More than Human Design

A Mindful Intervention into Design

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More-than-Human Design
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Abstract

This research is a critical quest to develop an inclusive More-than-Human (MtH) Design Process that recognizes non-human beings as valuable participants. This approach is meant to actively acknowledge the interconnectedness and interdependence of humans and other beings and act as an intervention in different stages of the "Design Thinking" process that is based on human-centred values. Through an MtH lens, this thesis questions the short-term profit-based model in the design industry that primarily benefits humans while bringing destructive consequences to the rest of the living planet. These consequences, such as global warming, loss of biodiversity, and environmental destruction, have foregrounded the need to take the agency of non-humans more seriously in the design discipline. The MtH Design Process expands the human-centred design methodology by borrowing methods from Interaction Design (IxD) and More-than-Human Participatory Research (MtH-PR).

This work has been structured in four main sections. In part 1, *re-frame*, we start our inquiry by looking at Interaction Design from a More-than-Human perspective. We include a series of place-based explorations in Vancouver B.C that challenged our old assumptions and biases towards different participants in design. In part 2, *re-imagine*, we work towards an MtH design practice by identifying its core values. These values guide several case studies that demonstrate how an MtH approach can alter existing products. Part 3, *re-build*, focuses on formalising the MtH design process by creating changes in different phases of the Design Thinking process. The MtH Design Process includes five steps – 1. Encounter 2. Learn 3. Plan 4. Map and 5. Build – all of which offer multiple methods, prompts, and points of inquiry into the MtH design practice. This work also includes the MtH design toolkit to support its pedagogical potential. The final part, *re-connect*, concludes the work by discussing the implications of MtH design and its potentials and challenges.

Keywords

Acknowledgements

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Land Acknowledgement

This work has been written and shaped on the unceded territories of the Coast Salish peoples–Sḵwx̱wú7mesh (Squamish), Stó:lō and Səl̓ílwətaʔ/Selilwitulh (Tsleil-Waututh) and xʷməθkʷəy̓əm (Musqueam) Nations. As uninvited guests, we are grateful to live and work on this land and we hope that through this project we can find ways to treat this place and all their beings with care and respect.

Glossary of Terms

Agency
"The capacity of an individual or thing to act, create intervention or influence independently" (Fletcher et al., 2019).

Design Thinking[1]
A widely used definition of DT given by Time Brown, the CEO of IDEO is: "A human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success" (IDEO, 2022).

Human-Centered Design (HCD)
Human-Centred Design is an approach to problem-solving, commonly used in design and management frameworks that develops ideas by involving the human perspective in all steps of the process. HCD relies on narrative design methods in which the "human" or the "user" is used as a specific metaphorical inspiration for developing the design.

Interaction (MtH Interaction)
Any form of action-reaction that exists between humans, non-humans, and their surroundings.

Interaction Design (IxD)
The creation of a dialogue between a person and a product, system, or service" (Kolko, 2011, p. 12). The term User Experience Design (UX) is the broader term used more often in the industry that includes Interaction Design.

More-than-Human (MtH)[2]
The More-than-Human world consists of humans and non-humans and all the encompassing actors and systems.

Non-Human
Non-human beings are all the living self-originating entities of the planet except human beings.

1. In this thesis, we primarily refer to Brown's concept of Design Thinking. Both Tim Brown and David Kelley (CEO and founder of IDEO) are known for formalizing and popularizing the concept within the design industry.

2. The term More-than-Human World, originally coined by David Abram (1997), was introduced instead of "nature" to oppose the nature vs. culture dichotomy and position humans as a subset of nature not oppose it. As Abram explains, the More-than-Human world includes humans, but always exceeds them (Garrison Institute, 2021). This research also uses the term "MtH world" intentionally to further step away from the otherness that is perpetuated by separating human societies and nature.

