. · Open public spaces to share with the community. · VR pods for focus work or crazy ideation sessions. · Unique rooms for creativity/ideation. · Interactive lobby and public areas to show brand history, strategy, and products and exchange improvement ideas. · Labs with last-tech to experiment and learn.

	Interior design elements · Design to last and safety.	Interior design elements · Access to natural light and fresh air. · Playful, colorful interiors. · Surfaces to write everywhere. · Integrate plants in the workplace. · Homestyle decor (Rugs, standing lamps, shelves, rugs). · Light with different intensity and colors.	Interior design elements · Changing-color materials. · Bio-based, 100% circular materials. · Different themes in areas or rooms. · Self-healing materials. · Smart materials and fabrics. · Furniture that adapts to your size or position right away.
SERVICES	· Work utilities such as printers, paper, clips, and pens, are always available. · Restaurants with different food options (Catering or food hall). · Vending machines. · Free coffee · Access to public transport. · Free parking. · Lockers.	· Gender-neutral toilets. · Free fruits and snacks. · Café with a barista. · Supermarkets and shopping stores nearby. · Company pool vehicles. · Shared bikes. · EV charging. · Game room (pool table, chess, ping pong, etc.). · Social and hobbies club (lessons/activities after work). · Gym or sport canter. · Tailor. · Hairdresser.	· A la carte robotized restaurants. · Wellness center/spa. · Health check mirrors with stress detectors. · Health provider, GP, physiotherapist on-site. · Shared vehicles hotspot. · Laundry. · Vertical farms in unused space to provide fresh food. · Kids kindergarten. · Bring your pet/ Pet kindergarten. · Bars. · Fully equipped kitchen (Also for personal use). · Event venue (Use work space for persona events).
TECHNOLOGY	Devices · Company tablet/laptop. Audio visual communication systems · HDMI connection to screens or click share. · Sound stations for calls in meeting rooms. · Cameras in meeting rooms for video calls.	Devices · Mobile-only. · Bring your own device (One device for all: personal and work). Audio visual communication systems · Audio-visual devices for hybrid meetings. · Wireless content sharing. · Smart interactive boards. · Insta communication systems with external stakeholders. Others · App for booking spaces. · Smart building to optimize temperature, lights, and water. · Access with biometrics.	Devices · Shared devices that quickly adapt to your preferences. · Smart surfaces in the workplace (Everything is a device). · VR headsets. · Smart glasses / AR. Audio visual communication systems · 3D holograms for hybrid meetings. · VR meetings. · Space booking app system with social features. · Spaces that adapt to communication style/language. Others · Intelligent micro climatization systems. · Ambient intelligent space adaptable to mood/needs. · Robots for manual work (Bring documents, coffee, etc.) · Personal bot assistants for everyone (A digital secretary). · Tracking map to find people easily in the office. · Smart noise-canceling everywhere you sit. · Wireless charging everywhere. · Shared power grid with other buildings. · Unplug technology to disconnect from the digital world.

Figure 4, part b. Workplace development map

4.2 TOOL OUTPUT: 'FUTURE WORKSPACE ENVISIONER' DESCRIPTION

The second output of this project is the tool designed to make users think about the future of the workplace, away from the constraints and suppositions of the current environment. It proved the goal to trigger clients and users to think and speak about the future during workplace studies' visioning and research stages after being tested. The tool was named the Future Workspace Envisioner. This tool uses the previous workplace development map content and presents it as inspiration and triggers to users.

4.2.1 APPLICATIONS AND USERS

The tool has two different applications. The first application of the tool is for visioning with the leadership team. In this case, the tool can be used with companies' leadership teams to create a future workplace vision on a ten-year horizon. It does not replace the existing visioning workshop that Drees & Sommer offers, which focuses on understanding the strategy and vision of the company and its connection to the workplace. On the contrary, it complements the visioning workshop with a tool that provides longer-term ideas for the future workplace. Some of these ideas might be too futuristic for the available time, cost and technology. However, they can become an inspiration in the conceptualization stage, and some might be included as minimal viable solutions in the workplace concept.

In the second application, the tool can be used with lead user employees from different levels as a research tool to understand what they value under future situations away from the current constraints. It also offers the possibility to co-create with them new future ideas to be included in the workplace concept.

The main benefit that the tool offers to companies is a new method to do visioning and user research in a shorter time and with a focus on the future. This can be a unique selling point for clients who demand future-oriented and user-centric workplace concepts but find existing workplace studies too time-consuming.

4.2.2 HOW THE TOOL WORKS

The tool was designed in a Miro interface for a workshop setting of two hours with a maximum of five participants. The decision to have this number is supported by creative facilitation techniques in which higher participation and engagement levels are achieved with smaller groups. (Heijne, 2019). Adaptations can be made to incorporate more participants if necessary and they will be discussed in chapter 11. On the other hand, Miro is a software that provides a whiteboard to collaborate with multiple participants online and can be accessed in a web version.

The workshop and tool application consists of eight steps (Figure 5). The first step is to open and share the company's strategy and context. Then, during steps, two to six participants work on different activities related to five workplace dimensions. Step seven is a ranking and summary exercise. Finally, the last step is for closure. Each of these steps takes 15 minutes.

The tool can be used in an online setting, a hybrid environment using the Miro board in a physical workshop, or a full analog workshop by printing the Miro boards on A3 paper. Figure 6 exhibits the tool on the Miro board with its different sections.

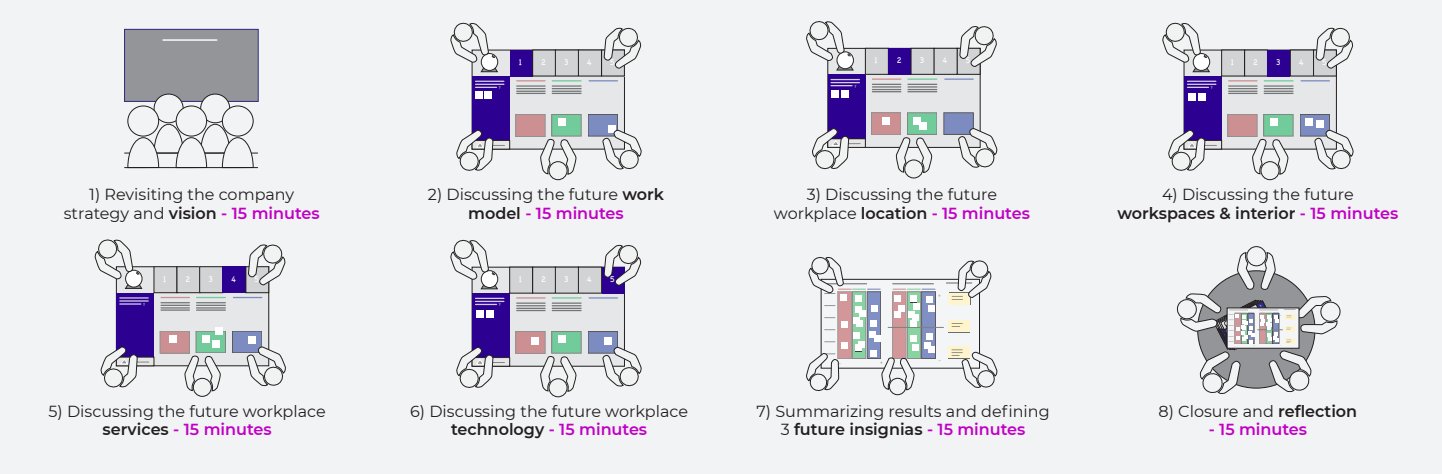


Figure 5. Workshop steps and time

Step 1:
The workshop's first step is dedicated to revisiting the company strategy and vision. The output from the visioning workshop that Drees & Sommer provides to clients can be shared here. In case no visioning workshop has been previously done, the project owner must present in ten minutes an overview of the company's strategy and goals. This input is necessary to ensure that during the rest of the workshop, participants are aware of the company vision and think about how the future workplace can enable it. Five additional minutes are assigned for participants' introductions and explaining the workshop's rules and the procedure for selecting participants. The top section of the Miro tool has a space to include the company strategy and keep it visible for participants during the workshop (Figure 6).

Step 2-6:
Steps 2 to 6 are the core of the tool. The middle section of the tool layout is assigned to work on these steps, and five boards/stops are designed for each step (Figure 6). Each of these stops is associated with one of the five workplace dimensions: Work model, location, space, services, and technology. Different questions are presented on each board, and 15 minutes are given to participants to provide ideas or solutions based on these questions. Participants work together through these five stops unless the workshop is adapted to incorporate more people. The boards can be accessed in any order depending on the type of project and client priorities. The five dimensions boards share the same design. Figure 7 explains the six items of the dimensions board.

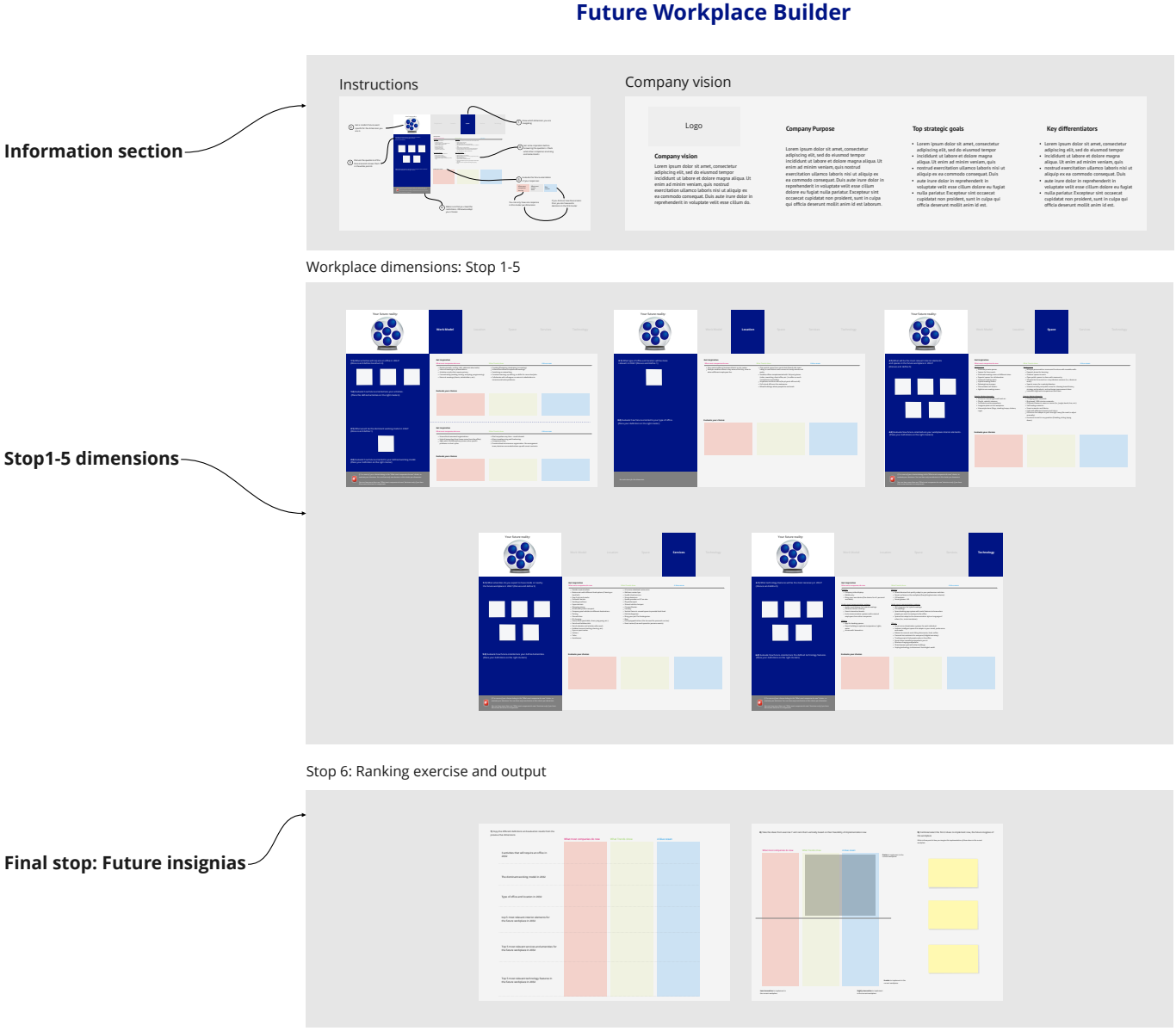


Figure 6. Tool interface overview

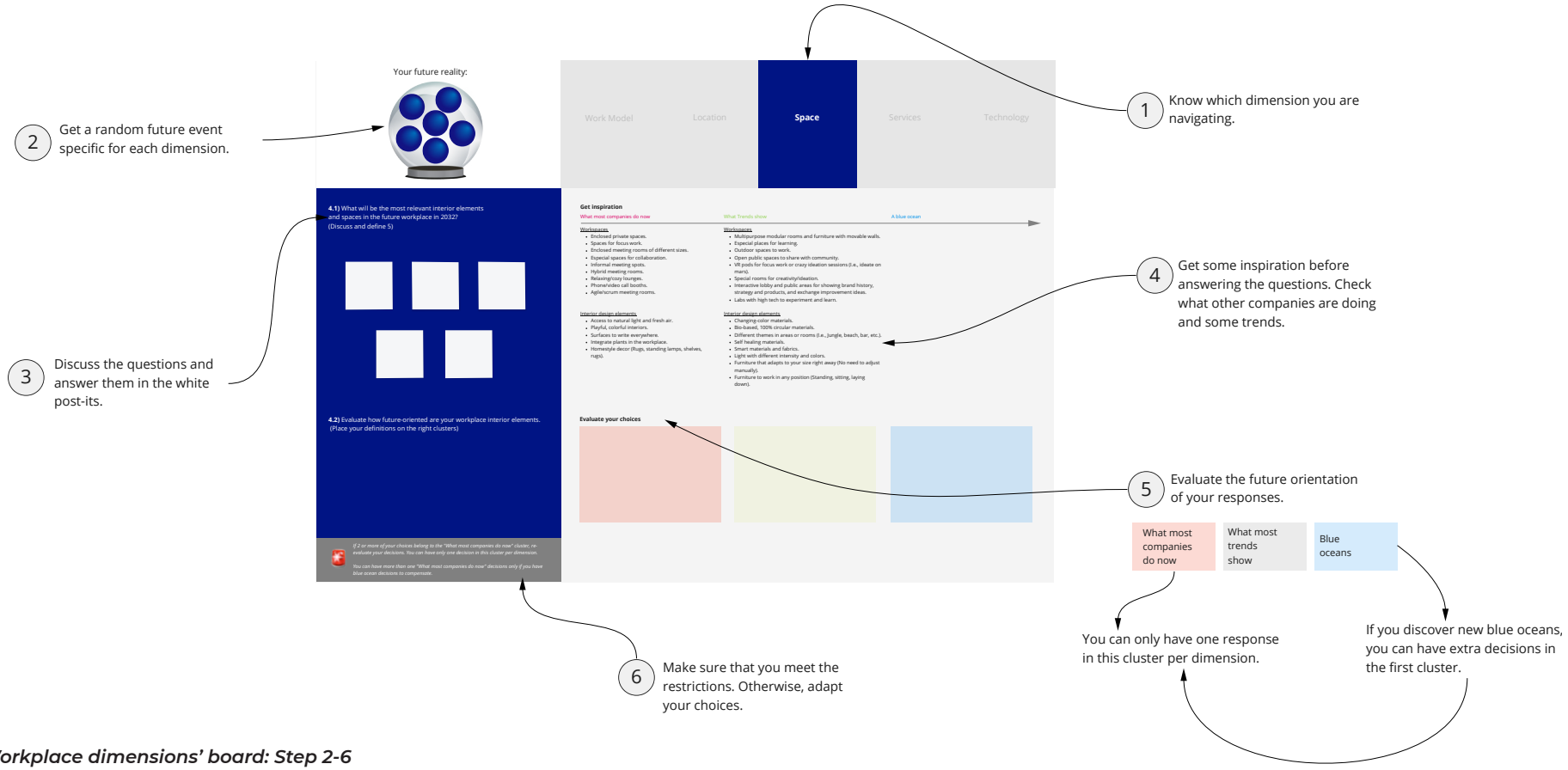


Figure 7. Workplace dimensions' board: Step 2-6

1. **Dimension bar:** It allows participants to have an overall picture of the workplace and know which aspect of the workplace they discuss every time.

2. **The future teller machine:** It provides random future predictions of what will happen in the world in 2032. Every time the group starts with a new workplace dimension, they get a prediction. The predictions are not directly related to the workplace; they can be things such as space travel being accessible to the middle class, humans living up to 150 years on average, or humans having neuro-transplants to enhance memory and thinking. Participants must place themselves in this future situation while they complete the task of each board. They must also assume that they are still working for the same company and that the vision and strategy remain valid. This element aims to get participants out of their present state of mind.

3. **Open questions related to each workplace dimension:** Every stop/board in this section has specific questions relevant to each workplace dimension. Participants answer these questions with open ideas. However, there is a limit to the number of ideas they can provide, encouraging

people to prioritize. For instance, what are the top three activities that will require you to visit the office in 2032? This limit keeps the exercise strategic and helps users articulate what really matters instead of providing long lists of nice-to-have things in the workplace.

4. **Inspiration section:** It presents relevant trends from the workplace development map (chapter 4.1). These trends are shown as inspiration for participants. These trends are divided into two categories to simplify the reading. First, the past timeline of the workplace development map is presented in the category *'What most companies do now.'* The content from the other two timelines is merged into the category *'What trends show.'*

5. **Assessment section:** The two categories and content used for inspiration are also used for assessing the ideas provided by participants. Once they finish with the ideas, participants place them in either one of the three boxes. The red box connects with ideas that fit the category: '*What most companies do now*'. The green box associates with the category: '*What trends show*'. The blue box is a section to place those ideas that do not fit the other two categories. It was named *'A blue ocean'*.

6. **Restriction for each stop:** A restriction was included in each board to stimulate participants to provide more future-oriented ideas. Therefore, only one of the provided ideas can belong to the '*What most companies do now category*' unless participants create new '*blue ocean*' ideas to compensate.

Step 7:
Once participants finish working on the five stops related to the five workplace dimensions, they move to the sixth stop located in the bottom section of the tool (Figure 6) to do a ranking exercise that brings participants back from the future to the present. First, participants copy all the post-its from the assessment section of the previous stops and place them on a summary table. This table provides a quick overview of the previous stops' output and automatically classifies the ideas on the innovation level. Then, participants rank the ideas on the feasibility level in a second table, forming a C-box matrix with feasibility and innovativeness. Finally, based on these rankings, the participants are asked to select three ideas to be implemented as minimal viable products (MVP) for the future workplace. These ideas can also be seen as the first actions for developing the future workplace concept. Figure 8 exhibits the ranking board interface. Appendix 16.1 presents all the detailed boards of the concept.

Step 8:
The last step of the workshop is a space to reflect on the results. The group looks back at the summary of the results made during step 7 and reflects on them. This closing discussion is about finding the shared meaning of the results. It is also a space for the facilitator to solve questions and dive deeper into the decisions made. The group discussions and the reasons behind the provided ideas are an additional source of knowledge. This step is designed to make some of that knowledge explicit.

The tool Miro board can also be accessed using this link:
https://miro.com/app/board/uXjVOvk2Oxo=/?share_link_id=979240119866

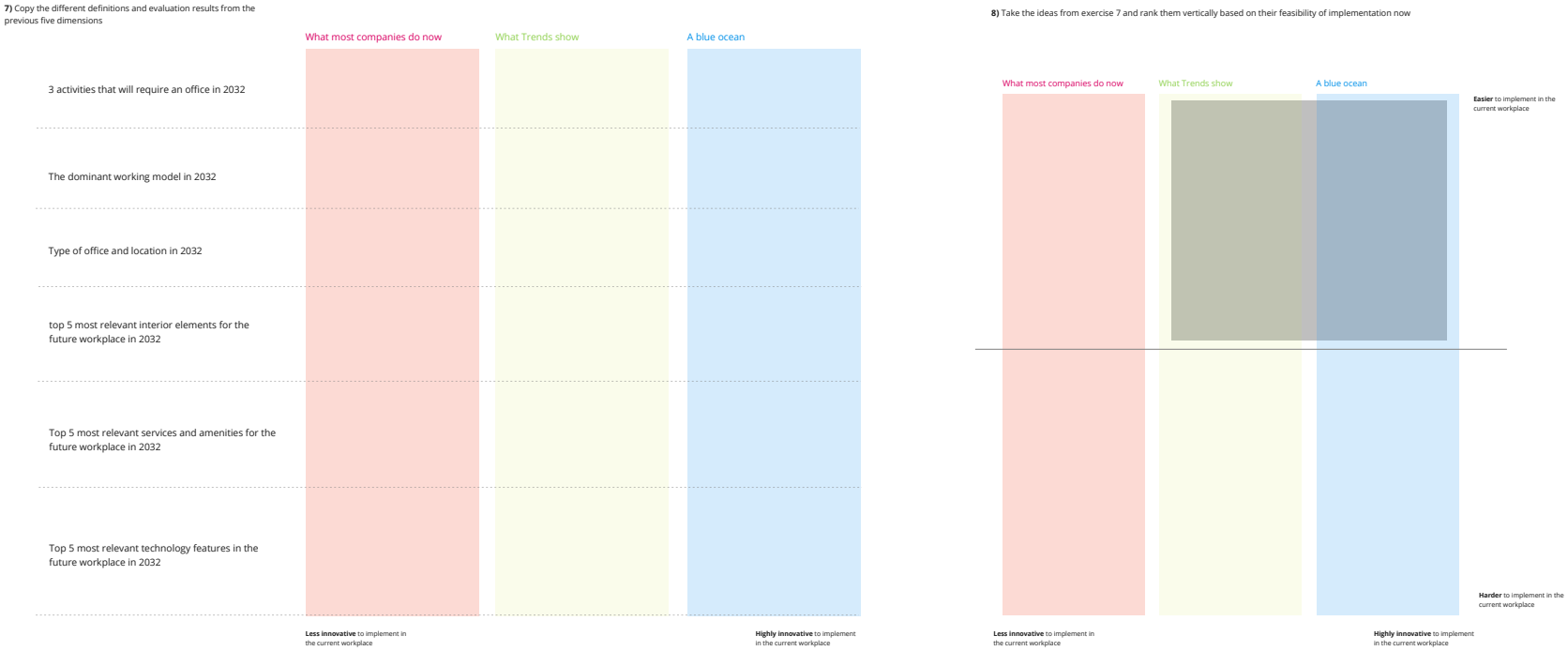


Figure 8: Ranking step layout: Step 7

4.2.3 OUTPUTS

The tool provides results in two ways. First, the direct tangible result of the tool is the apportioned output from each dimension's stop. These deliverables can be seen as a direct vision, a summary of future user needs, or potential ideas for workplace studies' conceptualization stage.

In addition to the direct output, the tool creates a platform for rich discussions among the participants. These discussions are a source of information and knowledge about clients and users. Furthermore, recording the discussions or taking notes about the reasons behind the provided ideas gives additional research insights into the workplace study process.

The direct outputs of the tool are:

- Three activities that will require an office in 2032.
- The dominant working model in 2032.
- Location and type of workspace for 2032.
- Five main interior elements for the future workplace in 2032.
- Five main services and amenities in the workplace of the future in 2032.
- Five main technology features in the future workplace in 2032.
- Three future workplace concept ideas to implement now.

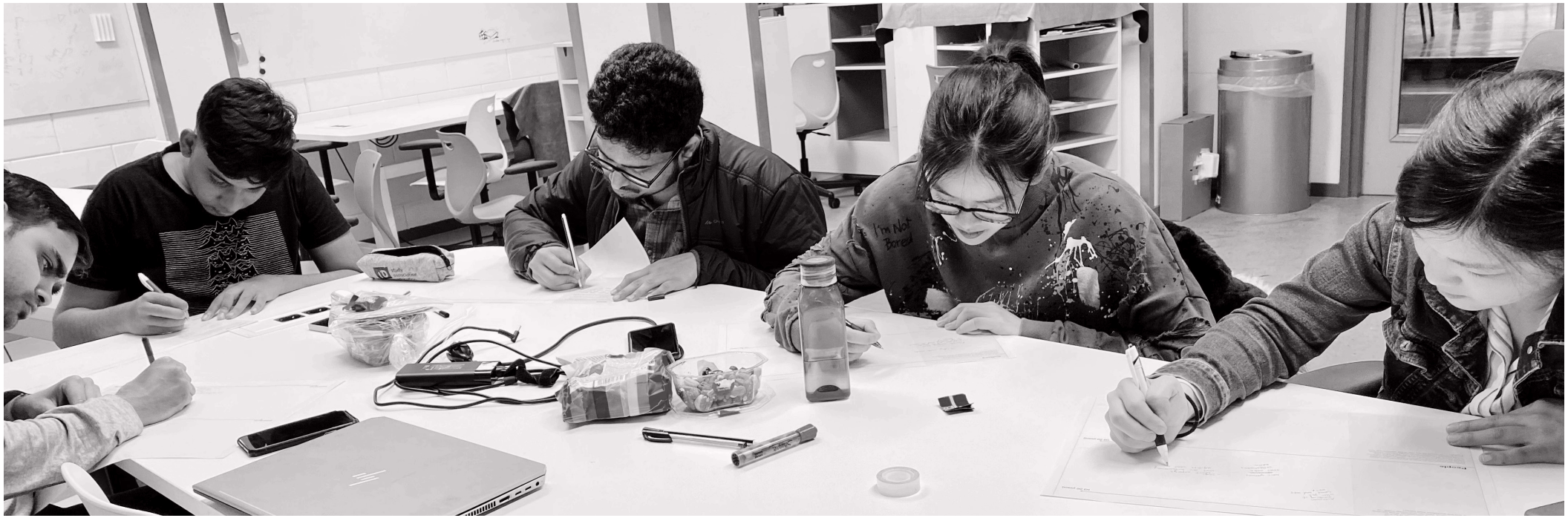
4.2.4 CONNECTION TO OTHER TOOLS AT DREES & SOMMER

This tool is designed to be used ideally after the visioning workshop with the leadership team. Thus, the output from the visioning workshop can be used as a starting point for the tool. It can also complement the traditional research methods of workplace studies with additional needs and future elements that were not expressed during surveys or interviews. The tool provides a future vision of the workplace, an extension of user needs, and more future-oriented ideas to the design team. It is important to note that the tool complements other sources of information in the workplace study process. The tool's output is material for the designers and not a final concept. It requires the rest of the workplace study process stages to ensure a concrete future workplace concept.

The main benefit of using this tool is that it provides a simplified research and visioning method for workplace studies and user briefing. In addition, the visioning and research tool is focused on the future, which creates differentiation from what most tools and research methods of the industry offer. Chapter 6 dives deeper into the existing workplace studies tools reflecting this new tool's potential value.

4.2.5 IMPLEMENTATION

The UX consultants will use and manage the tool at Drees & Sommer. Two activities are required to ensure the tool's implementation and continuity. First, the facilitators must understand how the tool works and know about facilitation. Second, it is necessary to have a frequent update of the tool's content component to ensure its accuracy when being used. Chapter 11 presents an implementation plan and discusses some of the company's implications for using the tool.



4.3 TOOL OUTPUT: 'FUTURE WORKSPACE ENVISIONER' IN PRACTICE (TEST CASE)

4.3.1 CASE STUDY

The tool was tested in an online workshop with three employees from a Colombian bank. The participants belonged to different departments and roles within the company. Chapter 10.10 presents more information about the participants, the test procedure, and the testing company. This bank is considered one of Colombia's most innovative organizations and one of the best places to work. Its offices have received several recognitions in the past. In addition, its employees are used to having state of the art in workspaces, services, and amenities. Therefore, this case becomes an exciting opportunity to validate how many new future possibilities participants can find with the tool.

4.3.2 RESULTS: THE FUTURE WORKPLACE FOR A BANK

The following written scenario represents the vision of the future workplace for this bank, and it was created using the results from the testing session. These results provide a fresh vision of what the organization already has and prove the tool's value to create new future possibilities even for a leading organization.

Future workplace for a bank

A combination of a small headquarter, client branches, and the metaverse will provide an ecosystem of locations that employees can select. The key word is convenience. Most of the work will happen online, and people will have the opportunity to work anywhere they want. The metaverse will allow people who are away to feel like they are in an actual workplace with other colleagues. It will also encourage people to live anywhere they want. In addition, there will be a few moments during the year when employees must visit the headquarters. This is for extraordinary planned activities such as strategy sessions, recognition moments, cultural workshops, or events. Apart from that, there is complete flexibility.

Physical locations are designed to integrate with the virtual world easily. For instance, they are equipped with smart surfaces and screens everywhere. People can access their data and have a working surface (device) anywhere they want. They do not need to bring a device because everything can become one, and all the software and data are available and easily accessible in the cloud. Content is easily shared using gestures and voice commands within devices and to other people. In addition, there are special rooms for connecting to the metaverse and collaborating with people in other locations. So, for instance, some team members might be together in the physical room designed for metaverse sessions, and others connect from abroad. Moreover, holograms will substitute video calls and allow people to feel they are taking a space in a room.

The physical locations are also designed with two goals in mind. First, to enable maximum social interaction, and second to provide stimuli for creativity. Those will be the two main reasons to motivate people to visit one of the physical locations. Apart from that, everything else can be done online. For this reason, the physical locations are designed as open spaces to socialize and network. Not only are employees allowed, but special areas for the community, guests, family, friends, and pets are also created. These spaces are complemented with inside amenities such as bars, free drinks, barista coffee, and fresh and healthy food to promote social interaction.

Furthermore, convenience is the key word. Going to one of the locations should be a multipurpose journey. For example, if people go to the workplace to meet people and work for some hours, they must also be able to do some of their chores along the way. Such as getting a haircut, visiting the tailor, doing laundry, getting groceries, washing the car, getting fresh vegetables from the vertical farms in the building, or bathing the pet.

The interior of the spaces is a constant stimulus. People will go to the different workplace locations to get inspired by the people they meet and the spaces themselves. Spaces they would never imagine or would never have access to at home. Hence, nature, universe, movies, or sci-fi can inspire thematic interior designs. These spaces can also include natural sounds, water streams, animals, birds, outdoor areas, different furniture, changing colors in walls and materials, and spaces that adapt to the users' mood.

4.3.2 THE TOOL IN ACTION

This section illustrates the process, results, and some of the group discussions while participants worked on one of the tool's dimensions, specifically, the *'work model'* dimension. The results of the other dimensions can be accessed in chapter 10.10.

After participants were informed about the instructions of the workshop and a summary of the company's strategy and goals, participants started working on the first dimension of the workshop about the work model. First, they selected one of the future predictions from the future teller machine (Figure 9). Their prediction was: *'It is the year 2032, and all manual and physical work is 100% automated.'* Then, based on this prediction, they started to discuss the two questions from the work model dimension: What activities will require an office in 2032, and what would be the dominant working model in 2032?

While discussing the first question, participants quickly realized that most of the activities they do now could be done online. They also thought that the need for physical presence is reduced if most manual work is automated, as the prediction stated. Therefore, they focused on activities that cannot be done efficiently online. After their discussion, they defined the workplace as a place to mainly socialize, network, have human contact, and escape from technology and the virtual world. This idea fits what trends show and was classified in the green box. An additional second idea was proposed: they imagined the physical workplace as a space full of stimuli for imagination and creativity. A place with uncommon shapes, colors, textures, sounds, and lights that inspires people to be more creative. This idea was not included in the list of trends and therefore was classified as a blue ocean (Figure 9). They did not select a third activity because they did not find more reasons to justify commuting to a physical workspace.

The second question was quickly discussed. For this question, participants immediately referred to the printed board's developments and trends to seek inspiration. In line with the ideas of the first question and the future prediction that most manual work would be automated, they imagined a world where people could work anywhere. Where work is mainly online and where people can become digital nomads. They also discussed the need to have some physical points of connection with other colleagues and with the company culture and brand several times a year, but always planned in advance. This idea was in line with trends and classified in the green box (Figure 9).

Completing the tasks of this board took 15 minutes. First, participants used Miro's post-its to write ideas individually in one minute; they took the initiative to do this independently. Then they shared their ideas, discussed them, selected their priorities, and evaluated them based on the trends from the board.

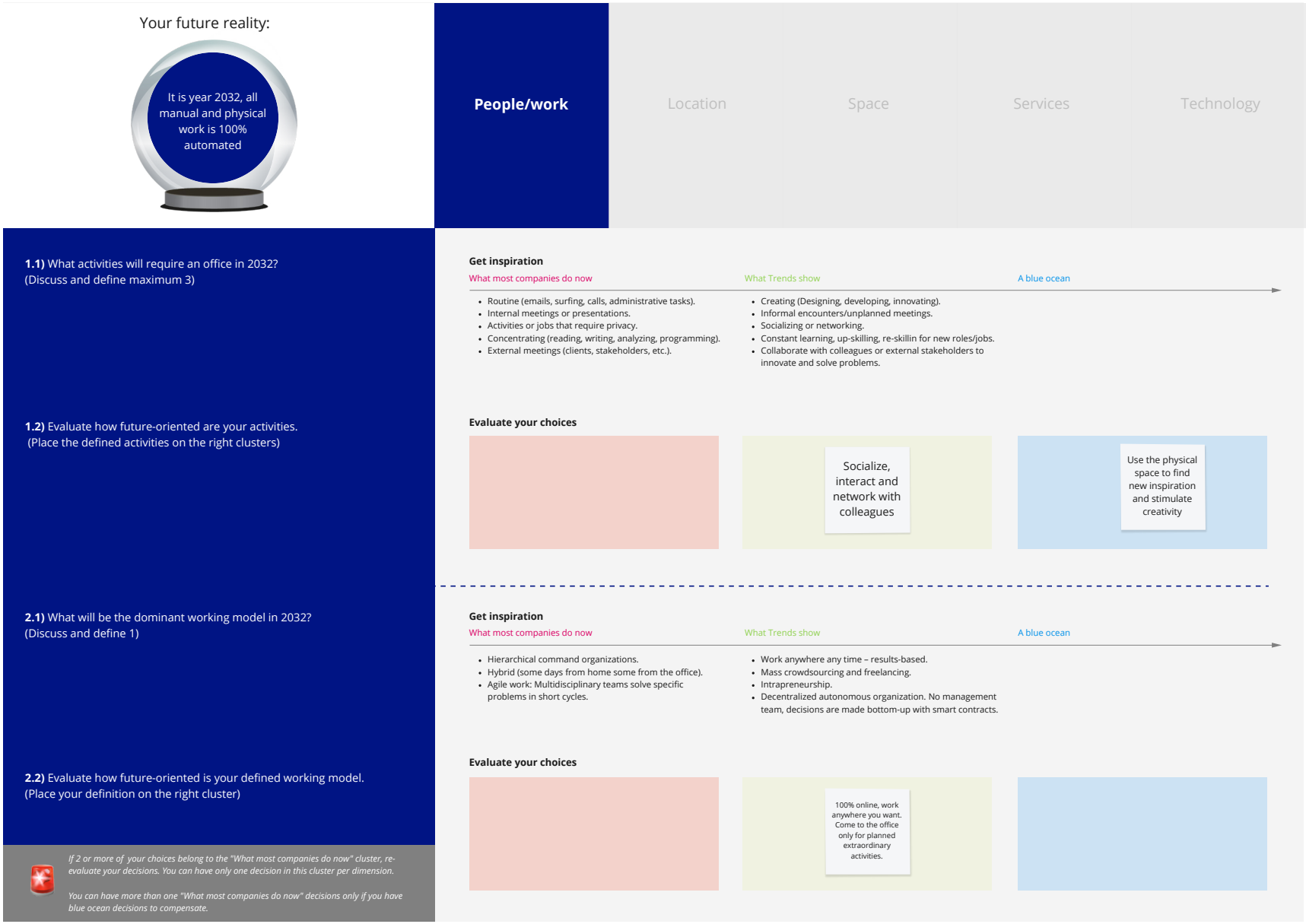


Figure 9: Results from user testing in the 'work model' board

SECTION B

THE DETAILED DESIGN PROCESS

In this section you can dive deeper into the development of the six phases of the design process of this project which led to the final results. Each phase corresponds to a chapter.

This section goes back to the design process explained in chapter 3. The evidence and steps to achieve the results presented in the previous section can be found here. The design process for this project was divided into two components and 6 phases. Phases 1, 2, 3, and 6 correspond to the tool component. Phases 4 and 5 correspond to the content component. Finally, in phase 6, the tool and content components integrate.

Each chapter of this section elaborates on the procedure, methods, and results of a phase of the design process. Figure 10 shows the design process and the chapters assigned to each phase. Furthermore, each chapter starts with key takeaways. Read only the takeaways if you are interested in an overview of the design process for this project. Otherwise, read the whole chapters to dive deeper into the procedures and the evidence for the results.

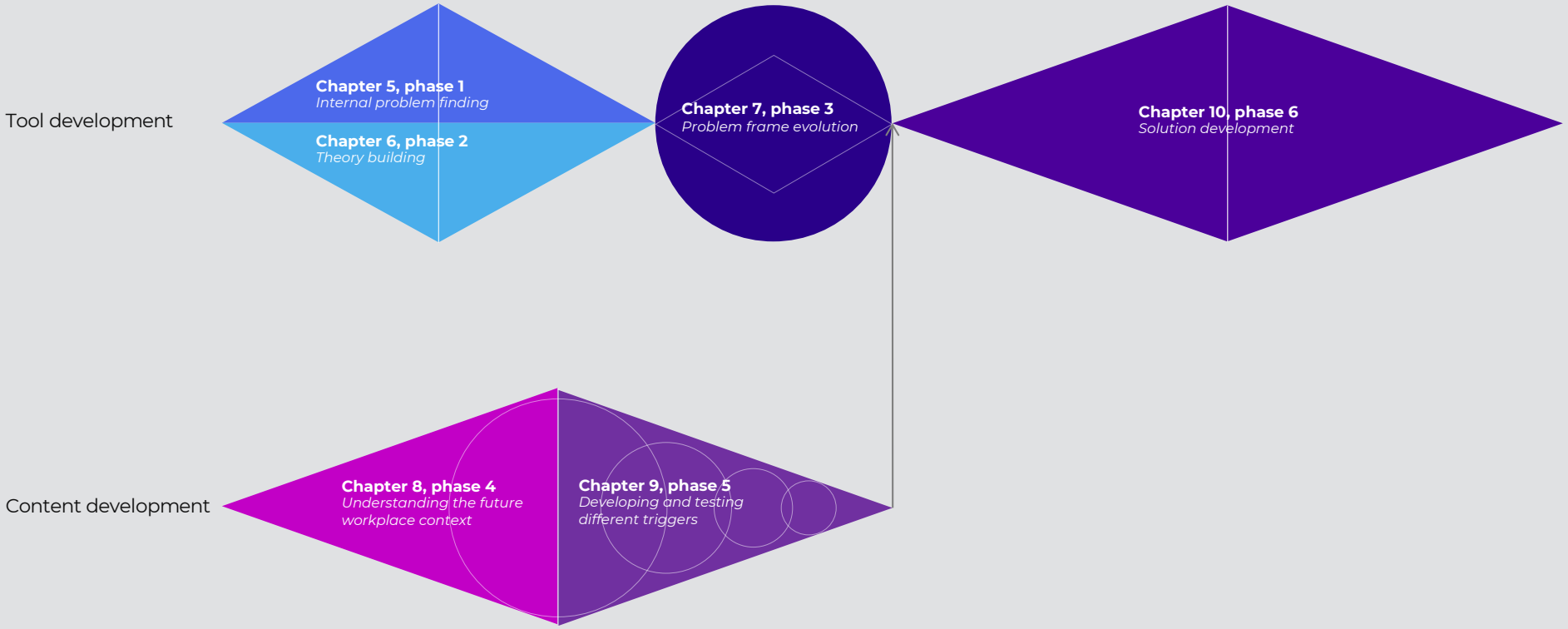


Figure 10. Design process phases connected to the report's chapters

5

PHASE 1: INTERNAL PROBLEM FINDING

5.1 KEY TAKEAWAYS

An internal analysis of the Drees & Sommer UX business line was performed during this phase. The internal analysis consisted of revising existing company documentation about the workplace study process, mapping the existing tools and methods that the UX team uses, reviewing reports of previous UX projects, and talking with different UX team members.

This analysis improved the understanding of the UX process and how it connects with the rest of the business lines in the organization. One key takeaway of this understanding was the definition of the project's scope. The UX business line is divided into three specialties or teams: UX consultancy, fit-out project management, and facility management. However, this project focuses only on UX consultancy, specifically in the workplace study process. This process is the first step of an office or interior design project. It uses user research and design techniques to define the vision, user needs, project requirements, and initial concept designs for the project before moving to the rest of the construction phases.

The second key takeaway from the internal analysis was identifying the two main problems related to the workplace study process. These problems have been explored as areas of improvement and therefore are formulated as questions. (1) How to design a workplace study that takes less time? (2) How to design workplace studies to be more future-oriented? These questions became the initial input for the subsequent project problem definition.

5.2 THE INTERNAL ANALYSIS PROCESS

The internal analysis was a constant iteration between conversations with different UX team members and internal document analysis. The senior UX consultant and the company supervisor were the most active members. The constant conversations with them led to direct insights or questions that could be answered by diving into the documentation of previous projects or process descriptions. The internal documentation also provided direct insights or questions that were escalated to the team. Figure 11 shows how this process worked.

Scope: Workplace study process.

Opportunity areas:
1) Designing a workplace study that takes less time.

2) Designing workplace studies more future-oriented.

The internal documents and conversations were analyzed using a Miro board. This board had screenshots of relevant information in different frames. Post-it notes of different colors were used to highlight insights or possible questions. Figure 12 shows an example of the response to a client's request for a proposal (RFP). Red post-its show questions, and yellow post-its show insights.

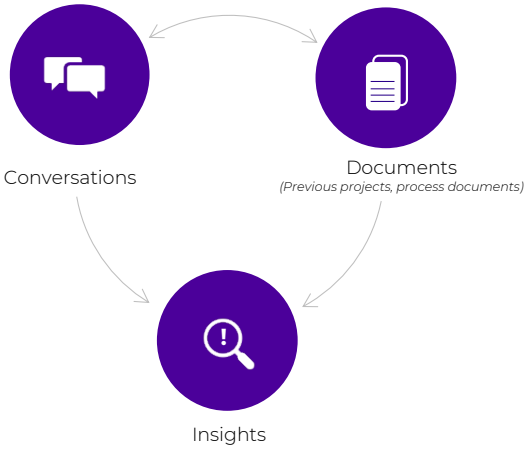


Figure 11. Internal analysis process

5.3 INTERNAL ANALYSIS RESULTS

Drees & Sommer offers services related to the eight stages of a construction project (Figure 13) based on the RIBA plan of work (Royal Institute of British Architecture, 2020). One of the company's business lines is user experience (UX). This business line develops and designs buildings adapted to user needs, and their expertise is divided into three teams: UX consultancy, fit-out project management, and facility management. Within the UX consultancy team, there are two types of services. Workplace studies and change management. This project will focus on workplace studies because it was the area where the project was formulated (Figure 13).

The workplace investigation process can be divided into four stages, and it can take eight to twelve weeks to be completed. The first stage usually starts with a visioning workshop in which the leadership team or direct clients participate. During this workshop, a workplace vision and success measures are defined and aligned to the client's company strategy, brand and culture.

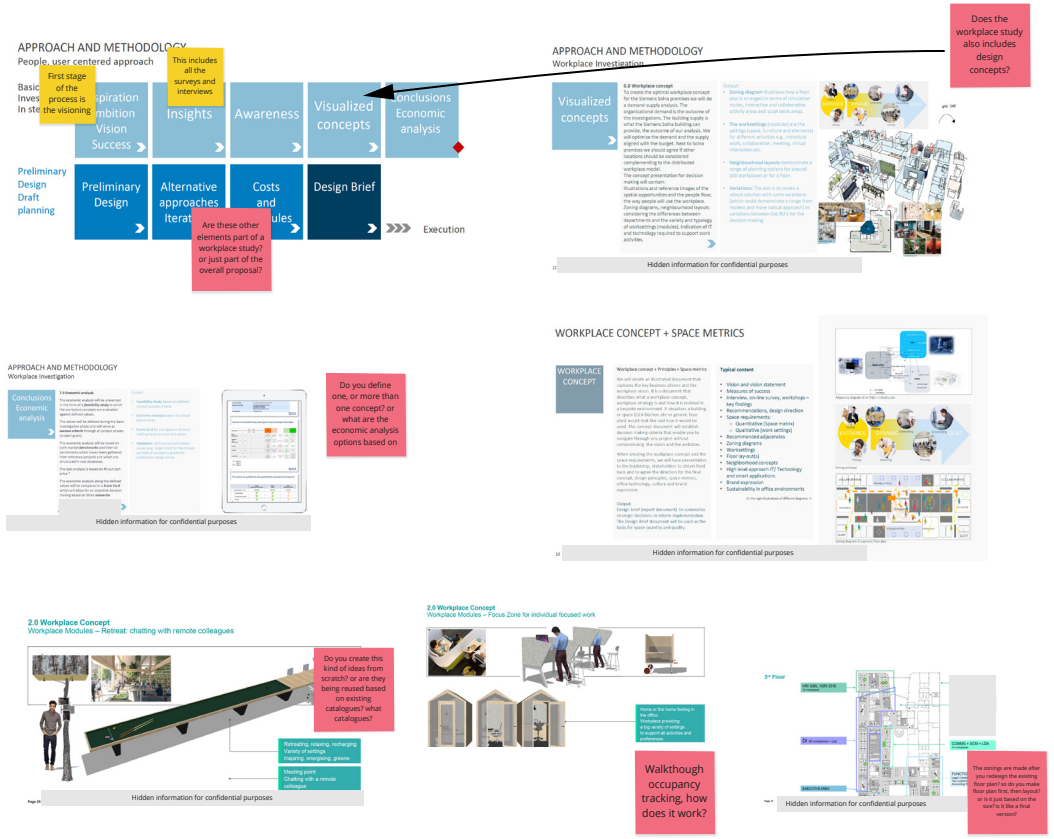


Figure 12. Internal analysis of a response to a client's RFP using Miro

In parallel to this stage, workplace research is usually conducted using interviews with team leaders and surveys of all employees. Sometimes this research phase is complemented with diary studies, occupancy measurements, or future journey co-creation workshops. The output of the second stage is a set of personas that describe the type of employees in the company, the number of employees represented by each persona, user pain points, space needs, and work dependencies.

In the third stage of the process, a design direction is defined using the input from the research stage. The design direction is completed with a workplace concept where zoning diagrams and examples of work settings for each persona and zone are defined. Space requirements are also defined using a space planning tool from which the primary input is the combination of the number of users represented by each type of persona and the work settings. The concept proposal is usually validated and iterated with the client or users before moving to the next stage.

Lastly, the concept is translated to the actual building floorplan to test if it fits the existing space in this final stage. Based on this test-fit, recommendations and scenarios are provided to the client next to the design brief. This is the input for the subsequent phases of the construction process (Figure 13). The detailed workplace study process with the duration, outputs, activities, tools, and people involved per stage can be observed in Figure 14.

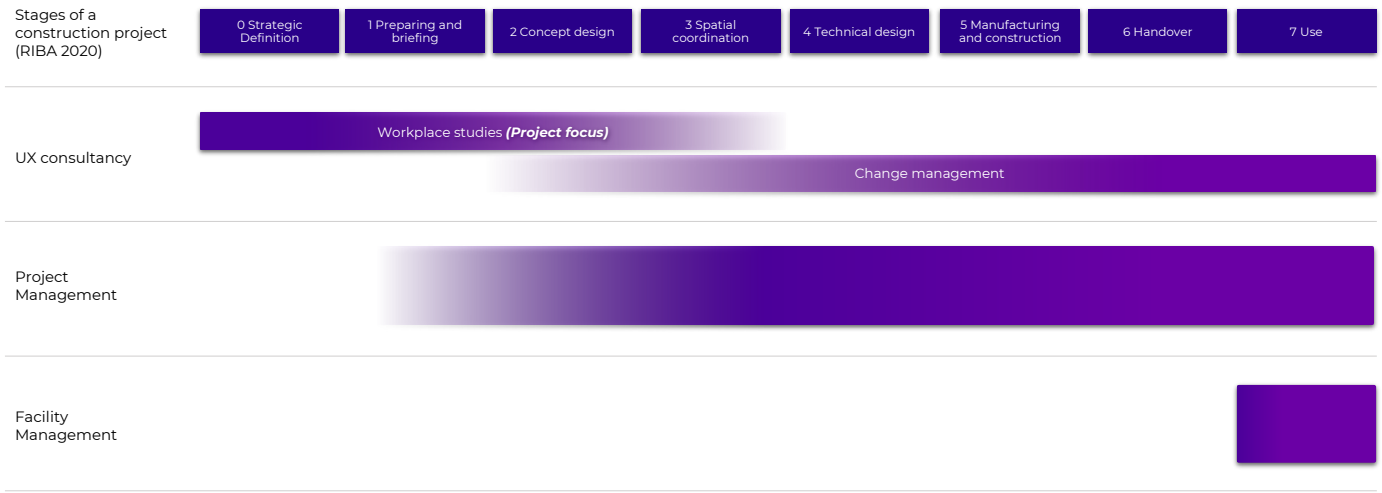


Figure 13. Drees & Sommer UX business line services and project focus associated with construction stages

5.3.1 INTERNAL AREAS OF IMPROVEMENT

The internal analysis opened up two improvement areas related to the workplace study process. First, the duration of workplace studies can be a limiting factor for some clients. For example, sometimes, clients have to make decisions before their lease contracts finalize, and they want to support their decisions with a workplace study. When the decision has to be expedited, the workplace study process cannot be deployed on time. In this case, the research stage is the longest stage of the workplace study process. It becomes the main constraint because it is dependent on the availability of participants, especially for interviews and complete population surveys. Other stages can be more flexible with time pressure by increasing resources like freelancers. Time can also be a limiting factor for small projects or projects with a low budget, where clients tend to skip the workplace study to start with the construction or renovation phases immediately. For example, this year, a client from the financial industry asked Drees & Sommer to develop a fast-track version of the workplace study because they had limited time since their lease building contract was close to expiring. As a result, they needed to define promptly whether or not to stay in the current location and the amount of space needed.

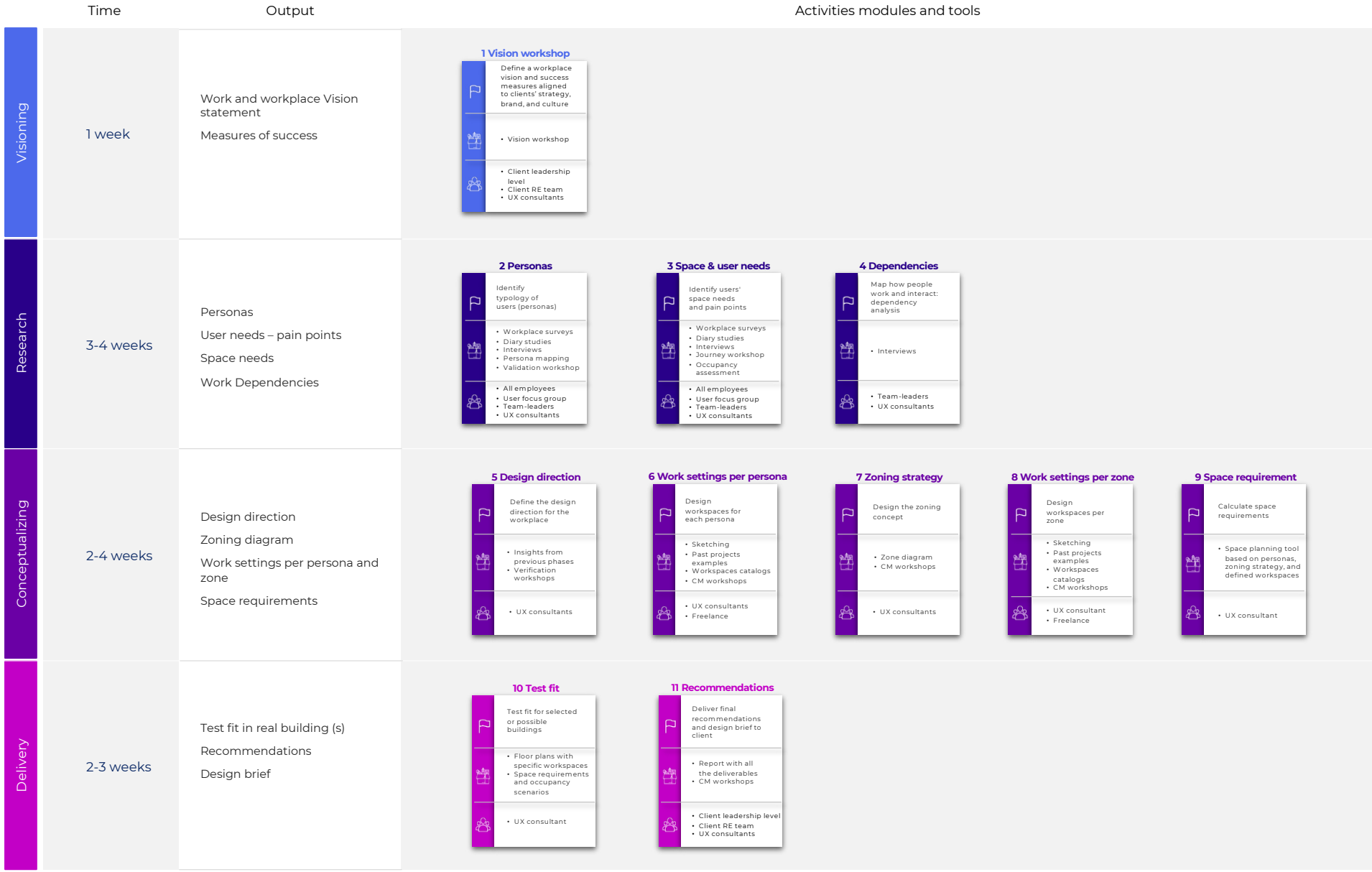


Figure 14. Current workplace study process, modules, tools, and outputs

The second area of improvement showed that the existing methods and tools used during the visioning and research stage of workplace studies focused on identifying current users' needs rather than future ones. In addition, the visioning stage mainly focuses on connecting the workplace vision to the current company strategy rather than creating a future-oriented one. A piece of evidence for this claim is example questions from visioning workshops, surveys, interviews, diary studies, and future journey workshops applied by Drees & Sommer during workplace studies' visioning and research stages (Table 1). These questions demonstrate that the issues addressed during the visioning and research stages are mainly connected to present, familiar, and near-future situations. Only a few questions explore an open future away from current restrictions or mindsets, such as the questions used in the visioning workshops and diary studies. Moreover, this opportunity area was directly discussed and reaffirmed with the UX team leader and the company supervisor.

Visioning workshops *Addressed questions during the workshops.*	What is unique about (company name)? How will people interact in 2025? What is your vision of the future of (Company name)? How can the building and workplace support that vision? What are the measures of success? What to keep, toss, or create in culture, brand, technology, workspace/settings, services?
Surveys *These are multiple-choice questions that come with a set of options or with a agree/disagree scale.*	What is your primary mode of commuting? What do you think would be the right balance between office and home office? When you can go to the office, what should the office offer you? To what extent does the office support the following activities? Please indicate what percentage of time you spend on each activity in a typical week. How well do the tools and technology support you in performing these activities? Considering the type of work you do, how important are the following features to you?
Interviews *Addressed questions during the interviews.*	What are the KPIs for your BU? What is your BU current headcount? Are there plans to change it in the future? Are there plans for changes in work practices in your team? What % of time does your team spend in the following spaces (desk, meeting room, lab, etc.) Describe how you interact/collaborate with other departments' teams? What works and does not work in the current workplace?
Diary studies *Included questions in diaries.*	Add a picture of your favorite workplace setting. Write a mind map about your workplace experience. What work settings did you use today? what did you use if for? what was the experience? What obstacles did you find in the office today? What is your perfect world?
Future journey workshops *Addressed questions during the workshops.*	What activities do you do on a typical working day/week? Where do you do them? What tools do you use? What difficulties do you encounter in each step? How do you feel about each step? (Your experience) What can be improved in the future journey?

Table 1. Example of questions included in five different tools used at Drees & Sommer workplace studies.
Note: This is a sample to support the claim. There are more questions and activities included in each tool.

6

PHASE 2: THEORY BUILDING

6.1 KEY TAKEAWAYS

The theory-building process started by mapping potential user research methods. In total, 42 user research methods were mapped. Figure 15 shows the result of the method mapping process. Methods were clustered in five categories and arranged based on the maturity level in workplace studies at Drees & Sommer. The five categories include traditional research methods for user-centered design, context mapping, strategy studies, co-design, and future studies. Traditional research methods for user-centered design have been well developed in workplace studies in the company. Additionally, some context mapping, visioning, and co-design methods have also been explored in the company before. Therefore, even though new specific methods are to be explored in these categories, 'future studies' methods present a new opportunity to innovate in workplace studies in the company.

'Future studies' combined with 'co-design' were the selected methodological approaches to explore and integrate during the tool development. The reason for selecting these two methodological approaches is that they respond to the two problems identified with the current workplace studies: making workplace studies more future-oriented and less time-consuming (Chapter 5). The main goal of 'future studies' methods is to inspire users, provoke conversation, raise questions, and explore future possibilities more openly (Bleecker, 2009; Auger, 2013). On the other hand, co-design is a design approach where researchers, designers, and users work together to understand a problem and find a solution. Furthermore, research insights focus on the latent needs level, which is fundamental when exploring the future (Sanders & Stappers, 2018). It can also be a more efficient approach to traditional user research because knowledge is brought directly to the design process by involving users and key stakeholders (Gardien et al., 2016).

The main takeaway from this chapter was identifying 'future studies' and 'co-design' as the focus areas for the tool development. Consequently, this chapter will provide some expert perspectives and theoretical background on these topics.

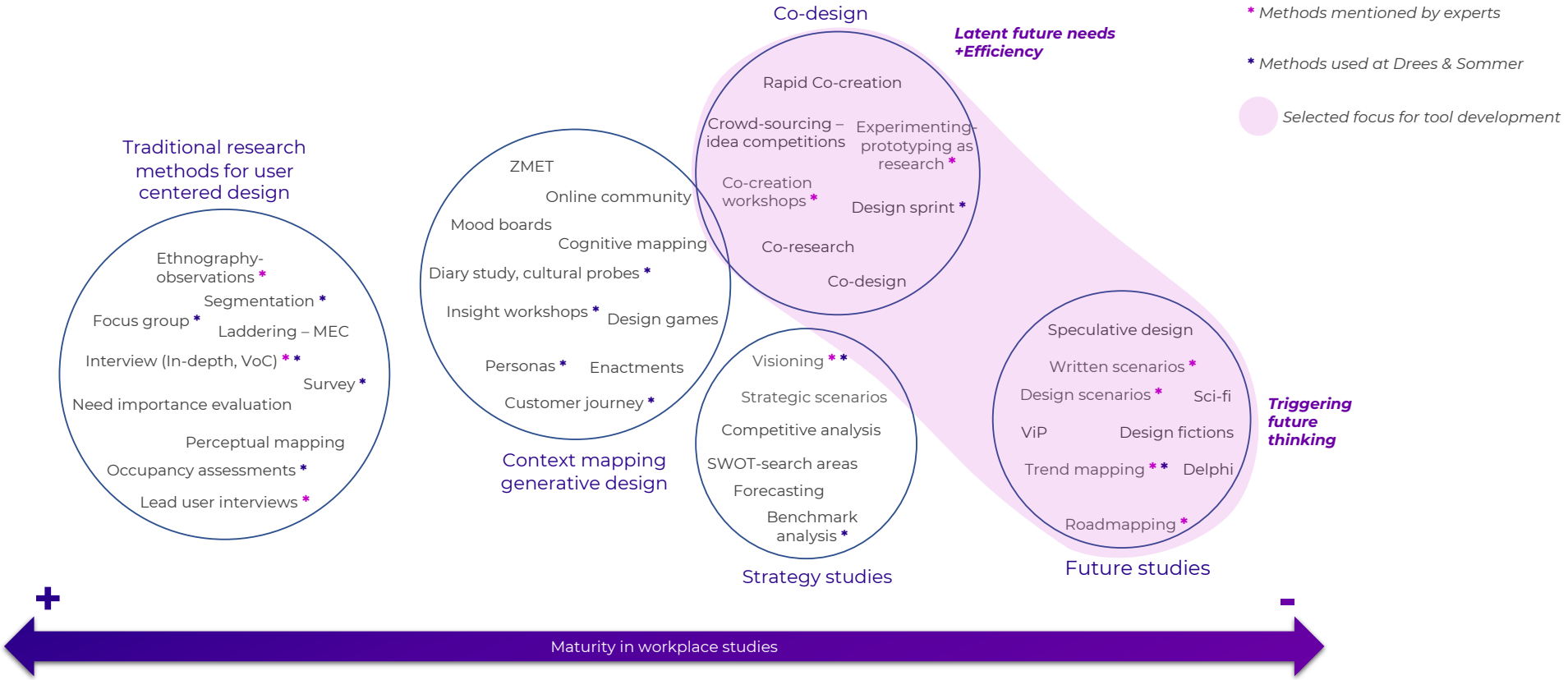


Figure 15. User research methods mapping result

6.2 METHOD MAPPING PROCESS

The method mapping process consisted of three iterations. First, user research methods from eight compiled design methods books were mapped (Table 2). Then, these methods were grouped into five categories: Traditional user research methods for user-centered design, context mapping methods, strategy studies, co-design, and future studies (Figure 15). Then, these methods were compared to those that Drees & Sommer applies (Chapter 5.3). Finally, the maturity level of the five clusters of methods was assessed according to the current workplace studies tools used at Drees & Sommer (Figure 15).

During the second iteration, five semi-structured expert interviews were executed. The participants were recruited using Drees & Sommer network (Table 3). Two of the experts were heads of real estate multinational companies, and they had previously collaborated with Drees & Sommer. Two other experts were founders of architecture and interior design studios in the Netherlands. The fifth expert was a part-time academic in urban design and works

Design research methods 8 books
Delft Design Guide (van Boeijen et al., 2020).
Strategic design: 8 essential practices every strategic designer must master (Calabretta et al, 2016).
Convivial toolbox (Sanders & Stappers, 2018)
Rapid Contextual Design (Holtzblatt et al, 2005)
Design Roadmapping (Simonse et al., 2018)
Sprint: How to solve big problems and test new ideas in just five days (Knapp, 2016).
Road Map for Creative Problem Solving Techniques (Heijne & Van der Meer, 2019).
ViP-Vision in design: A guidebook for innovators (Hekkert & Van Dijk, 2011)

Table 2. Method mapping iteration 1: Compiled design methods books

currently at Drees & Sommer. Each interview took 60 minutes, and they were conducted via zoom. The interviews were audio-recorded, and notes were taken. The interviews were divided into three sections. An interview guide with questions and some prompts was used (Appendix 16.3). The last section was about new methods for future-oriented workplace studies. I will only mention the insights from this section in this chapter. Some methods were reaffirmed based on the expert interviews, but no new methods were identified. The interviews also helped me find which methods have the most innovative potential in workplace studies. It reaffirmed the potential of future studies as an innovative methodological approach in workplace studies.

The last iteration was a literature review of the two groups of methods where the tool development will focus: 'Future studies' and 'co-design.' The selection of these two methodological approaches followed two criteria. First was the potential to solve the two problems of making workplace studies more future-oriented and less time-consuming. The second criterion was the innovation opportunity compared to other methods used in workplace studies at Drees & Sommer. Even though it was possible to find ways to improve or deepen the other three methodological approaches that the company has implemented, it will add more value to the company to incorporate new methods into their existing tools. Different directions were discussed with the company before selecting this approach. The next chapter presents some of these directions in more detail. On a personal note, it was also a more exciting challenge to explore the application of these methods in workplace studies. One of my motivations, when I chose this project was to deepen my knowledge of future and vision creation.

The literature review was made using the Scopus database. Thirty-two articles were analyzed, 20 for futures studies and 12 for co-design. These articles complement the insights from the eight books mentioned in table 2. Different keywords were used and combined. Figure 16 presents the keywords per methodological approach and the references of the 32 articles. The results from the literature review are presented at the end of this chapter.

	Role	Industry	Country
Interviewee 1	Head of real estate	Technology	Portugal
Interviewee 2	Head of real estate	Telecom	Germany
Interviewee 3	Founding partner	Architecture	Netherlands
Interviewee 4	Founding partner	Architecture	Netherlands
Interviewee 5	Urban designer	Real estate	Netherlands

Table 3. Expert interviews participants

Futures studies
20 articles

Key words

Design fiction | Speculative design | Future methods | Prospective | Sci-fi | Futures study | Foresight | Scenarios | Utopias | Futurology | Scenario building | Written scenarios | Future probes | Futures research | Workplace research

Used articles

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Co-design
12 articles

Co-creation | Real estate | Agile | Architecture | Workplace research | Co-design | Interior design | Collaboration | Design sprint | Participatory design | Workplace design | Fast prototype | Workplace prototype | User involvement

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Figure 16. Keyword for Literature and analyzed papers

6.3 INSIGHTS FOR TOOL DEVELOPMENT FROM EXPERTS

Audio recordings of the interview were transcribed into text using office 360 transcribe functionality. Then, the transcripts were coded using Atlas software. First, first-order codes were defined based on direct quotes from the participants. Then, these codes were exported and regrouped into second-order codes using an excel sheet. Most of the insights from the interviews connect back to the two selected methodological approaches for the tool development. The code structure and its connection to the methodological approaches can be seen in Table 4.

6.3.1 INSIGHTS FROM EXPERTS

One of the key insights from the experts was the invitation to open up to try new methods in workplace studies. Workplace studies in the past used to rely on long questionnaires, with many quantitative questions that became an input for space calculation sheets. These calculations provided a clear view of the amount and type of spaces needed but little information about the quality of the space. Furthermore, the real estate industry's success measures are moving from quantitative measures, where the quantity of the space mattered the most, to quality and variety as the primary measures of success (Faccio et al., 2020). Thereupon, the methods and tools used to design the workplace should adapt. *"Excel tables don't really work anymore. [...] We used to validate the size of an office compared to the workforce of a company by these excel sheets. [...] So, I guess, for me maybe, it's more about*

First-order codes	Second-order codes	Methodological approach
• Cocreate after vision • Cocreation as change management	Co-create after the vision as part of CM	
• Gaming as a method	Co-creation games	
• Experiment • Living labs	Experimenting (mock-ups, living labs, small scale)	Co-design
• Technology for prototype	Prototyping through IT	
• End of quantity ratios • Stories instead of calculations • Qualitative methods	Qualitative stories before metrics	
• Lead users • Selective with participants	Look for lead users	
• Open perspective with dreamed conceptual designs options • Let people compare options	Scenarios or conceptual options	Futures studies
• Vision first • Make visions concrete (visuals) • Vision beyond voting or consensus • Trendsetter	Vision first, but tangible	
• Show small steps	Roadmapping	

Table 4. First and second-order codes from expert interviews

collecting stories and wishes, or thoughts from people rather than sitting somewhere tapping how many hours they spend doing which activity, and then creating a kind of activity-based excel sheet" (Interviewee 3).

Experts also emphasized the importance of having a clear future vision as a critical step in building a future-oriented workplace. "The question is what is really the vision we w*ant to build, and that vision is local and has to come from the sight. At the same time, it has to be integrated with the corporate vision of the company"* (Interviewee 1). This is important because the current workplace study process usually starts with a visioning workshop. However, the problem identified in the previous chapter (chapter 5.3.1) is that the questions and outputs of this workshop are too focused on the current strategy and situation of companies. As a result, it works more as an alignment workshop between the strategy and the workplace than a future creation one. Thus, there is an opportunity to re-imagine this visioning workshop or complement it with the new tool.

To make sure that the vision is future-oriented in the first place, designers have the responsibility to open-up clients' and users' perspectives about the future. This can be achieved by showing people conceptual designs, visuals, or stories of potential visions and allowing users and key stakeholders to compare and discuss what they mean. *"Show people different kinds of potential visions. Kind of dream a little bit more [...] you could actually show them conceptual design images or much more abstract concepts [...]. Show them different options and say which one is better, so it's a different question. One question is out of your own library, 'tell me what you want', but you can also try and open up the library people have"* (Interviewee 3). This insight connects directly to the selected methodological approach of 'futures studies'.

Finally, it is crucial to know whom to involve in the process. Not everyone is ready to think about the future. Thus, involving lead users during the design phase is necessary, especially when thinking about the future. The rest of the users can be involved during the change management phase. *"[...] but the biggest value for future aspects you get from dialogues and there's always a very small group who is able to think about or is already a step ahead"* (Interviewee 4). This is also an important insight to consider when defining the tool procedure.

> *"Show people different kinds of potential visions. [...] So it's a different question. One question is out of your own library, 'tell me what you want', but you can also try and open up the library people have"* (Interviewee 3)

6.4 LITERATURE BACKGROUND FOR FUTURES STUDIES

The 'futures studies' field systematically explores possible, probable, and preferable futures (Bell, 1996; Inayatullah, 2013). Future studies aim to help people, organizations, and societies choose and create the most desirable future for the prosperity of humanity (Bell, 1996). Futures studies are also known in the literature as futures research, futures field, prospective, futurology, foresight, previsions, prognostics, and futuristics (Bell, 1996; Masini, 2010; Medina, 2006). Some of these concepts were developed in different regions, producing a variety of interpretations and methods for the discipline (Masini, 2010).

6.4.1 ANTECEDENTS AND EVOLUTION

Interest in the future has existed for generations. We can refer to historical figures trying to leave a vestige for posterity with statues or monuments, philosophers discussing the ideal world, writers imagining crazy scenes and plots, or shamans interpreting people's destiny (Masini, 2010). Historically, three perspectives have co-existed when exploring the future: Magic, narratives, and science (Kuosa, 2011; Medina, 2006).

The practice of predicting and preparing for the future is ancient, and it has taken many different forms. Many were supported by divination and connected to a mystical, magical or supernatural perspective. Foretelling, astrology, and many other methods are still considered good ways to predict the future for some people (Bell, 1996; Inayatullah, 2013; Kuosa, 2011). One key characteristic of this type of prediction is its deterministic orientation, in which the future already exists and can be seen by someone with the right power, knowledge, and methods (Kuosa, 2011).

The narrative perspective sees the future as something that might happen and therefore is open to a more extensive imagination. Two important narrative genres fit this perspective: Utopias and science fiction (Medina, 2006). Utopia is a concept from the 16th century. It is a fiction genre narrative where an ideal place is introduced. This place is usually distant from current societies. In the narrative, someone usually visits and lives with the habitants of this place and comes back to tell the story. Thus, problems in the current way of living are identified by contrasting it with the utopian world (Bell, 1996). On the other hand, science fiction combines scientific advancements and fiction to imagine the impact of actual or recreated technology in life in modern societies (Menadue et al., 2019). These narratives can also be used as a future research tool to evidence cultural paradigms, evaluate reactions or create new expectations (Raven, 2017).

The most recent perspective is supported by the scientific achievements of the 20th century and got stronger after the Second World War. The war showed people the value of planning and strategy, and it provided a platform to recover and develop new nations for the future. Most of the recent future studies techniques and principles were developed during this period, with a remarkable boom in the 1960s (Bell, 1996; Kuosa, 2011). This modern perspective is indeterministic because it acknowledges that the future constantly forms, involving many variables and complex iterations. Therefore, it uses empirical evidence and multiple sources of knowledge to provide different possible future deployments (Kuosa, 2011). A popular method created around the 1960s to gather this type of knowledge is trend mapping or technology assessment, where early changes in behaviors and technology become good indicators of further future changes (Bell, 1996; Simonse et al., 2018).

6.4.2 THREE METHODOLOGICAL APPROACHES FOR FUTURES STUDIES

Since its boom in the 1960s, futures studies have evolved from predicting the future to identifying possible futures to building a desirable future (Inayatullah, 2013; Amara, 1981). Each of these evolutions became a future studies approach with its own techniques and perspectives of the future. The first approach uses regressions and other mathematical models to project past events and forecast the future. These predictions tend to be highly probable because the research scope and variables are limited, and the time span is short-term. Consequently, the methods developed in this approach are mainly quantitative (Kuosa, 2011).

The second approach is known as the scenario paradigm (Kuosa, 2011). Its aim is no to predict an accurate future but to create possible options for the future that ignite discussions with different stakeholders (Dean, 2019). It also provides knowledge for organizations to prepare for the future (Goodier & Soetanto, 2013). Therefore, it is highly related to strategic scenario planning

techniques and roadmaps that connect the present to the selected future scenario (Dean, 2019). However, there are two primary differences between strategic planning scenarios and future scenarios. The first is the time span; future scenarios focus on the long-term, with horizons usually ranging from 5 to 50 years, while strategic scenarios are usually devised for five years (Inayatullah, 2013). The second difference is the scope. Traditional strategic scenarios seek plausible futures, coping with existing trends and forces to reduce risks and losses rather than creating future innovations and transformations (Dean, 2019). On a different note, the methods and inputs to develop scenarios are both qualitative and quantitative (Dean, 2019). One of the most popular methods used to gather data for scenarios is the Delphi method, where experts' opinions are gathered and iterated using different rounds of surveys until a consensus about the future topic is achieved (Renzi & Freitas, 2015).

The last approach is more about building the desired future. The focus is not so much on the accuracy of the prediction or the options that allow people to reduce risks; but on the visioning of desired futures and definition of current efforts to make the future happen (Inayatullah, 2013; Masini, 1983; Medina, 2006). This approach is also popular for addressing complex societal challenges, where the current trends and developments are part of the problem, and a new development path must be envisioned (Dreborg, 1996). It also requires more participatory techniques to understand the views of different stakeholders and create a vision together (Inayatullah, 2013; Medina, 2006). The creative and participatory approach of this approach also connects to the design discipline with methods such as speculative design, design fictions, and design scenarios, and the second theory topic of this thesis, co-design.

6.4.3 FUTURES STUDIES AND DESIGN

There are two approaches that designers use to conceptualize the future: design scenarios that are more focused on the present or near future and design fictions that are more future-oriented (Swanson, 2016). Design scenarios, also known as written scenarios, are narratives about a group of users, the activities they perform, a context where the activities happen, future technologies that support users in the activities they want to do, and interactions with the technology (Nardi, 1992; van Boeijen et al., 2020). This type of scenario combines realistic activities and challenges that users have with imagined future technologies and interactions. Thus, user research and data that backs up the activities, needs, and context, together with creative associations of technology and interactions, are necessary to build these scenarios (Nardi, 1992; Swanson, 2016). Design scenarios aim to provide an alternative vision of how the current challenges and activities can be addressed and stimulate ideas in different areas (Nardi, 1992). They are also used to help the project team understand and agree on criteria and the interaction that the solution must support (Boeijen et al., 2020). They are primarily suitable for the initial phase of the design process and are not intended as final solutions or predictions (Boeijen et al., 2020; Nardi, 1992).

Design fictions fall into a broader design perspective known as speculative design, which promotes conversation around societal issues by giving a form to possible future situations (Boeijen et al., 2020). It is also connected to other design concepts such as discursive design, design probes, and critical design (Auger, 2013). Design fictions deviate from pure fiction to create more logical futures by combining science fiction narrations, science facts, and design (Auger, 2013; Bleecker, 2009). Compared to the science fiction concept explained before, the main difference is how disbelief is suspended when using science-based elements in combination with physical representations, visuals, or prototypes. This balance makes the stories credible and allows people to immerse in them openly (Auger, 2013). The visuals or prototype is intended as a trigger for conversations instead of a testing object (Colombo et al., 2018). One advantage of speculative design is that it is not intended as a commercial activity to bring products to the market. Therefore, it creates an environment open to criticism (Auger, 2013). The main goal of design fictions is to generate conversations about the future, raise questions, explore the potential outcome of future technologies and evaluate the reactions of these technologies before they even exist. It is also a way to inspire users and identify their future needs (Auger, 2013; Bleecker, 2009; Noortma, 2019).

6.5 LITERATURE BACKGROUND FOR CO-DESIGN

Design practice has evolved from designing products or services for the market to designing for people in context and society (Margolin & Margolin, 2002), requiring a significant involvement of users and key stakeholders in the design process (Sanders & Stappers, 2018). On the other hand, the nature of problems is also becoming more complex (Barnett, 2000). Complex problems are comprised of many elements with multiple connections between them. The interconnectedness of these problems creates a system where small decisions or actions in one element can have many repercussions and effects in unrelated areas (Dorst, 2015). It also requires extensive collaboration because, in a complex situation, it is impossible for a single designer to absorb all the context and information to develop a compelling idea on their own (Dahle, 2019).

User involvement in the design process is not something new. The study of users to inform the design process has existed for several decades, and it is known as *'design research'* (Sanders & Stappers, 2018). However, there are two interpretations regarding user involvement. *'User-Centered Design'* and *'Co-design'* (Sanders & Stappers, 2008). On one side, users are seen as passive research subjects. The researcher and designer are considered the experts who take the insights from the research and translate them into solutions. The concept of User-Centered Design is a philosophy about designing products that adapt to the needs and values of users instead of forcing users to change their behaviors to use a specific solution (Chun et al., 2015). On the co-design side, users are seen as the real experts who co-create solutions together in collaboration with designers and researchers (Sanders & Stappers, 2008, 2018). This leads to the definition of co-design, which can be understood as the involvement of designers, users, researchers, and other stakeholders in the different phases of the design process (Chun et al., 2015; Sanders & Stappers, 2018; van Boeijen et al., 2020).

Accessing user and context knowledge becomes the essential goal of design research. However, accessing all the information before the start of the designing phase can become a time-consuming activity. Therefore, involving the right users and stakeholders during the different design phases can save time (Gardien et al., 2016). Furthermore, from the knowledge level perspective, design is a future-oriented activity because the solutions we design today will always be used in the future (Reeves et al., 2016). Thus, having access to users' future needs and values becomes very valuable. However, people cannot often articulate their needs, especially when we refer to the future; in this case, people are not even aware of them. Hence, combining what people say, do, and make during co-design sessions is a way to identify these future latent needs (Sanders & Stappers, 2018).

Even though co-design is gaining recent popularity due to the nature of the new problems designers address, its beginnings can be traced back to the 1970s in Scandinavia with the birth of participatory design. It was the first time that system engineers collaborated with unions and workers to develop and implement new computer systems for the workplace (Sanoff, 2006). Since then, participatory design has evolved, and several methods, definitions, and approaches have been developed (Caixeta et al., 2019). Related approaches are design activism, action research, context mapping, service design, and democratic design (Knutz et al., 2014; Sanders & Stappers, 2018).

6.5.1 CO-DESIGN IN BUILD ENVIRONMENTS

Participation of communities in the city planning process and the physical environment significantly impacted urban development in American society. This movement that started in the 1960s acknowledged the physical environment's impact on social and economic development (Sanoff, 2006). However, this participatory approach was more connected to urban planning than building design. Involving users in built environment design is not something new, but the extent to which users participate differs from the industrial design discipline (Chun et al., 2015).

User involvement in build environment design relates more to the user-centered design concept than to co-design (Lallimo, 2014). Built environment design usually involves users at two different moments. First, during the beginning of the project, to gather insights about the user needs through employee surveys and interviews. These insights are interpreted by the designer and translated into a building concept. Secondly, to test the final design with users. One popular

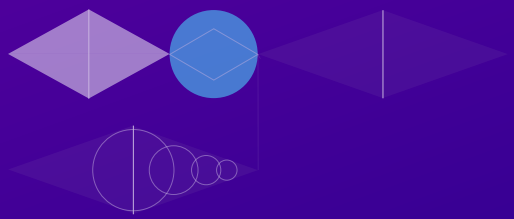
method is post-occupancy surveys. However, one of the most significant downsides of this approach is that involving users at such a late stage does not leave room for changes since the cost to change a built environment is too high. Therefore, the insights are used for future projects, but they do not help solve the problems identified in the final design (Granath, 2001).

The low level of user involvement in the rest of the design stages of built environments can be explained by the nature of the discipline, where both artistic and technical skills are required. According to Granath (2001), it is hard for architects to let go of the artistic component and involve other stakeholders in the process because art creation is considered an individual and not a collective activity. Advocates of greater participation in built environment design argue that involving users from early stages can have positive benefits in quality, costs and performance. However, they also acknowledge that participation can reduce the freedom and imagination of the design (Granath, 2001; Rigolon, 2011).

The technical aspect of the built environment also poses a limitation. Therefore, users are mainly involved in the early stages of the construction process, like strategic definition and project briefing (Caixeta et al., 2019). Even when there is a more active co-designing role, users' input tends to focus on the performance, behavior, and subjective aspects rather than on the technical requirements or space settings (Chun et al., 2015). Finally, the industry configuration poses another limitation to increasing user participation. The role and different expectations of investors, developers, owners, companies, designers, employees, leaders, teams, facility managers, and visitors add an extra level of complexity when defining whom to involve and when (Chun et al., 2015; Granath, 2001). On the positive side, the complexity of these iterations creates a good candidate to try a more participatory approach in built environment design (Dahle, 2019).

7

PHASE 3: PROBLEM FRAME EVOLUTION



7.1 KEY TAKEAWAYS

Three takeaways are highlighted from this chapter. The first is the final problem definition, the second is the design direction, and the third is the 12 requirements (Figure 17). All of these definitions guide the solution-finding phase of the design process.

There are three aspects worth mentioning about the problem statement—first, the tool focuses on workplace studies' research and visioning stages. Second, the tool should be time-efficient compared to other research methods used by the company. Third, the tool aims to trigger clients and users to think and speak about the future. On the other hand, the design direction incorporates the theoretical dimension by defining futures studies and co-design as the methodological approaches that support the solution. Two sub-questions are also defined in line with the selected methodological approaches from theory and the design direction:

1) How can future workplace predictions and trends be used to help people openly think and speak about the future workplace?

2) How to develop a co-design tool that provides visions and insights about the future workplace efficiently?

Problem

How to design a time-efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?

Design direction

To design a tool that incorporates future studies and co-design methods to trigger clients and users to think and speak about the future during the visioning and research stages of workplace studies.

Requirements

The solution should...

1. Provide a future vision in a ten-year time horizon.
2. Provide insights into user needs in a ten-year horizon.
3. Complement existing research and visioning methods.
4. Incorporate research-based content on future trends.
5. Present the future content creatively to inspire and trigger users.
6. Be durable with easily updated content.
7. Provide future-oriented ideas for the workplace design stage.
8. Be used with clients or lead users.
9. Be used in a workshop setting.
10. Require a maximum of 2 hours of participants.
11. Provide direct insights without the need for additional analysis.
12. Be flexible for different situations, projects, clients, and channels.

Figure 17. Problem, design direction, and requirements

7.2 PROBLEM FRAME EVOLUTION

The problem space definition started with the project brief question about developing a method/toolkit to create future workspaces with Drees & Sommer's clients. From this initial brief, the internal analysis process started (Chapter 5), and two problem streams were identified. The definition of the final problem was the result of an iterative process combining these two problem streams:

How to design a workplace study that takes less time?

How to design workplace studies to be more future-oriented?

Furthermore, some ideas were iterated from the early stages of the process to explore the problem in parallel to understanding the problem from the internal analysis (chapter 5) and the literature analysis (chapter 6). These ideas can be classified into three preliminary design directions (Figure 18). The first explored direction was about intervening in the whole process and seeing the bigger picture to make the workplace studies shorter. The second direction was to shorten the existing methods and design lean versions of current tools. These two directions primarily focused on the first problem of making workplace studies shorter. Finally, the third direction was incorporating new methods that were more future-oriented into the existing tools at Drees & Sommer. This direction is aimed at the second problem of designing more future-oriented workplace studies. The specific ideas defined at this stage can be seen in Appendix 16.4.

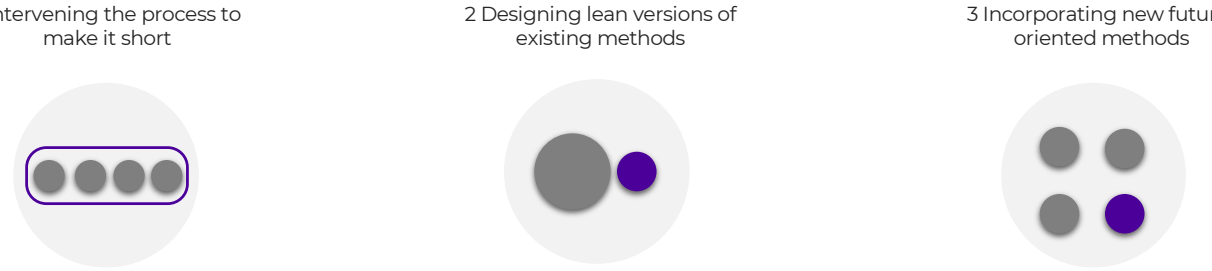


Figure 18. Three preliminary design directions

7.2.1 EVOLUTION OF THE FIRST PROBLEM STREAM: MAKING WORKPLACE STUDIES FASTER

The first stream about designing future workplace studies that take less time (top row of figure 19) was iterated three times. During the first iteration, the problem was reframed as redesigning the workplace studies to deliver value to clients in shorter periods rather than making the whole process shorter. This framing was derived after some discussions with the project mentors. The hypothesis was that the time pressure was caused by the clients' lack of understanding of the process and the produced value. However, evidence showed that the time pressure, derived from soon-to-expire leasing agreements, added time constraints to many projects (Chapter 5.3).

The previous problem frame led to an idea and eventually a new frame of the problem about designing a modular workplace study with different module durations. The idea was, for instance, to have a user's needs research of three sizes. A *small-size* version of three days using workshops and co-research methods, a *medium-size* version of one week using surveys, and a *large-size* version of two weeks using surveys and interviews. The current workplace study process was mapped during this iteration, and the four stages and 11 modules were identified (Figure 14). This second iteration was essential in problem understanding because it provided a bigger picture of the process and problem.

Finally, after seeing the bigger picture of the process, the final frame of the time reduction problem stream was defined. The conclusion was that the time problem of workplace studies mainly focused on the research stage, as evidenced in chapter 5.3. In addition, existing methods are mature enough to work well when there is no time pressure (chapter 6.1). Therefore, more value can be added by incorporating an alternative simplified user research method that can complement the existing methods and tools already implemented in the company.

7.2.2 EVOLUTION OF THE SECOND PROBLEM STREAM: MAKING WORKPLACE STUDIES FUTURE-ORIENTED

The second row of Figure 19 shows the evolution of the second problem stream of designing more future-oriented workplace studies. Based on the internal analysis (chapter 5.3) and the expert interviews about methods in workplace studies (chapter 6.3), it was possible to identify that the visioning and research phase are the two critical stages for designing a future-oriented workplace. If the vision is not future-oriented, the results of the rest of the process will not follow. The same happens with the research phase. If the insights are based on current user needs, the outcome will be a workplace for the present and not the future. An additional frame about the vision was also obtained from the expert interviews, which emphasized the importance of opening up users' and clients' perspectives about the workplace and the role of designers to trigger new ideas by showing conceptual designs and different sources of inspiration in the process (Chapter 6.3). Finally, the two frames were combined, and the last frame for this problem stream was formulated as triggering clients and users to speak about the future during the workplace studies' visioning and research phase.

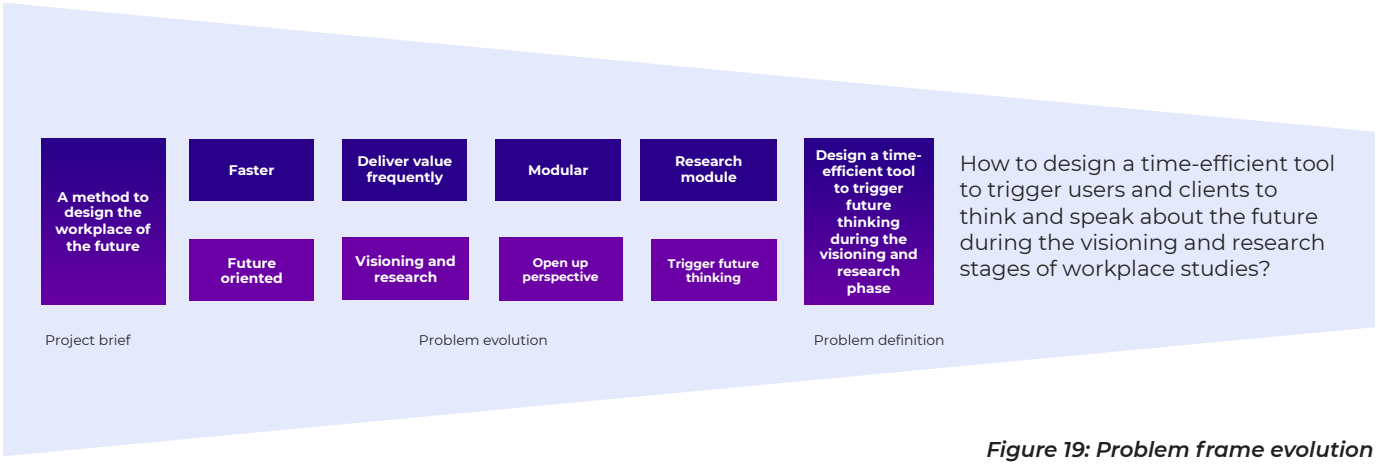


Figure 19: Problem frame evolution

7.3 PROBLEM DEFINITION

The different iterations presented before and the combination of the two problem streams led to the definition of the final problem. This problem guided the rest of the design process and the solution-finding. The problem can be represented by the following question: **How to design a time-efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?**

There are three critical components to this problem statement (Figure 20)—first the emphasis on workplace studies' research and visioning stages. The outcome of these two stages is a prerequisite to ensuring a future-oriented workplace concept. On the other hand, the research phase is where the time duration problem is concentrated. Therefore, designing an efficient tool becomes a second essential component to keep in mind. Finally, visioning and research are the product of clients' and users' insights. Hence, designing a tool that challenges and triggers both stakeholders to think and speak about the future is the last vital component of this problem statement.

In addition to the central design question, two other sub-questions were formulated, guided by the methodological approaches selected in the literature review: *'Futures studies'* and *'Co-design'* (Chapter 6). Each sub-question is associated with one of these methodological approaches. For example, one characteristic of futures studies is how it uses stories, predictions, and multiple sources of knowledge to support understanding of the future. It uses this knowledge to provide inspiration, conversation triggers, research objects, or tools for decision-making processes (Kuosa, 2011). This led to the definition of the first sub-question of this project: **How can future workplace predictions and trends be used to help people openly think and speak about the future workplace?** This first sub-question is also related to the third component of the central question about triggering people to speak and think about the future (Figure 20).

The second sub-question is connected with *'co-design'*: **How to develop a co-design tool that provides visions and insights about the future workplace efficiently?**. As explained in chapters 2 and 6, co-design is a methodological approach that supports two aspects of the central research question: triggering users to speak about their latent future needs and a possible time-efficient research tool.