Introduction: *Zahra Jalali*

Growing up in a big city, I found myself deprived of nature. I was familiar with the web pages on the internet, while I rarely encountered the beautifully crafted spider webs. I had a hard time leaving the city and the idea of poor reception and not having a reliable internet connection made me uncomfortable. Years later, I was conflicted with my urban environment and lack of greenery. I was frustrated by the air pollution, traffic, and the buildings that blocked my view of the moon or the sunlight. When the pandemic started and our lives suddenly slowed down, I realised how much I was missing my interactions, no matter how little, with the natural world. I inevitably started to notice other beings living with us, and I learned to care for them in different ways. I felt joy through their growth and was comforted by their resilience. I sensed a strong connection to them and a part of me that I had perhaps lost before. I was finally reunited with earth. This reunion made me realise how my life has been constructed in ways that kept me from forming a relationship with the non-human world, neither in my day-to-day life nor in my professional career as a designer. The world that I knew was binary (literally and figuratively). It was either Human or Non-Human, never both, and not on the same level. Nature was a commodity; to use. Even after witnessing the implications of climate change endangering all living beings, we still have to argue why we should save the earth, and strangely enough, the answer is not "because we should" but "to save humans."

I started my masters with a handful of questions: how can I really "reconnect" with nature through my practice and put non-humans at the forefront? How can I design interactions that emphasise this? What does that connection mean in a highly digitised world? To explore these inquiries, I tried different ways to know the non-human community that I shared space with and reflected on our relationship. As an Interaction Designer, I envisioned interactive interfaces that could redirect our attention to the natural world instead of estranging us from it. All those attempts led me towards a collaborative exploration with Kimia Gholami (MDes 2022), whose research was also centred around non-human beings. We started by experimenting with the tools that we had been working with unquestioningly, only to realise that we were perhaps limited by them. This realisation shaped our collaborative thesis which turned into a critical quest on creating a More-than-Human design practice that recognizes all beings.

If "we design our world" and "our world acts back on us and designs us" (Willis, 2006, p. 80), what and how we design is primarily a reflection of how we perceive the world and how we wish for it to evolve. But can we expect a rich and highly interconnected ecosystem to thrive when we do not even recognize the contributions of non-human beings in our efforts? To cultivate this more-than-human recognition in design, we need a change of perspective about the human-nonhuman relationship and our relative positionality. And this change only manifests itself as we start to design for all beings, not just humans, in our More-than-Human world.
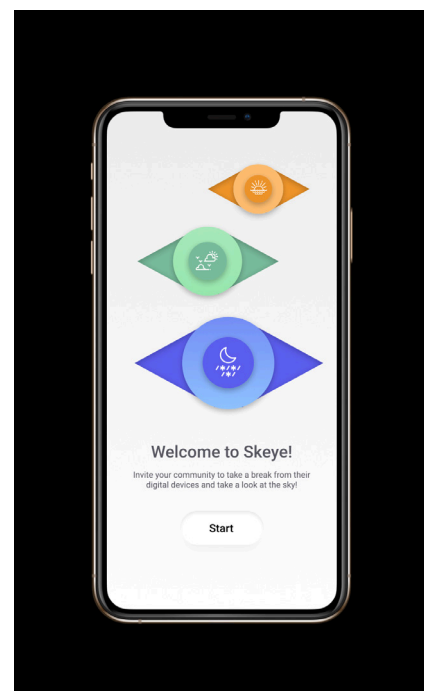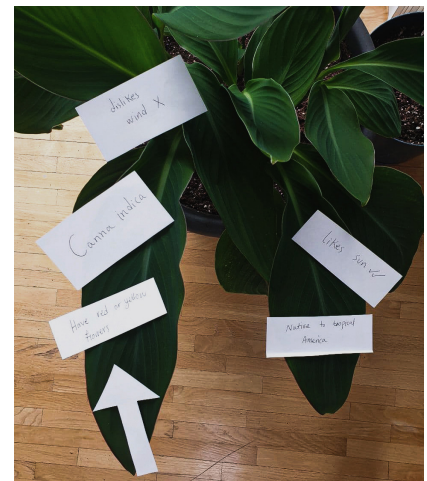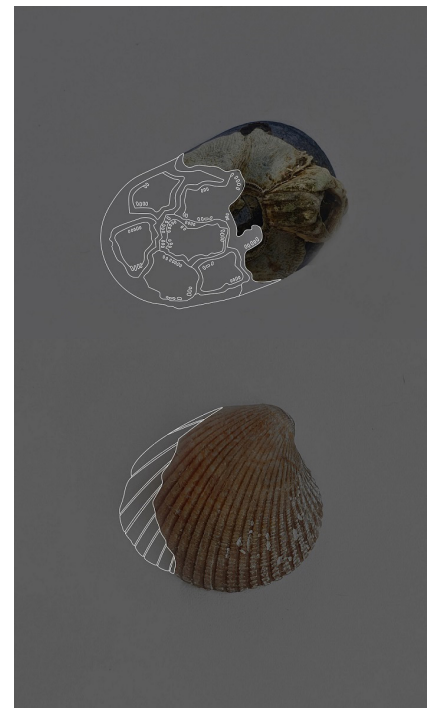