How to design a time efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?

1. Focus on **research and visioning** stages
2. **Time-efficien**t tool for the research stage
3. **Trigger** users and clients to **think and speak about the future**

Figure 20: Problem definition

7.4 DESIGN DIRECTION

Futures studies and co-design were methodological approaches selected to support the solution development. The reasoning was explained in chapter 6; however, it can be summarized in three arguments. First, futures studies and co-design directly address the two key components of the problem, opening a solution space to create a tool where future thinking and time efficiency can be achieved. Second, the company has not yet explored the combination of future studies and co-design methods. Finally, my personal motivation is to learn new future and visioning methods as areas of expertise for my professional career. Therefore, the chosen direction for this project was: **To design a tool that incorporates future studies and co-design methods to trigger clients and users to think and speak about the future during the visioning and research phase of workplace studies**. This direction is also in line with the two sub-question of this project.

In order to refine this direction and guide the solution development phase, three criteria based on the literature from futures studies and co-design were defined: future timing, presenting the future, and the participation level. In addition, a fourth criterion regarding efficiency was included. The first sub-question is addressed by criteria one and two. Consequently, criteria three and four are associated with the second sub-question. These four criteria were translated to specific requirements in section 8.4 and supported the definition of solution ideas.

The future timing discusses how far into the future we should look. The answer to this question depends on the speed of the industry and how fast changes happen. For fast-moving industries such as the technology sector, the long term can be five years (Simonse et al., 2018). In the real estate industry, projects require a lot of time and resources to be developed (Gau & Kohlhepp, 1980). The high investments, contracts, intertwined connections of actors, and the cyclical structure of the industry require long-term planning (Wheaton, 1999). There has been innovation in the sector, especially in design and construction technologies (Rose, 2003). However, the workplace's overall concept has not suffered many changes (Faccio et al., 2020). On the other hand, according to Drees & Sommer definitions (Chapter 5), a future-proof office concept tends to be designed to last ten years. Based on this information, a ten-year horizon was used to set the discussions for the future workplace. From the future-studies theory, the long term is at least five years, never less. Therefore, a ten-year horizon aligns with the industry and the theory.

The second criterion had to do with how to support and present the future. This project focuses on the scientific perspective of futures studies in which the future is indeterministic by nature. It means that there are no black and white predictions because the future results from complex iterations of billions of variables. Therefore, gathering multiple sources of information, signals, and trends can become indicators of possible future changes and provide different possible future deployments (Bell, 1996; Kuosa, 2011). Hence, possible and desirable future

approaches will be used by providing researched information on possible futures as sources of inspiration and triggers but leaving open spaces to create desirable future visions (Inayatullah, 2013; Amara, 1981). Finally, it is essential to consider a creative way to present future inspirations. Using a suitable medium and form can increase participants' openness about the future (Auger, 2013).

The third criterion was about the participation level, and it has to do with co-design theory. Two questions arise, whom to involve and to what extent in the process. During workplace studies' visioning and research stages, three groups of participants can be defined: the leadership level, team leaders, and employees. During the visioning stage, the focus is on the leadership level. They are referred to as clients for this project because they are usually the people in charge of the organization, the investments, and major decisions of workplace projects. This group is small, and the tool is designed to work with them. On the other hand, team leaders and employees are the users of the workplace. Therefore, the solution should also include them. However, no distinctions will be made between team leaders and employees because the project aims to facilitate users to think and speak about the future workplace without the constraints from the present, including roles. Nonetheless, the solution will focus on a particular group of users, lead users, who have a more considerable ability to look into the future (Eisenberg, 2011).

The extent to which involve participants is the other question about participation level. Participants will be considered experts who collaboratively provide ideas about the future workplace in a workshop setting, aided by the designed tool. During the elaboration of these ideas, the discussion becomes a knowledge source about future needs. Moreover, the provided ideas are also an input for the designing stage and can be an additional source of inspiration for the designer. It is not the scope of this project to elaborate on the participation after the visioning and research stages, where the workplace design precisely occurs. Some thoughts about this are provided in the discussion (chapter 12).

The last criterion was about the efficiency of the tool. Chapter 5 explained the time constraint that the research stage of workplace studies poses on some projects, mainly because it depends on the availability of participants to collect data with interviews and complete population surveys. In addition, it requires extra time to prepare the research and do the analysis. The solution considers four aspects to make research more time-efficient. First, reduce the preparation time by creating a standard tool easily adaptable to different situations. Second, simplify the data collection process by relying on lead users and clients who, in a participatory way, co-create solutions and generate insights in the process. Third, increase the availability of finding participants with a workshop that takes two hours. Lastly, shorten the analysis phase by providing direct insights after using the tool without going back to transcribe and analyze the content.

7.5 REQUIREMENTS

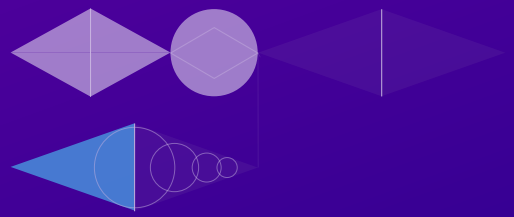
The four criteria explained before were expanded into twelve specific requirements. For example, requirements 1 to 3 responds to the first criterion of future timing. Requirements 4 to 6 refer to the second criterion of supporting the future. Requirements 7 to 9 respond to the third criterion of participation. Lastly, requirements 9 to 12 refer to the fourth criterion of efficiency.

These requirements were used to evaluate the different ideas during the solution development phase. In addition to these requirements, desirability, viability, and feasibility analysis complemented the evaluation.

1. The solution provides a future vision of the workplace in a time horizon of ten years.
2. The solution provides insights into user needs and values in a ten-year future.
3. The solution fits and complements existing research and visioning methods without causing contradictory insights or outputs.
4. The solution incorporates research-based content on future trends and developments.
5. The solution presents the future content in a simple and creative way to inspire and trigger users to think about the future.
6. The solution is durable, and the content can be easily updated.
7. The solution provides future-oriented ideas for the workplace design stage.
8. The solution can be used with clients or lead users.
9. The solution can be used in a workshop setting.
10. The solution requires a maximum of 2 hours of participants.
11. The solution provides direct insights without the need for additional analysis.
12. The solution is flexible enough to be used in different situations, projects, clients, and channels without strenuous preparations.

8

PHASE 4: UNDERSTAND-ING THE FUTURE WORKPLACE



8.1 KEY TAKEAWAYS

There are two components developed in this project: tool and content. The tool component connects directly to the central question of this thesis about developing an efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies.

On the other hand, the content component develops an understanding of the future workplace trends and developments and uses this information as triggers in the tool. This component responds to the first-sub-question and to the design direction of using 'futures studies' as a methodological approach for the tool. This approach creates inspirational content about the future to elicit conversations with different stakeholders. The content is a combination of research, design, and imagination (Auger, 2013; Bleecker, 2009; Noortma, 2019). This and the next chapter will focus on the content component before moving to the solution development in chapter 10.

Trend mapping on 45 sources of information provided around 600 signals about the future workplace. These signals were clustered into 66 factors and complemented by expert and user interviews. The final result of the process was 76 factors grouped into seven categories: Economy, social/culture, politics, environment, technology, work, and workplace. These factors are the most granular form of content for the tool development. Therefore, the rest of this chapter elaborates on the process of defining them. Other levels and forms to present the content were tested with users and are described chapter 9. Figure 21 shows an example of some factors in the seven categories. Appendix 16.5 presents the 76 factors in detail.

Domain	Economy	Social/culture	Political	Environment	Technology	Work	Workplace
Factor example	Ecosystems move: No boundaries between industries	Not everyone has the conditions to work from home	Geopolitical instability will continue to grow	Sustainability is at the center of companies' strategy	There is a new reality: Metaverse, NFTs, Avatars economy, VR, AR	People want to go to the office without losing the flexibility they gained	From my space to our space: The era of no dedicated spaces
Other factors	+6	+12	+0	+5	+8	+11	+27

Figure 21. Future workplace factors examples

8.2 METHOD FOR UNDERSTANDING THE WORKPLACE CONTEXT

Three sources of information were used to create the future content in the domain of the future workplace (Table 5).

8.2.1 Trend mapping

In the initial phase of the trend mapping process, 617 signals were collected from 45 publications from 23 sources, such as specialized workplace and architecture magazines, consulting firm reports, and university reviews. The leading search keyword was “future workplace”; however, additional sociocultural, technological, economic, political, environmental, and work model signals were included. The sources were not older than the year 2020. Table 6 shows the primary sources of information and the number of signals identified. Appendix 16.2 exhibits the detailed publications. Signals were highlights from the literature that could indicate a possible trend. These signals were documented using post-it notes on a Miro board. Figure 22 shows an example of 14 signals collected from a Harvard business review publication.

8.2.2 Expert interviews

The same five expert semi-structured interviews used for the method mapping section (Chapter 6) were used to identify supplementary trends about the workplace and dive deeper into those from the trend mapping exercise. These interviews were divided into three sections.

Information source	Goal	Method
1 Trend mapping	Identify workplace trends and developments.	Trend mapping (+40 sources, including consultancy firm papers, architecture and workplace studies, magazines, and newspapers).
2 Expert interviews	Identify additional workplace trends and developments. Dive deeper into mapped trends.	5 semi-structured online interviews with experts.
3 Users interviews	Identify additional workplace trends and developments. Connect user needs to workplace trends.	5 semi-structured and interactive interviews with lead users from different roles, industries, and work models.

Table 5. Sources of information and methods for understanding the context

Type	Source	Signals
Consultancy firms reports	Accenture	44
	BCG Global	29
	CBInsights	7
	Deloitte Insights	20
	Gartner	4
	McKinsey & Company	25
	PWC	3
	World Economic Forum	26
Architecture/workplace firm report	Gensler	67
	Hermanmiller	25
	Leesman	12
	Moser Associates	14
	Steelcase	89
	Workplace Insight	17
University reviews	Harvard Business Review	69
	Mit Sloan Mngm	110
Other	AESC	3
	Bloomberg	20
	Forbes	3
	Future Forum	3
	Harvard Gazette	8
	RMIT	4
	Work Design	6

Table 6: Sources for trend mapping

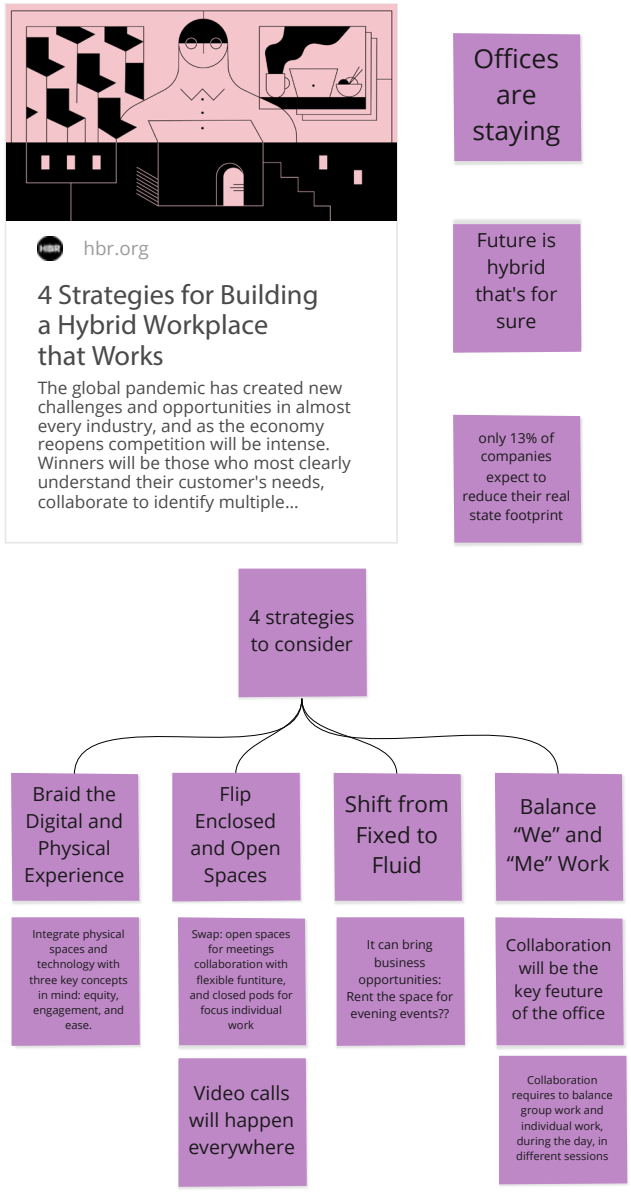


Figure 22. Signal collection example

The first section of the interview was about the expert's vision of the future of the workplace. The second section presented some insights from the trend mapping process to participants. Then participants were asked to rank the relevance and uncertainty of some topics and discuss missing elements in the trends. The final section was about new methods for future-oriented workplace studies. This chapter highlights the results from the first two sections. The detailed interview guide with the different questions and prompts used can be seen in Appendix 16.3. The transcripts of the interviews were coded using Atlas software. First-order codes were defined based on direct quotes from the participants on the Atlas software. Figure 23 shows an example of a first-order code connected to a quote from interviewee 3. Then, these codes were exported and regrouped into second-order codes using an excel sheet. Finally, the codes were compared to the factors identified during trend mapping. As a result, 11 out of the 16 second-order codes from expert interviews provided additional insights about the future workplace. Table 7 displays the code structure and the codes that provided new insights.

8.2.3 USER INTERVIEWS

User interviews were designed with two goals in mind. First, as a way to explore future user needs that could complement the future workplace trends mapped from literature and expert interviews. Second, to test which content levels triggered users to think and speak about the future. The insights presented in this chapter will refer to the initial goal. Five semi-structured interactive interviews were conducted. The participants were recruited using my personal network. Three criteria were used to select the participants. They must have an office-related job. They must be lead users. Moreover, they must be from different roles, industries, and work models. Table 8 shows an overview of the participants and their profiles.

One week before the user interviews started, a sensitizing question was sent to users every day from Monday to Friday using WhatsApp. Users replied to the questions using the same channel. They could send words, audio, or photos. The sensitizing questions can be seen in Appendix 16.6. After sensitizing, users were interviewed.

Figure 23: Example of a first-order code from an interview transcript using Atlas Software

Each interview took 60 minutes, and they were conducted via zoom. The interviews were audio-recorded, and notes were taken. The interviews were divided into three sections. An interview guide with questions and some prompts was used (Appendix 16.7). The first section of the interview dived into the questions from the sensitizing materials to get the users' initial thoughts about the future workplace. The second section of the interview was an interactive exercise using a Miro board to test different content levels as triggers. While users did the interactive exercises, they were asked to elaborate on the process and decisions. Section three was about the users' feedback on the method used. This chapter elaborates only on section one and the reasoning for the users' decisions in section two.

Participant	Role	Work model	Industry
Interviewee 1	Analytical	Hybrid	IT logistics
Interviewee 2	Interactive	Hybrid	Real estate
Interviewee 3	Team lead	100% home	Financial
Interviewee 4	Creative	Hybrid	Architecture
Interviewee 5	Commercial	100% office	Retail

Table 8. User interviews participants

First-order codes	Second-order codes	New insights?
Big retail stores into offices; Commercial/office space combined; Hybrid neighborhoods; Office as a retailer; Residential/office mix; Work private life mixed	Hybrid/mix space development	Y
Fun activities/amenities; Expanded amenities; Bring at office what people can not have home	Offer what people cannot find at home (extended ammenities)	Y
Cool, emotional, colorful, cozy; Cool/unique locations to differentiate; Define the unique vibe of your office; User experience	Focus on the wow factor: workspace and location to differenciate	Y
Ecosystem of spaces; Distributed workforce; Hybrid; in hybrid distance matters less; Home for convenience	Ecosystem of spaces :next level hybrid	
Wellbeing; Mental health	Wellbeing	
Involve cities and other stakeholders; New business models; Flexible real estate agreements; Role of owners/investors;	New flexible business models of real estate need to be in place	Y
Variety of work settings; End of open plan floors; No department divisions; Office space not reduced; Purpose	Flexibility of worksetting with purpose	Y
Frictionless online collaboration; Avatars; Balance between physical, privacy and digital	Phygital life	Y
Outside public environment; Public space vs cybersecurity	Semi-public spaces	
Critical about sustainability; Sustainability a must	Sustainability a must, not a trend	
Real time spatial data inteliggence	Real time space data intelligence	
User empowerment; Space booking; Team empowerment	Empowerment of users	Y
Workplace to build culture; Connection to company	Environments shaping culture as a key differenciator	Y
Mainly collaboration/retreat; Not for meetings; Office as a conference centre; Personal/human connections; Social capital as differenciator	Workplace for human interaction	
Office for brand/uniqueness	Workplace as a brand showroom	Y
Employee retention; Employee retention; Team building	Workplace for employee development, attrition & retention	Y
Workplaces will change; Desk sharing increased; Less space demand; Not everyone has the conditions	Offices will change but not disappear	Y

Table 7. First and second-order codes of expert interviews

The interviews were audio-recorded and later transcribed into text using office 360 transcribe functionality. Then direct quotes from the interviews were coded into first-order codes using Atlas software. Next, the codes were exported and regrouped into second-order codes. Finally, the codes were compared to the factors identified during trend mapping. Seven out of the 15 second-order codes from user interviews provided additional insights about the future workplace. Table 9 exhibits the code structure and the codes that provided new insights.

First-order codes	Second-order codes	New insights?
Colorful/dynamic; Cool varied spaces; Lightning for every moment	Focus on the wow factor: workspace and location to differenciate	Y
Location relevant	Location still matters	
Social interaction; Culture, innovation and social interaction	Workplace for human interaction	
Diversity of thought; Inclusive culture	Workplace to enable a diverse culture	
Household amenities; Fun extended ammenities	Offer what people cannot find at home	
No hierarchy workplace; No divisions workplace	No division workplace	
Reserve spaces coworking type; Distributed workplace; Coworking spaces; No designated desk	Next-level hybrid	
Noise needs to be solved	Noise and comfort needs to be solved	Y
Office as showroom	Workplace as a brand showroom	Y
Active office/exercise; Nature/outdoors; No monitoring/techhealth invasive; Greener office	Greener and healthier workplaces	
Virtual meeting effective with retail stores; Digital/avatars/metaverse; Full virtual	A new digital workplace	Y
Grow without extra cost	Hybrid brings flexibility for growth	Y
Work anywhere; Hybrid; taxes for digital nomads	Work anywhere is the big dream	Y
Ikea design yourself	Design your own space	
All resources at hand; Separate personal/professional life	Work and private life needs to be separated again	Y

Table 9. First and second-order codes of user interviews

8.3 SEVENTY-SIX FUTURE WORKPLACE FACTORS AS THE MOST GRANULAR FORM OF CONTENT

Seventy-six future workplace factors were defined after combining the insights from the three sources of information. The basis was the trend mapping results. First, the 617 signals from trend mapping were clustered with similar signals and resulted in 66 initial factors. Figure 24 presents an example of different signals from different sources grouped into the same factor. The different post-it colors represent a specific information source.

Then, the second-order codes from expert and user interviews were compared to the initial 66 factors. Ten new factors were created during this process, and six existing factors were complemented. Figure 25 displays the analysis process. Finally, the 76 factors were organized into seven categories: Economy, social/ culture, politics, environment, technology, work, and workplace. Appendix 16.5 shows the final 76 factors divided into the seven categories and denoting what factors were obtained or adapted from expert and user interviews.

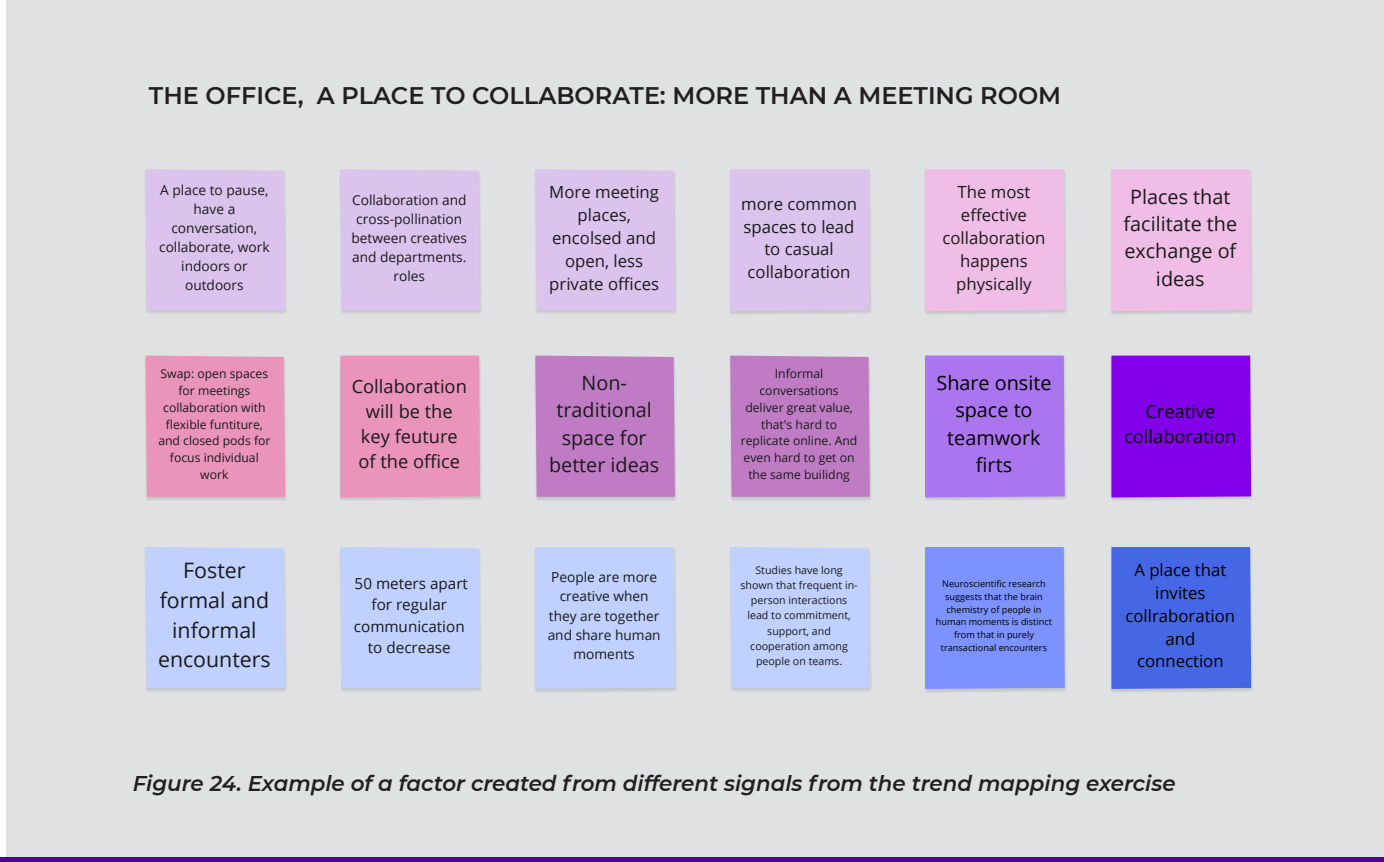
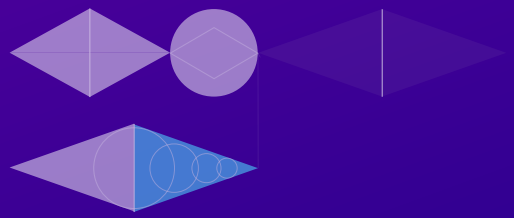


Figure 24. Example of a factor created from different signals from the trend mapping exercise

Figure 25. The process of defining the 76 future workplace factors

9

PHASE 5: DEVELOPING & TESTING DIF-FERENT LEVELS OF CONTENT AS TRIGGERS



9.1 KEY TAKEAWAYS

During this phase, the 76 factors about the future workplace were used as a granular ingredient to create different layers of content and test if they triggered users to think and speak about the future workplace. Each of the four iterations consisted of a cycle with two activities: Content creation and testing. The insights of each test were applied to the next iteration of content creation. The 28 factors related to the workplace category were used in the first iteration. During the second iteration, 12 dimensions were defined by clustering different factors. In the third iteration, four future scenarios were determined by combining the 12 dimensions. Finally, a combination of dimensions and factors was used in the last iteration to create a workplace development map with three timelines (past, present, and future). The last iteration also involved a co-creation session with other designers who provided ideas for the future timeline. The user testing in each iteration provided different insights. The combination of dimensions and timelines was the selected content level for the tool development. Figure 4 of chapter 4.1 presented the outcome of this iteration, a workplace development map with three timelines (Status quo, current changes, upcoming trends) and five dimensions (Work model, location, space, service, and technology). Figure 26 exhibits the process and general insights from each test round.

9.2 TESTING PARTICIPANTS

Ten users participated in the four iterations. Five of them were the same users from the interviews mentioned in the previous chapter. The user interviews were designed with the double goal of gathering other workplace trends and testing which content levels triggered users to think and speak about the future. The insights presented in this chapter will refer to the second goal. The information about the participants and how they were recruited was presented in chapter 8.2.3. The interviews were divided into three sections. The second section of the interview was an interactive exercise using a Miro board to test different content levels as triggers. Section three was about the users' feedback on the exercise. This chapter elaborates on sections two and three. The interview guide with all the sections, questions, and prompts can be accessed in Appendix 16.7. The five interview participants contributed individually in either iterations 1, 2, or 3.

Iteration 4 was made in a workshop setting with five additional participants. The participants for the final iteration were five master's students from the industrial design faculty at TuDelft. They were recruited using my personal network. Table 10 displays the participants assigned to each iteration.

Iteration	Content level	Activity	Participants
Iteration 1	Factors	Interactive interview with Miro	Interviewee 1, 2
Iteration 2	Dimensions	Interactive interview with Miro	Interviewee 3, 4
Iteration 3	Scenarios	Interactive interview with Miro	Interviewee 5
Iteration 4	Horizons+ Dimensions	Physical workshop	5 IDE students

Table 10. Participants for content testing

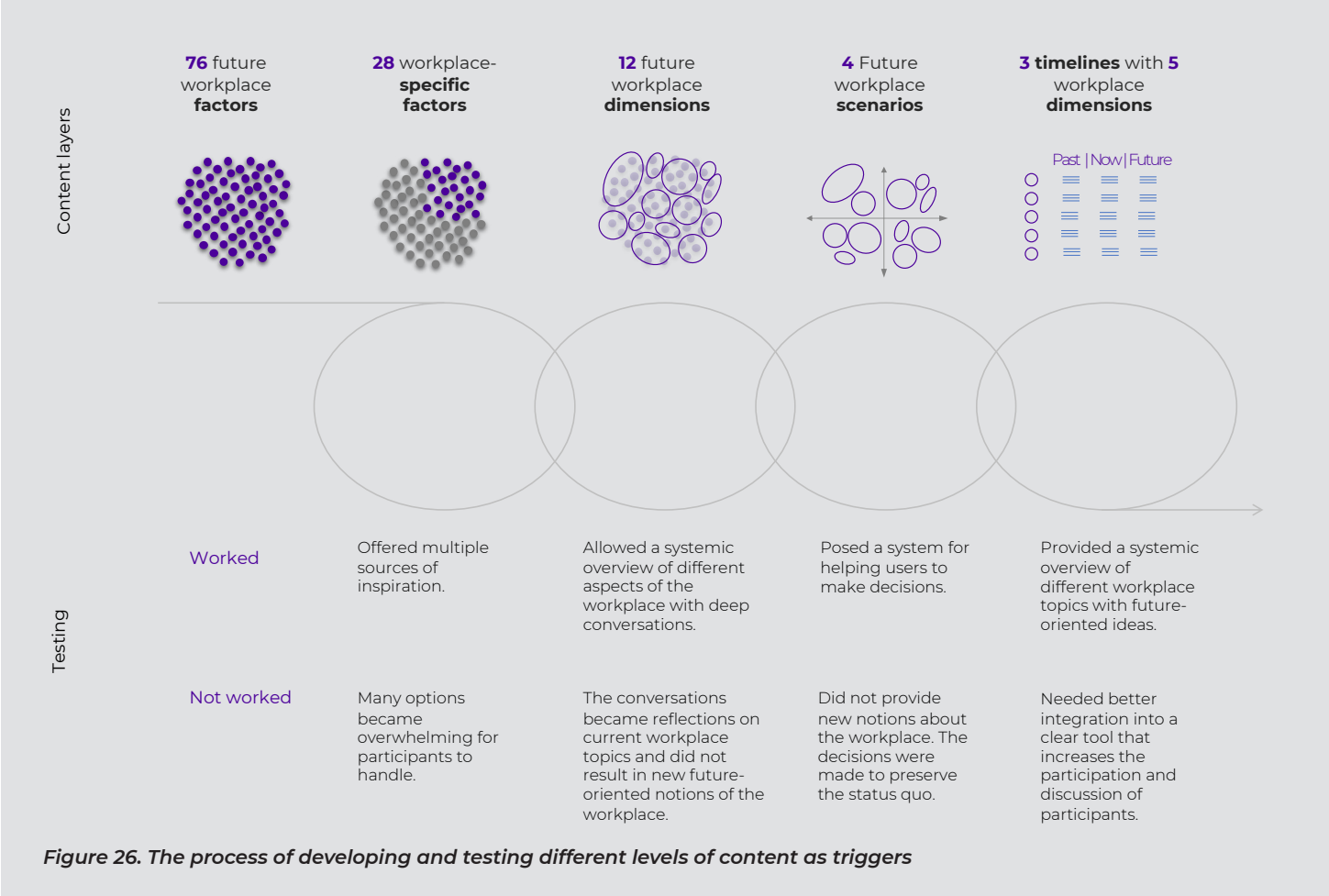


Figure 26. The process of developing and testing different levels of content as triggers

9.3 ITERATION 1: USING FACTORS AS A TRIGGER

9.3.1 CONTENT CREATION

The 76 future workplace factors were divided into seven categories (Figure 21). One of these categories included 28 factors specific to the workplace. These factors were selected, and the 48 remaining factors from the economy, social/culture, politics, environment, technology, and the work categories were assigned to the workplace-specific factors as additional external support. The classification was made using a Miro board where all the factors were easily visible. The workplace-specific factors were the target, and the factors from other categories could be designated to them. Figure 27 exhibits an example of a workplace factor supported by five additional factors from other categories. During the testing, users could initially see only the workplace-specific factors. However, they could expand the information and check the related factors from other categories if they needed extra information. The 28 workplace-specific factors used for this iteration can be viewed in Appendix 16.5.

9.3.2 TESTING PROCEDURE

Two participants were individually involved in this iteration. Each testing exercise took 35 minutes, with ten additional minutes for users to give their feedback on the exercise. The exercise was made using a Miro board. The exercise consisted of four activities. During the first activity, the 28 workplace-specific factors were shown, and users were asked to drag to the right the factors they found most relevant to implement in the future workplace. During the first activity, users had the chance to ask about the factors and check the related factors of other categories by double-clicking the cards (Figure 27). In the second activity, participants added new factors that they considered missing in the initial list. The third activity was a ranking exercise using a c-box with two variables: The factor's importance level and the impact they foresaw for each factor in the future workplace. Lastly, they were asked to provide ideas of their ideal workplace in 2032 using the factors clustered on the top-right quadrant. Appendix 16.8 presents the board used for this exercise and the results for the activity made by interviewee 1.

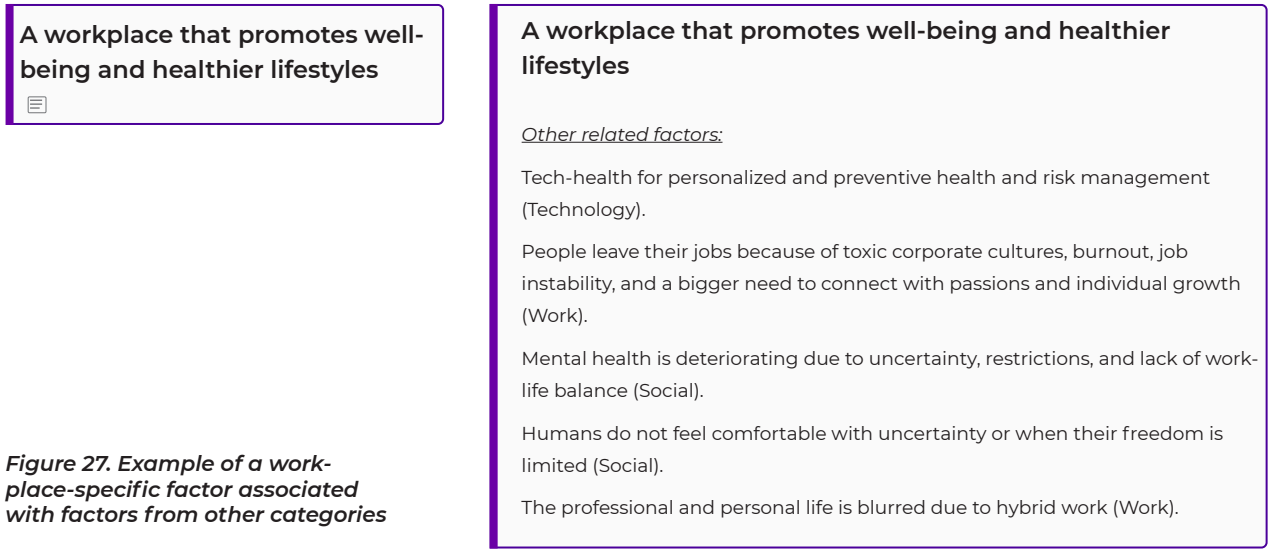


Figure 27. Example of a work-place-specific factor associated with factors from other categories

9.3.3 TESTING INSIGHTS

The insights were obtained by analyzing the Miro board results and the recordings of the third section of the interviews, where users were asked to give their feedback on the exercise. The last activity of the Miro board showed that users had the ability to produce ideas for the future workplace by using the factors as inspiration. When comparing the ideas produced with the 28 factors, it was possible to fit all the ideas into the pre-given factors (Figure 28). However, the provided ideas were also more detailed and connected to the particular situations of the participants. This takeaway was incorporated into the final tool: Offering participants an open space to provide specific ideas for their context inspired by some future factors.

Positive and negative feedback was received from this exercise. The positive feedback was that the different factors inspired people to think about topics they usually would not have imagined. *"The method you implemented really makes you think about all the options there are. [...] There was stuff there that I didn't even think about"* (User interview 2). On the negative side, the numerous factors limited participants and made the activity complex since they felt they had to read and understand each of them. *"What I see is that there are many categories and they could be less"* (User interview 1) *"That's really a lot, because in my mind I want to have a good reason of where should I put them. [...] It makes choosing really hard"* (User interview 2).

9.4 ITERATION 2: USING DIMENSIONS AS A TRIGGER

9.4.1 CONTENT CREATION

Based on the insights from the previous iteration to reduce the number of elements presented to users and inspired by the ViP method of Hekkert & Van Dijk (2011), the 76 factors were grouped into dimensions. The clustering process was made using a Miro board, and factors from all categories were combined according to the implications they could have on the workplace. The result was 12 dimensions of the future workplace. Each dimension was given a title and a definition (Figure 29). Appendix 16.9 exhibits the related factors to each dimension.

9.4.2 TESTING PROCEDURE

Two additional participants contributed to this iteration. Like the previous iteration, each testing exercise took 35 minutes with ten additional minutes for feedback. The exercise was made using another Miro board .The exercise consisted of four activities. The 12 future workplace dimensions were shown during the first activity, and users were asked to rank them based on their personal relevance level. In the second activity, participants added new dimensions that they considered missing in the initial list. During the third activity, participants made an additional ranking exercise using the uncertainty level of each dimension. After combining the ranking of activities one and three, they ended up with a C-box of relevance and uncertainty. The final activity was to provide a future vision for the workplace in 2032 and ideas of how to materialize

Figure 28. User testing ideas of content iteration 1 connected to factors

that vision using the dimensions clustered on the top-right quadrant. Appendix 16.10 presents the board used for this exercise and the activity results obtained by interviewee 2.

9.4.3 TESTING INSIGHTS

The dimensions allowed participants to have an overview of different topics about the workplace and created a platform for them to give more open interpretations and ideas of the topics. For instance, the first participant focused on discussing each dimension and the implications they could have in her current workplace. This participant did not finish the four activities. However, she took each dimension and started reflecting on it. The dimensions inspired her to speak about the future workplace on different topics. For example, when she was discussing the dimension of *Greener open spaces to promote wellbeing*, she commented: "*I can imagine it, like a place on the ground floor, a big park, with cafes, chairs around, and plants. I would like something like that, I imagine it now, cool, I like it*" (User interview 3). For the second participant, the exercise was also a source of inspiration. He was more selective in having opinions on specific dimensions, and he finalized the exercise on time. For example, he was inspired by the dimension of *The workplace, the center of culture, brand & human capital*, and it triggered some ideas: *"The office is not just a place to work, it is also a showroom of what we do. We do interior design, so our chairs should talk about design, our socket should talk about design, everything should talk about what we do [...] So people are always in contact with the products"* (User interview 4).

Figure 29. Twelve future workplace dimensions

The direct feedback about this exercise was, in general, positive. People felt the dimensions opened up their perspective and overall vision of different workplace elements. *"I think that it enriches the discussion, it opens up the perspective because sometimes we have not thought about all of that, then this makes you have an idea of the ideal future"* (User interview 3). On the negative side, the output of the exercise became more reflections about the different dimensions based on current participant perceptions rather than new future-oriented notions of the workplace. *"I don't think the vision changed; however, I think that it became more tangible, down to the earth"* (User interview 3). This insight was incorporated into the final concept. Dimensions are used in the tool to keep a systemic view of the different aspects of the workplace.

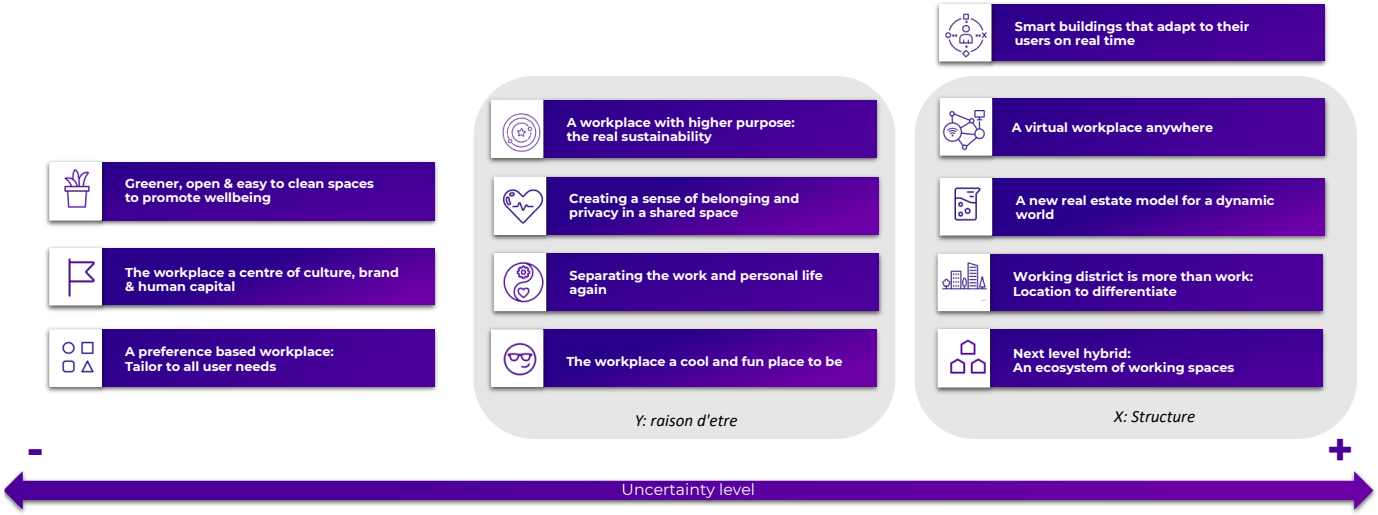


Figure 30. Dimensions' uncertainty level

9.5 ITERATION 3: USING SCENARIOS AS A TRIGGER

9.5.1 CONTENT CREATION

The next iteration of content was guided by the insight from the previous iteration to have more tangible and out-of-the-box ideas about the future workplace instead of just philosophical discussions. Thus, inspired by the popular futures studies' method about scenarios (Kuosa, 2011), the 12 dimensions were iterated to create future scenarios. Based on Dean's framework (2019), the 12 dimensions were classified in their level of uncertainty regarding the future workplace in 2032 (Figure 30). The classification was made based on insights from expert interviews and the factors contained in each dimension. After the classification was made, two uncertainties were identified: The workplace's structure and purpose (raison d'etre).

First is the structure, in which two views oppose each other. On one extreme is the possibility of creating an ecosystem of spaces that employees can choose depending on their needs, convenience to their homes, or proximity to clients' locations. It is a decentralized model of the workplace. These ecosystems demand a more collaborative role of the real estate department to share facilities with other companies or access coworking spaces, cafes, or other third-party places. It also demands a new urban planning strategy since working locations can mix residential and commercial spaces. On the opposite extreme, the workplace is kept as a centralized location.

The second variable is the purpose of the workplace (raison d'etre). The two opposing views are, on the one hand, to have an exciting workplace that invites individuals to return to the office to work regularly or some days—on the other hand, to have a workplace that focuses only on specific activities such as culture, brand, social and human development. In this case, regular work and meetings are done at home.

Based on these two variables of structure and raison d'etre, a four-quadrant matrix was made, and four scenarios were defined (Figure 31). Appendix 16.11 provides a detailed description of each scenario.

9.5.2 TESTING PROCEDURE

This iteration was tested with one participant. The testing exercise took 35 minutes with ten additional minutes for feedback. The exercise was made using a different Miro board. The exercise consisted of three activities. First, the participant was asked to map his current work journey, indicating the activities that he has to do during a typical workday. During the second activity, each scenario description was presented to the participant. Then, he was asked to identify the positive and negative experiences in his workday journey connected to each scenario and adapt the journey to the future situation. The last activity was deciding which scenario was considered the most and least probable and preferred. Appendix 16.12 presents the Miro board used for this exercise and the activity results made by interviewee 5.

9.5.3 TESTING INSIGHTS

Providing discreet scenarios allowed the participant to see the overall picture and decide which would be the preferred next move. While the participant analyzed each scenario, he was able to express his beliefs and needs regarding the future workplace. *"I preferred this scenario mainly for the interaction topic; I think it's cool to have a defined space that allows you to separate the personal and work life. Also, the interaction is very important"*

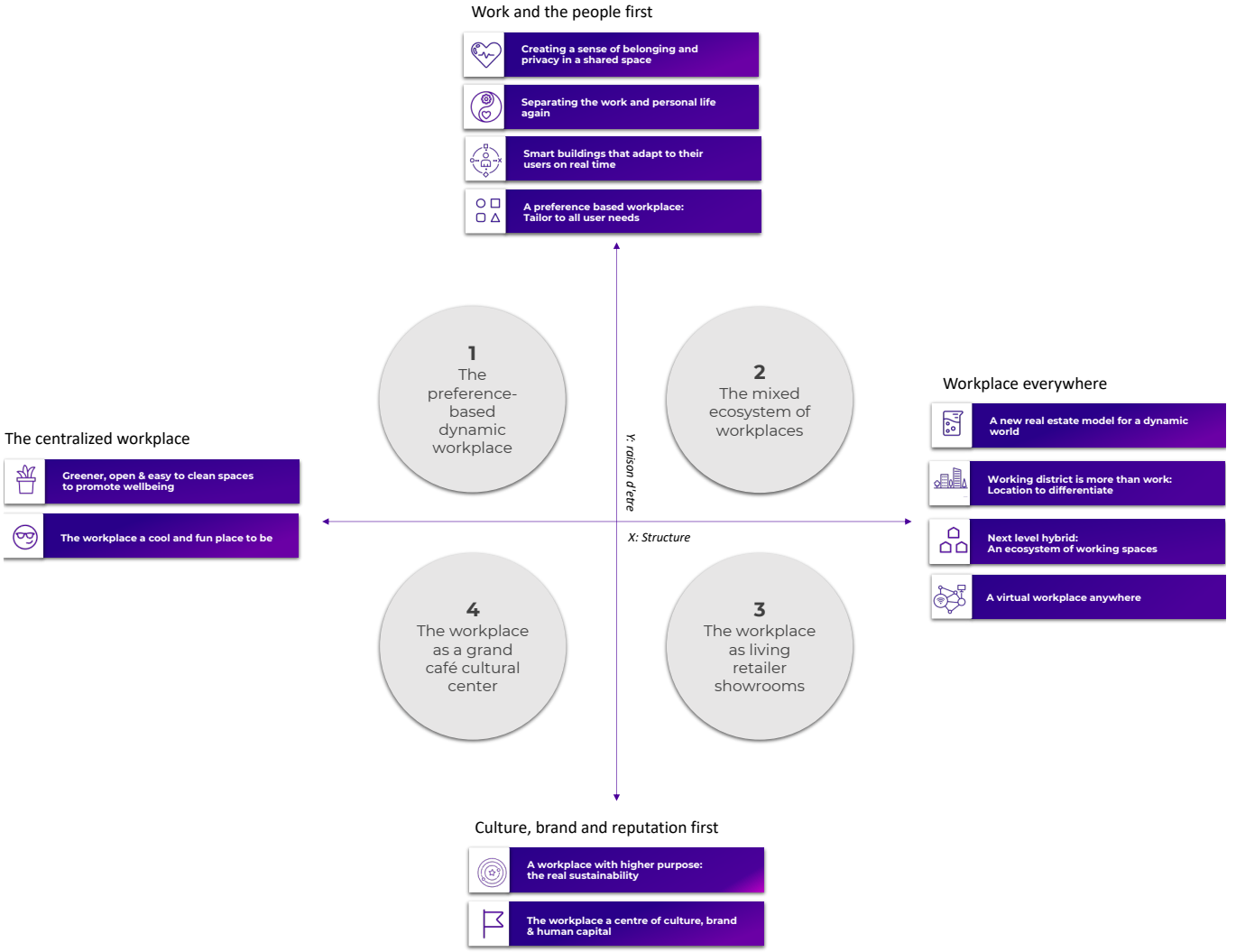


Figure 31. Workplace scenarios: 4 models of the workplace of the future

(User interview 5). However, the selection of the preferred scenario was aligned with the initial belief system of the participant. Thus, he chose the most conventional scenario *"I know that in the future it can change, but I like to keep something similar, at least for me"* (User interview 5). In addition, the conversation about the workplace was more limited to specific elements that the participant recalled and not as broad as when factors and dimensions were used. On the other hand, the journey exercise in each scenario did not provide additional ideas about the future workplace. Two learnings from this iteration were implemented in the final solution concept: First, make participants more strategic by giving them decisions (options) and then following up on their selections' reasoning. Second, offering incentives or wild situations that prevent users from returning to their present state of mind.

9.6 ITERATION 4: USING DIMENSIONS AND TIMELINES AS A TRIGGER

9.6.1 CONTENT CREATION

Three steps were necessary to create the last layer of content. This last iteration took the best elements out of the previous iterations. First, new dimensions were created by combining the defined dimensions of iteration 2. Second, three timelines (past, present, and future) were defined for each new dimension using the 76 future workplace factors. Lastly, new content was created during the testing exercise to expand the future timeline with more out-of-the-box ideas.

During the first step, five new dimensions were defined: Work model, location, space, services, and technology. These dimensions were created by combining the dimensions of iteration 2. These dimensions also connect with the five topics usually discussed during workplace studies' visioning workshops at Drees & Sommer: Space, technology, services, people, and brand and culture. The reasoning for reducing the number of dimensions was to divide the conversations while keeping them focused and short.

The second step created three timelines using the 76 future workplace factors. The first timeline corresponded to the workplace's status quo or past developments. The second timeline refers to the current workplace trends. Some of these trends are already happening in leading companies but are not mainstream. Finally, the last timeline was about the future trends mainly available in other fields such as technology. The reasoning for organizing trends like this was to expand the future orientation of the dimensions by creating a contrast between the past, present, and future.

The last step was to create new content for the future timeline. For this step, the testing exercise had a dual purpose. First, test whether the combination of dimensions and more specific timelines triggered users to think and speak about the future workplace. Second, to gather new ideas for the future timeline. Figure 32 presents an outline of the content structure, the content provided as testing triggers, and the content created during the workshop. The final outcome of this iteration is the workplace development map presented in Figure 4 of chapter 4.1.

9.6.2 WORKSHOP SETTING

This iteration was tested in a workshop with five industrial design master students. The workshop had a dual purpose (Figure 32). First, test whether the combination of dimensions and timelines was a sufficient trigger for users to think and speak about the future workplace. Second, to create content for the future timeline of the workplace development map. The workshop took place in the TuDelft Industrial Design Faculty and took 90 minutes. It was divided into three moments.

During the first moment, an update on state-of-the-art and workplace trends was presented as inspiration to participants. This information was divided into three timelines: The past, the present, and the future. Each timeline was presented using a collage with words and examples. The collages were printed and placed in the room to keep as inspiration. Appendix 16.13 presents the collages. In the second moment, the five participants were individually assigned to different dimensions. Each participant was given an A3 sheet of paper with a dimension and a description of the timelines printed. They were asked to read the content as inspiration in one minute and provide ideas for the future timeline in five minutes. The rules were that they had to think in a ten-year future horizon and that the ideas had to be different from what the provided information already presented. Once they finished, they rotated the paper, took a new dimension, and repeated the same exercise. They could read other participants' ideas and build on them. Five rotations were made until the paper each participant started with was returned to

them. Appendix 16.14 shows some examples of the format and ideas provided by participants. The last workshop moment was for feedback about the workshop and provided tools.

9.6.3 TESTING INSIGHTS

The dimensions and timelines proved to be helpful as triggers to generate new ideas. In total, the participants created 177 ideas. Some of them were repeated or similar; thus, 73 unique resulting ideas served as an inspiration to design the future timeline of the workplace development map (Chapter 4.1). The direct feedback of the participants was also positive. Using the dimensions helped participants see the bigger picture and think about the different aspects of the workplace. *"Some aspects or headings that I didn't think were presented which helped me think under more categories and integrate them with each other."* (Participant 1). The timelines also inspired participants to expand their thinking beyond what already exists. *"Well, they validated that my thinking was pretty short term, and I had to think further. So, it was good to have an idea of what is already thought about"* (Participant 2).

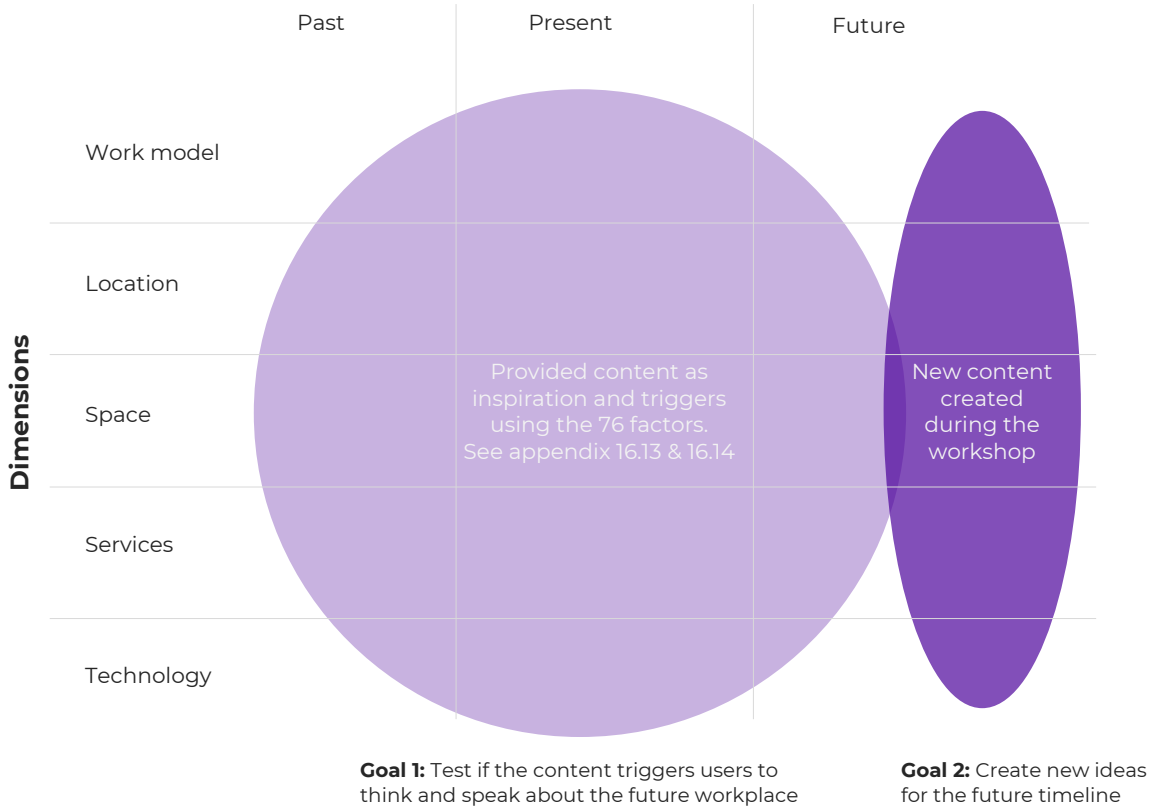


Figure 32. Content structure and goals for iteration 4

There were three areas of improvement based on participants' feedback. First, participants wanted to have more active discussions with each other rather than an entire individual exercise. Second, they asked to include more general trends for inspiration different from the workplace domain *"Some global trends for the future horizon would have provided some additional context to this use case"* (participant 3). Finally, they liked the collages as inspiration. However, they thought that they could be used differently in the activity *"The collage could be used as a tool of storytelling. Different elements of the images could be stitched together"* (Participant 5).

A combination of timelines and dimensions will be used in the final solution. In addition, the insights from this testing provided further elements that were incorporated into the final solution, such as the active discussion while using the tool and including other general trends as inspiration.

10

PHASE 6: SOLUTION DEVELOPMENT

10.1 KEY TAKEAWAYS

This chapter showcases the whole design process, from defining ideas to selecting, testing, and iterating a concept. Figure 33 presents a summary of the process steps and their outputs. The main highlight of this chapter is the definition of the '*future workspace envisioner* concept,' which was presented in chapter 4. This concept was iterated, prototyped, and evaluated two times by users. It was also validated with the company UX consultants. The concept proved to fulfill the project goal of triggering clients and users to think and speak about the future workplace. The final solution is operational and ready to use by the company.

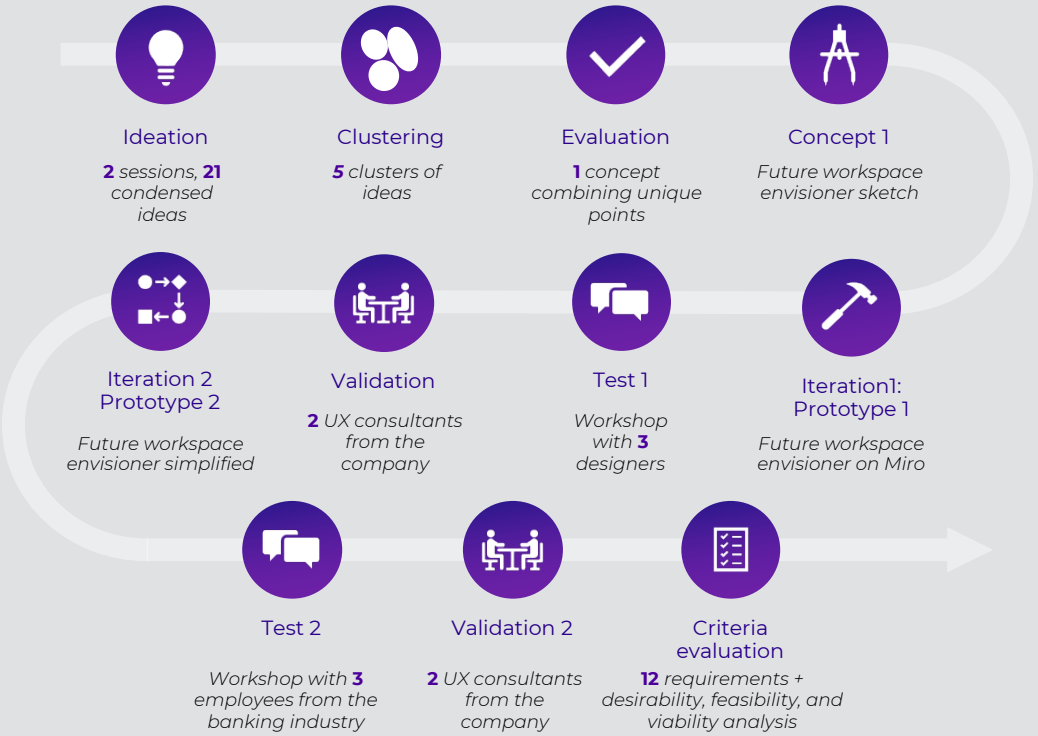


Figure 33. Solution finding process and outputs

10.2 IDEATION PROCESS

An initial tool idea was devised after the design direction was defined and the final content iteration finalized. The intention was to start testing this idea with users (Appendix 16.15). However, this idea was an evolution of other ideas included in the early stages of the process during the problem definition phase (Chapter 7.2). Therefore, it was necessary to expand the solution possibilities to avoid fixation before moving to solution testing. For this reason, two additional rounds of ideation were procured. The preliminary solution was left aside, and the problem definition and design direction was the only input.

The first round of ideation was an individual exercise; I developed ten ideas during this round. The goal was to purge ruminating ideas. This ideation session took two hours. A white paper was used to write down the ideas. The ideas were defined in detail, including the process of how the tool could be implemented with users.

After purging, the second round of ideation was made to expand the solution space. The second ideation round was made in collaboration with a professional from the education sector. This person has experience with digital tool development for high school education using gamification, and it was an excellent way to explore new perspectives. The session took 60 minutes. The method used was an adaptation of *the crazy 8s* method of design sprints (Knapp, 2016). A sheet of white paper was divided into eight parts. During the first 15 minutes, each of us had to individually develop four ideas on the top four boxes of the paper.

Sketches with text notes were encouraged. Then we rotated the paper two times. We received the other participant's paper during the first rotation, and we defined two more ideas inspired by each other's previous ideas. We were also allowed to add extra elements to the already defined ideas in the paper. This activity took five minutes. Then a second rotation was made, we received our initial paper, and the final task was to define two more crazy ideas. In the final rotation, we also discussed the produced ideas. A total of 16 ideas were defined using this method. Appendix 16.16 presents the two sheets of paper with the 16 ideas.

The final step in the process was to organize the ideas. Some of the ideas from the first and second rounds were similar; thus, Twenty-one unique ideas were conceived. Each idea was given a number, a name, a description, and a sketch. Appendix 16.17 showcase the 21 ideas in detail.

10.3 CLUSTERING

The 21 resulting ideas from ideation were grouped into five clusters using a Miro board (Figure 34). Each cluster was defined by looking at the central goal of each idea and checking what common aspects were used to trigger people to think and speak about the future workplace. Some of the ideas can belong to more than one cluster.

Cluster 1: Immersing participants in future stories
Three ideas were created about using different media to tell future stories and immerse users into future scenarios. The core of this group of ideas was using the future stories to inspire participants about what might happen in the future and then guiding users to talk, evaluate and select different elements from the stories to create an ideal situation.

Cluster 2: Getting participants out of their present mindset before talking about the workplace
Nine ideas were devised in this cluster. The common denominator of this group was to provide random situations to get participants out of their comfort zone. Participants can create the situations, or they can be predefined in advance. This group of ideas incorporates *what if* fiction situations as a way to suspend disbelief. Then, the conversation about the workplace takes place.

Cluster 3: Using future workplace content as conversation support
Two ideas were provided about using the future workplace content created in chapter 9 as random conversation triggers or elements for users to support their thoughts about the future workplace. The essence of this cluster was to have the future workplace content as a supporting element that helps users back up their ideas or as an additional source of inspiration.

Cluster 4: Quantifying the future readiness & gamification

Six ideas were defined in this cluster. The heart of this cluster was about quantifying the future and using points or scores to guide participant decisions or make them aware of how far into the future they are. The points or score also adds a gamification aspect to some ideas.

Cluster 5: Build and see the future workplace in real-time

The final four ideas refer to using visuals, 3D models, or AR technology to enable participants to quickly prototype future ideas and see how they will look in real space or a 3D model. Based on this, initiate conversations about what they perceived.

10.4 CONCEPT EVALUATION AND SELECTION

The five clusters of ideas were assessed against the 12 design requirements defined in chapter 7.5. This evaluation was made using a 3-color scale. Dark green meant that all the ideas in the cluster met the criteria. Light green meant that some of the ideas met the criteria or needed adaptation. Red meant that none of the ideas met the criteria. In addition to the color scale, each cluster's unique points, advantages, and limitations were defined. Figure 35 shows the evaluation of the five ideas clusters.

Based on this evaluation, it can be seen that there is not a single cluster of ideas that meets the 12 criteria at once. It also shows that each cluster has its own unique points and advantages. It

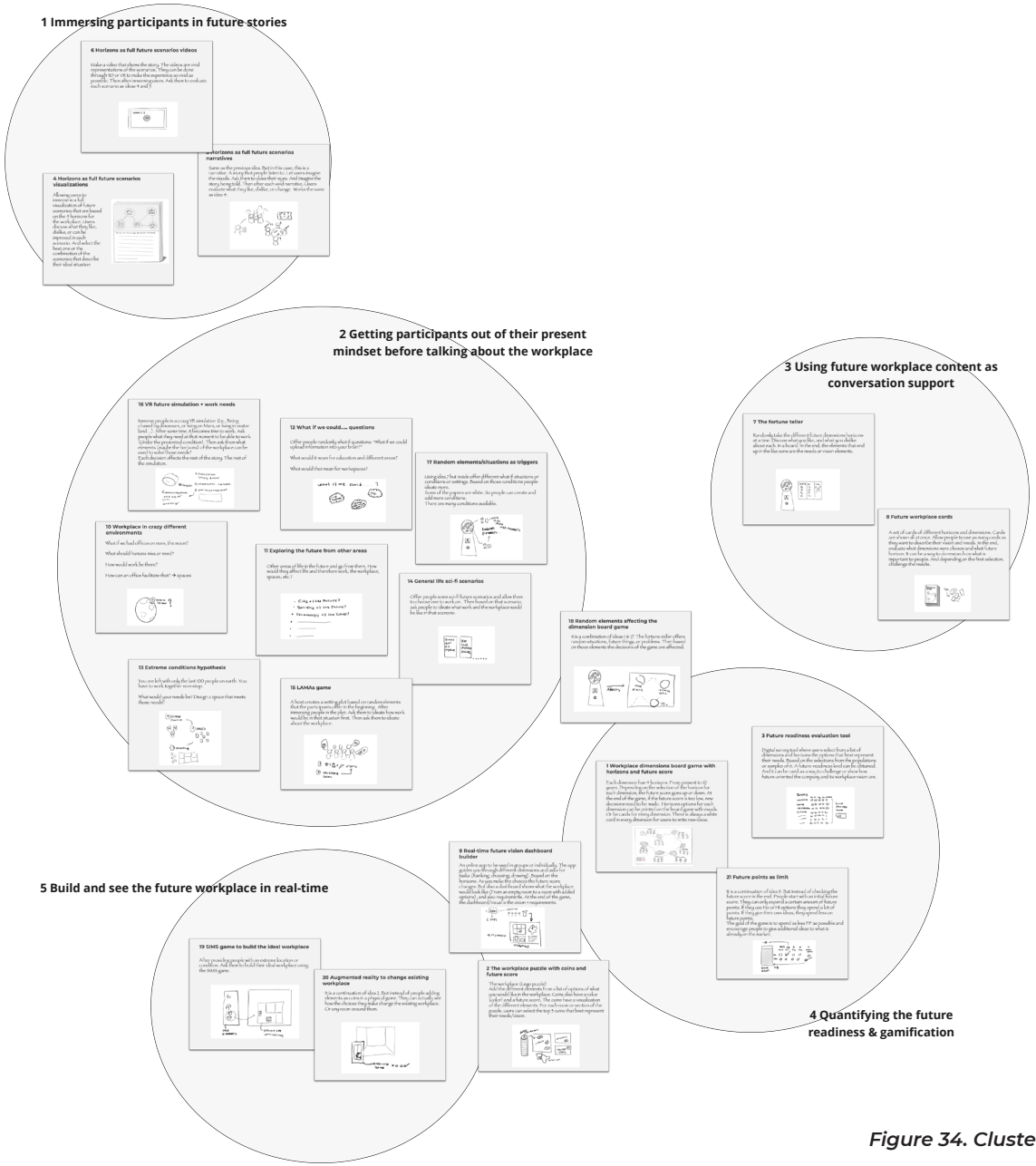


Figure 34. Clusters of ideas

CRITERIA	1 Immersing participants in future stories	2 Getting participants out of their present mindset before talking about the workplace	3 Using future workplace content as conversation support	4 Quantifying the future readiness & gamification	5 Build and see the future workplace in real-time
1.Provide a future vision in a ten-year time horizon.	●	●	●	●	●
2.Provide insights into user needs in a ten-year horizon.	●	●	●	●	●
3.Complement existing research and visioning methods.	●	●	●	●	●
4.Incorporate research-based content on future workplace trends.	●	●	●	●	●
5.Present the future content creatively to inspire and trigger users.	●	●	●	●	●
6.Be durable with easily updated content.	●	●	●	●	●
7.Provide future-oriented ideas for the workplace design stage.	●	●	●	●	●
8.Be used with clients or lead users.	●	●	●	●	●
9.Be used in a workshop setting.	●	●	●	●	●
10.Require a maximum of 2 hours of participants.	●	●	●	●	●
11.Provide direct insights without the need for additional analysis.	●	●	●	●	●
12.Be flexible for different situations, projects, clients, and channels.	●	●	●	●	●
UNIQUENESS	Selecting and evaluating situations to be more efficient and strategic	Random triggers to get participants out of the present state of mind	Allowing users to think about different workplace topics and have the overall picture	Score and gamification to challenge decisions and future visions/needs	Dynamic visualizations and representation of ideas
STRENGHTS	• Scenarios stories proved to be an effective way to elicit conversations. • It is an efficient way to make visions because the process is more about selecting or evaluating given situations. • It provides a high-level picture of the context and the future. • It can be an immersive experience depending on how the content is presented.	• It gets participants out of their comfort zone and makes them play in a more hypothetical situation. • The content can be adaptable to many different situations. • It can be included in any tool as a warm-up activity.	• It allows participants to look at the workplace from different perspectives. • Providing options to inspire participants and facilitate the decision-making process. • It thoroughly incorporates future workplace trends. • Options can be used in different situations or have different interpretations.	• It makes the tool more dynamic and fun by applying gamification. • Scores and points can challenge users to create new ideas or select more future-oriented options.	• It can be a way to do fast prototyping of future workplace ideas. • It is an immersive experience for users to play with their future decisions. • The output is tangible from the beginning.
LIMITATIONS	• The content is challenging to update. • The content representations are static and hard to adapt to different situations. • The process is focused on evaluation and selection, not on creating new ideas.	• It requires finding a way to connect with the workplace study elements of research and visioning.	• Users might be biased by the options presented instead of letting their creativity flow freely. • The content might be hard to update, and the tool can turn obsolete.	• Avoid making it a questionnaire or test. • It can be seen as unprofessional depending on the type of participants. • It might require high investment to develop a digital tool.	• It might require significant investment to develop. • It is challenging to update or requires technical support. • It is difficult to adapt to different situations.

● All ideas do ● Some of the ideas do ● Not applicable to any idea

Figure 35. Evaluation of clusters

was also possible to see that the 12 criteria can be met with different solutions. In addition, the limitation of some ideas become the strengths of others. For instance, using the random future triggers to get users out of their comfort zone provides the dynamic and flexible element that other ideas, such as the scenario stories or the workplace factors, need. Doing this exercise was very inspiring, especially when looking at the unique points of each cluster, because it showed that these elements could be combined in the final concept.

The final concept combined the five unique points from the five clusters. Figure 36 presents a high-level sketch of the concept where the five unique points from the different clusters of ideas are included with a different post-it color. The value of these unique points was also tested during the prototyping and testing phase with users. This concept is detailed in the next sub-chapter.

10.5 CONCEPT DEFINITION

This section elaborates on the initial concept in detail. Please note that some definitions are similar to the solution presented in chapter 4, while others evolved after user testing and subsequent iterations.

10.5.1 GOAL OF THE TOOL

The tool has been designed to make users think about the future of the workplace, away from the constraints and suppositions of the current workplace environment. It is designed as a

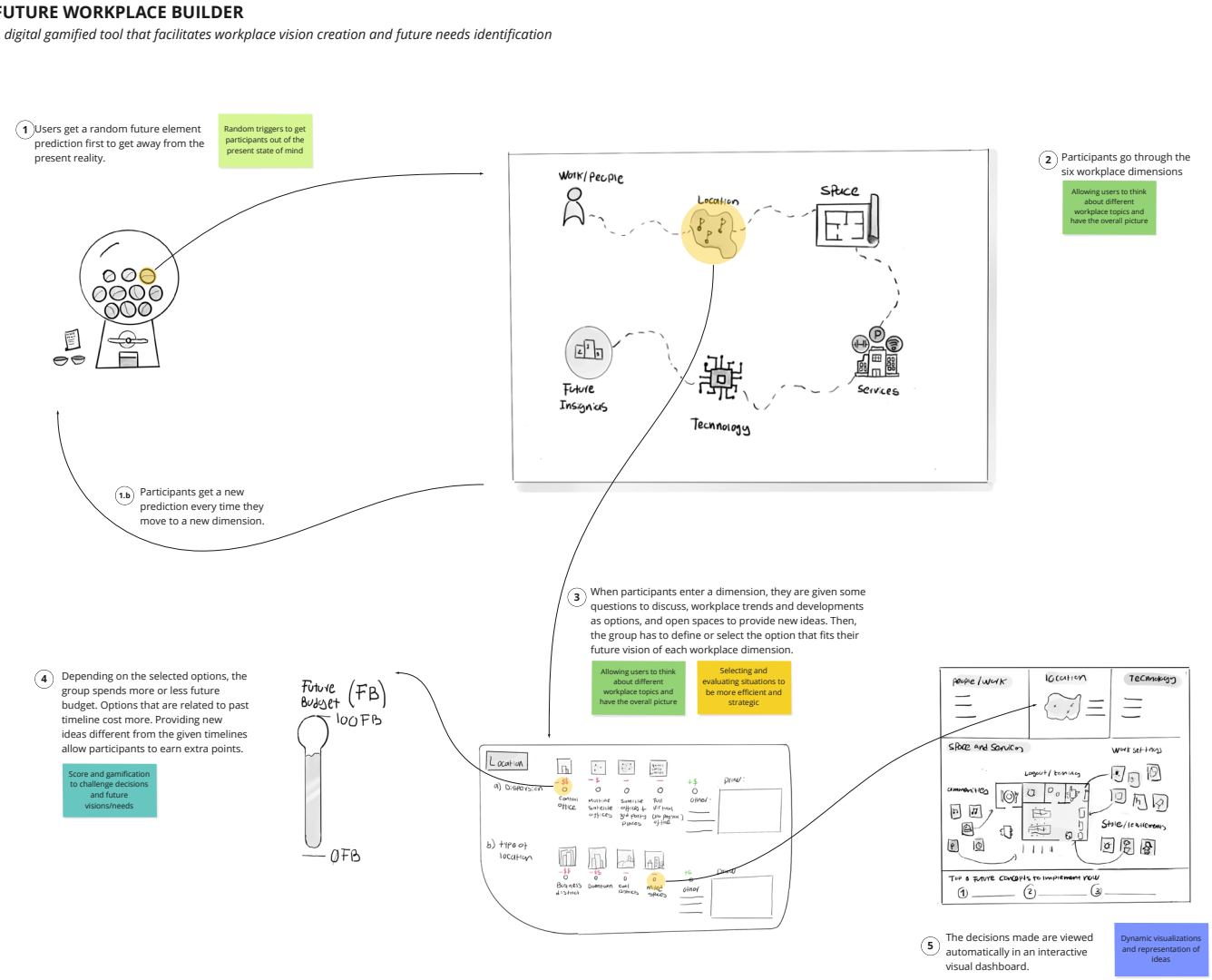


Figure 36. High-level definition of the final concept

strategy decision-making tool and a creativity method to inspire new ideas. The tool is also designed to be used in different situations, and with two types of users, the procedure and output will be the same. However, the result analysis might differ.

The first application of the tool is for visioning with the leadership team. In this case, the tool can be used with leadership teams of companies to create a future workplace vision. It is not a replacement for the existing visioning workshop at Drees & Sommer, which focuses on understanding the strategy and vision of the company and its connection to the workplace. On the contrary, it complements the visioning workshop with a tool that considers different future elements.

In the second application, the tool can be used with employees from different levels as a research tool to understand what they value under future situations away from the current constraints. It also offers the possibility to co-create new future ideas to be included in the workplace concept.

10.5.2 TOOL USERS

The tool can be used with the leadership team and employees from different levels. This aligns with the definitions of the participation criterion in chapter 7.4, where the leadership level is defined as the clients of the project, and the other employee levels will be considered users. It was also noted in the participation criterion that mainly lead users will be involved. They can be defined as employees who tend to be ahead of other colleagues in adopting new technologies, processes, and ways of working inside the company (Eisenberg, 2011).

The tool is designed to be used in groups of a maximum of five because smaller groups have higher performance in creative sessions and decision-making processes (Heijne et al., 2019), especially when there is time pressure (Knapp, 2016).

10.5.3 APPLICATION PROCEDURE

The tool is intended to have a digital interface with six stops (Figure 37). Five of them are the workplace dimensions defined in the content section: Work model, location, space, services, and technology (chapter 9.6). The sixth stop is a summary one, where users have to come from the future and take three future insignias to implement in the present. The group goes together through the six stops. Using the dimensions allows users to keep a complete picture of the workplace, as explained in chapter 9.4.

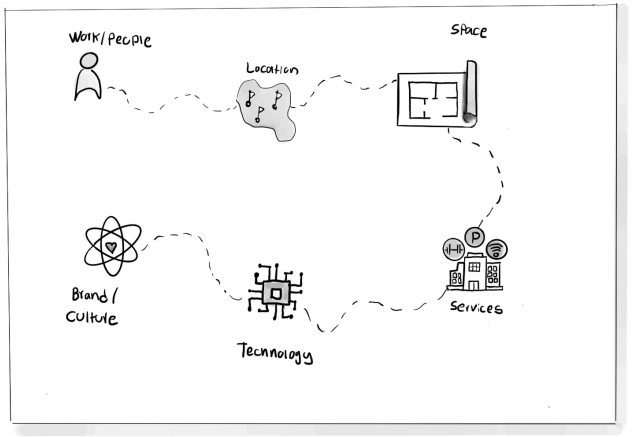


Figure 37. Main interface with six stops related to the workplace dimensions

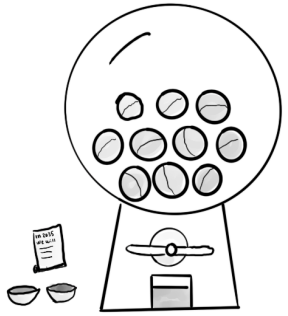


Figure 38. Future teller machine

When entering each stop or dimension, the group gets an unexpected future prediction about what is happening in the world in 2032 from the future teller machine (Figure 38). For instance, predictions like humans live 150 years on average, there is a city on the moon, or humans have neuro-transplants to enhance our memory and thinking. Participants must place themselves in this future situation. They must assume that they are still working for the same company and that the vision and strategy remain valid. The goal of the random future element is to get participants out of their present state of mind and move them to a future state.

Afterward, the participants get questions related to each workplace dimension. They will have a limited time to discuss and then select some options. They also can create their own options (Figure 39). The predefined options are based on the workplace development map presented in chapter 4. This component's goal is to facilitate the decision-making process by providing trends and information about what is happening in the workplace and ideas about what might happen in the future. The questions are designed as prioritization questions where participants have a finite number of choices, making the process more strategic because the focus is on making decisions instead of providing nice-to-have solutions. Lafley and Martin (2013) highlight the importance of making decisions in strategy-making.

A future budget limits the decisions (Figure 40). Options related to the past and present timeline of the workplace development map (chapter 4.1) cost future budget. Future timeline options do not cost future budget. Finally, when users create their own options, which must be different from those given in the tool, they earn future budget. The activity goal is to walk through the five dimensions with a positive budget. If the budget is gone, the group must return to the previous dimensions and change their decisions. The future budget component aims to challenge users to create new ideas and make more future-oriented decisions instead of choosing the status quo.

The final step of the game is to come back from the future to the present by selecting three different ideas to be implemented as minimal viable products (MVP) for the future workplace. The selected ideas refer to future workplace insignias that the company can start to implement now. Therefore, participants must look for innovative and feasible ideas simultaneously. These ideas can also be seen as the first steps for developing the future workplace concept.

Every decision will be recorded on the interactive and visual future workplace dashboard. Participants can see how their decisions change the dashboard and have a preview of the workspace, like a sims-like interface. At the end of the game, this dashboard summarizes all the decisions. It can be used as a vision, requirements summary, an ideas portfolio, and a source of inspiration for the workplace design concept (Figure 41).

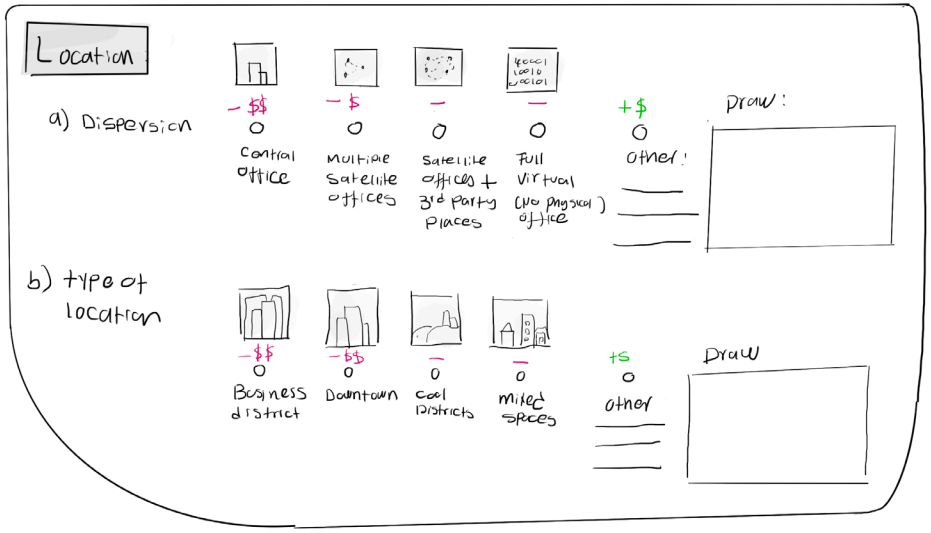


Figure 39. Example of the location dimension stop board

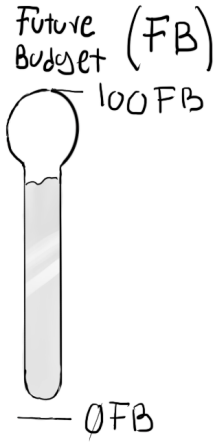


Figure 40. Example of the future budget component

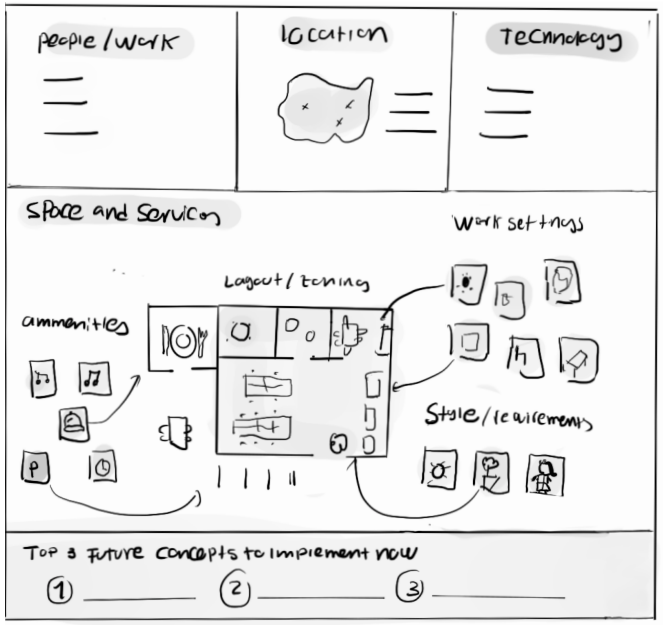


Figure 41. Example of interactive decision summary dashboard

10.5.4 INTERFACE AND MATERIALS

The game will use a digital interface; thus, it can be used during online or physical workshops alike. It also makes the options update easier, keeping it relevant for extended periods. In addition, post-its and white paper will be provided to allow people to write their thoughts during physical sessions.

10.5.5 TOOL OUTPUT

The main output of the tool is the digital future workplace dashboard. This dashboard shows a summary of the decisions or provided ideas:

- Three activities that will require an office in 2032.
- The dominant working model in 2032.
- The future office model that will be dominant in 2032.
- Type of location for the future office in 2032.
- Five main interior elements for the future office in 2032.
- Five main services and amenities in the office of the future in 2032.
- Five main technology features in the future office in 2032.
- Three future workplace concept ideas to implement now.

10.5.6 STEP BY STEP WITH TIME

The workshop is designed for 90 minutes and takes ten steps:

- Introduction (5 minutes): Introduction to the game, goal, and rules.
- Organization strategy summary (5 minutes): Provide a quick summary of the company strategy or vision workshop results.
- Dimension 1: Work model (10 minutes): Take a random future element, read it, discuss the two questions, and make decisions.
- Dimension 2: Location (10 minutes): Take a random future element, read it, discuss the two questions, and make decisions.
- Dimension 3: Space (10 minutes): Take a random future element, read it, discuss the question, and make decisions.
- Dimension 4: Services (10 minutes): Take a random future element, read it, discuss the question, and make decisions.
- Dimension 5: Technology (10 minutes): Take a random future element, read it, discuss the question, and make decisions.
- First 3 ideas to implement now (10 minutes): Organize the ideas or decisions from the dashboard in an innovation-feasibility matrix. Then, combine elements and select three ideas from the matrix that will become an insignia of the future workplace.
- Changing decisions (10 minutes): Buffer time to go back and change decisions if the future budget reaches zero at the end of the game or during other stops.
- Reflection on the dashboard results (10 minutes): After the exercise is completed, the group looks at the final dashboard and reflects on it. This closing discussion is about finding a shared meaning as a group of the results. It is also a space for the facilitator/researcher to solve questions about the decisions made. The group discussions in each step of the method are also a source of knowledge and research.

10.6 CONCEPT PROTOTYPING

The prototype of this concept was made using a Miro board. The Miro board provided the functionalities to simulate a digital tool without programming. The prototype's goal was to test the tool's efficacy to trigger users to think and speak about the future workplace. The interface design was not part of the test, and therefore a Miro prototype was suitable for the task. The layout of the prototype board indicating the different components can be seen in Figure 42.

The detailed version can be accessed directly using this link: https://miro.com/app/board/uXjVO3L1O2Y=/?share_link_id=534097545110

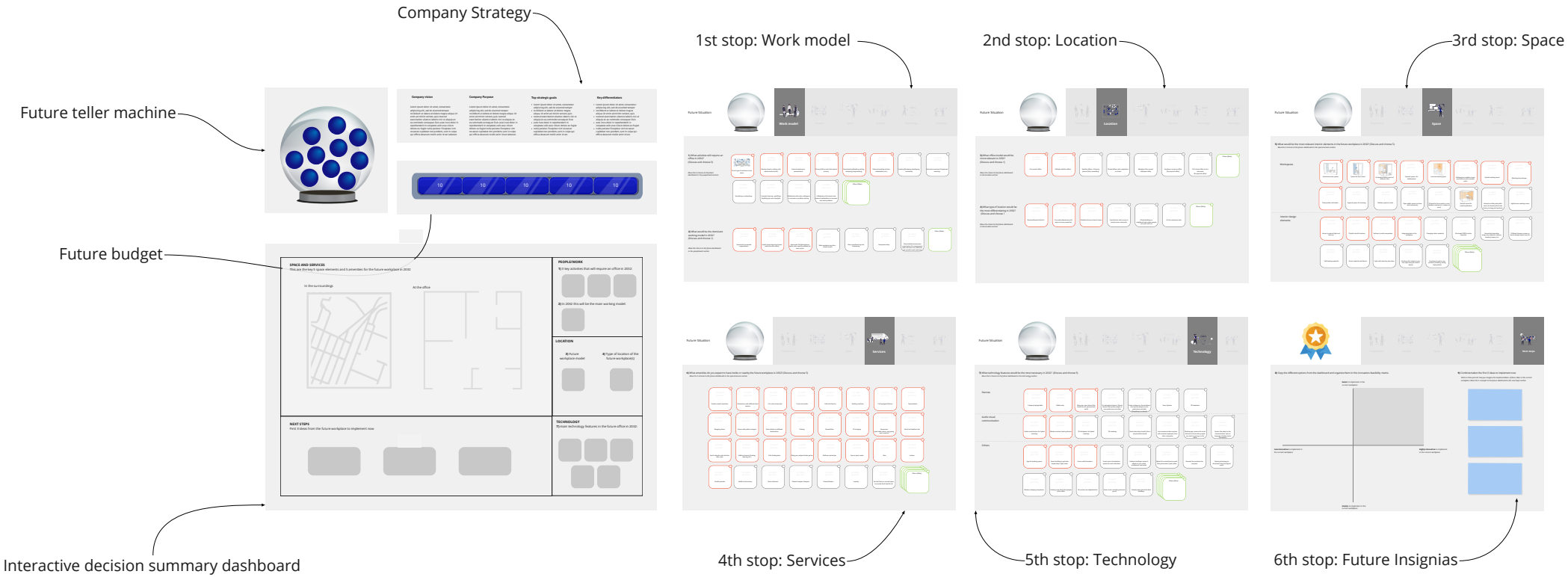


Figure 42. Interface prototype with different components on Miro

10.6.1 PROTOTYPING THE FIVE WORKPLACE DIMENSIONS' STOPS

The main component of the prototype is the five stops associated with the five workplace dimensions: Work model, location, space, services, and technology. Figure 43 indicates the different elements in the dimensions' board.

When participants enter a dimension stop, they must get a future prediction from the future teller machine (Figure 44) and put it on the top-left area of the board. Then, the group reads specific dimension questions and discusses the possible answers. To answer the questions, participants can use the given options. Options come in three colors. Red options cost -10 future budget because they are already things from the past or what most companies are doing in the present. Grey options do not cost future budget because they are more aligned to trends. Finally, green options are spaces for new ideas, which become a bonus that allows participants to get a +10 future budget. Participants can use as many green options as they want. The only requirement is that the idea they provide has to be different from the existing options. Once the group has made their decisions, they drag the selected options to the summary dashboard (Figure 45), and depending on the selected options; the future budget score is updated (Figure 46).

10.6.2 PROTOTYPING THE FUTURE TELLER MACHINE

The future teller machine simulated a fortune teller ball. It contained ten different future predictions. By selecting the ball and deleting the top layer, participants could access the prediction (Figure 44). The predictions were inspired by the futurist Thomas Frey's blog (2022). A list with 15 different predictions can be seen in Appendix 16.18. Participants could get one new prediction every time they started a new dimension stop. Once participants read the prediction, they could move the text to a designated place in the specific stop board to keep it in sight during the discussion (Figure 43).

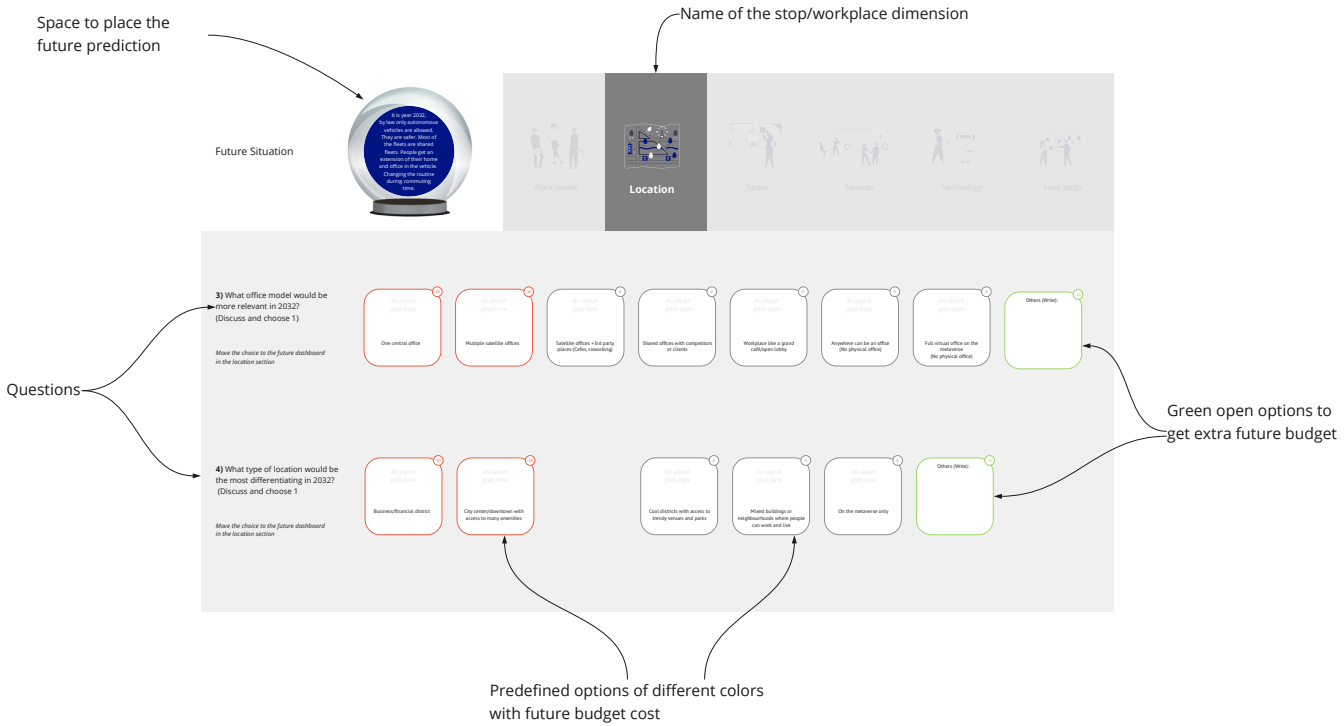


Figure 43. Prototype of a dimension stop (case for location)

10.6.3 PROTOTYPING THE INTERACTIVE DECISION SUMMARY DASHBOARD

The interactive decision summary dashboard was prototyped as a destination place where users dragged the final selections of each stop (Figure 45). The summary dashboard has empty spaces with names and numbers equivalent to the questions of each stop, making the process intuitive for participants. The space and services zone was thought of as a sims-

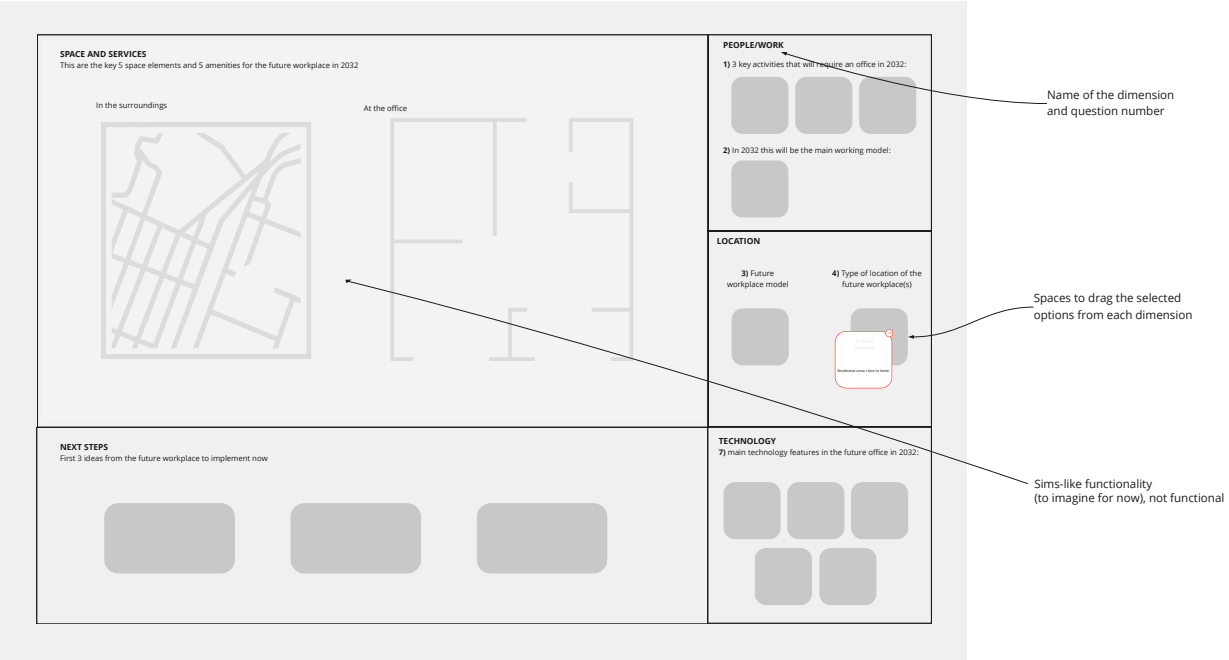


Figure 45. Prototype of the interactive decision summary dashboard

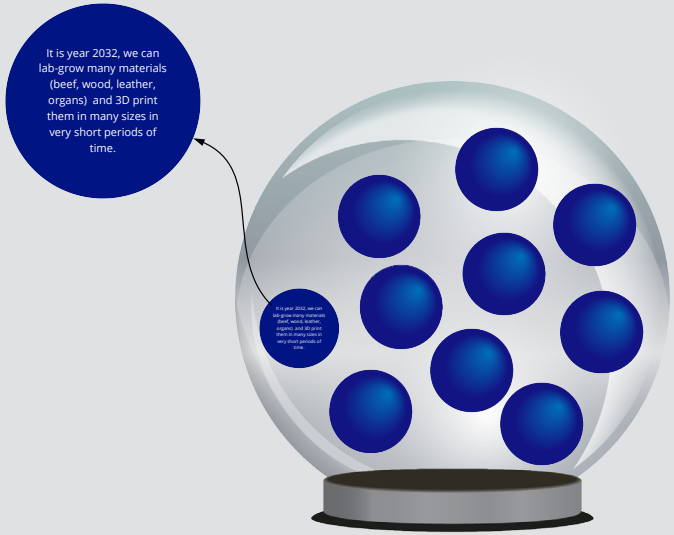


Figure 44. Prototype of future teller machine

like application where the environment changed automatically depending on the selection. The prototype did not include this functionality, and users simply dragged their selections either to the office's interior or to the workplace surroundings.

10.6.4 PROTOTYPING THE FUTURE BUDGET SCORE SYSTEM

The future budget was prototyped using a score bar (Figure 46). This bar was complete at the beginning of the game with 50 points. The reasoning behind this initial score was to provide a constraint to make people choose more grey or green options. A total of 21 selections had to be made during the workshop. Fifty points allowed participants only five red options during the whole workshop or more if they created their new options with the green bonuses. After participants finished a stop and dragged their final selections to the summary dashboard, the facilitator counted the number of red, grey, and green options and adjusted the score bar accordingly by deleting or adding points to the bar.

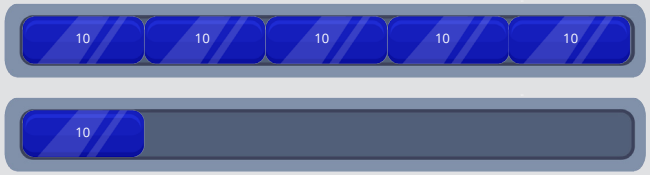


Figure 46. Prototype of the future budget score bar

10.7 CONCEPT TESTING

10.7.1 TESTING PROCEDURE

The first concept was tested with a group of three industrial design master students from TuDelft. The three participants had had previous working experience, and they were familiar with what it meant to work in an office setting. Since the participants did not work in the same company, a case was provided simulating that they were all employees of a design studio in Amsterdam. Some information from the company website was presented initially, so the group had a shared understanding of the company and the situation. Participants were told that the company was rapidly expanding and needed a new office. The purpose and strategy of the company were emphasized.

The testing was made in a meeting room at the industrial design faculty of TuDelft. During the testing, I was the facilitator. The Miro built-in timer was used to control the time for each stop. One laptop with the Miro board prototype was provided to participants. The facilitator's laptop was connected to a projector, mirroring the participants' view to ensure that everyone could see the information. The stops were hidden on the Miro board. Once the participants finished a stop and were ready to move to the next one, the stop board was made visible. Figure 47 exhibits a photo of the workshop layout while participants discussed one of the dimensions.

At the end of the workshop, a questionnaire was sent to participants (Appendix 16.19). Participants were asked to rate each concept component in two dimensions: The extent to which it triggered future thinking about the workplace and how much they liked each component. The first measure was a 5-point frequency Likert scale. The second measure was a 5-point satisfaction Likert scale. In addition, they were also asked to provide open answers about what they liked and disliked and what could be improved about the tool. After they finished the questionnaire, we had a follow-up conversation.

10.7.2 TESTING RESULTS

The workshop was executed in the 90 minutes planned. Participants engaged actively in deep discussions about the future workplace while navigating the tool's different stops. The result from the workshop can be seen in the interactive decision summary board (Figure 48). These results showed that from the 21 options and decisions that the participants had to make during the exercise, six were red options related to what most companies have implemented in the present. Eight were grey options that are more connected to the current workplace trends. Finally, six were green options or new ideas provided by the participants. Apart from these results, the discussions that led to the decisions were the most insightful part of the exercise. It is an additional research element that the tool provided. Unfortunately, these discussions were not recorded, but participants emphasized their value in the questionnaire.

Based on the observations made during the first testing, the insights provided by the participants

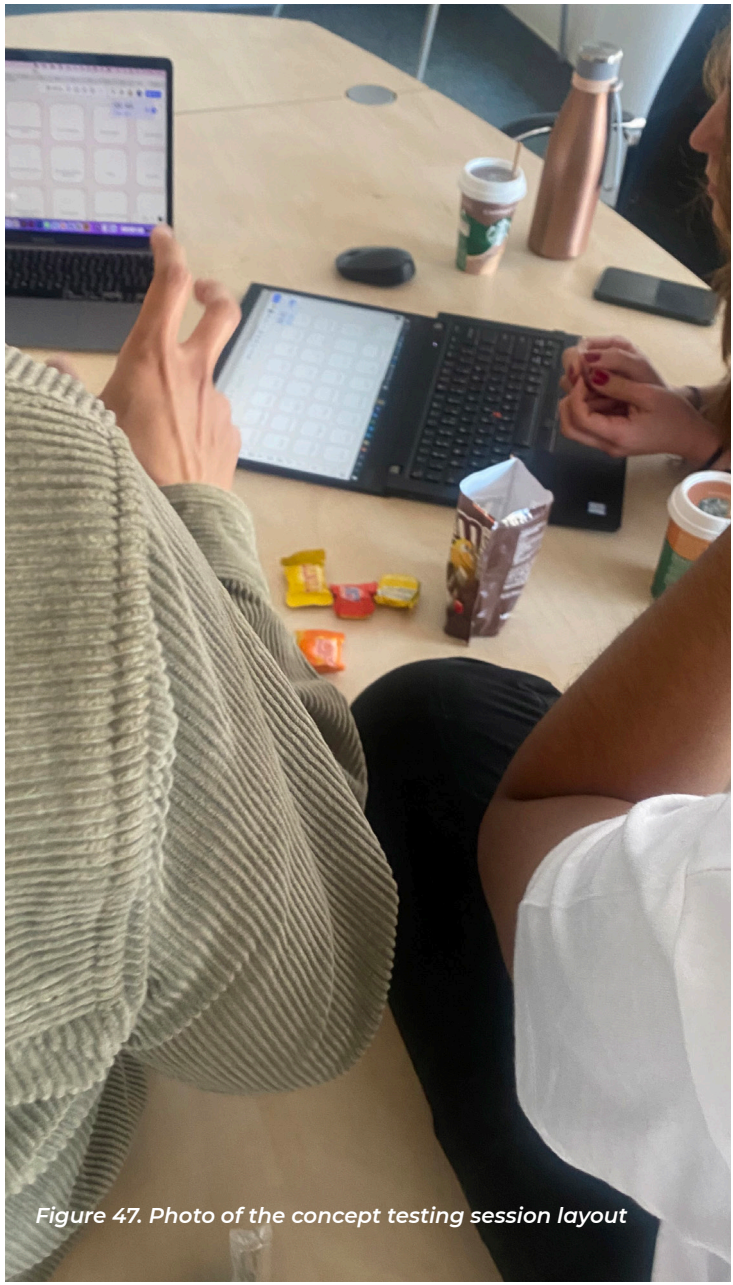


Figure 47. Photo of the concept testing session layout

with the questionnaire, and the feedback discussion, five strengths were identified in the tool. According to the questionnaire's evaluation (Figure 49), the three components that users found more helpful to trigger their future thinking about the workplace were the group discussions, the green open options to co-create new ideas, and the division of the workshop into six stops connected to different dimensions of the workplace. These components will be kept and reinforced in the subsequent iterations of the tool. Furthermore, it reaffirms the value of the theoretical approach to include co-design elements that allow participants to co-create solutions and discuss them openly with other peers.

During the feedback discussion, two additional strengths were mentioned: the random future events and the gamified experience. The group participants found that the future events provided by the future teller machine helped them be engaged and think creatively during the exercise. *"I especially liked the future events, stimulates thinking about the future"* (participant 2). *"New prompts kept me going, thinking creatively"* (participant 1). In addition, the interactive activities simulating a sort of game with different stops and time constraints also helped participants be active all the time. *"It was very interactive and engaging due to the visual and gamified experience"* (participant 3). Apart from the strengths, four main opportunities to improve the tool were identified. These improvements will be incorporated in the following concept and prototype iteration.

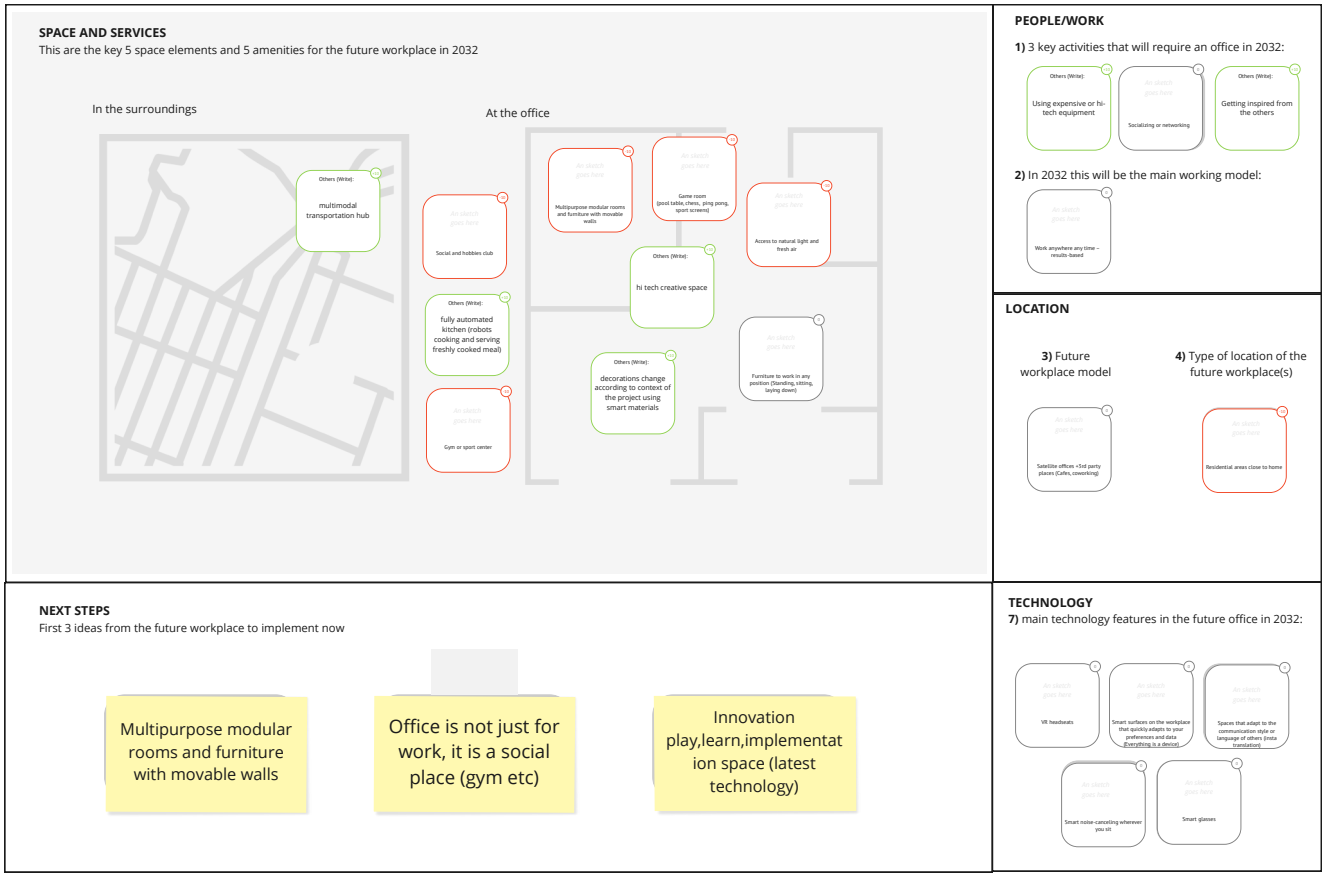


Figure 48. Testing workshop results in the interactive decision summary board

The first improvement opportunity was about the future events from the future teller machine, even though participants appreciated this component as a fun element that helped them expand their future thinking. One of the observations that participants had, was to make the predictions more connected to each stop. For instance, the prediction of autonomous vehicles can be better suited for discussing location, services, or space. Moreover, participants felt confused because they had to take new predictions at every stop, and they were unsure if they were supposed to combine them or put the previous prediction apart.

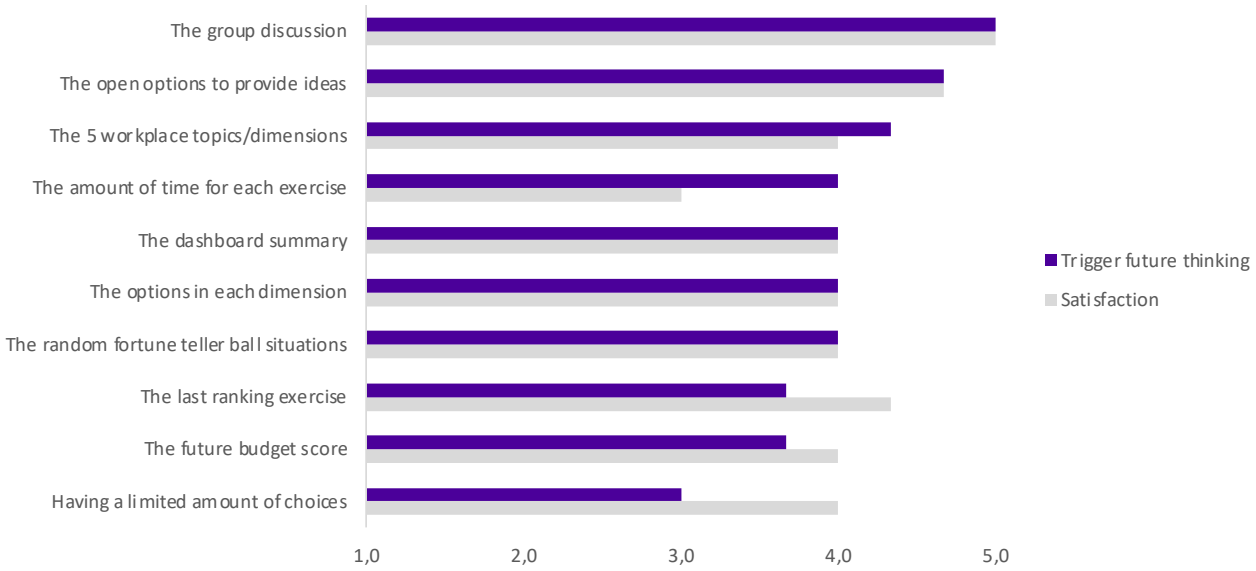


Figure 49. Survey results of the evaluation of the different tool components in the first iteration.
n=3. Trigger future thinking is measured by a 5-point frequency Likert scale. Satisfaction is measured by a 5-point satisfaction Likert scale.

The second improvement opportunity had to do with the number of options provided to users. They liked the options as inspiration; however, they felt overwhelmed because there were many options at some stops, and it took too much time to process all of them. *"Reading through the options took a while for some exercises, but they help spur my thoughts"* (Participant 3). *"Maybe there are too many options, less options could be given to stimulate discussions"* (Participant 2).

The third improvement opportunity was the future budget. This component was one of the aspects with the lowest score in the evaluation (Figure 49). It did not help limit participants from selecting present options. On the contrary, participants provided more green open ideas than expected, ending with an excess future budget.

The last improvement opportunity was the time. According to users, the time constraint from each stop served as a trigger because it made their discussion more strategic and focused (Figure 49). However, the ten minutes given per stop was not enough. It was always necessary to give them between 3-5 additional minutes and create some pressure to close the discussion. Furthermore, participants felt that some extra time could be helpful, mainly because they had to first read all the options before moving to discussion and selection. *"The time felt a tiny bit short some times but was good in general"* (Participant 3).

10.8 CONCEPT VALIDATION WITH THE COMPANY

After the evaluation with users, a validation session took place with two UX consultants from Drees & Sommer, including the company supervisor. The goal of this session was to validate the desirability and viability of the concept from the company perspective.

10.8.1 DESIRABILITY FROM THE COMPANY PERSPECTIVE

A positive reaction was received from the client about the concept and the prototype. They liked the future predictions with the future teller machine, the separation of the workshop into different stops with questions related to different workplace dimensions, and the given options to answer the questions inspired by trends. Furthermore, they saw it as a tool that could be used with clients. Therefore, they took some concept elements right away to design a workshop with a client from the education sector.

Only three components were used for this workshop: The dimensions and their questions, the options based on the trends, and the future teller machine. The future budget and the interactive decision summary board were not included. This workshop design only included three dimensions: work model, location, and services. A new prototype was built for this workshop. One of the company recommendations was to think about a physical prototype that could be used without a computer. The dimensions and questions were printed on A3 paper, and the options were written

Figure 50. A physical prototype of the services dimension for a tentative client workshop

on small post-it notes. Finally, the future teller machine was prototyped using a bingo machine (Figure 50). The bingo machine provides random numbers assigned to the future predictions of Appendix 16.18.

Unfortunately, the workshop could not be executed because one key stakeholder could not be present. Since there was a lot of time pressure with this project, the client input had to be collected by email. Therefore, we did not get to test this prototype. However, it denotes the positive reaction and desirability of the company to use the tool. The idea is to test this physical version of the prototype with a new project in the future. For now, the central insight from the session with the UX consultants was to develop a tool that can be easily used in a physical setting. This insight was considered for the next iteration of the concept.

10.8.2 FEASIBILITY AND VIABILITY FROM THE COMPANY PERSPECTIVE

Developing the tool as an interactive gamified experience is feasible; there are no complex technical elements in the solution. However, some of its components, especially the interactive dashboard with sim-like functionalities, will require considerable development and design resources. An interactive educational game can cost between €230.000 to €370.000 to develop on average (Javornik, 2021). This cost becomes a limitation because it is not viable for the company to make this investment in just one tool. After all, there are other priorities in line, and most of the current workplace study tools that the company uses do not require capital investments. Thus, finding a way to keep the tool's main features without the need for IT development becomes an essential new requirement to consider in the subsequent iteration.

10.9 SECOND CONCEPT AND PROTOTYPE ITERATION

After gathering the first concept feedback from users and the company, a second iteration of the concept and prototype was made. The new concept considered the four improvement opportunities from the users and the two insights from the company validation. The four improvements from the users were to create future events from the future teller machine more connected to the stops/dimensions, reduce the number of presented options, rethink the future budget, and improve the time assigned to each activity. The insights from the company validation were to create an analog version of the tool and to think about a tool that did not require significant investments.

Based on the different insights, especially on the two insights from the company validation. A simplified interface was designed (Figure 51). The new tool interface focused mainly on the six stops distributed in the lower region with six specific boards. There are two sections on the top for instructions and to keep visible the vision and strategy of the company. In addition, Miro will be considered a more definitive platform for the tool because the UX team already uses Miro. In addition, the six activity boards stops were designed in A3 size, so it is easy to print for physical workshops.

Future Workplace Builder

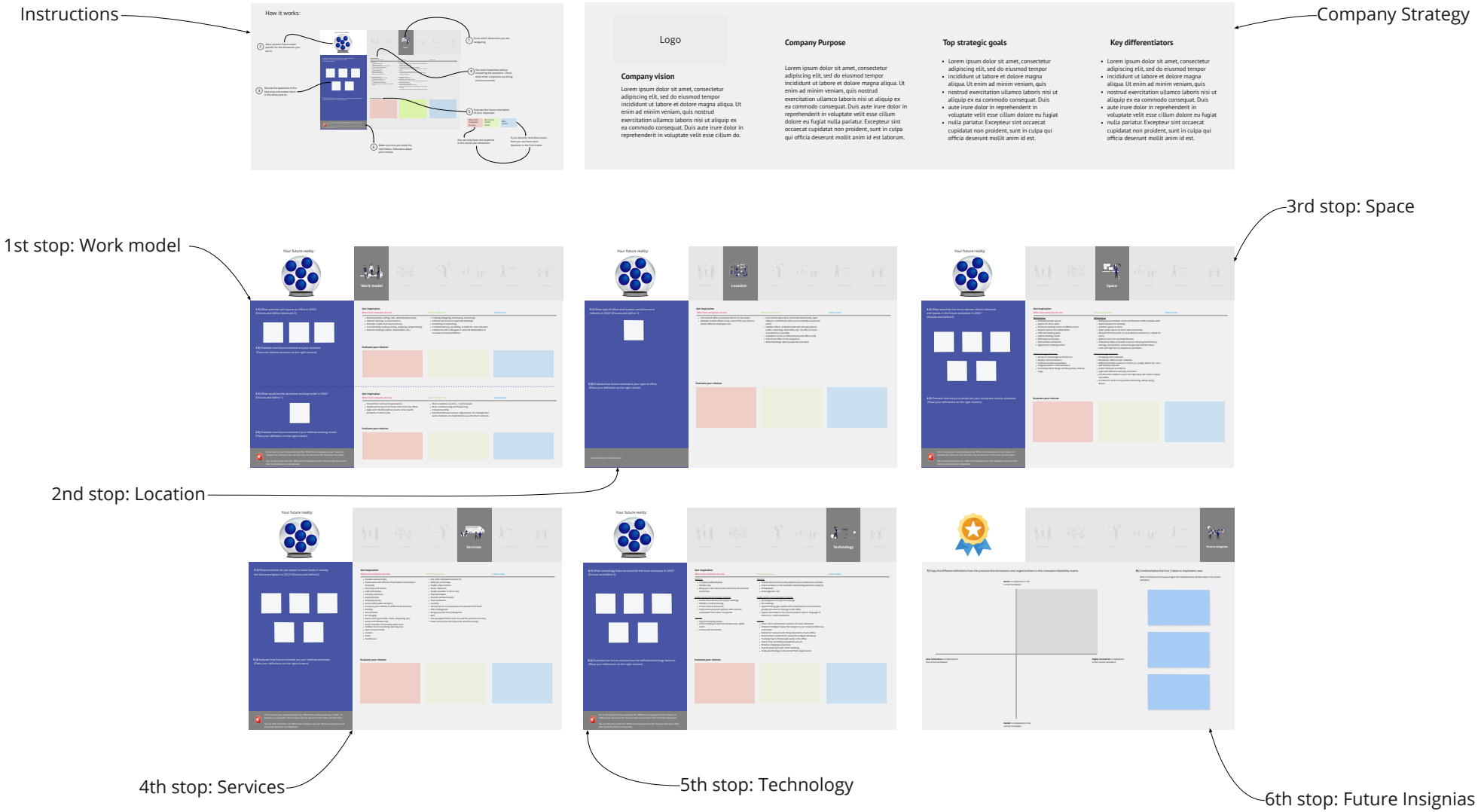


Figure 51. Tool interface: second concept iteration

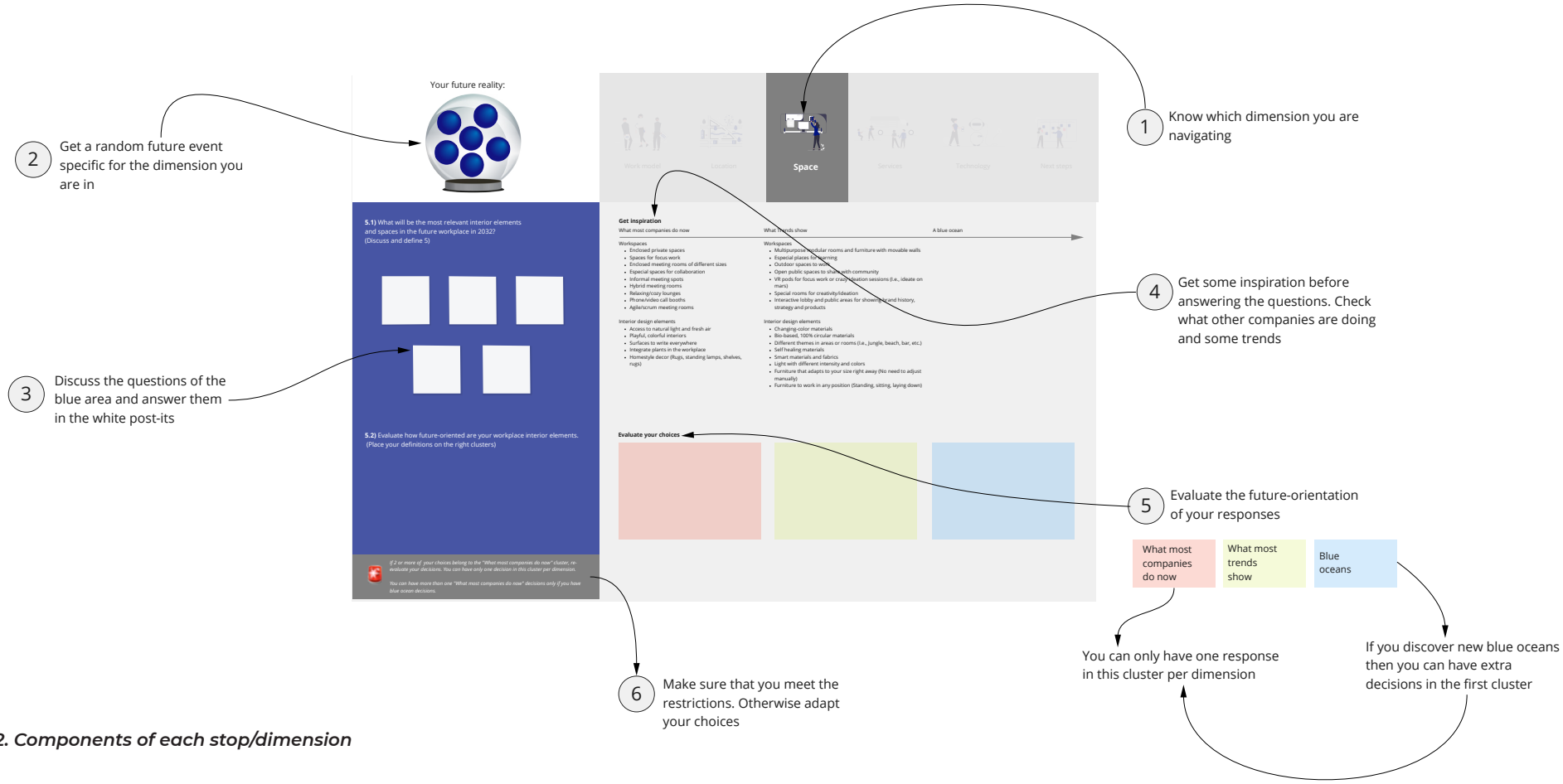


Figure 52. Components of each stop/dimension

Stops 1 to 5 has a similar interface. Each of these stops is associated with the five workplace dimensions. Six components form each stop (Figure 52). The principal adaptations from the previous prototype are reflected there.

1. The dimensions bar on the top right region of each stop: This component lets participants know which topic or dimension of the workplace they are discussing and gives them an overall picture of the other topics they will discuss during the workshop.

2. The future teller machine: This component was integrated into each stop and the predictions included are more specific for each workplace dimension. The second column of Appendix 16.18 exhibits the predictions related to each dimension. This adaptation was inspired by users' insights from the first concept testing.

3. Questions related to each dimension and white post-its to provide ideas: This was a meaningful change compared to the first iteration and also inspired by user insights from the first concept testing. Participants

are asked to provide open ideas instead of choosing from an extensive list of options. The participants can provide a limited maximum number of ideas for each question. This limit keeps the exercise strategic and helps users articulate what really matters instead of providing long lists of unnecessary wishes.

4. Inspiration section divided into two categories: The trends choices options from the previous concept are shown not as options but as lists for inspiration whenever participants are stuck in finding ideas. The workplace development map content of chapter 4.1 was used to create these lists, and it was divided into two categories to simplify the reading: '*What most companies' do now* and '*What trends show.'*

5. Assessment section: The list of trends is also used for evaluating the procured ideas. Participants must move their ideas to one of the three boxes. The red box is for the ideas connected to the category of '*What most companies do now*.' The green box is for ideas aligned with '*What trends show*.' Finally, the blue box is for new ideas that do not fit the last two categories. It was named *'a blue ocean*.'

6. Restriction for each stop: The future budget bar was replaced by a restriction for each stop, making the activity more fluid without adding and subtracting scores. The restriction is the same for all stops. Only one of the provided ideas can belong to the '*What most companies do now*' category unless participants create new '*blue ocean'* ideas to compensate.

The dimensions questions of each stop were kept similar except for the location dimension. In this case, the two questions were combined into one to reduce the complexity of the task and reduce the needed time. The sixth stop did not have any changes compared to the former prototype.

The improvement opportunities provided by the first concept testing with users are included in the different components explained before. The first opportunity to make the future teller machine more connected to the specific dimensions relates to component 2. The second opportunity to have more open questions and reduce the number of presented options was incorporated in components 3, 4, and 5. The third opportunity to rethink the future budget was covered by component 6.

Finally, the opportunity to increase the time was also considered. The time for each stop was increased from 10 to 15 minutes. This time was divided into two fragments. First, participants are given 10 minutes to provide ideas to the questions of each dimension and then 5 minutes to assess the ideas and adjust the answers if the restriction is not met. With this decision, the total time for the workshop increased to 120 minutes, which is in line with the design requirements (Chapter 7.5).

10.10 SECOND CONCEPT TESTING

10.10.1 TESTING PROCEDURE

The new concept and prototype was tested in a workshop with three employees from a Colombian bank. These employees belong to different departments and have different roles in the company (Table 11). The participants belong to an internal segment of the company of natural leaders. This classification is comparable to the lead-user concept. Regardless of their role, employees in this segment are considered creative, influential, and vital actors in change management in the company. In addition, this bank is considered a leading company in Latin America and one of the most sustainable companies in the world. It is also considered the best place to work in Colombia. Its headquarters are Gold LEED-certified and incorporate sustainable and innovative designs and amenities. Therefore, this company is an excellent case to test the tool and validate how much it can create new workplace ideas for a leading organization.

The online workshop was performed through zoom, and it took two hours. The Miro board was shared with participants, and each of them accessed it individually from their locations. This online setting allowed testing the versatility of the tool for different situations.

For example, at Drees & Sommer, some clients are abroad, and traveling is not always possible. After the workshop was finalized, 15 minutes extra were used for evaluating the tool and receiving feedback from users. A questionnaire similar to the first test was used (Appendix 16.20).

Participant	Department	Role
Participant 1	Human resources	Team leader
Participant 2	Operations	Analyst
Participant 3	Leasing	Commercial support

Table 11. Testing participants for the second iteration

10.10.2 TESTING RESULTS

The results from this workshop were positive. Participants were able to finish the workshop and use the tool without inconvenience. They were also able to create 18 ideas about the future workplace in the different dimensions. Only two of these ideas belonged to the '*What most companies do now*' category. Twelve ideas were aligned to '*What trends show.*' Finally, four ideas were '*blue ocean* ideas.' It is an exciting result because it shows that the tool provides triggers even for leading companies in the market. Figure 53 presents the resulting ideas from this testing exercise.

Figure 53. Testing workshop results of the second iteration

The direct feedback was very positive in general. People liked that the tool was interactive and fun. They mentioned that it allowed them to let their imagination set free and have inspiring conversations about the future workplace with other colleagues. *"I liked that it is fun, it allows you to set your imagination free, there is no censorship"* (Participant 1), and *"I liked that you can have conversations, share ideas"* (Participant 2). They also found helpful the last exercise to rank the ideas and create something that can be implemented now *"I liked to have the ranking with a minimum viable to implement"* (Participant 2). In addition, the three components they found more beneficial to trigger their future thinking were: the evaluation criteria to classify their ideas into three innovation categories, the division of the workshop into dimensions, and the future predictions from the future teller machine (Figure 54).

Only two improvement opportunities were directly mentioned by some of the users; however, they were not unanimous. One of them was the time. Even though the time increased, some participants felt the time was short mainly because the open options left room for more discussions on topics that sometimes deviated from the workshop's scope. *"I didn't like the time restriction because sometimes interesting discussions start and we can't finish them"* (Participant 2). The second one was that the sixth component to set a restriction for the ideas was perceived as the element that added the least value in triggering participants to think about the future (Figure 54).

10.11 SECOND CONCEPT VALIDATION

Another validation of the second prototype with a senior UX consultant and the project supervisor from the company was made. The results of the user testing were presented to them. They had positive feedback about the new concept. However, they had a recommendation about the layout. Since the six stops were placed together with the five workplace dimensions and the future insignias stop, it generated confusion. The five workplace dimensions are the tool's core, and the insignias activity is a closure activity.

Furthermore, the workplace dimensions order can sometimes be modified depending on the project. For instance, it might be convenient for a tech client to start the discussion from the technology dimension before moving to other dimensions. On the other hand, some dimensions might be irrelevant in other situations, such as when there is a fixed location because of a contract. Hence, separating the last stop as a distinct section in the interface facilitates the flexibility to adapt the dimensions depending on the clients' projects. This improvement was incorporated in the final layout presented in chapter 4.2.

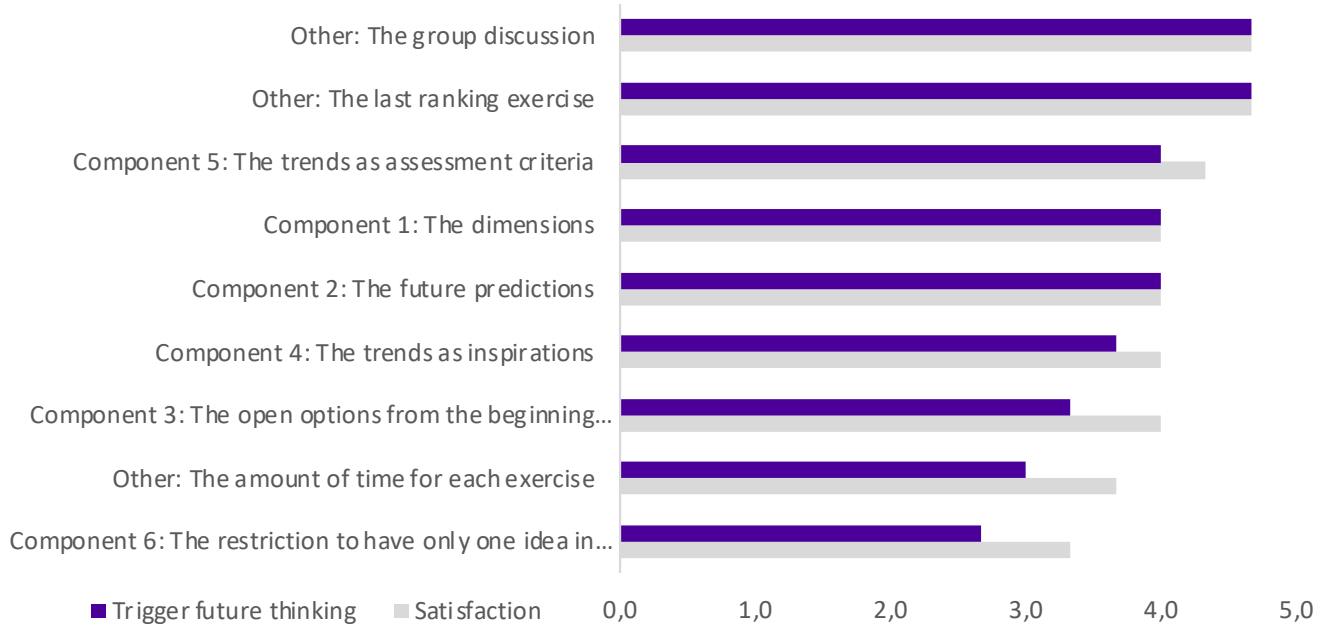


Figure 54. Survey results of the evaluation of the different tool components in the second iteration
n=3. Trigger future thinking is measured by a 5-point frequency Likert scale. Satisfaction is measured by a 5-point satisfaction Likert scale.

10.12 FINAL SOLUTION

The final solution incorporated the layout improvements suggested by the client. However, no further iterations were made to the solution. Some improvements can be applied based on the previous testing with users; however, since these recommendations were not unanimous more testing is required to conclude. There are also opportunities to include more aspects of the futures studies theory, such as probes or visuals instead of the written predictions for the future teller machine. These aspects will be included in the discussion session (Chapter 12). For now, the last concept and prototype proved to be a desired solution from the company perspective and also from the users' perspective because it fulfills the goal of this project to trigger clients and users to think and speak about the future workplace. There are some limitations with the participants used for testing, mainly because the other group of users, the clients or leadership team, was not included. This will also be discussed in chapter 12.

Furthermore, the solution meets the 12 requirements defined in chapter 7.5, including feasibility and viability criteria. The solution does not require additional development or production resources, and it can be used as it is by the company. Figure 55 shows the evaluation of the 12 requirements and the desirability, feasibility, and viability criteria. More information about the final solution was presented in chapter 4.2.

Criteria		Explanation
Requirements: The solution should...		
1. Provide a future vision in a ten-year time horizon.	✓	*The different ideas in the five workplace dimensions provide a vision for the workplace in the year 2032.*
2. Provide insights into user needs in a ten-year horizon.	✓	*Users showed their priorities for the future triggered by the limited amount of decisions possible in each dimension. In addition, the discussions in the workshop provided extra research material.*
3. Complement existing research and visioning methods.	✓	*The tool leverages the visioning workshop as a key input. It also provides additional insights into user needs and direct ideas for the visioning and conceptualization stage.*
4. Incorporate research-based content on future trends.	✓	*The workplace development map produced in chapter 10 was incorporated in the tool as inspiration information and assessment criteria.*
5. Present the future content creatively to inspire and trigger users.	✓	*The future content is presented as horizons to inspire people and help them rate the innovativeness of their ideas. In addition, the future teller machine presents predictions for the future in a fun way.*
6. Be durable with easily updated content.	✓	*The Miro interface allows the trends to be easily updated. Some trends can be deleted or added depending on the sector and type of client. A procedure for this is proposed in chapter 11.*
7. Provide future-oriented ideas for the workplace design stage.	✓	*The 20 ideas related to the different five workplace dimensions that the tool produces can be used for designers in the conceptualization stage. In addition, the tool ranks the ideas and selects three key ideas to implement in the present.*
8. Be used with clients or lead users.	✓	*The tool is designed for both clients and lead-users. However, the testing was made only with lead-users. It is still necessary to test it with clients.*
9. Be used in a workshop setting.	✓	*The tool was tested in a workshop setting. The workshop discussion was one of the better-rated components of the tool.*
10. Require a maximum of 2 hours of participants.	✓	*The tool was designed to be used in a workshop of two hours. The time worked and stimulated participants to be more strategic.*
11. Provide direct insights without the need for additional analysis.	✓	*The 20 ideas in the five workplace dimensions and the three priorities are the direct output of the tool.*
12. Be flexible for different situations, projects, clients, and channels.	✓	*The tool was tested with designers and with bank employees, in a physical and online workshop. The Miro boards are designed in A3 and are easy to print for analog sessions. The trends and content can easily be adjusted to incorporate industry-specific content.*
Desirability	✓	*Users and the company liked the tool and saw value in it. They are willing to use it.*
Feasibility	✓	*The tool is ready to use as it is. It does not require further development or production resources.*
Viability	✓	*The tool will be used for a new marketing strategy in the company and offered to clients as a unique selling point.*

Figure 55. Evaluation of criteria for the final concept

SECTION C

IMPLEMENTATION & DISCUSSION

In this section, you can find an implementation plan, the discussion and reflections on the results and the process, and the general conclusions of the project.

11 IMPLEMENTATION

11.1 IMPLEMENTATION PLAN

This thesis provides Drees & Sommer with knowledge about the evolution and trends of the workplace that can be used by its consultants when working or presenting offers to clients. The company can access this content in the workplace development map of chapter 4.1. In addition, the tool provides a differentiating method to do user research in a shorter time and with a focus on the future. This can be used as a unique selling point for clients. That is why to ensure the tool's adoption, an implementation plan with three strategies is provided to the company (Figure 56). I will implement the first strategy before finishing my thesis contract.

The first strategy is ensuring that the UX team understands the tool, especially the UX consultants. They will be the tool owners; therefore, they must understand how it works and how to facilitate a session with it. I will make a presentation session with the team to present the project results and clarify questions. This presentation will include the test case to show how it was applied in an actual situation. In addition, they will have access to all the information in this thesis and the showcase, which is a flyer with instructions on how to use the tool (See the separate file named showcase). One advantage of the UX consultants is that because of their design and facilitation experience; they do not require additional training in facilitation.

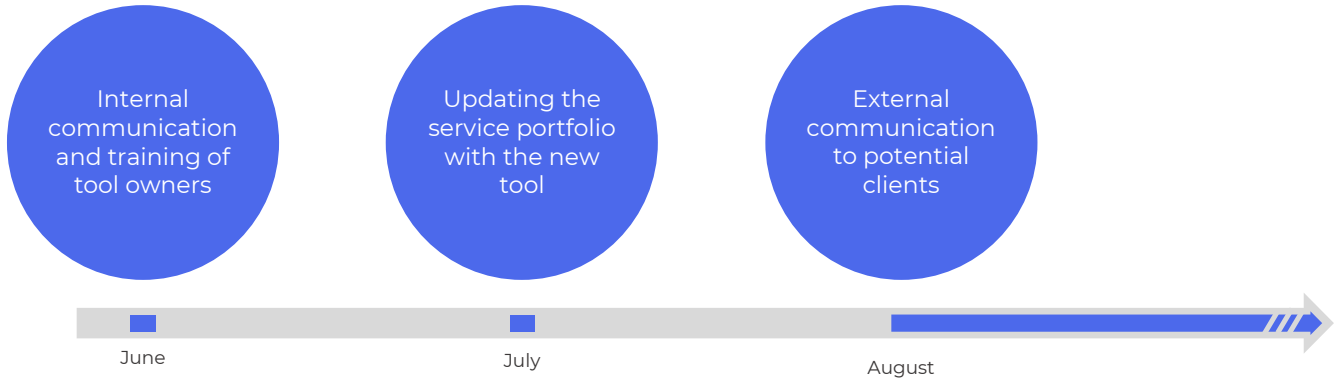


Figure 56. Implementation plan

The second strategy is to update the UX presentation and website with some trends from the workplace development map and then market this tool as a new innovative service for clients. There have been some meetings with the UX team about this strategy, and some ideas have been shared with them. It is not the scope of the thesis to develop this website; however, all the information of the thesis and content generated in it is available for the company to ensure its execution.

Finally, the third strategy is to share the website and the updated UX presentation to potential users to show the UX team's value and the new method they provide. This strategy aims to capture potential clients who are reluctant to do workplace studies because of the required time and resources, or those who have already accessed current users' needs with internal employee surveys. Lastly, UX consultants can also share the content on social media.

11.2 ADAPTING AND UPDATING THE CONTENT

One of the design requirements for developing the tool was to ensure a solution that could be easily updated and adapted to different situations and clients. As a result, the Miro board interface was selected as the end platform, and the content included in the tool can be easily changed. However, it is crucial to design a process that facilitates knowledge management about workplace trends. The UX consultants are very experienced and are constantly exposed to trends and changes in the market. Consequently, the workplace development map can be an active repository or a shared document, where consultants can constantly add new trends. If the knowledge about the future workplace is accessible, updating the tool becomes easier.

There are two situations in which the tool can be adapted. The first situation should be a programmed activity every three or six months. One of the UX consultants can be responsible for taking the content from the shared workplace development map document and changing the five templates of the tool accordingly: Work model, location, spaces, services, and technology. The second situation is more of a tailored exercise. Some of the trends might not apply, or new trends must be incorporated for specific clients—for instance, in a current project with a client from the education sector, the building design does not only require working spaces for the staff and professors, but it also requires spaces for education and students. In this case, the tool can incorporate a new dimension or adapt the existing dimensions to trends in education.

11.3 INVOLVING MORE PARTICIPANTS

The tool was designed as a conversation and co-design tool with a maximum of five participants to ensure engagement and facilitate the decision-making process in the group. However, there are occasions when it is necessary to include more participants, particularly when clients need to involve all key stakeholders at once. In these situations, the tool can be adapted. The group can be divided into smaller teams, and the different dimensions can be assigned to them. Then, before the ranking stop, each group presents its decisions, and the entire group can do the last ranking and future insignias as a closure exercise. Depending on the size of the group, it might be necessary to include some extra facilitators to help the other subgroups, take notes and record the conversations. As mentioned before, the group discussion while using the tool provides further insights.

11.4 BUSINESS MODEL: SOURCES OF REVENUE

Incorporating the tool into the UX portfolio can become a new unique selling point for the company. There are three ways to translate this tool to revenue (Figure 57)—first, a claim to win more contracts requiring workplace studies. Especially in the current situation, many clients come with open questions about the future workplace. Therefore, this tool and its supporting background can be used as a sales argument and can help open up the market to new segments of clients who cannot find simplified workplace studies in the market focused on future user needs. Second, workplace studies become the door to other phases of the construction process (Chapter 5.3, Figure 13), enabling cross-selling with other business lines, for instance, project management. Finally, having a complementary tool in the workplace study portfolio means additional consulting hours can be charged when applying this tool to a project.

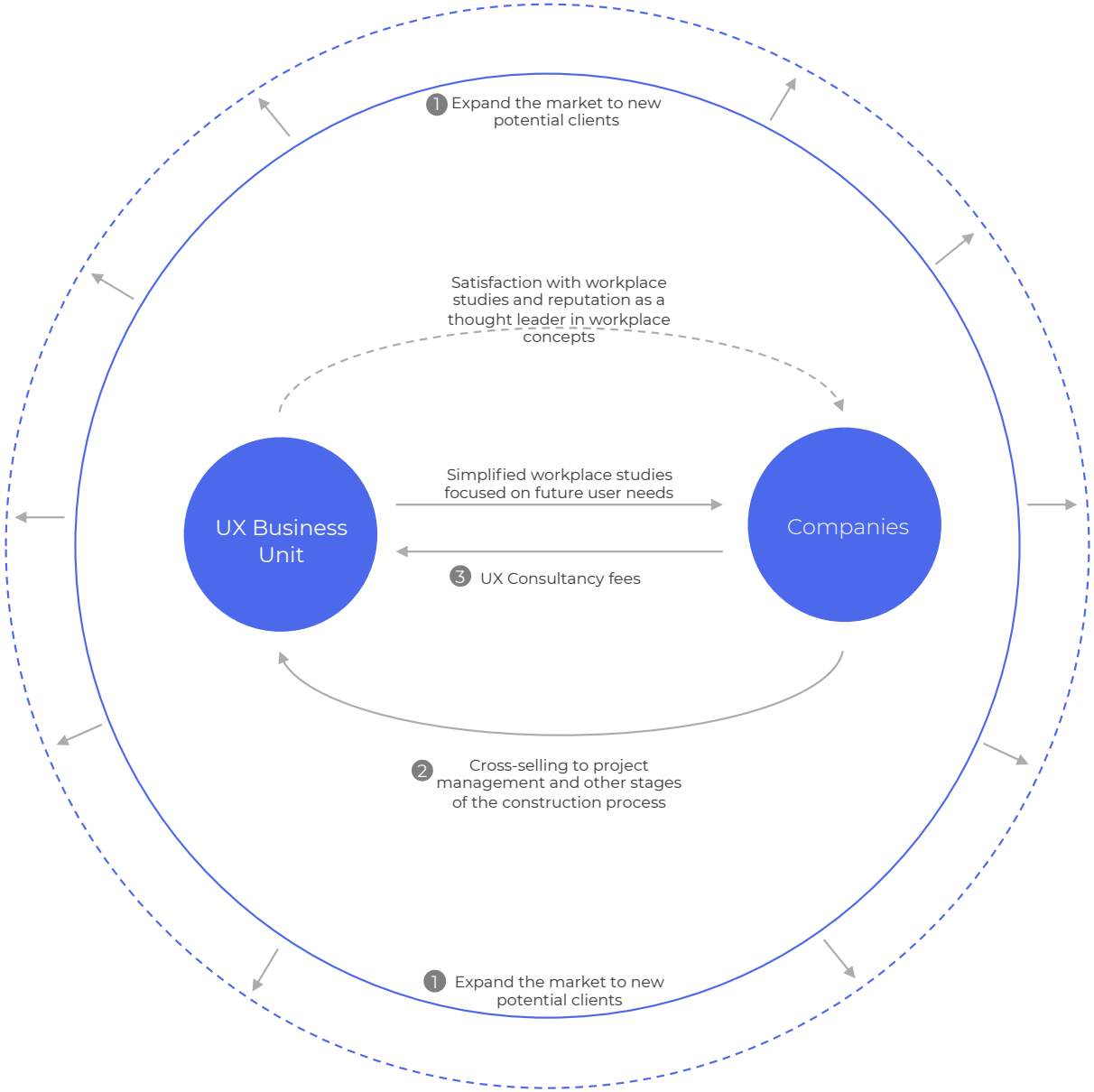


Figure 57. Potential revenues streams for incorporating the new tool

12 DISCUSSION

12.1 RESULTS INTERPRETATION

This chapter analyses the tool testing sessions' results and discusses how the solution addresses this thesis's central question and two sub-questions. Three topics will be discussed: A tool for future visioning and user needs research (Central question), A tool that incorporates workplace trends and predictions to trigger participants to think and speak about the future (Sub-question 1), and A co-design tool that provides visions and insights about the future workplace efficiently (Sub-question 2).

12.1.1 A TOOL FOR FUTURE VISIONING AND USER NEEDS RESEARCH (CENTRAL QUESTION)

The seven tool outputs (Chapter 4.2.3) were designed to provide both a vision and an understanding of future user needs. The scope of the result depends on the participants involved, while the workshop remains the same. A vision is created when the workshop is implemented with the company's leadership team or the client. Future user needs and priorities are defined when the workshop is carried out with lead users. (See chapter 4.2 for information about the type of participants of the tool).

For instance, the first output of the tool is the definition of the maximum three activities that will require an office in 2032. The answer to this question from the leadership team is considered the vision they have for the company's work model. This visioning workshop can be organized in one session, and all the leadership team can be involved at once. Since they are also the project owners, the decisions of this type of session do not require further validation.

When the same question is discussed with lead users or employees from the company, the results cannot be directly considered the company's vision. Instead, it becomes a user perspective about what employees might need in the future. However, since the number and segments of employees can be more diverse than the ones represented in a workshop, the results are informative for the design process and open to interpretation by designers and UX consultants.

One might consider including a representative sample of the population of users to have significant results in the users' workshops. However, it is important to note that this also goes against the requirement of having a time-efficient tool and the definition of co-design itself (Sanders & Stappers, 2018). Moreover, the actual tool's differentiation is not the representativeness of the results, but the way the questions and different triggers are designed to make the leadership team or users think and provide new ideas about the future workplace, away from the present constraints. For instance, in both testing sessions, participants were more open to accepting future technologies that are still incipient, such as holograms, smart surfaces, or mass adoption of the metaverse.

On the other hand, the tool becomes a source of knowledge and inspiration but not a source of predictions or facts. In fact, it is the role of the designer and other stakeholders involved in the

process to find new perspectives and combine both the vision provided by the leadership team and the user insights to define a future-oriented workplace concept that satisfies both clients and users. This definition is in line with generative design theory (Sanders & Stappers, 2018).

12.1.2 A TOOL THAT INCORPORATES WORKPLACE TRENDS AND PREDICTIONS TO TRIGGER PARTICIPANTS TO THINK AND SPEAK ABOUT THE FUTURE (SUB-QUESTION 1)

Futures studies theory combines science, research-based evidence, stories, fiction, and objects to stimulate conversations about the future (Auger, 2013; Bleecker, 2009; Kuosa, 2011). From this theoretical support, the content layer of this thesis was developed and tested as possible triggers (Chapter 10), ending with the workplace development map (Chapter 4.1). The following process step was to find a way to incorporate the content into a tool. For this goal, six triggers were methodically designed in the tool to trigger people to think and speak about the future: 1) Division into five workplace dimensions, 2) Future teller machine predictions, 3) Open questions with a maximum limit of answers, 4) trends for inspiration, 5) Idea evaluation criteria, 6) Restriction of red box ideas. Three of these six elements were assessed by users as the most useful to trigger their future thinking (Chapter 10.10, Figure 54). The first is the idea evaluation criteria inspired by the workplace development map. This trigger allowed participants to validate how future-oriented their ideas were. Combined with trigger 6, it incentivized participants to think about ideas aligned with trends or even new ones. It also prevents participants from presenting ideas about things that are already the norm or outdated. This can be proven by the fact that only 2 out of 18 ideas in the second test belonged to the red box category: 'what most companies do.' The second most appreciated trigger was the division of the workshop into five dimensions. This trigger allowed participants to focus on specific topics about the future workplace one at a time, and it kept the conversations focused. It was also designed to give participants an overall picture of the workplace and avoid spending all the time on just one topic. Finally, the third most appreciated trigger was the future teller machine predictions. Participants found this to be a fun element that stimulated their future thinking. It was designed to get participants from their present state of mind into a future reality and make them more open to new ideas.

In addition to the triggers, a particular emphasis was made by participants on the discussions. Indeed, this was the most valuable aspect of the tool in both testing sessions (Chapter 10, Figures 49 and 54). This is an exciting result because the tool was designed as a co-creation tool, where speaking openly about the future was encouraged. Therefore, having participants accentuate the value of the discussions provides good evidence that the triggers worked and that the tool's goal was achieved, not only in triggering people to think about the future but in ensuring that people share their thoughts and speak about them.

12.1.3 A CO-DESIGN TOOL THAT PROVIDES VISIONS AND INSIGHTS ABOUT THE FUTURE WORKPLACE EFFICIENTLY (SUB-QUESTION 2)

The application of co-design had two goals in the development of the tool. The first one was to help participants access their latent needs. The theory is that when participants are considered experts instead of passive research subjects and are allowed to make things instead of passively speaking about what they think, it gives designers insights into their latent needs (Sanders & Stappers, 2018). Thus, participants are considered experts during the workshop, and the facilitator plays a passive role. Moreover, the participants have all the answers to the different tasks; there is no hierarchy or anyone else in the room with more knowledge than them. For this reason, participants are carefully recruited, and at the beginning of the workshop, they are reminded about why they were selected. Moreover, the different triggers are designed to empower participants and make them share a similar level of knowledge.

The discussions are initially open, but there is always a tangible outcome after every dimension: a limited set of written or drawn ideas to summarize the discussions. There is also a tangible result at the end of the workshop, a one-pager with all the ideas ranked and the three future insignias. This allows people to take away something. Actually, the final ranking and future insignias exercise was also the second most valued element in the second concept testing (Chapter 10, Figure 54). According to the feedback

conversation with participants, the reason is that participants feel adding more value when they see what they made at the end.

The second application of co-design in the tool was related to efficiency. This was a critical problem within the workplace study process in the company because most of the existing research tools take too much time to be implemented. In turn, this becomes a reason for some clients to decide not to do workplace studies (Chapter 5). This new tool offers a simplified user research version compared to extensive surveys or interviews. As mentioned in the previous paragraphs of this chapter, this tool aims not to create statistically significant results. Instead, design research provides different perspectives about the users and can be used as inspiration in the design process (Sanders & Stappers, 2018). Therefore, a small number of sessions can provide equal value as having many of them. However, using the tool with different groups within a company is recommended to get different perspectives. For instance, there can be different workshops for each company department or location. It will depend on each company's structure and requirements. A benefit is that the workshops are designed for two hours, enabling multiple sessions in a day and more than enough in a week if necessary.

12.2 REFLECTIONS ON THE PROCESS

The design process used during this thesis enabled the development of a tool that fulfills the goal of this project of triggering clients and users to think and speak about the future workplace during the visioning and research stages of workplace studies. However, several personal learnings are highlighted apart from this project's direct output.

12.2.1 LEARNING FROM GOOD PRACTICES

I will start discussing what worked well. First, I saw in practice how the problem frame was constantly evolving, and I was able to put into practice the theory of co-evolution of the problem-solution space (Dorst & Cross, 2001). I was able to do this because, from the early stages of the process, I started collecting information from different sources that clarified the problem space combined with preliminary ideas that helped delineate the actual problem. In addition, I was able to do research through design to test many of these preliminary ideas. For instance, the several iterations I made of the content implicitly tested some elements incorporated later in the tool development.

The second thing that worked well was the division of the thesis into two components, content creation and tool development. It helped me clarify the project's scope and bring back the attention to the tool development, which was the project's primary goal.

Third, the close communication with the company supervisor and other UX consultants spurred a deep understanding of the company and provided constant validation about the different decisions made during the project. This strategy proved helpful because the decisions were clear to the client throughout the project and facilitated a positive attitude toward implementing the tool.

Finally, having experienced coaches in different disciplines provided a constant fresh perspective to the process and the project results. Their questions challenged many of my assumptions and helped me expand the problem-solution space on several occasions and avoid fixation.

12.2.2 LEARNINGS FROM DEFICIENCIES

There were two aspects of the process that did not work well. First is the amount of time invested in developing the content. This happened because I expected to analyze the workplace context comprehensively before moving to solution development. Understanding the context was necessary to formulate the problem; however, having perfect predictions was not the project's scope. On the contrary, the project's focus was the tool to enable the creation of different visions with clients and users. Fortunately, the mentors noticed this problem. To overcome the situation, I divided the project scope into two routes, the content and the tool, keeping the tool as the destination and the content as an ingredient used in the tool. I also reframed the content scope from trying to predict the future workplace to

testing which content levels and representations triggered participants better to think about the future. These actions helped me be back on track and finish the tool component on time.

The second problem I encountered was fixation, a design bias in which designers adhere to a set of ideas or concepts that limit the design outcome (Jansson & Smith, 1991). In my case, I was fixated a couple of times with specific ideas. First, during the early stages of the project, I was fixated on the idea of implementing a design sprint as a way to solve the problem of time efficiency that was discovered in the internal analysis (Chapter 5). This idea was tested with a client, and it worked as a method. However, it did not consider other angles of the problem, such as the future orientation. Another fixation was after the definition of the design direction. A method idea that incorporated a board game with cards seemed to be the best solution to start prototyping. However, there were new things that could be incorporated to make this solution even better. My two mentors were vital players in helping me uncover these fixations, challenging me to expand the solution space and seek new possibilities.

12.3 LIMITATIONS AND FUTURE RESEARCH

12.3.1 PROCESS LIMITATIONS

There are two groups of users for the tool—lead user employees of different levels of the organization and the leadership team. The tool was only tested with the first group of users, and no testing was done with the leadership team of a company. This can become a limitation because these participants might have different mindsets. The participants used for testing were lead users, which tend to be more open to innovation (Eisenberg, 2011). In addition to this, the tool was iterated only two times and was tested with a specific industry. New tests with a different group of users and different types of clients from different industries can lead to different insights and adjustments to the tool in the future.

12.3.2 FUTURE RESEARCH

There is an opportunity to incorporate other futures studies methods and elements to the tool and test how it impacts people. One of these methods could be design fictions (Bleecker, 2009), in which the current elements of the tool could be complemented with probes or tangible representations of the future. It could be interesting to combine the future teller machine predictions of the tool with tangible representations to make participants more aware of the future possibilities. For instance, there could be an alliance with technology companies and other tech suppliers to co-create probes. It could also be possible to access tech labs where innovations are happening and do the workshops in such locations. A good example could be the Microsoft Customer Experience Center in Amsterdam (Microsoft, 2020), which offers an area for customers to learn about digital transformation and see different future applications of the Microsoft technology developed by third parties as inspiration.

Another area for future research can be about increasing the scope of participation and co-design beyond the visioning and research stages of the workplace study process. There are opportunities to benefit from a participatory approach in other stages of the process. Participation in the real estate industry and construction process is not new (Lallimo, 2014). Participation is seen as a communication and change management activity for Drees & Sommer and many other real estate actors. Different workshops and interventions are designed to communicate and evaluate concepts with users. Nonetheless, it would be interesting to design other spaces where there can be a more active role from the participants.

The problem with the industry's current approach is that the insights from users are usually generated when the concept has been developed, and there is little room for change (Granath, 2001). The future workspace envisioner proved that new ideas could be incorporated into the workplace design concept by involving informed lead users and using the right tools. For now, the ideas provided by the tool are input for designers, but maybe in the future, there can be a continuation to elaborate and test with users more detailed concepts.

12.4 OTHER APPLICATIONS & VALUE FOR DESIGNERS

The principles behind the future workspace envisioner tool can be extended to other situations when triggering people to think and speak about the future is required. The five principles are: Start with a multiperspective trend analysis on the specific topic, organize the information into timelines and dimensions, include random future predictions, enable open conversations in a workshop setting, and keep the outcome strategic and tangible.

The first principle is the core of the tool and future studies. It requires preliminary research on the specific context in which the tool might be used. This is what was called in this thesis the content creation phase. The research is mainly a trend mapping exercise on the specific context and subjacent areas. For instance, this project's central topic was the future workplace; however, the trend mapping exercise looked into technology, economy, politics, work, social, and environment domains. A recommendation here can be to use checklists such as the DEPEST (D=Demographic, E=Ecological, P=Political, E=Economic, S=Social, T=Technological) to have a broad view of the trends (Simonse et al., 2018). Chapter 8 elaborates more on this process.

Once an understanding of the evolution of the topic has been determined, it is then necessary to organize the information. This is what we called content layering in this project. This project's central insight was identifying a combination of timelines and dimensions as the best way to trigger people to think and speak about the future workplace. Therefore, the second principle extrapolates this insight to other situations and suggests organizing the information into timelines and dimensions.

The first recommended step in implementing the second principle is to divide the researched trends into dimensions. Dimensions are general themes or perspectives from which the central situation can be developed. For the case of the workplace, five dimensions were defined: Work model, location, space, services, and technology. The recommendation is to keep it to a maximum of five, so it can be manageable in a workshop of two hours. It is also important to ensure that the defined dimensions provide an overall picture of the different angles from which the central topic can unfold. For this project, clustering the trends from different domains and thinking about the impact they can have on the central topic worked well. The process was also inspired by the way dimensions are defined in the ViP method (Hekkert & Van Dijk, 2011). More information can be found in chapter 9.

Once the dimensions are defined, the trends clustered in each dimension can be divided into three timelines (Past, present, and future). This step might require additional research or conversations with experts from the field to understand the trends, the past, and the current situation. For the context of this project, the past evolution of the workplace was one of the first activities (Chapter 1). Second, the trends were divided into two categories; those that were more salient were the things that leading companies were doing; therefore, it was visible in many of the trend sources in the specific workplace domain and was connected to the present timeline. On the other hand, the future timeline was itself inspired by trends from the other domains, primarily the technology domain, where nascent technologies create future applications. A critical remark is that the future timeline is more open to creativity. For instance, a co-creation session with other designers was facilitated in this project to provide ideas about the future timeline. More information can be accessed in chapter 9.

The third principle is to find future predictions that are not entirely related to the central topic, and that can be used as external triggers and sources of inspiration. This step is open to even more creativity and sources. For example, applying fiction, probes, and other future predictions can be of great value. This principle

5 Principles derived from the *Future Workspace Envisioner* tool

1. Start with a multiperspective trend analysis on the specific topic.
2. Organize the information into timelines and dimensions.
3. Include random future predictions.
4. Enable open conversations in a workshop setting.
5. Keep the outcome strategic and tangible.

aims to get people out of their comfort zone and expand their solution space. This principle was incorporated into the tool using the future teller machine, using predictions from a futurologist blog. More information can be found in chapter 10.

The fourth principle is exemplified by the tool itself. It combines the previous steps into a co-creation tool that enables people to speak openly about the future and challenges their perspectives using the content mentioned in the former principles. This principle's primary goal is to enable users' active participation, understanding that there are no single answers for the future. Therefore, the users and problem owners involved in the situation are the best informed to create future visions. It is also recommended to define the participants carefully. A combination of the clients and lead users was defined for this project. The detailed functioning of the tool is explained in chapter 4.

Finally, the last principle is to empower participants to develop ideas on each defined dimension, keeping the outcome tangible. This was made possible by ensuring that each dimension has one or a maximum of two questions and that each question encourages participants to define a fixed set of priorities instead of providing an open list of ideas. Of course, open ideas are welcomed at the beginning, but the tool guides people to make decisions and define what really matters. The result is that at the end of the workshop, participants get a clear overview of what they did and the tool output is clearly defined and ready to use in other stages of the design process.

12.5 IMPLICATIONS FOR ACADEMIA

The theory from the tool development can also be extended to other areas of the strategic design field. It opens the opportunity to incorporate futures studies as a strategic design method to devise the future and complement other methods taught during the master's, such as road mapping. It is well known that most of the things we design today will be used in the future. However, the information about the future is not perfect or accessible (Reeves et al., 2016). Furthermore, strategy is shifting from planning sessions that project past budgets and goals to a dynamic strategy that puts tangible innovation at the center. It is not only about competing in the current market but innovating and quickly adapting to change (Bradley et al., 2018). Thus, the strategic design field's ability to incorporate design principles and tools to devise and implement companies' innovation strategy becomes more pertinent than ever (Calabretta et al., 2016).

There are two possible applications for futures studies in the strategic design discipline. First is the ability to understand the future thoroughly with different tools and approaches. There are methods used by other professionals that can provide new insights into the future. For instance, the application of the Delphi method, quantitative methods to define scenarios, AI and big data to make future predictions, technology mapping, or science-fiction development. Designers are already equipped with other tools and mindsets to understand users and the future. Designers have an innate ability to work with uncertainty (Tracey & Hutchinson, 2016) and to design for a context that does not exist yet (Hekkert & Van Dijk, 2011). Therefore, there is a vast potential for strategic designers to be referred to as knowledgeable futurologists in every role or institution they work.

The second application of futures studies has to do with the ability of designers to not only understand the future but also create it. The futurologist role is changing from predicting a linear future to a more activist role that can devise new visions and manage initiatives to make the future happen (Inayatullah, 2013; Masini, 1983; Medina, 2006). Therefore, combining futures studies with design offer new possibilities to explore the future and make it more tangible. This combination uses creativity, research-based facts, and representations to elicit conversation in areas no one has imagined before (Auger, 2013). It is the first step to procuring change to make people aware of the future possibilities. In addition, strategic designers can lead change and manage strategic initiatives to enable such visions (Calabretta et al., 2016).

Furthermore, futures studies and design share the same purpose: designing a better future for society (Bell, 1996, Manzini, 2014; Reeves et al., 2016). However, today's societal problems are complex by nature (Barnett, 2000). In this regard, the future can also be considered a complex context where many variables and actors influence the outcome, making intervening hard (Kuosa, 2011). Therefore, to navigate complexity, designers have developed participatory approaches that incorporate other disciplines and perspectives (Dahle, 2019; Sanders & Stappers, 2018). Thus, the combination of futures studies and co-design creates an approach where the future is not a result of an expert but more a collaboration of actors who can envision a desirable future together. In addition, design supplies futures studies with tools to intervene in the present and co-create these visions and solutions, moving from just understanding the future to implementing it. After all, in the age of complexity, designers are invited to have a more activist role in this regard, leading initiatives that promote change (Manzini, 2014).

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CONCLUSION

This thesis project was inspired by a general uncertainty that many companies faced recently and brought directly by the real estate consulting firm Drees & Sommer: what would be the future of the workplace after the recent pandemic? After diving deeper into the problem space and the company processes, it was discovered that there is no single answer to this question. On the contrary, the future workplace needs to adapt to the specific future needs of different employees and companies. Therefore, the actual problem was first to identify such future needs to design future-oriented workplaces. Two difficulties were found when further examining this problem at Drees & Sommer. First, their existing workplace study tools are focused on understanding present user needs and not precisely on the future. Second, some companies are reluctant to do workplace studies because it requires much time. From these understandings, the central question of this project was defined: How to design a time-efficient tool to trigger users and clients to think and speak about the future during the visioning and research stages of workplace studies?

This thesis provides two outputs. First is an understanding of the evolution of the workplace, which was summarized in a workplace development map (Chapter 4.1). This map is divided into five workplace dimensions (Work model, location, space, services, and technology) and organized into three timelines (past, present, and future). This output was integrated into the second and end-output of this thesis: a tool to trigger people to think and speak about the future workplace (Chapter 4.2). In addition, two theoretical frameworks supported the tool development: Futures studies which is about the systemic understanding of the future (Bell, 1996; Inayatullah, 2013), and Co-design, which integrates designers, users, researchers, and other stakeholders in the different phases of the design process (Chun et al., 2015; Sanders & Stappers, 2018; van Boeijen et al., 2020).

The different elements of the tool were methodically designed to trigger future thinking and conversations about it. Users highlighted five elements as the most valuable to achieving this goal. First, the discussions that the tool generated around the future workplace. Second, the tangible outputs that the tool offers to participants. Third, incorporating the workplace development map content to guide the decisions that participants make in the tool and allow them to assess the innovation level of their ideas. Forth is the division of the workshop into five dimensions allowing participants to have organized and focused conversations on specific topics without losing the overall picture of the workplace. Lastly, the random predictions in the future teller machine include a fun element in the tool and get participants to be more open about the future possibilities.

Finally, this project's main contribution is the possible application of this tool to other domains different from the workplace, where triggering people to think and speak about the future is required. Of course, further research will be required to support this application. However, the principles inferred from the things that worked in the tool testing sessions suggest a starting point: 1) Start with a multiperspective

trend analysis on the specific topic, 2) organize the information into timelines and dimensions, 3) include random future predictions, 4) enable open conversations in a workshop setting, and 5) keep the outcome strategic and tangible. Moreover, the combination of futures studies and co-design also opens a new opportunity for research. Design and future studies' practices generate new ways to understand and enable the future, making possible the shared purpose of both disciplines: to design a better future for society (Bell, 1996, Manzini, 2014).

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FIGURES & TABLES

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APPENDICES

APPENDICES

16.1 DETAILED BOARDS FROM THE FUTURE WORKSPACE ENVISIONER TOOL

Your future reality:

Work Model | Location | Space | Services | Technology

1.1) What activities will require an office in 2032?
(Discuss and define maximum 3)

1.2) Evaluate how future-oriented are your activities.
(Place the defined activities on the right clusters)

2.1) What would be the dominant working model in 2032?
(Discuss and define 1)

2.2) Evaluate how future-oriented is your defined working model.
(Place your definition on the right cluster)

If 2 or more of your choices belong to the "What most companies do now" cluster, re-evaluate your decisions. You can have only one decision in this cluster per dimension.

You can have more than one "What most companies do now" decisions only if you have blue ocean decisions to compensate.

Get inspiration

What most companies do now	What Trends show	A blue ocean
• Routine (emails, surfing, calls, administrative tasks). • Internal meetings or presentations. • Activities or jobs that require privacy. • Concentrating (reading, writing, analyzing, programming). • External meetings (clients, stakeholders, etc.).	• Creating (Designing, developing, innovating). • Informal encounters/unplanned meetings. • Socializing or networking. • Constant learning, up-skilling, re-skillin for new roles/jobs. • Collaborate with colleagues or external stakeholders to innovate and solve problems.	

Evaluate your choices

Get inspiration

What most companies do now	What Trends show	A blue ocean
• Hierarchical command organizations. • Hybrid (some days from home some from the office). • Agile work: Multidisciplinary teams solve specific problems in short cycles.	• Work anywhere any time – results-based. • Mass crowdsourcing and freelancing. • Intrapreneurship. • Decentralized autonomous organization. No management team, decisions are made bottom-up with smart contracts.	

Evaluate your choices

Your future reality:

Work Model | **Location** | Space | Services | Technology

3.1) What type of office and location will be more relevant in 2032? (Discuss and define 1)

3.2) Evaluate how future-oriented is your type of office. (Place your definition on the right cluster)

No restrictions for this dimension

Get inspiration

What most companies do now

- One central office in business district or city center.
- Multiple satellite offices in key areas of the city, close to where different employees live.

What Trends show

- One central space like a social club (Grand cafe, open lobby) in cool districts with access to trendy venues and parks.
- Satellite offices complemented with 3rd party places (cafes, coworking, client office, etc.) to offer as much convenience as possible.
- Anywhere can be an office (No physical office at all).
- Full virtual office on the metaverse.
- Mixed buildings where people live and work.

A blue ocean

Evaluate your choices

Your future reality:

Work Model | Location | **Space** | Services | Technology

4.1) What will be the most relevant interior elements and spaces in the future workplace in 2032? (Discuss and define 5)

4.2) Evaluate how future-oriented are your workplace interior elements. (Place your definitions on the right clusters)

If 2 or more of your choices belong to the "What most companies do now" cluster, re-evaluate your decisions. You can have only one decision in this cluster per dimension.

You can have more than one "What most companies do now" decisions only if you have blue ocean decisions to compensate.

Get inspiration

What most companies do now → What Trends show → A blue ocean

Workspaces

- Enclosed private spaces.
- Spaces for focus work.
- Enclosed meeting rooms of different sizes.
- Especial spaces for collaboration.
- Informal meeting spots.
- Hybrid meeting rooms.
- Relaxing/cozy lounges.
- Phone/video call booths.
- Agile/scrum meeting rooms.

Interior design elements

- Access to natural light and fresh air.
- Playful, colorful interiors.
- Surfaces to write everywhere.
- Integrate plants in the workplace.
- Homestyle decor (Rugs, standing lamps, shelves, rugs).

Workspaces

- Multipurpose modular rooms and furniture with movable walls.
- Especial places for learning.
- Outdoor spaces to work.
- Open public spaces to share with community.
- VR pods for focus work or crazy ideation sessions (I.e., ideate on mars).
- Special rooms for creativity/ideation.
- Interactive lobby and public areas for showing brand history, strategy and products, and exchange improvement ideas.
- Labs with high tech to experiment and learn.

Interior design elements

- Changing-color materials.
- Bio-based, 100% circular materials.
- Different themes in areas or rooms (I.e., Jungle, beach, bar, etc.).
- Self healing materials.
- Smart materials and fabrics.
- Light with different intensity and colors.
- Furniture that adapts to your size right away (No need to adjust manually).
- Furniture to work in any position (Standing, sitting, laying down).

Evaluate your choices

Your future reality:

Work Model | Location | Space | **Services** | Technology

5.1) What amenities do you expect to have inside or nearby the future workplace in 2032? (Discuss and define 5)

5.2) Evaluate how future-oriented are your defined amenities. (Place your definitions on the right clusters)

If 2 or more of your choices belong to the "What most companies do now" cluster, re-evaluate your decisions. You can have only one decision in this cluster per dimension.

You can have more than one "What most companies do now" decisions only if you have blue ocean decisions to compensate.

Get inspiration

What most companies do now

- Gender-neutral toilets.
- Restaurants with different food options (Catering or food hall).
- Free fruits and snacks.
- Café with barista.
- Vending machines.
- Supermarkets.
- Shopping stores.
- Access with public transport.
- Company pool vehicles to different destinations.
- Parking.
- Shared bikes.
- EV charging.
- Game room (pool table, chess, ping pong, etc.).
- Social and hobbies club.
- Social calendar and activities after work.
- Hobbies lessons (cooking, dancing, etc).
- Gym or sport center.
- Lockers.
- Tailor.
- Hairdresser.

What Trends show

- A la carte robotized restaurants.
- Wellness center/spa.
- Health check mirrors.
- Stress detectors.
- Health provider or GP on-site.
- Physiotherapist.
- Shared vehicles hotspot.
- Cinema/theater.
- Laundry.
- Vertical farms in unused space to provide fresh food.
- Kids kindergarten.
- Bring your pet/ Pet kindergarten.
- Bars.
- Full equipped kitchen (Can be used for personal use too).
- Event venue (Use work space for persona events).

A blue ocean

Evaluate your choices

Your future reality:

Work Model | Location | Space | Services | **Technology**

6.1) What technology features will be the most necessary in 2032? (Discuss and define 5)

6.2) Evaluate how future-oriented are the defined technology features. (Place your definitions on the right clusters)

If 2 or more of your choices belong to the "What most companies do now" cluster, re-evaluate your decisions. You can have only one decision in this cluster per dimension.

You can have more than one "What most companies do now" decisions only if you have blue ocean decisions to compensate.

Get inspiration

What most companies do now	What Trends show	A blue ocean

Devices
- Company tables/laptop.
- Mobile only.
- Bring your own device (One device for all: personal and work).

Audio visual communication systems
- Audio visual devices for hybrid meetings.
- Wireless content sharing.
- Smart interactive boards.
- Insta communication systems with external employees from other companies.

Others
- App for booking spaces.
- Smart building to optimize temperature, lights, water.
- Access with biometrics.

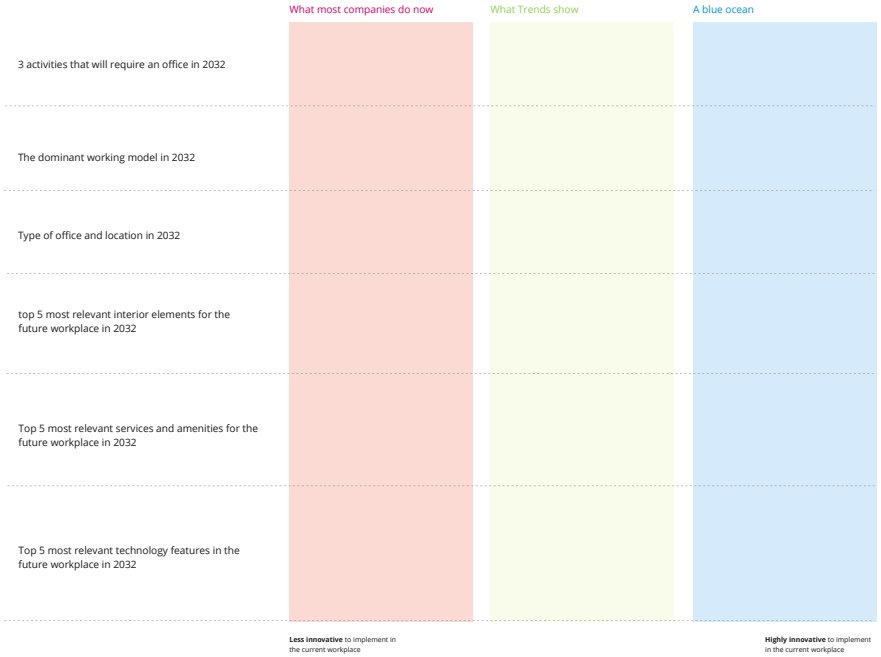
Devices
- Shared devices that quickly adapt to your preferences and data.
- Smart surfaces on the workplace (Everything becomes a device).
- VR headsets.
- Smart glasses / AR.

Audio visual communication systems
- 3D holograms for hybrid meetings.
- VR meetings.
- Space booking app system with social features to know when people you want to meet go to the office.
- Spaces that adapt to the communication style or language of others (I.e., insta translation).

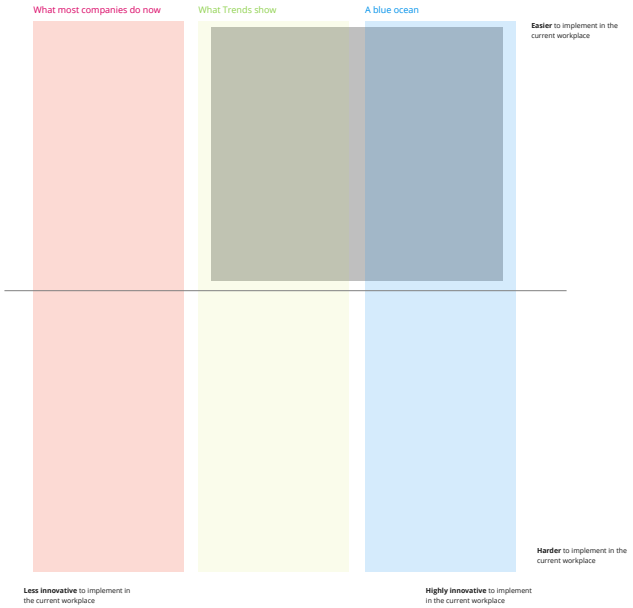
Others
- Smart micro climatization systems for each individual.
- Ambient intelligent space that adapts to your mood, preferences and needs.
- Robots for manual work: Bring documents, food, coffee.
- Personal bot assistants for everyone (A digital secretary).
- Tracking map to find people easily in the office.
- Smart noise cancelling everywhere you sit.
- Wireless charging everywhere.
- Shared power grid with other buildings.
- Unplug technology to disconnect from digital world.

Evaluate your choices

7) Copy the different definitions and evaluation results from the previous five dimensions



8) Take the ideas from exercise 7 and rank them vertically based on their feasibility of implementation now



9) Combine/select the first 3 ideas to implement now, the future insignias of the workplace

Write in these post-its how you imagine the implementation of these ideas in the current workplace.

16.2 TREND MAPPING SOURCES

Source		Publication	Year	Signals
Consultancy firm reports	Accenture	The future of work: A hybrid work model	2021	12
		Technology vision 2021: Leaders wanted, experts at change at a moment of truth	2021	24
		Fjord trends 2022: The new fabric of life	2022	8
	BCG Global	Future of Work	2021	2
		Work Will Never Be the Same—Savvy Business Leaders Are Adapting to Change That's Already Here	2022	7
		The How-To of Hybrid Work	2021	12
		What 12,000 Employees Have to Say About the Future of Remote Work	2021	8
	Deloitte Insights	Reconstructing the workplace: The digital-ready organization	2021	12
		Real Estate Predictions 2021: From Location, location, location to Location, insights, and experience	2021	8
	McKinsey & Company	The future of the workplace: Embracing change and fostering connectivity	2021	4
		What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries	2021	11
		The workplace will never be the same: Imperatives for real-estate owners and operators	2021	10
	CBInsights	12 tech trends to watch closely in 2022	2022	7
	Gartner	Top strategic technology trends for 2022: 12 trends shaping the future of digital business	2022	4
	PWC	Office of the future & remote working	2021	3
	World Economic Forum	5 tech trends to watch in 2022	2022	4
		The global risks report 2022 (17th edition)	2022	22
Architecture/workplace firm reports	Gensler	Design forecast 2021: Design strategies for a post covid world	2021	34
		Design forecast 2022: Resilient, design strategies for human experience	2022	33
	Leesman	Workplace 2021: Appraising future-readiness	2021	7
		Why workplace: A leader's guide to rebuilding the post-pandemic workplace	2021	5
	Workplace Insight	A brief history of the future of work	2021	65
		The way we talk about hybrid working can reflect a failure of imagination	2021	4
	Hermanmiller	Drivers of change for the future of work	2022	25
	Moser Assoc.	Rethinking the future workplace	2020	14
	Steelcase	Changing expectations and the future of work insights from the pandemic to create a better work exp.	2021	11
		Together Again: Shared Spaces in the Post-COVID Office	2020	32
		Five hybrid workplace mistakes to avoid	2022	1
		The new Era of hybrid work	2022	4
		Steelcase flex personal spaces	2022	41
Universities reviews	Harvard Business Review	5 Models for the Post-Pandemic Workplace	2021	19
		12 Questions About Hybrid Work, Answered	2021	13
		4 Strategies for Building a Hybrid Workplace that Works	2021	26
		The Future of Flexibility at Work	2021	17
		Don't Let Returning to the Office Burn Out Your Team	2021	21
		Do you really need all that office space? Harvard Business Review	2021	11
		Designing the hybrid office from workplace to "Culture space	2021	3
	Mit Sloan	Toxic culture is driving the great resignation	2022	3
Others	Bloomberg	Are you a robot?	2021	3
	Forbes	Five Predictions For The Future Of In-Office Work	2021	8
	Future Forum	The hybrid how-to: How leaders can embrace flexible working models	2021	4
	Harvard Gazet	Survey reveals what worked about online work	2021	6
	RMIT	Design leadership for the future of work	2022	29
	Work Design	In A Remote World, We Are Still Designing For Social Creatures	2020	17
	AESC	Workplaces Disrupted: The Office of The Future	2020	3

16.3 INTERVIEW GUIDE FOR EXPERTS

00:00 (5 mins)

Hi .
Thank you for participating in this interview.
Before we start 3 things worth mentioning.

- *This is an anonymized interview; we will not use your company name or your name in the reports. The information we will gather will be used for the development of this graduation thesis.*
- *I am not testing you, so feel comfortable to say what is on your mind. There are not right or wrong answers. I want to learn from your opinions and points of view.*
- *The interview will be audio recorded for the purpose of analyzing it later.*

Do you agree with this?
It is important however to sign a form, for formal procedures of the university. I will send it to you after the interview. Please send it back by email, this way I will be able to use the data.

This interview will be divided in 3 sections.

First, we will talk about your vision of the workplace
Second, I will present some literature trends I found; and we will have a discussion about it
Finally, I will ask you some questions about methods for workplace studies.

00:05 (30 mins)
Part 1: The workplace challenges and future
Goal: The questions of this section are designed to identify concerns and needs from the industry, clients and users. Moreover, capture additional future factors about the workplace.

Questions	Prompts
1. What would you say are the major shifts happening now in the workplace? / Shifts the pandemic left us?	*What are social, technological, economic, political, environmental aspects to consider?*
2. Which of these trends are going to stay?	*Why?*
3. What are the clients' major concerns about the workplace?	*What need do your clients have or express?*
4. What are user concerns about the workplace?	*What are the needs from the users, the employees?*
5. What would you say are the major concerns and challenges in the real estate industry now?	*How is real estate reacting to these challenges?*
6. Why do we need an office?	*What activities or type of work is going to happen in the office?*
7. What's next for the workplace in 10 years?	*Are we going to have offices in 2030-2050?* *What are those offices going to look like?* *How will we work in the future?* *Is this future for everyone? or for some roles/industries?*
8. What are important considerations to start designing those future-oriented workplaces now? Top 3 priorities to keep in mind?	*How must the current offices/workplace be adapted for that future?* *What technologies must we consider?* *What other aspects are relevant (i.e. Sustainability, cost, flexibility, wellbeing, health, etc.)*

00:35 (10 mins)
Part 2: Deep-Dive: Identified factors from literature
Goal: The questions of this section are designed to dive deeper into some of the elements that were found in the initial literature review.
Instructions: I will present you with 9 developments I found from literature review about the future workplace. After I present them, I will ask you some questions regarding these factors.

Questions	Prompts
9 Which of these developments would you say will be the most relevant in the future workplace?	*Select you top 3 and reason why.*
10 Which of these developments are the most uncertain or hard to predict?	*Select you top 3 and reason why.*
11 After reading these developments are new things you would like to add about the future workplace vision?	*To what extend did the vision we discussed earlier changed?*

00:45 (15 mins)
Part 3: Methods
Goal: The last section of the interview is to gather recommendations or ideas from the experts regarding possible methods to incorporate in our toolkit. This is also a wildcard. So if time is running out I can skip this last section.

Questions	Prompts
12. What recent workplace study methods have you tried?	
13. What workplace study methods would you recommend to incorporate to have a more future oriented vision about the workplace?	*In your opinion, what is the most effective method to capture future needs in workplace studies?*
14. How would you take an experimenting mindset in the workplace design?	*If you had to prototype and test a workplace in one week, what would you do? Any methods you would recommend for this?*
15. To what extend do you involve users in the design of the workplace?	*Is it participatory design (research and interpret insights) or is it more a co-creation approach? Would you prefer one over the other? Why?*

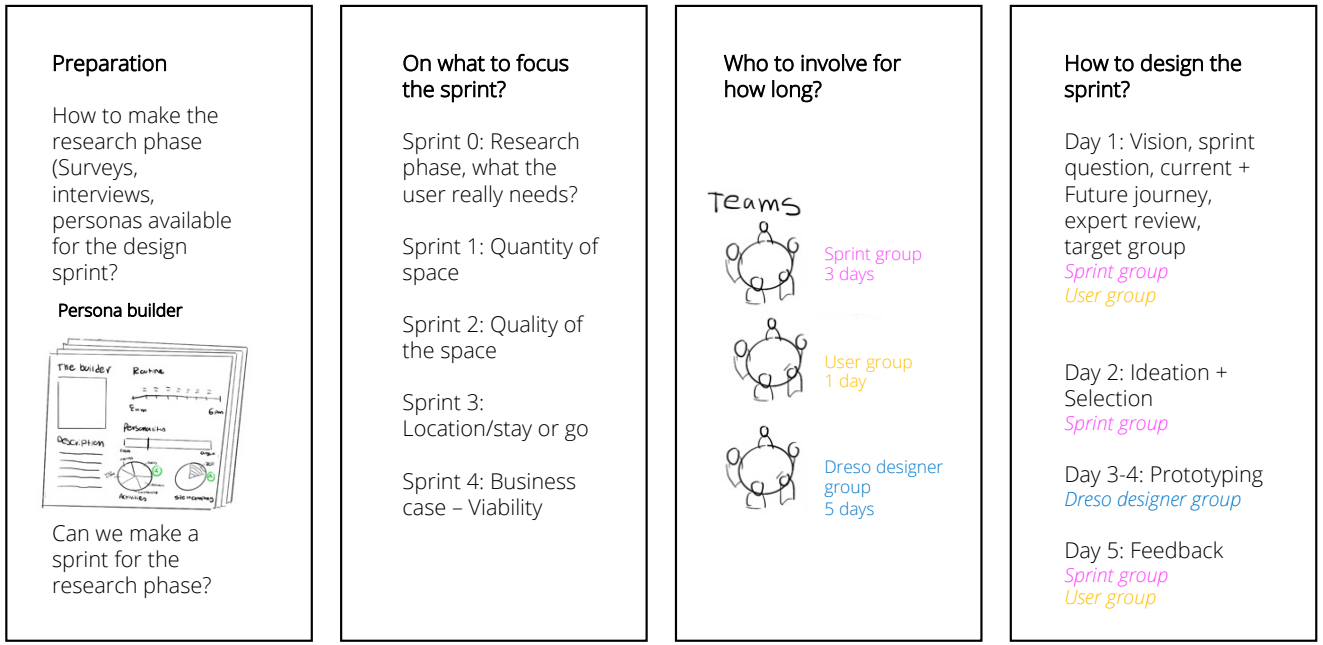
16.4 PRELIMINARY IDEAS DURING PROBLEM EXPLORATION

From the early stages of the process, ideas were explored to improve the understanding of the problem. These ideas can be classified into three directions. The first explored direction was about intervening in the whole process and seeing the bigger picture to make the workplace studies shorter. The second direction was to shorten the existing methods and design lean versions of current tools. Finally, the third direction was about incorporating future-oriented methods into the existing tools at Drees & Sommer.

16.4.1 INTERVENING THE PROCESS

Two ideas were developed in this direction. The initial idea was to implement the design sprint methodology to shorten the workplace study duration. This idea had several iterations. It was also supported by literature studies, especially the Design sprint book (Knapp, 2016) and the Philips rapid co-creation process (Gardien et al., 2016; Calabretta et al., 2016). A design sprint was tested with a Drees & Sommer client. I participated in the user testing phase of this project. The design sprint successfully developed and tested a workplace concept with users in four days. However, the concept was based on the current state of the art of the workplace and not on a visionary future. On the positive side, it validates the application of some co-design methods as an alternative and efficient user research tool.

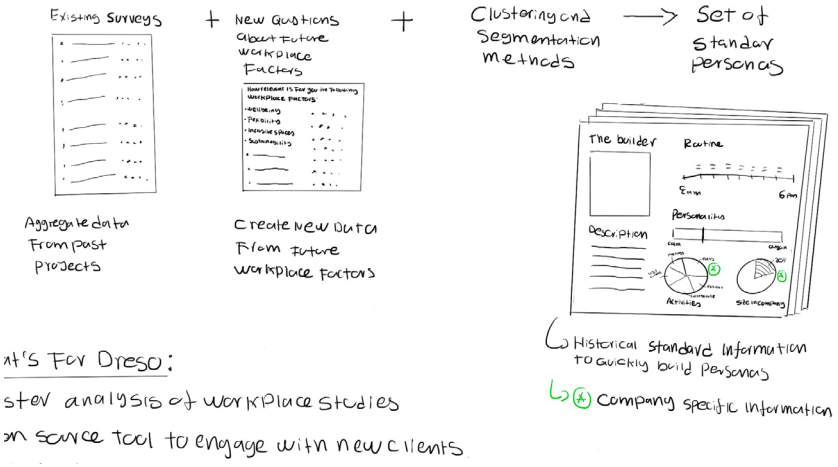
The second idea developed in this direction was developing a modular workplace study process with different module sizes (small, medium, large). The modules were mapped, and they were beneficial to understanding the current workplace study process at Drees & Sommer (Chapter 5, Figure 14). I did not develop this idea further because it will require to intervene each module and existing tool, which is not feasible for the project's time frame. However, an important insight from this idea was the concept of creating a modular tool that can be used in different situations and stages of the workplace study process.



16.4.2 SHORTENING EXISTING METHODS

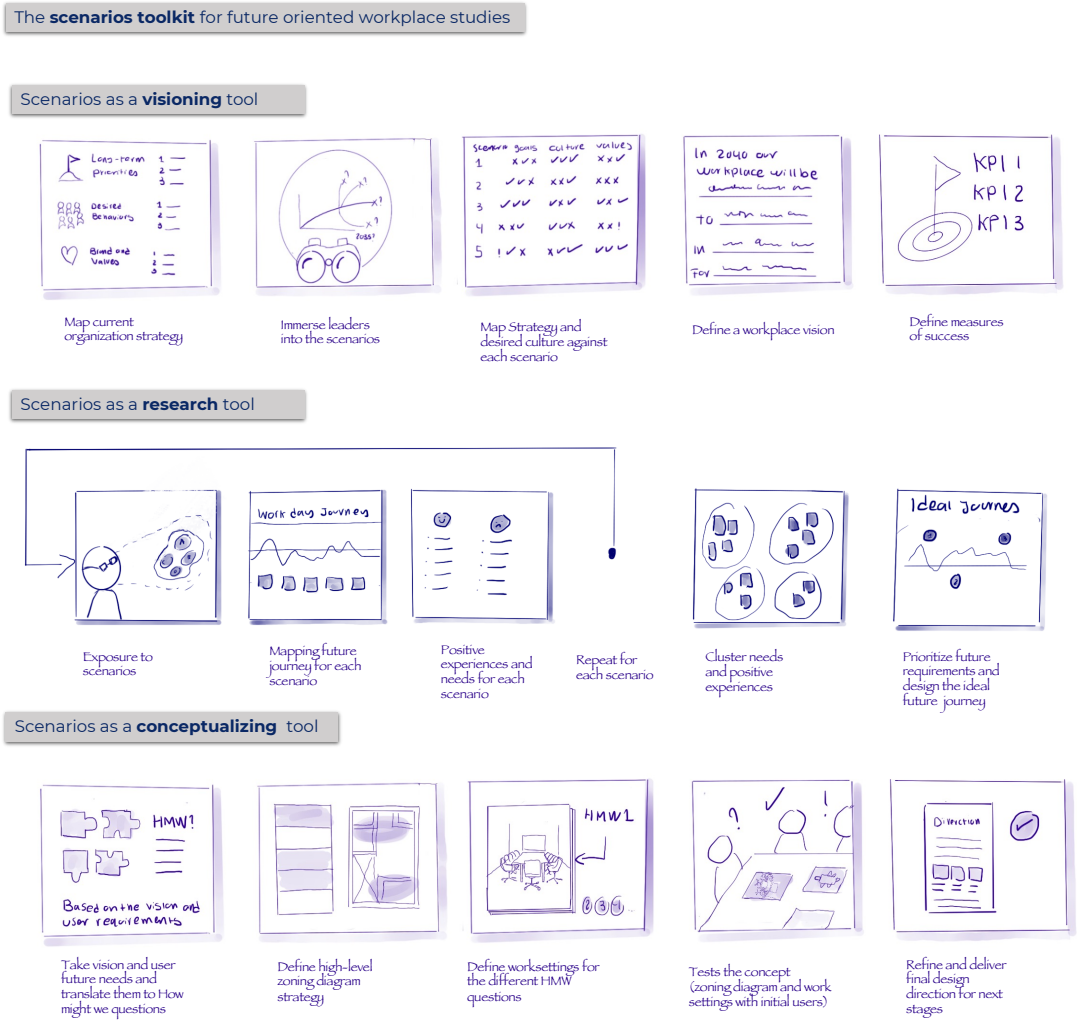
This direction takes elements from the previously discussed modular workplace study idea with different module sizes. A specific opportunity was identified with the persona module (Chapter 5, Figure 14) and translated into an idea called the persona builder. Personas have been used as a research tool by Drees & Sommer, and they are designed based on the surveys and interviews carried out during the research stage of the workplace study process. The problem with this module is that new personas are defined with each new project, and the entire analysis is made from zero. The analysis of the surveys and interviews is a manual and time-consuming process. The persona builder idea is about automating this process and using previous project data to create a robust set of personas that can be used for any project while keeping personalized fields for the own client data. Even though this idea might not be implemented during this project, it is a future

opportunity for the company to develop it, involving some data scientists and software developers.



16.4.3 INCORPORATING FUTURE-ORIENTED METHODS INTO EXISTING TOOLS

This third direction had a couple of iterations. It first started with the idea of applying the ViP method (Hekkert & Van Dijk, 2011) in the existing workplace study tools of visioning and future journey workshops. Then, it evolved to developing scenarios as a cross-module tool for visioning, research, and conceptualizing. The general idea is to use future scenarios in a written or visualized form to trigger leaders to define future-oriented visions of the workplace and trigger users to speak about future needs and solution ideas. Based on the content testing iteration of chapter 9, scenarios are helpful to guide users to think about the options of the future workplace model and select the model that best works for them. However, they are more limited when diving into specific dimensions of the workplace.



16.5 SEVENTY-SIX FACTORS ABOUT THE FUTURE WORKPLACE

ECONOMY

- GLOBAL PANDEMICS AND WARS HAVE LONG LASTING EFFECTS ON SOCIETY
- INCREASING COMMODITY PRICES, SUPPLY CHAIN DISRUPTIONS AND DEBT WILL AFFECT SOCIETY IN THE LONG TERM
- ULTRA CONVINIENCE ECONOMY: EVERYTHING TO YOUR DOOR, WHENEVER YOU WANT
- ECOSYSTEMS MOVE: BREAKING DOWN THE BORDERS BETWEEN INDUSTRIES
- THERE'S AN INCREASING AMOUNT OF EMPTY OFFICE BULDINGS
- TAXES FOR DIGITAL NOMADS CAN BE THE FIRST STEP FOR ENABLING A REAL FLEXIBLE WORKFORCE
- COMPANIES GROWTH LESS LIMITED BY WORKPLACE OR WORKFORCE LOCATION RESTRICTIONS

SOCIAL/CULTURE

- EXPECTED WAVES OF MIGRATION DUE TO POLITICAL, ENVIRONMENTAL AND SOCIAL PROBLEMS
- INEQUITY AND EXTREME POVERTY IS RAPIDLY GROWING DUE TO PANDEMIC
- TECH-HEALTH FOR A PERSONALIZED AND PREVENTIVE HEALTH AND WORK RISK MANAGEMENT
- EROSION OF SOCIAL COHESION IS LEADING TO GROWING POLARIZATION (ME VS WE)
- WORLD'S POPULATION IS GROWING AND GETTING OLDER
- URBANIZATION IS GROWING
- PEOPLE ARE MORE CONNECTED TO THINGS WITH MEANING
- HUMANS FEEL THE PAIN OF LOSS TWICE AS INTENSIVE AS THE EQUIVALENT PLEASURE OF GAIN

ENVIRONMEMT

- ECONOMIC AND HEALTH PROBLEMS ARE DEVIATING THE ATTENTION FROM LONG TERM ENVIRONMENTAL ISSUES (Development)
- PEOPLE ARE HAVING A MORE CONSCIOUS AND LEAN CONSUMPTION DUE ENVIRONMENTAL DISASTERS, INFLATION AND SUPPLY CHAIN SHORTAGE (Trend)
- THE PRIVATE SECTOR IS PUTTING SUSTAINABILITY AS A KEY ELEMENT OF THEIR STRATEGY (Trend)
- THE ELECTRIFICATION OF EVERYTHING (Development)
- FROM THE LAB TO THE TABLE, A NEW SOURCE OF CARBON-FREE MEAT (Development)
- CIRCULARITY EVERYWHERE (Development)

TECHNOLOGY

- DIGITALIZATION ACCELERATED BUT WITH DISPARITIES IN DIFFERENT PLACES AND INDUSTRIES
- HYPER-PERSONALIZATION AND CONVENIENCE ARE CREATING HIGHER USER EXPECTATIONS
- INCREASING DIGITALIZATION IS LEADING TO MORE CIBERSEURITY RISKS
- HYPERAUTOMATION: THE AUTOMATION OF EVERYTHING
- DATA PRIVACY AND TRANSPARENCY AS A FUNDAMENTAL RIGHT
- GENERATIVE AI - HELPING HUMANS CREATE CONTENT
- THE EXTENDED REALITY: Metaverse, NFTs, Avatar economy, digital humans, VR, AR.
- DATA FABRIC: DATA IS EVERYWHERE BUT WE ARE STILL STRUGGLING TO PROCESS IT ALL
- THE WORLD WILL BECOME EXPONENTIALLY MORE CONNECTED

- THE PROFESSIONAL AND PERSONAL LIFE IS GETTING BLURRED DUE TO HYBRID WORK, NOT EVERYONE IS HAPPY ABOUT IT (Development)
- DIGITAL PLATFORMS AND FREELANCE MODELS ENABLING PEOPLE TO MAKE A LIVING OUT OF THEIR PASSIONS AND HAVE MORE INDEPENDENCE (Trend)
- STRUCTURES ARE VIRTUALLY GETTING FLATER WITH LESS SILOS (Development)
- FLEXIBILITY BEYOND A SPACE, ENABLED BY HR PRACTICES, POLICIES, CULTURE, LEADERSHIP, INCENTIVES, STRATEGY AND PROCESS (Development)
- WORKING FROM ANYWHERE WITHOUT RESTRICTIONS (Development)

WORKPLACE

- WORKPLACES ARE BEING DESIGNED TO PROMOTE WELLBEING AND HEALTHIER LIFESTYLES
- WORKPLACES ARE GETTING GREENER AND ARE ALSO MOVING OUTDOORS
- A PREFERENCE BASED WORKPLACE WITH PURPOSEFUL FLEXIBLE WORKSETTINGS: DIFFERENT SPACES TO MEET, COLLABORATE, DO FOCUS WORK, CONCENTRATE, RETREAT, ETC.
- WORKPLACES USING TECHNOLOGY TO OFFER FRICTIONLESS AND NATURAL PHYGITAL EXPERIENCES
- FOCUS WORK AND PRIVACY ARE IMPORTANT REASONS TO GO TO THE OFFICE, HOWEVER, NOISE AND DISTRACTIONS IS STILL A NEED FROM MANY USERS
- FROM MY TO OUR SPACE. NO DEDICATED SPACES
- WORKPLACES ARE PROMOTING HEALTHIER AND CLEANER ENVIRONMENTS. EASY TO CLEAN MATERIALS, SOCIAL DISTANCING, AIR CIRCULATION
- THE WORKPLACE NEEDS TO REFLECT ORGANIZATIONS' SUSTAINABLE EFFORTS AND STRATEGIES - IT IS A MUST

- THE REAL ESTATE NEEDS TO EXPERIMENT, PROTOTYPE, TEST BEFORE ESCALATING SOLUTIONS
- SMART BUILDINGS USING TECHNOLOGY TO CREATE BETTER INTERACTIONS AND COLLECT SPATIAL USE DATA
- A NEW WAY TO MEASURE RE IMPACT: EXPERIENCE, VARIETY, MOBILITY INSTEAD OF USED SPACE, QUALITY VS QUANTITY
- THE WORKPLACES DESIGNED MAINLY TO FOSTER HUMAN INTERACTION, COLLABORATION AND INNOVATION
- THE WORKPLACES DESIGNED AS A CENTER OF ORGANIZATION CULTURE, PROFESSIONAL DEVELOPMENT, LEARNING AND TALENT ATTIRITION
- WORKPLACE NEIGHBOURHOODS TO CREATE SENSE OF BELONGING IN A SHARED WORKING SPACE
- MIX USED SPACES ON THE RISE MAKING WORK AND PRIVATE LIFE MORE INTERTWINED: RETAIL STORES CONVERTED TO OFFICES, COMMERCIAL AND OFFICE SPACE COMBINED, MIX NEIGHBORHOODS, REDUNDANT OFFICE SPACE CONVERTED TO RESIDENTIAL UNITS
- THE WOW FACTOR MATTERS BOTH INSIDE AND IN THE SURROUNDINGS: COOL/COZY INTERIOR VIBES AND COOL/DISTINCTIVE LOCATIONS (The end of industrial, flat open floors)
- A NEW FLEXIBLE BUSINESS MODEL OF REAL ESTATE NEED TO BE IN PLACE FOR A MORE UNCERTAIN WORLD WITH A DYNAMIC GROWTH
- A NEW EXPERIENCE OF THE VIRTUAL WORKPLACE ENABLED BY THE METAVERSE
- MORE EMPOWERED USERS/TEAMS WHO DECIDE WHEN, AND WHERE TO GO, WHICH FLOOR, LOCATION, SPACE TO USE
- THE WORKPLACE AS A BRAND-IDENTITY SHOWROOM

HUMANS DO NOT FEEL COMFORTABLE WITH UNCERTAINTY OR WHEN THEIR FREEDOM IS LIMITED

HUMANS NEED TO EXPRESS THEIR IDENTITY AND FEEL ACCEPTED

WE ARE SOCIAL CREATURES, WE WANT TO FEEL INCLUDED, BE RECOGNIZED

SPACES REFLECT OUR LIFESTYLES AND INFLUENCE HOW WE BEHAVE

NOT EVERYONE HAS THE CONDITIONS TO WORK FROM HOME

POLITICAL

GEOPOLITICAL INSTABILITY WILL CONTINUE TO GROW

WORK

EMPLOYEES' PRODUCTIVITY IS HIGH WHEN WORKING FROM HOME

PEOPLE WANT TO GO SOME DAYS TO THE OFFICE, BUT THEY DON'T WANT TO LOOSE THE FLEXIBILITY THEY GAINED

PEOPLE ARE LEAVING THEIR JOBS BECAUSE OF TOXIC CORPORATE CULTURES, BURNOUT, JOB INSTABILITY, AND A BIGGER NEED TO CONNECT WITH PASSIONS AND INDIVIDUAL GROWTH

MENTAL HEALTH IS DETERIORATING DUE TO THE UNCERTAINTY, RESTRICTIONS AND LACK OF WORK-LIFE BALANCE

PEOPLE ONLY WORKING FROM HOME FEEL ISOLATED AND LESS CONNECTED TO THE COMPANY BRAND

SOME JOBS ARE RAPIDLY OBSOLETE DUE TO AI, COVID AND DECARBONIZATION

HYBRID WORK WITH FLEXIBLE SCHEDULES AND LOCATIONS IS A NEW STANDARD IN SOME INDUSTRIES BUT IS DOESN'T APPLY FOR ALL

THE WORKPLACE NEEDS TO ENABLE INCLUSION BEYOND GENDER

FUN, VARIED AND EXCITING AMENITIES TO OFFER CONVENIENCE AND BETTER EXPERIENCES OF WHAT PEOPLE ALREADY HAVE AT HOME

WORKPLACES NEED TO CREATE A SENSE OF BELONGING AND PERSONALIZATION, ESPECIALLY WITH NOT DEDICATED PLACES

WORKPLACE DESIGNS TO BREAK DOWN THE BARRIERS BETWEEN TEAMS AND HIERARCHY - NO DEPARTMENT DIVISIONS

THE WORKPLACE AS AN ECOSYSTEM OF DIFFERENT SPACES BEYOND THE CENTRAL OFFICE

THE COMMUNITY IS GETTING MORE RELEVANT WHEN DESIGNING AN OFFICE, THE PUBLIC AND PRIVATE SPACES ARE MERGED -SEMIPUBLIC SPACES

THE WORKPLACE TO INTEGRATE AND CO-CREATE WITH CLIENTS AND THE COMMUNITY

A NEW CONCEPT OF CITIES TO ENABLE A HYBRID WORKPLACE: THE 20 MINS NEIGHBORHOOD, LESS COMUTE, INCLUSION, ACCESS TO TALENT, LESS CO2

LITERATURE FACTOR ADAPTED BY EXPERTS

LITERATURE FACTOR ADAPTED BY USERS

NEW WORKPLACE FACTORS FROM EXPERTS

NEW WORKPLACE FACTORS FROM USERS

16.6 USERS' SENSITIZING QUESTIONS

These are the sensitizing questions sent every day, to users from Monday to Friday from February 28th to March 4th 2022, through WhatsApp.

Monday – Your current workplace
Good morning_____ Thank you again for agreeing to participate in this graduation research. As I mentioned before, every day during this week, I will send you through this channel a small task. Feel free to answer through the chat when you have time.
Small disclaimers:
There are not good or bad answers, just reply the first thing that comes to your mind.
Workplace is about the physical place where you work, not your company or job-specific.
So today's task: What is the first word that comes to your mind when you think about your workplace?

Tuesday – What you like
Hi____ this is today's task: What are the three things that make you the happiest about your workplace?
(You can send pictures, words, or both)

Wednesday – If I could work anywhere
Hi, we are half-way
Today's question: If you could work from anywhere were would it be? (Use an image to answer to this question)

Thursday – What do you dislike
Hi, thanks for your active participation, we are almost done. The question of today: What are the three things you dislike the most about your workplace?
(You can send pictures, words, or both)

Friday– The future
We made it; final day question: How would you think the perfect workplace would be in 2050.

16.7 INTERVIEW GUIDE FOR USERS

00:00 (5 mins)
Intro

Hi .
Thank you for participating in this interview.
Before we start 3 things worth mentioning:

- This is an anonymized interview; we will not use your company name or your name in the reports. The information we will gather will be used for the development of this graduation thesis.
- I am not testing you, so feel comfortable to say what is on your mind. There are not right or wrong answers. I want to learn from your opinions and points of view.
- The interview will be audio recorded for the purpose of analyzing it later.

Do you agree with this?
It is important however to sign a form, for formal procedures of the university. I will send it to you after the interview. Please send it back by email, this way I will be able to use the data.

This will be an interactive interview, divided in 3 sections.

- First, I want to go deeper on some of the answers from last week.
- Second, we will do an interactive exercise of 35 minutes.
- Finally, we will reflect on the exercise.

00:05 (10 mins)
Part 1: The probing process and the current vision

Goal: Get user insights about how much they would like to be involved in the design of their office and get input on their initial future vision before providing them extra information about the factors (interactive part) this way I can test if the factors exercise creates new visions and gets future needs from users.

Questions	Prompts
1 How comfortable did you feel answering the questions last week?	*Was there any particular question you felt harder to answer to? Why?*
2 What are the main changes that the covid pandemic left in your workplace?	
3 Which of these changes do you think are going to be long term and which might be temporary?	
4 How do you feel about these changes?	
5 In your interview you mentioned you would like to work from_____and that you don't like the How do you think those things could be solved in the future workplace?	
6 Can you describe to me how you imagine the workplace in 10 years?	
7 If you had the chance, would you like to be involved in the design of the office of the future? Why? And how would you like to be involved?	*And how would you like to be involved?*

00:15 (35 mins)
Part 2: interactive section

Goal: Get user insights about the identified factors from literature, and test how much into the future they are able to look when provided with extra information and a method.

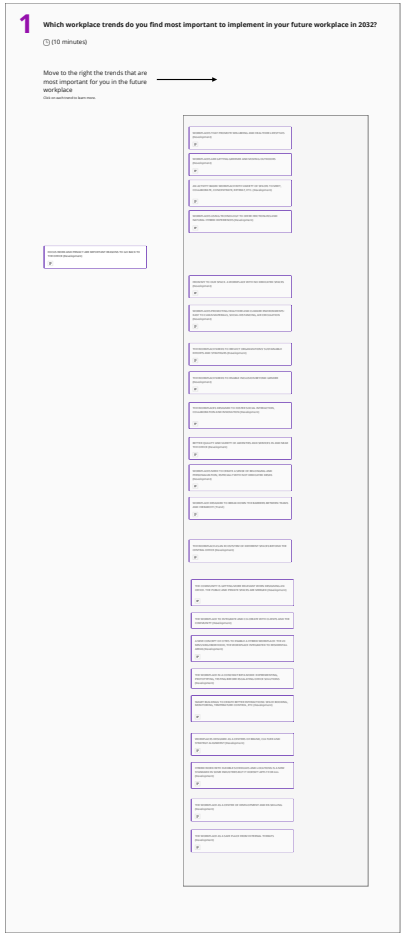
Instructions: This exercise will take 35 minutes, it will be made through Miro. I will provide you the link through this chat. The exercise has 4 sections. I will guide you through each section. Time is very important. If we don't get to finish after 35 minutes we will stop where we are and reflect. Important consideration: Please think out loud as much as you can.

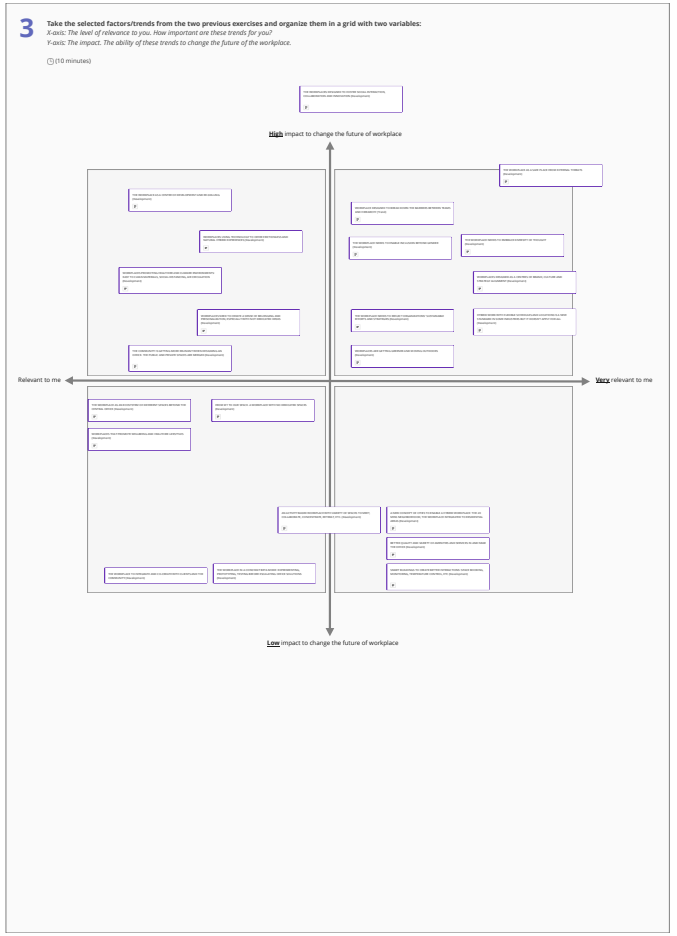
00:50 (10 mins)
Part 3: The interactive tool process

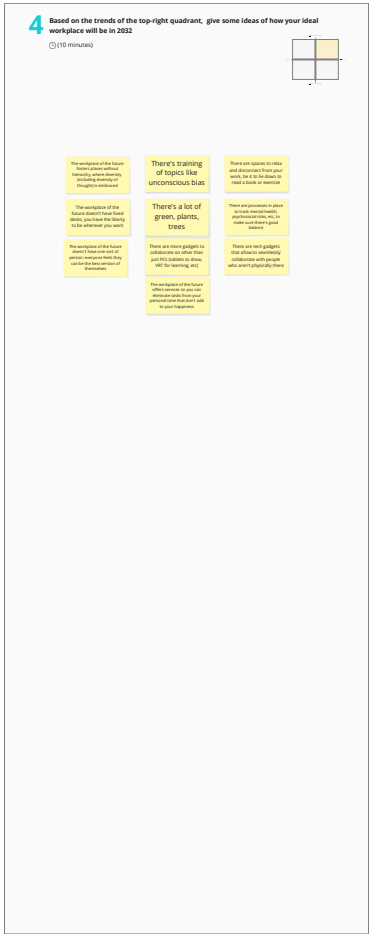
Goal: Evaluate the method used as a way to improve future visioning and future needs identification.

Questions	**Prompts**
8 What is your vision about the workplace of the future now?	
9 How do you think this vision changed based on the exercises we did las week and today?	*To what extend do you think this vision changed based on the previous exercised from this week and today?*
10 How did the methods help or limit your ability to look into the future?	*Or would you have gotten to the same pla without the methods? How comfortable a you normally when thinking about the future?*
11 What did you liked about the method?	*About both the sensitizing and the interac tive exercise*
12 What can be improved?	*About both the sensitizing and the interac tive exercise*

16.8 MIRO BOARD EXERCISE FOR TESTING FACTORS AS TRIGGERS: RESULTS FROM INTERVIEWEE 1







16.9 TWELVE FUTURE WORKPLACE DIMENSION WITH RELATED FACTORS

A workplace with higher purpose: the real sustainability

A conscious capitalism where companies and employees seek a higher purpose requires bold moves from organizations. Sustainability is more than an energy label, it is about social equity and communities development. It considers the design, the construction, the use and after use of the building for all the different stakeholders.

- PEOPLE ARE HAVING A MORE CONSCIOUS AND LEAN CONSUMPTION DUE ENVIRONMENTAL DISASTERS, INFLATION AND SUPPLY CHAIN SHORTAGE (Trend)
- THE PRIVATE SECTOR IS PUTTING SUSTAINABILITY AS A KEY ELEMENT OF THEIR STRATEGY (Trend)
- CIRCULARITY EVERYWHERE (Development)
- INEQUITY AND EXTREME POVERTY IS RAPIDLY GROWING DUE TO PANDEMIC (Development)
- DIGITALIZATION ACCELERATED BUT WITH DISPARITIES IN DIFFERENT PLACES AND INDUSTRIES (Development)
- ECONOMIC AND HEALTH PROBLEMS ARE DEVIATING THE ATTENTION FROM LONG TERM ENVIRONMENTAL ISSUES (Development)
- THE WORKPLACE NEEDS TO REFLECT ORGANIZATIONS' SUSTAINABLE EFFORTS AND STRATEGIES - IT IS A MUST (Development)
- THE ELECTRIFICATION OF EVERYTHING (Development)
- THE WORKPLACE NEEDS TO ENABLE INCLUSION BEYOND GENDER (Development)
- STRUCTURES ARE VIRTUALLY GETTING FLATER WITH LESS SILOS (Development)

Greener, open & easy to clean spaces to promote wellbeing

The workplace will become greener with access to exterior spaces for work. More sources of natural light and ventilation. Allowing people to disconnect, be in contact with nature, and have fresh air.

- WORKPLACES ARE GETTING GREENER AND ARE ALSO MOVING OUTDOORS (Development)
- WORKPLACES ARE BEING DESIGNED TO PROMOTE WELLBEING AND HEALTHIER LIFESTYLES (Development)
- MENTAL HEALTH IS DETERIORATING DUE TO THE UNCERTAINTY, RESTRICTIONS AND LACK OF WORK-LIFE BALANCE (Development)
- PEOPLE ONLY WORKING FROM HOME FEEL ISOLATED AND LESS CONNECTED TO THE COMPANY BRAND (Development)
- EMPLOYEES' PRODUCTIVITY IS HIGH WHEN WORKING FROM HOME (Trend)
- WORKPLACES ARE PROMOTING HEALTHIER AND CLEANER ENVIRONMENTS. EASY TO CLEAN MATERIALS, SOCIAL DISTANCING, AIR CIRCULATION (Development)
- PEOPLE ARE LEAVING THEIR JOBS BECAUSE OF TOXIC CORPORATE CULTURES, BURNOUT, JOB INSTABILITY, AND A BIGGER NEED TO CONNECT WITH PASSIONS AND INDIVIDUAL GROWTH (Trend)
- TECH-HEALTH FOR A PERSONALIZED AND PREVENTIVE HEALTH AND WORK RISK MANAGEMENT (Development)

The hybrid working district is more than work: Location to differentiate

Urban development will create more mix used spaces. The 20 minutes neighbourhood where work and living are closer. Retail areas converted to office space. Business districts becoming more residential. Open lobbies creating semi-public spaces for the community.

- MIX USED SPACES ON THE RISE MAKING WORK AND PRIVATE LIFE MORE INTERTWINED: RETAIL STORES CONVERTED TO OFFICES, COMMERCIAL AND OFFICE SPACE COMBINED, MIX NEIGHBORHOODS, REDUNDANT OFFICE SPACE CONVERTED TO RESIDENTIAL UNITS (Development)
- ULTRA CONVINIENCE ECONOMY: EVERYTHING TO YOUR DOOR, WHENEVER YOU WANT (Development)
- URBANIZATION IS GROWING (Development)
- THE WORKPLACE TO INTEGRATE AND CO-CREATE WITH CLIENTS AND THE COMMUNITY (Development)
- THE WOW FACTOR MATTERS BOTH INSIDE AND IN THE SURROUNDINGS: COOL/COZY INTERIOR VIBES AND COOL/DISTINCTIVE LOCATIONS (The end of industrial, flat open floors) (Development)
- WORLD'S POPULATION IS GROWING AND GETTING OLDER (Principle)
- A NEW CONCEPT OF CITIES TO ENABLE A HYBRID WORKPLACE: THE 20 MINS NEIGHBORHOOD, LESS COMUTE, INCLUSION, ACCESS TO TALENT, LESS CO2 (Development)
- THERE'S AN INCREASING AMOUNT OF EMPTY OFFICE BUILDINGS (Development)
- THE COMMUNITY IS GETTING MORE RELEVANT WHEN DESIGNING AN OFFICE, THE PUBLIC AND PRIVATE SPACES ARE MERGED -SEMIPUBLIC SPACES (Development)

A new real estate model for a dynamic world

The real estate model and its actors need to be reinvented. The distance between investors, owners, developers and the final users has to be shortened. The real estate requires more flexibility, it requires more experimenting. The metrics are changing from SM2 to experience, quality and flexibility.

- A NEW FLEXIBLE BUSINESS MODEL OF REAL ESTATE NEED TO BE IN PLACE FOR A MORE UNCERTAIN WORLD WITH A DYNAMIC GROWTH (Development)
- INCREASING COMMODITY PRICES, SUPPLY CHAIN DISRUPTIONS AND DEBT WILL AFFECT SOCIETY IN THE LONG TERM (Development)
- THE REAL ESTATE NEEDS TO EXPERIMENT, PROTOTYPE, TEST BEFORE ESCALATING SOLUTIONS (Development)
- EXPECTED WAVES OF MIGRATION DUE TO POLITICAL, ENVIRONMENTAL AND SOCIAL PROBLEMS (Development)
- GLOBAL PANDEMICS AND WARS HAVE LONG LASTING EFFECTS ON SOCIETY (Principle)
- GEOPOLITICAL INSTABILITY WILL CONTINUE TO GROW (Development)
- HUMANS DO NOT FEEL COMFORTABLE WITH UNCERTAINTY OR WHEN THEIR FREEDOM IS LIMITED (Principle)
- COMPANIES GROWTH LESS LIMITED BY WORKPLACE OR WORKFORCE LOCATION RESTRICTIONS (Development)

Creating a sense of belonging and privacy in a shared space

The As workplaces become hybrid, designated desks will disappear. Companies will need to design new workplaces that make people feel part of a community. Zoning strategies that go beyond departments, like neighbourhoods where people can make adaptations to their place. Especial offices for high levels will disappear, making the workplace more inclusive. On the other hand spaces will be designed to consider people's privacy and noise control for focus work, since people got used to a more quiet controlled environment when working from home.

- FROM MY TO OUR SPACE. NO DEDICATED SPACES (Development)
- FOCUS WORK AND PRIVACY ARE IMPORTANT REASONS TO GO TO THE OFFICE, HOWEVER, NOISE AND DISTRACTIONS IS STILL A NEED FROM MANY USERS (Trend)
- HUMANS NEED TO EXPRESS THEIR IDENTITY AND FEEL ACCEPTED (Principle)
- WORKPLACES NEED TO CREATE A SENSE OF BELONGING AND PERSONALIZATION, ESPECIALLY WITH NOT DEDICATED PLACES(Development)
- HYPER-PERSONALIZATION AND CONVENIENCE ARE CREATING HIGHER USER EXPECTATIONS (Trend)
- DATA PRIVACY AND TRANSPARENCY AS A FUNDAMENTAL RIGHT (Principle)
- HUMANS FEEL THE PAIN OF LOSS TWICE AS INTENSIVE AS THE EQUIVALENT PLEASURE OF GAIN (Principle)
- STRUCTURES ARE VIRTUALLY GETTING FLATER WITH LESS SILOS (Development)
- WORKPLACE NEIGHBOURHOODS TO CREATE SENSE OF BELONGING IN A SHARED WORKING SPACE (Development)

The workplace a center of culture, brand & human capital

A place for human and emotional connection, where people share knowledge and meaning. A place where culture and brand are strengthened and materialized.

- THE WORKPLACES DESIGNED AS A CENTER OF ORGANIZATION CULTURE, PROFESSIONAL DEVELOPMENT, LEARNING AND TALENT ATTIRITION (Development)
- SPACES REFLECT OUR LIFESTYLES AND INFLUENCE HOW WE BEHAVE (Principle)
- WE ARE SOCIAL CREATURES, WE WANT TO FEEL INCLUDED, BE RECOGNIZED (Principle)
- PEOPLE ARE LEAVING THEIR JOBS BECAUSE OF TOXIC CORPORATE CULTURES, BURNOUT, JOB INSTABILITY, AND A BIGGER NEED TO CONNECT WITH PASSIONS AND INDIVIDUAL GROWTH (Trend)
- DIGITAL PLATFORMS AND FREELANCE MODELS ENABLING PEOPLE TO MAKE A LIVING OUT OF THEIR PASSIONS AND HAVE MORE INDEPENDENCE (Trend)
- EROSION OF SOCIAL COHESION IS LEADING TO GROWING POLARIZATION (ME VS WE) (Development)
- THE WORKPLACE NEEDS TO ENABLE INCLUSION BEYOND GENDER (Development)
- THE WORKPLACES DESIGNED MAINLY TO FOSTER HUMAN INTERACTION, COLLABORATION AND INNOVATION (Development)
- THE WORKPLACE AS A BRAND-IDENTITY SHOWROOM (Trend)
- PEOPLE ONLY WORKING FROM HOME FEEL ISOLATED AND LESS CONNECTED TO THE COMPANY BRAND (Development)
- PEOPLE ARE MORE CONNECTED TO THINGS WITH MEANING (Principle)
- SOME JOBS ARE RAPIDLY OBSOLETE DUE TO AI, COVID AND DECARBONIZATION (Development)
- EXPECTED WAVES OF MIGRATION DUE TO POLITICAL, ENVIRONMENTAL AND SOCIAL PROBLEMS (Development)

A preference based workplace: Tailor to all user needs

The workplace is a myriad of spaces for different needs, from conventional focus work and meeting rooms to lounges, collaboration zones and retreat spaces. For people who need to be full time to hybrid workers who come by hours or days.

- MORE EMPOWERED USERS/TEAMS WHO DECIDE WHEN, AND WHERE TO GO, WHICH FLOOR, LOCATION, SPACE TO USE (Trend)
- A PREFERENCE BASED WORKPLACE WITH PURPOSEFUL FLEXIBLE WORKSETTINGS: DIFFERENT SPACES TO MEET, COLLABORATE, DO FOCUS WORK, CONCENTRATE, RETREAT, ETC. (Development)
- HYBRID WORK WITH FLEXIBLE SCHEDULES AND LOCATIONS IS A NEW STANDARD IN SOME INDUSTRIES BUT IS DOESN'T APPLY FOR ALL (Development)
- FLEXIBILITY BEYOND A SPACE, ENABLED BY HR PRACTICES, POLICIES, CULTURE, LEADERSHIP, INCENTIVES, STRATEGY AND PROCESS (Development)
- HYPER-PERSONALIZATION AND CONVENIENCE ARE CREATING HIGHER USER EXPECTATIONS (Trend)
- PEOPLE WANT TO GO SOME DAYS TO THE OFFICE, BUT THEY DON'T WANT TO LOOSE THE FLEXIBILITY THEY GAINED (Trend)
- HUMANS DO NOT FEEL COMFORTABLE WITH UNCERTAINTY OR WHEN THEIR FREEDOM IS LIMITED (Principle)
- FROM MY TO OUR SPACE. NO DEDICATED SPACES (Development)
- STRUCTURES ARE VIRTUALLY GETTING FLATER WITH LESS SILOS (Development)
- NOT EVERYONE HAS THE CONDITIONS TO WORK FROM HOME (Trend)
- WORKPLACE DESIGNS TO BREAK DOWN THE BARRIERS BETWEEN TEAMS AND HIERARCHY - NO DEPARTMENT DIVISIONS (Trend)

Next level hybrid: An ecosystem of working spaces

The workplace is decentralised allowing offering people different options apart from the central office, these might include co-working spaces, client locations, satellite offices, cafes where secure connections can be made, etc.

- THE WORKPLACE AS AN ECOSYSTEM OF DIFFERENT SPACES BEYOND THE CENTRAL OFFICE (Development)
- ULTRA CONVINIENCE ECONOMY: EVERYTHING TO YOUR DOOR, WHENEVER YOU WANT (Development)
- ECOSYSTEMS MOVE: COMPANIES PLAYING TOGETHER TO THRIVE (Trend)
- INCREASING DIGITALIZATION IS LEADING TO MORE CIBERSEURITY RISKS (Development)
- WORKING FROM ANYWHERE WITHOUT RESTRICTIONS (Development)
- TAXES FOR DIGITAL NOMADS CAN BE THE FIRST STEP FOR ENABLING A REAL FLEXIBLE WORKFORCE (Development)
- COMPANIES GROWTH LESS LIMITED BY WORKPLACE OR WORKFORCE LOCATION RESTRICTIONS (Development)
- DIGITAL PLATFORMS AND FREELANCE MODELS ENABLING PEOPLE TO MAKE A LIVING OUT OF THEIR PASSIONS AND HAVE MORE INDEPENDENCE (Trend)

The workplace a cool and fun place to be

The workplace offers amenities and fun activities that no one has home. Pizza & beer afternoons, games, laundry service, name it. Cool and comfortable interiors in very hype districts with complementary services.

- THE WOW FACTOR MATTERS BOTH INSIDE AND IN THE SURROUNDINGS: COOL/COZY INTERIOR VIBES AND COOL/DISTINCTIVE LOCATIONS (The end of industrial, flat open floors) (Development)
- FUN, VARIED AND EXCITING AMENITIES TO OFFER CONVENIENCE AND BETTER EXPERIENCES OF WHAT PEOPLE ALREADY HAVE AT HOME (Development)
- ULTRA CONVINIENCE ECONOMY: EVERYTHING TO YOUR DOOR, WHENEVER YOU WANT (Development)
- A NEW WAY TO MEASURE RE IMPACT: EXPERIENCE, VARIETY, MOBILITY INSTEAD OF USED SPACE, QUALITY VS QUANTITY (Trend)
- FROM THE LAB TO THE TABLE, A NEW SOURCE OF CARBON-FREE MEAT (Development)
- HYPER-PERSONALIZATION AND CONVENIENCE ARE CREATING HIGHER USER EXPECTATIONS (Trend)

A virtual workplace anywhere

The virtual world in the Metaverse will allow companies to reinvent how employees experience the online work. It will create new phygital and frictionless experiences. A easier way to connect with people far away with natural online interactions and collaboration.

- A NEW EXPERIENCE OF THE VIRTUAL WORKPLACE ENABLED BY THE METAVERSE (Development)
- THE EXTENDED REALITY: Metaverse, NFTs, Avatar economy, digital humans, VR, AR. (Trend)
- INCREASING DIGITALIZATION IS LEADING TO MORE CIBERSEURITY RISKS (Development)
- WORKPLACES USING TECHNOLOGY TO OFFER FRICTIONLESS AND NATURAL PHYGITAL EXPERIENCES (Development)
- GENERATIVE AI - HELPING HUMANS CREATE CONTENT (Development)

Smart buildings that adapt to their users on real time

Smart buildings are more than light sensors, thermostats and elevators. Iot and AI developments will allow environments to read their users and adapt to their needs. Improving their wellbeing and creating personalised environments.

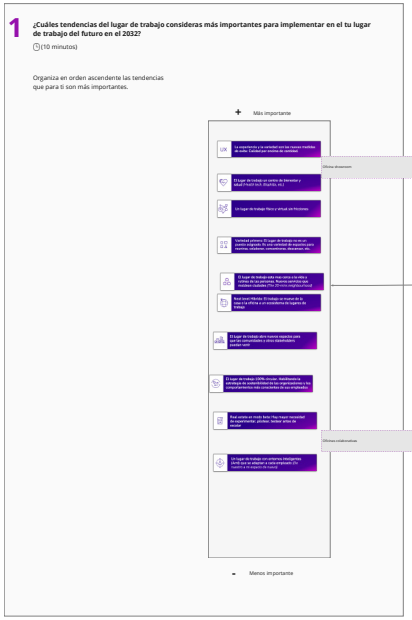
- SMART BUILDINGS USING TECHNOLOGY TO CREATE BETTER INTERACTIONS AND COLLECT SPATIAL USE DATA (Development)
- HYPERAUTOMATION: THE AUTOMATION OF EVERYTHING (Development)
- The world will become exponentially more connected (Principle)
- DATA FABRIC: DATA IS EVERYWHERE BUT WE ARE STILL STRUGGLING TO PROCESS IT ALL (Development)
- GENERATIVE AI - HELPING HUMANS CREATE CONTENT (Development)
- WORKPLACES NEED TO CREATE A SENSE OF BELONGING AND PERSONALIZATION, ESPECIALLY WITH NOT DEDICATED PLACES(Development)

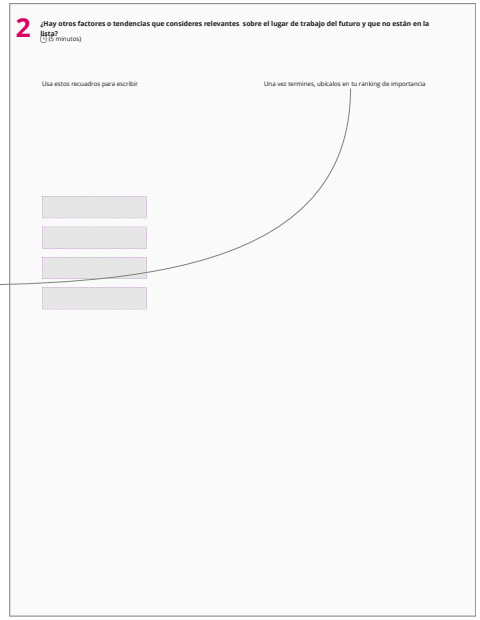
Separating the work and personal life again

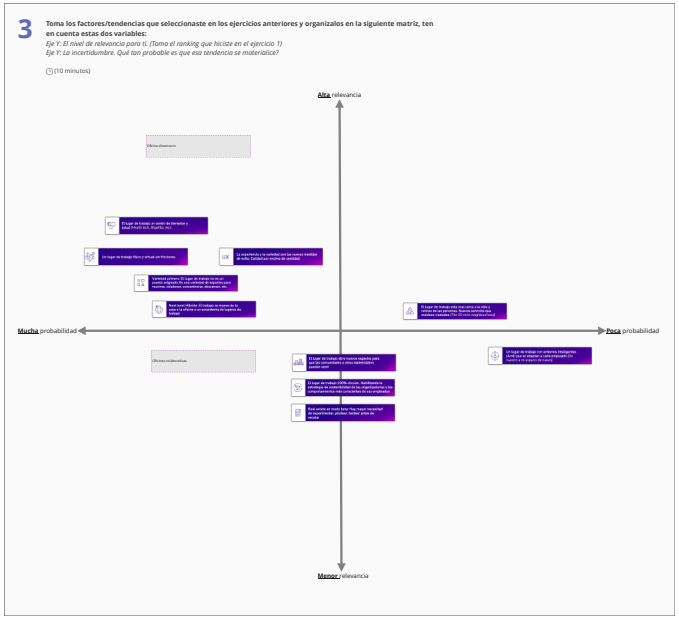
The workplace will become a key destination for people who do not have the conditions to work from home. Companies will invest more on people's home conditions, or even in adapting communal in the neighbourhoods to work. VR to change settings, or IT blockers to signal the end of the working day.

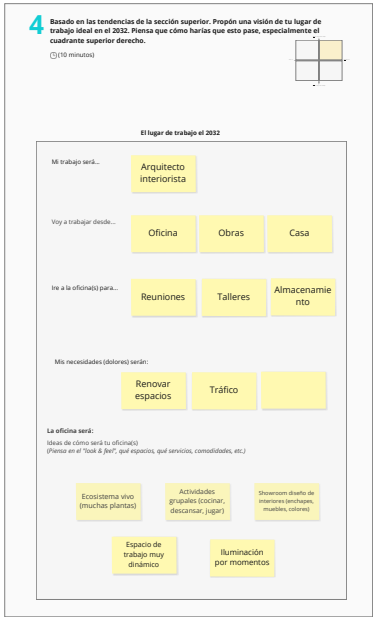
- THE PROFESSIONAL AND PERSONAL LIFE IS GETTING BLURRED DUE TO HYBRID WORK, NOT EVERYONE IS HAPPY ABOUT IT (Development)
- EMPLOYEES' PRODUCTIVITY IS HIGH WHEN WORKING FROM HOME (Trend)
- WORKPLACES USING TECHNOLOGY TO OFFER FRICTIONLESS AND NATURAL PHYGITAL EXPERIENCES (Development)
- A NEW EXPERIENCE OF THE VIRTUAL WORKPLACE ENABLED BY THE METAVERSE (Development)
- EROSION OF SOCIAL COHESION IS LEADING TO GROWING POLARIZATION (ME VS WE) (Development)
- INCREASING DIGITALIZATION IS LEADING TO MORE CIBERSEURITY RISKS (Development)
- FOCUS WORK AND PRIVACY ARE IMPORTANT REASONS TO GO TO THE OFFICE, HOWEVER, NOISE AND DISTRACTIONS IS STILL A NEED FROM MANY USERS (Trend)
- NOT EVERYONE HAS THE CONDITIONS TO WORK FROM HOME (Trend)

16.10 MIRO BOARD EXERCISE FOR TESTING DIMENSIONS AS TRIGGERS: RESULTS FROM INTERVIEWEE 4









16.11 SCENARIO DESCRIPTIONS

Scenario 1:
The preference-based dynamic workplace. This is a centralized location focused on attracting employees to the workplace. It recognizes that there will be no assigned workstations, but it wants to provide a sense of belonging to the people who come to the office. It also recognizes that there are different needs in the workplace. Therefore, it focuses on creating a variety of spaces for different activities such as focus work, collaboration, meeting, socializing, relaxing, ideating, etc. It also considers the importance of hybrid work and creates spaces to integrate with people working remotely. This scenario is a continuation of the activity-based workplace concept (Brunia et al., 2016) with two additional ingredients. First, it seeks to create a sense of belonging, ownership, and privacy in a place where there are not fully designated desks. For this, bookings systems are being implemented, enclosed spaces for privacy, focus areas, better soundproofing in open areas, and neighborhood areas to be familiar with people visiting the workplace. Second, it offers variety and dynamism to the workplace. For this, many different and multipurpose work settings are designed so employees can adapt the spaces to their needs instead of having fixed furniture and fixed rooms.

Scenario 2:
The mixed ecosystem of workplaces. This scenario refers to a set of decentralized workplaces to attract employees and offer them maximum convenience when going to any possible destination. The focus of this ecosystem is the employee. This scenario is a continuation of the distributed workplace concept that was introduced with teleworking theory (Kurland & Bailey, 1999: Morganson et al., 2010); however, it adds the possibility to have additional third-party destinations such as cafés, coworking, shared competitors' locations, clients' offices, communal areas in residential neighborhoods, etc. This scenario also takes advantage of the ecosystem economy (Adner, 2006; Moore, 1999) to collaborate with other companies or clients and share locations, thus, expanding the options to the employees. This scenario redefines some boundaries between business, residential, and commercial areas on an urban planning level. It also challenges some real estate business model preconceptions. Therefore, it creates the need to facilitate shared and flexible lease agreements, multi-tenant spaces that can be easily adapted, safe external working spaces, and the development of office destinations in the heart of residential areas.

Scenario 3:
The workplace as living retailer showrooms in the bottom-right quadrant. This scenario is similar to the previous scenario where the workplace is distributed in an ecosystem of spaces. However, the purpose of the ecosystem is not to provide convenience to all the employees but to show the brand and create meeting centers where employees can come in certain moments to socialize, collaborate and learn. These hubs are a complete representation of the brand. They start to become some sort of living labs that are integrated into the communities where they are located. Access to clients becomes relevant in this scenario. The workplace is designed to show the brand values and let clients or even the community interact with the company. The workplaces are designed as open halls to allow collaboration, learning, and social activities in the company. Work and formal meetings are mainly done at home. Some sections of these locations are designed for individual work. These individual workstations can be a destination for employees who, by exception, do not have the conditions to work at home. It can also be a place for those who came for some collaboration activities and want to stay the rest of the day. This scenario also offers to opportunity to re-purpose unproductive commercial-retailer space.

Scenario 4:
The workplace as a grand café cultural center in the bottom-left quadrant. This scenario keeps the elements from the previous third scenario but in a centralized location. It is a company-own grand coworking café, where most of the area is designed for collaboration, learning, and social interaction. As in the previous scenario, individual work and formal meetings mainly happen online. It is an innovation center where people can see previous projects' displays and interact with the strategy and goals. The incentive to come to this center is to meet the team, meet clients, ideate, get inspired by the movement of people, share knowledge, participate in learning activities, and even relax with colleagues in the pub. There are some individual working spaces for people who want to stay after collaborative activities or those who do not have the conditions to work from home.

16.12 MIRO BOARD EXERCISE FOR TESTING SCENARIOS AS TRIGGERS: RESULTS FROM INTERVIEWEE 5

1

Más probable

The workplace as an urban ecosystem

Different companies get together and share their offices. Co-working spaces are in high-demand. Companies pay subsciption to their employes for the best co-working locations. Companies pay their employees to improve their home space. Communal spaces are designed in collaboration with offices and building owners for employees to go there. Mobility is improved. Technology allows people to be securely connected anywhere

2

Menos probable

The workplace as a retailer store

Multipe Worlkplaces are developed in residential areas close to where people live. People get the chase to have different workplace locations to chose. Big central offices are left behind. These new office network serve as brand showrooms, helping companies to gain brand awareness with clients and reputation with their communities. Companies offer shuttle services between some locations during the day.

3

Menos probable

The workplace as a cultural centre

The central offices are redesigned as a convention centre for the company. The space is designed for education, collaboration and social interaction. Individual work and routinely meetings ares mainly done at home. People chose to go to the office for hours, either to have collaboration sessions, co-create, meet clients, receive training or have team bonding activities. The real estate footprint is reduced as space is used for a specific purpose.

4

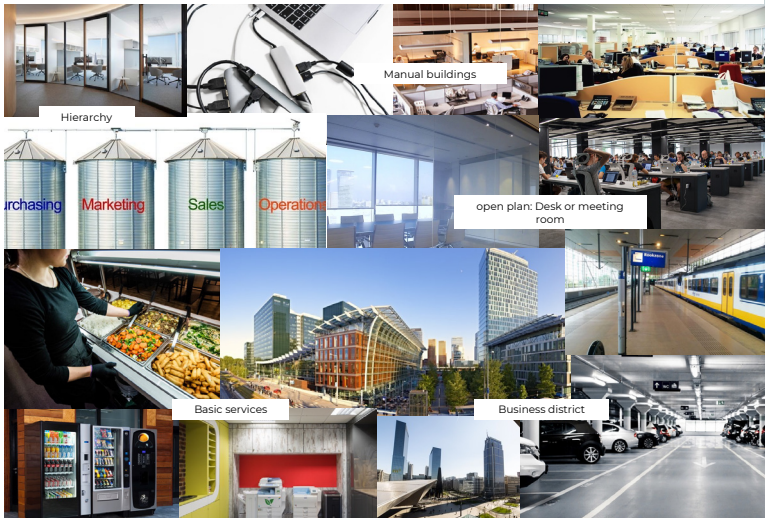
Preferido

The preference based hyper-personalized workplace

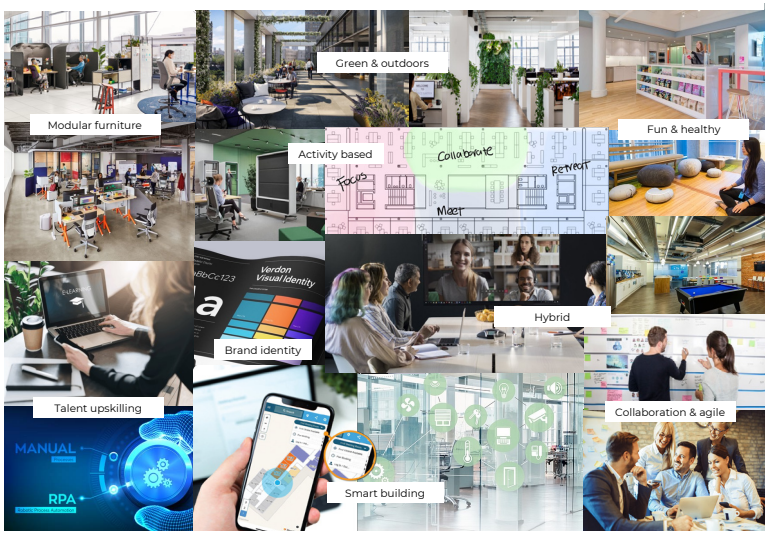
The workplace is a destination with multiple space options for the different needs, activities and preferences of the employees. The workplace is full of new and inviting amenities, bringing the convenience from home to the office. People feel excited about the workplace not only for the workstation or meeting rooms but for the inspiring design and activities they can do in the office. There is a space for every style in the office.

16.13 COLLAGES FOR PRESENTING WORKPLACE TIMELINES AS INSPIRATION IN A CONTENT TESTING WORKSHOP

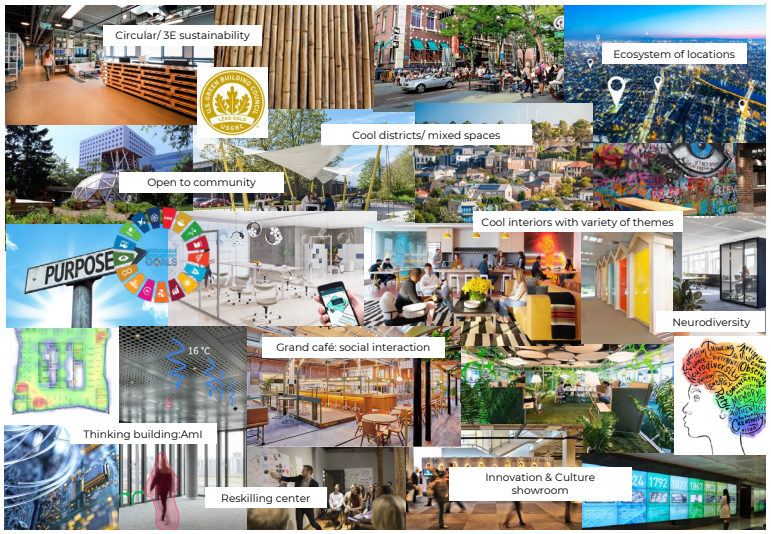
PAST: THE UTILITY WORKPLACE



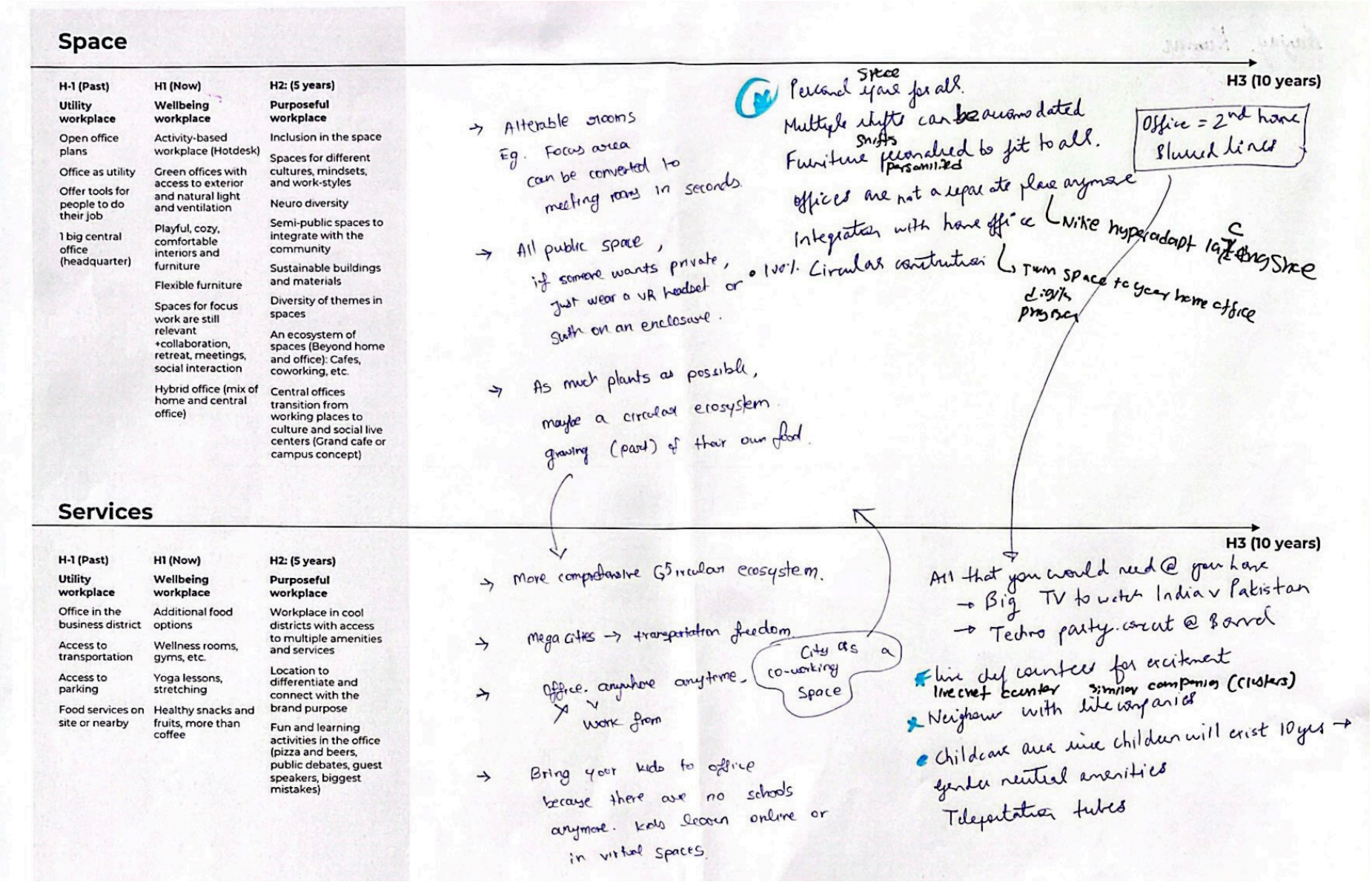
PRESENT: WELLBEING & HYBRID WORKPLACE



FUTURE: THE COSCIOUS & COOL WORKPLACE



16.14 FORMAT FOR TESTING DIMENSIONS AND TIMELINES AS TRIGGERS AND FOR IDEATING THE FUTURE TIMELINE



Space

H-1 (Past)	H1 (Now)	H2: (5 years)
Utility workplace	**Wellbeing workplace**	**Purposeful workplace**
Open office plans	Activity-based workplace (Hotdesk)	Inclusion in the space
Office as utility	Green offices with access to exterior and natural light and ventilation	Spaces for different cultures, mindsets, and work-styles
Offer tools for people to do their job	Playful, cozy, comfortable interiors and furniture	Neuro diversity
1 big central office (headquarter)	Flexible furniture	Semi-public spaces to integrate with the community
	Spaces for focus work are still relevant +collaboration, retreat, meetings, social interaction	Sustainable buildings and materials
	Hybrid office (mix of home and central office)	Diversity of themes in spaces
		An ecosystem of spaces (Beyond home and office): Cafes, coworking, etc.
		Central offices transition from working places to culture and social live centers (Grand cafe or campus concept)

H3 (10 years)

→ Alterable rooms
Eg. Focus area can be converted to meeting room in seconds

→ All public space, if someone wants private, just wear a VR headset or sit in an enclosure.

→ As much plants as possible, maybe a circular ecosystem growing (part) of their own food.

Personal space for all.
Multiple shifts can be accomodated
Furniture remodeled to fit to all.
offices are not a separate place anymore
Integration with home office
100% Circular construction

Office = 2nd home
Blurred lines

Nike hyperadapt
Turn space to your home office
digital privacy

Services

H-1 (Past)	H1 (Now)	H2: (5 years)
Utility workplace	**Wellbeing workplace**	**Purposeful workplace**
Office in the business district	Additional food options	Workplace in cool districts with access to multiple amenities and services
Access to transportation	Wellness rooms, gyms, etc.	Location to differentiate and connect with the brand purpose
Access to parking	Yoga lessons, stretching	Fun and learning activities in the office (pizza and beers, public debates, guest speakers, biggest mistakes)
Food services on site or nearby	Healthy snacks and fruits, more than coffee	

H3 (10 years)

→ More comprehensive 5 circular ecosystem.

→ Mega cities → transportation freedom

→ office. anywhere anytime.
work from

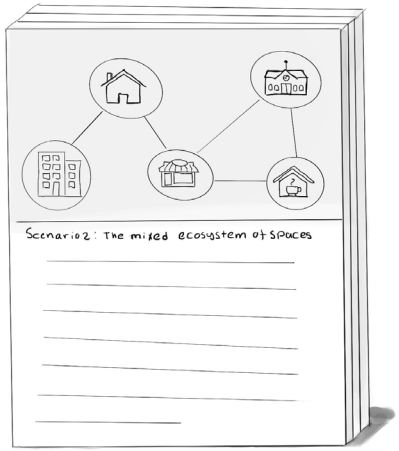
City as a co-working space

→ Bring your kids to office because there are no schools anymore. kids learn online or in virtual spaces.

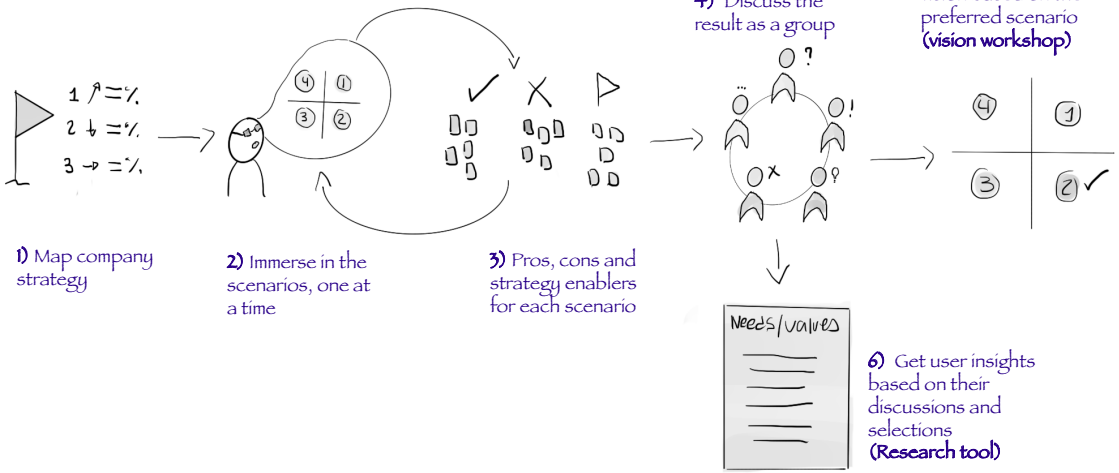
All that you would need @ your home
→ Big TV to watch India v Pakistan
→ Techno party. concert @ Barrel

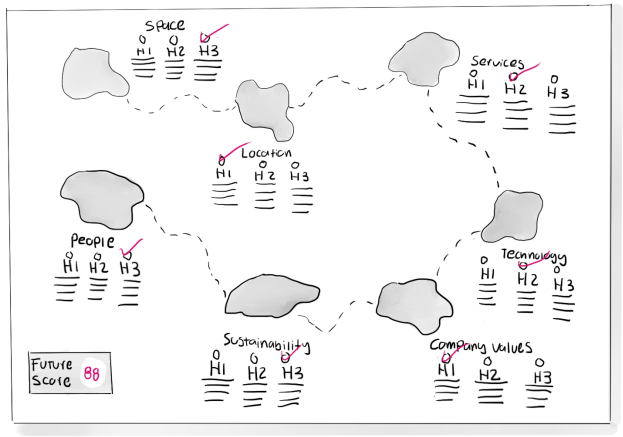
live chef counters for excitement
live cricket counter
similar companies (clusters)
Neighbour with like companies
Childcare area like children will exist 10 yrs →
gender neutral amenities
Teleportation tubes

16.15 FIRST PRELIMINARY IDEA TO TEST WITH USERS

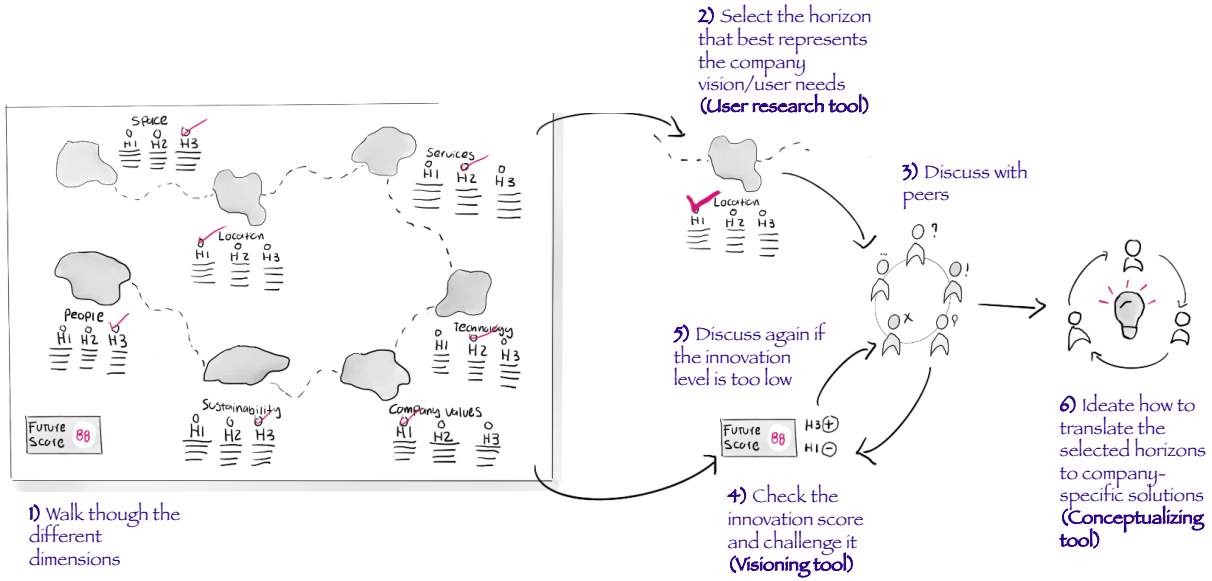


Tool 1: The scenarios boards
For choosing a workplace model-vision

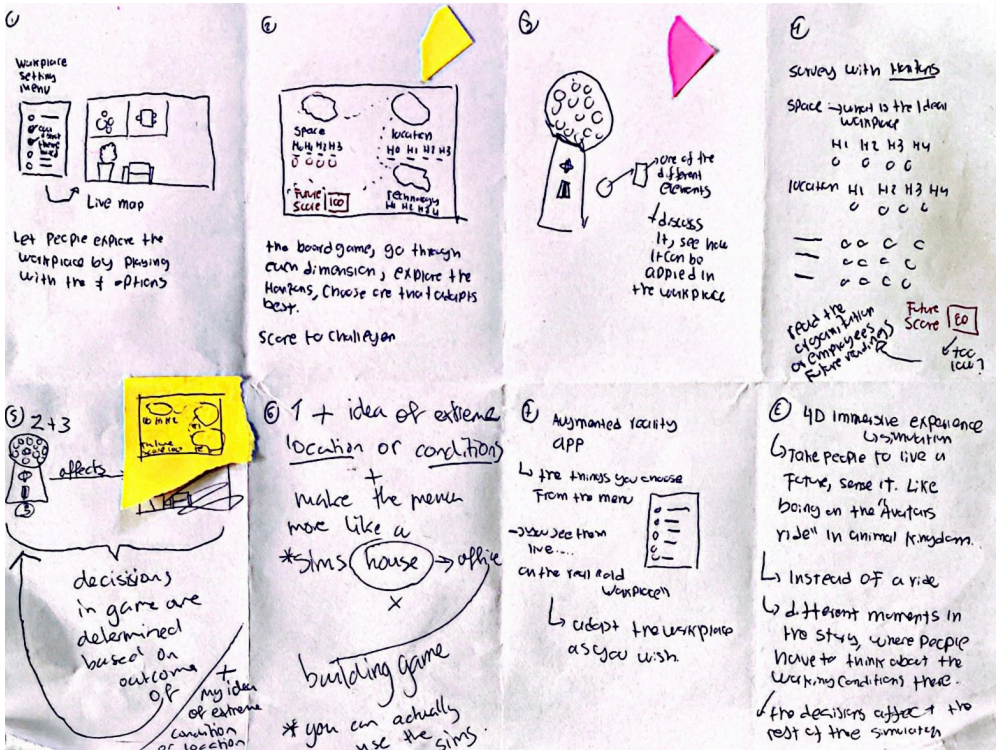


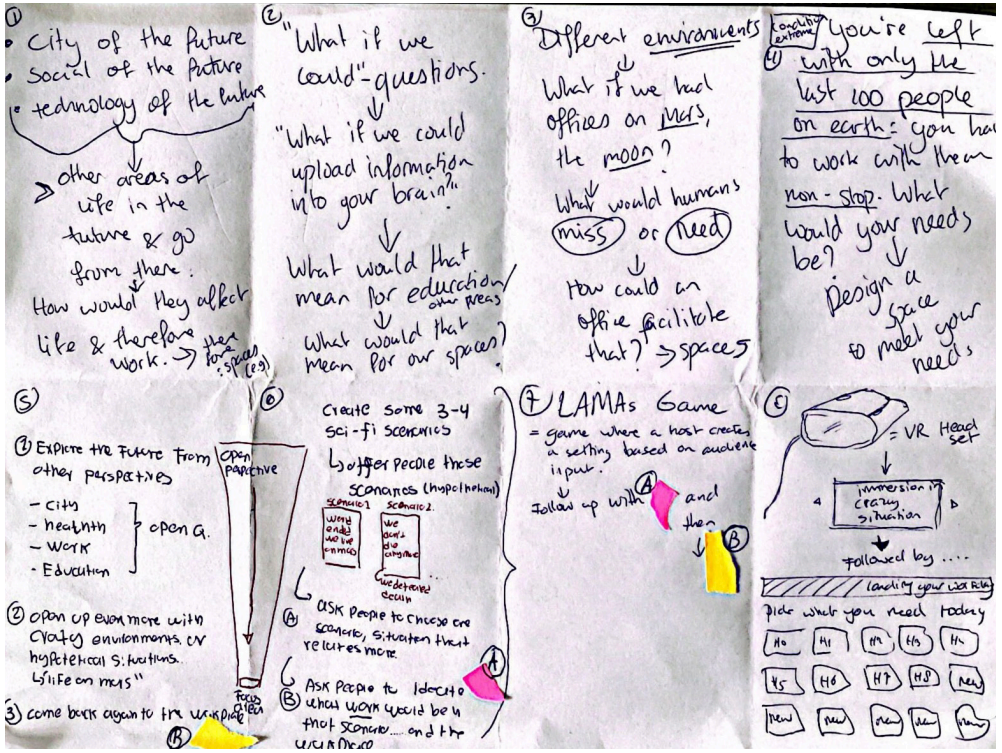


Tool2: The dimensions game
For specifying how the workplace will be



16.16 CRAZY 8S FORMAT FOR IDEATION

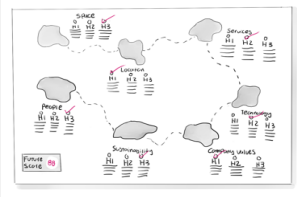




16.17 TWENTY-ONE IDEAS WITH TITLE, DESCRIPTION AND SKETCH

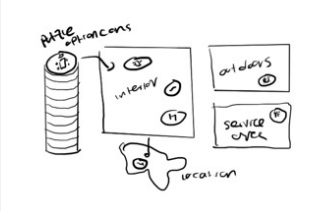
1 Workplace dimensions board game with horizons and future score

Each dimension has 4 horizons. From present to 10 years. Depending on the selection of the horizon for each dimension, the future score goes up or down. At the end of the game, if the future score is too low, new decisions need to be made. Horizons options for each dimension can be printed on the board game with visuals. Or be cards for every dimension. There is always a white card in every dimension for users to write new ideas.



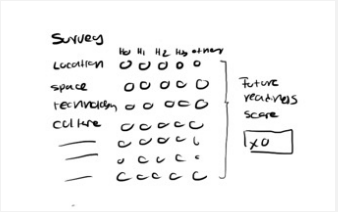
2 The workplace puzzle with coins and future score

The workplace (Lego puzzle)
Add the different elements from a list of options of what you would like in the workplace. Coins also have a value (color) and a future score. The coins have a visualization of the different elements. For each room or section of the puzzle, users can select the top 3 coins that best represent their needs/vision.



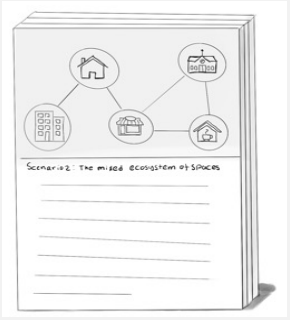
3 Future readiness evaluation tool

Digital survey tool where users select from a list of dimensions and horizons the options that best represent their needs. Based on the selections from the populations or samples of it. A future-readiness level can be obtained. And it can be used as a way to challenge or show how future-oriented the company and its workplace vision are.



4 Horizons as full future scenarios visualizations

Allowing users to immerse in a full visualization of future scenarios that are based on the 4 horizons for the workplace. Users discuss what they like, dislike, or can be improved in each scenario. And select the best one or the combination of the scenarios that describe their ideal situation

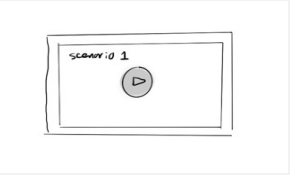


5 Horizons as full future scenarios narratives

Same as the previous idea. But in this case, this is a narrative. A story that people listen to. Let users imagine the visuals. Ask them to close their eyes. And imagine the story being told. Then after each vivid narrative. Users evaluate what they like, dislike, or change. Works the same as idea 4.

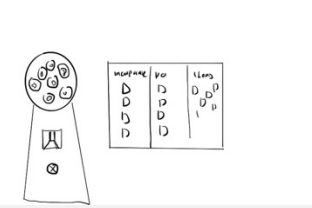
6 Horizons as full future scenarios videos

Make a video that shows the story. The videos are vivid representations of the scenarios. They can be done through 3D or VR to make the experience as vivid as possible. Then after immersing users. Ask them to evaluate each scenario as ideas 4 and 5.



7 The fortune teller

Randomly take the different future dimensions horizons at a time. Discuss what you like, and what you dislike about each. In a board. In the end, the elements that end up in the like zone are the needs or vision elements.



8 Future workplace cards

A set of cards of different horizons and dimensions. Cards are shown all at once. Allow people to use as many cards as they want to describe their vision and needs. In the end, evaluate what dimensions were chosen and what future horizon. It can be a way to do research on what is important to people. And depending on the first selection, challenge the results.

9 Real-time future vision dashboard builder

An online app to be used in groups or individually. The app guides you through different dimensions and asks for tasks (Ranking, choosing, drawing). Based on the horizons. As you make the choices the future score changes. But also a dashboard shows what the workplace would look like (From an empty room to a room with added options), and also requirements. At the end of the game, the dashboard/visual is the vision + requirements.

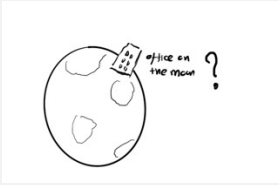
10 Workplace in crazy different environments

What if we had offices on mars, the moon?

What should humans miss or need?

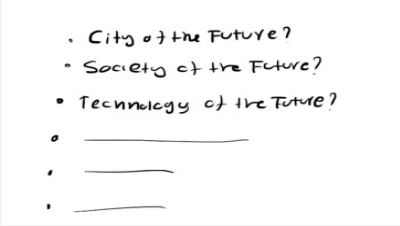
How would work be there?

How can an office facilitate that? → spaces



11 Exploring the future from other areas

Other areas of life in the future and go from there. How would they affect life and therefore work, the workplace, spaces, etc.?



12 What if we could..... questions

Offer people randomly what if questions: "What if we could upload information into your brain?"

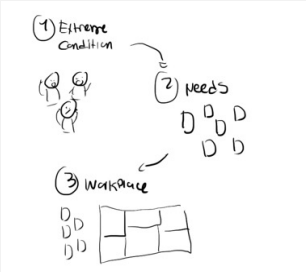
What would it mean for education and different areas?

What would that mean for workspaces?

13 Extreme conditions hypothesis

You are left with only the last 100 people on earth. You have to work together non-stop.

What would your needs be? Design a space that meets those needs?

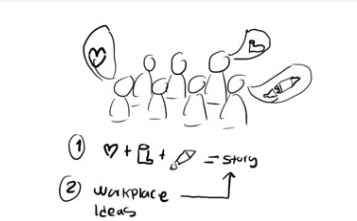


14 General life sci-fi scenarios

Offer people some sci-fi future scenarios and allow them to choose one to work on. Then based on that scenario, ask people to ideate what work and the workplace would be like in that scenario.

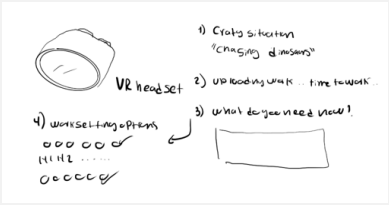
15 LAMAs game

A host creates a setting plot based on random elements that the participants offer in the beginning. After immersing people in the plot. Ask them to ideate how work would be in that situation first. Then ask them to ideate about the workplace.



16 VR future simulation + work needs

Immerse people in a crazy VR simulation (I.e., Being chased by dinosaurs, or living on Mars, or living in avatar land…). After some time, it becomes time to work. Ask people what they need at that moment to be able to work (Under the presented condition). Then ask them what elements (maybe the horizons) of the workplace can be used to solve those needs?
Each decision affects the rest of the story. The rest of the simulation.

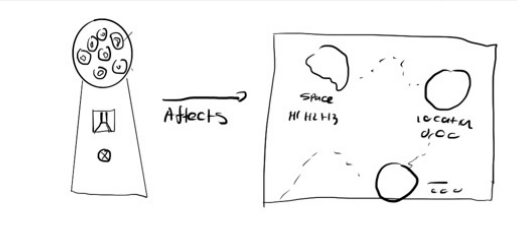


17 Random elements/situations as triggers

Using idea 7 but inside offer different what if situations or conditions or settings. Based on those conditions people ideate more.
Some of the papers are white. So people can create and add more conditions.
There are many conditions available.

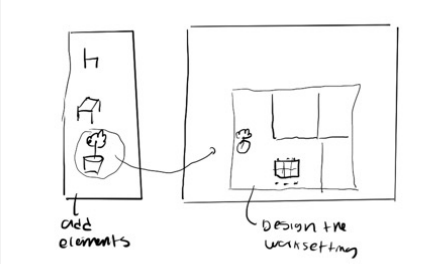
18 Random elements affecting the dimension board game

It is a combination of ideas 1 & 17. The fortune-teller offers random situations, future things, or problems. Then based on those elements the decisions of the game are affected.



19 SIMS game to build the ideal workplace

After providing people with an extreme location or condition. Ask them to build their ideal workplace using the SIMS game.

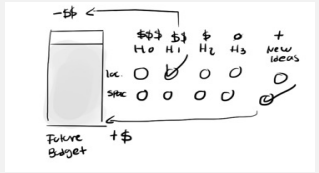


20 Augmented reality to change existing workplace

It is a continuation of idea 2. But instead of people adding elements as coins in a physical game. They can actually see how the choices they make change the existing workplace. Or any room around them.

21 Future points as limit

It is a continuation of idea 9. But instead of checking the future score in the end. People start with an initial future score. They can only expend a certain amount of future points. If they use Ho or H1 options they spend a lot of points. If they give their own ideas, they spend less on future points.
The goal of the game is to spend as less FP as possible and encourage people to give additional ideas to what is already on the market.



16.18 FUTURE PREDICTIONS FOR FUTURE TELLER MACHINE

Future prediction	Best for	Bingo #
It is year 2032 all chairs, beds, and furniture self-adapt to minimize pressure points and optimize comfort.	Space	1
It is year 2032, all manual and physical work is 100% automated.	Work/people	2
It is year 2032, all materials and objects are smart and connected to the internet, there is nothing unconnected.	Space	3
It is year 2032, an universal basic income is in place in most developed countries. People work to fulfill their passions and get extra benefits.	Work/people	4
It is year 2032, by law only autonomous vehicles are allowed. They are safer. Most of the fleets are shared fleets. People get an extension of their home and office in the vehicle, it changes the routine during commuting time.	Space	5
It is year 2032, cryptocurrencies are the standard global currency in the world. The financial industry offers crypto loans, crypto mortgages, crypto advice, etc. People are taxed on purchases, not on income. Central banks lose power.	Technology	6
It is year 2032, drone delivery is massified. You can things abroad from your door with a drone.	Location	7
It is year 2032, humans have the possibility to be enhanced with genome edition.	Work/people	8
It is year 2032, most people have access to neurochips that gives them enhanced memory and knowledge capabilities.	Technology	9
It is year 2032, since every object and material is smart. For instance, autonomous smart vehicles, smart surfaces, etc. Advertising happens everywhere.	Space	10
It is year 2032, Space travel it's possible for the middle class. Moon settlement has 1 million habitants.	Location	11
It is year 2032, technology advancements in health allow people to live up to 150 years.	Work/people	12
It is year 2032, we can 3D print food, which personalized nutritional content and flavors.	Services	13
It is year 2032, we can 3D print in any material and in many sizes in very short periods of time. This also includes organic materials 3D printing.	Space	14
It is year 2032, we have full-body physical health scanners offering instant AI medical diagnosis, located in key locations.	Services	15
It is year 2032, we spend about 50% of our time on the metaverse. In combination with VR most aspects of society are represented in the metaverse. We rent or buy properties, party, date, study, meet, have holidays, relax, play, etc in the metaverse.	Location	16
It is year 2032. Quantum computers are mainstream. These computers are 100 million times faster and more powerful than conventional computers.	Technology	17
It is year 2032. Thanks to nuclear fusion we have access to unlimited clean energy without dangerous waste.	Technology	18
It is year 2032. We all have nanorobots in our bodies that protect us from many diseases and can preventively do small procedures in real-time.	Services	19
It is year 2032. We are able to lab grow many materials including food. (Beef, wood, milk, plastics, leathers, even organs)	Space	20
It is year 2032. We have hyper-personalized precision-based pharmaceuticals produced by 3D pill printers.	Services	21
It is year 2032. We have smart plates and cups that help us have control of what we eat.	Services	22

16.19 GOOGLE FORMS QUESTIONNAIRE FOR FIRST PROTOTYPE TESTING

To what extent did the following components trigger you to think in a more future-oriented way about the workplace? *

	To a very large extent	To a large extent	To some extent	To little extent	To no extent
The random fortune teller ball situations	○	○	○	○	○
The future budget score	○	○	○	○	○
The 5 workplace topics/dimensions	○	○	○	○	○
The options in each dimension	○	○	○	○	○
The open options to provide ideas	○	○	○	○	○
The last ranking exercise	○	○	○	○	○
The dashboard summary	○	○	○	○	○
The amount of time for each exercise	○	○	○	○	○
The group discussion	○	○	○	○	○
Having a limited amount of choices (I.e., Choose 5)	○	○	○	○	○

How satisfied are you with the following method components? *

	Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied
The random fortune teller ball situations	○	○	○	○	○
The future budget score	○	○	○	○	○
The 5 workplace topics/dimensions	○	○	○	○	○
The options in each dimension	○	○	○	○	○
The open options to provide ideas	○	○	○	○	○
The last ranking exercise	○	○	○	○	○
The dashboard summary	○	○	○	○	○
The amount of time for each exercise	○	○	○	○	○
The group discussion	○	○	○	○	○
Having a limited amount of choices (I.e., Choose 5)	○	○	○	○	○

What did you like about the method?

Your answer

What did you not like about the method?

Your answer

What can be improved about the method?

Your answer

16.20 GOOGLE FORMS QUESTIONNAIRE FOR SECOND PROTOTYPE TESTING

¿En qué cantidad te ayudaron los siguientes componentes a tener ideas/pensamientos más orientados al futuro? *

	Completamente	Mucho	En algo	Un poco	Nada
Las situaciones aleatorias de la urna de cristal	○	○	○	○	○
Los 5 temas/dimensiones del lugar de trabajo	○	○	○	○	○
El contenido de tendencias y lo que otras compañías hacen como inspiración	○	○	○	○	○
Las pregutas abiertas de cada dimensión	○	○	○	○	○
La restricción de solo tener una opción en la categoría roja	○	○	○	○	○
El ultimo ejercicio de ranking	○	○	○	○	○
El tiempo disponible para cada dimensión	○	○	○	○	○
La discusión de grupo	○	○	○	○	○
Las tendencias para clasificar las ideas en cada dimensión	○	○	○	○	○

¿Qué tan satisfecho te encuentras en general (o que tanto te gustaron) los siguientes componentes? *

	Muy satisfecho	Satisfecho	Neutral	Insatisfecho	Muy insatisfecho
Las situaciones aleatorias de la urna de cristal	○	○	○	○	○
Los 5 temas/dimensiones del lugar de trabajo	○	○	○	○	○
El contenido de tendencias y lo que otras compañías hacen como inspiración	○	○	○	○	○
Las pregutas abiertas de cada dimensión	○	○	○	○	○
La restricción de solo tener una opción en la categoría roja	○	○	○	○	○
El ultimo ejercicio de ranking	○	○	○	○	○
El tiempo disponible para cada dimensión	○	○	○	○	○
La discusión de grupo	○	○	○	○	○
Las tendencias para clasificar las ideas en cada dimensión	○	○	○	○	○

¿Qué te gusto del método?

Your answer

¿Qué no te gusto del método?

Your answer

¿Qué se puede mejorar del método?

Your answer