Figures showing studio projects, by Zahra Jalali

Introduction: *Kimia Gholami*

This thesis started as an individual exploration into the ways in which we perceive, understand, and act towards the climate crisis; more specifically how designers could contribute to a worldview that sees nature as a creative realm with an active voice, rather than a resource for human exploitation. Ecological crises demand more than a narrow focus on energy substitutes and economic policies to face the challenges of the situation. In addition, what we also need is a thorough and open rethink about our basic cultural narratives and worldviews. "An alternative worldview to rival the one at the heart of this ecological crisis, which is embedded in interdependence rather than hyper-individualism, reciprocity rather than dominance, and cooperation rather than hierarchy" (Klein, 2014, p. 462). That being said, I initially set out to explore the path of transition, going from feeling individually passive and anxious at the face of climate change to being collectively active. Because of the complexity of this topic, I attempted to approach this matter through a more personal path. What does this transition look like for me as a designer? Navigating this research meant a lot of questioning, unlearning, and re-learning for me. To bring others into this research without implicating myself in this change first was meaningless, and I want to reiterate how my role as a designer throughout this journey has been filled with doubts, questions, and discoveries.

My understanding of my research started to shift as I began to question the meaning behind collective action. What does it mean to shift from the anxiety individuals feel at the face of the climate crisis, to collaboration and responsibility? How does it look to replace dominance with reciprocity, and hierarchy with interdependence? Who are the beings we think of when we talk about the notions of collectivism and collaboration? Are all of them necessarily human? Through these questions, a clearer path of research appeared in front of me. Living in a world in which humans are always constituted through diverse webs of non-human life, how can we approach collectivism in relation to non-humans, as well as humans? When human life is constituted through a network of non-human forces, the idea of an autonomous and rational human self that can tackle this crisis by itself, seems unattainable. If we take humans away from the centre of the action, how can we build non-human partnerships?

From this point, this thesis fell into a more concrete place. To investigate the power of partnership, Zahra Jalali (MDes 2022) and I decided to approach the work on this thesis from this point of view as well. By combining her work on reconnecting with nature, with my explorations on non-human collaboration, we attempted to question our practices as designers and sought how we could shift it to better fit the urgent requirements of our time. Our collaborative work falls into two main parts: part one is an unlearning and self-reflecting journey, played through open-ended prompts and experiments. Part two is a critical journey and rebuilding of an established practice through exploring the notions of non-human agency, relationality, and reciprocity.

Figures showing studio projects, by Kimia Gholami

Part 1: *Re-frame*

"...along with the other animals, the stones, the trees, and the clouds, we our-
selves are characters within a huge story that is visibly unfolding all around
us, participants within the vast imagination, or Dreaming, of the world."

David Abram, The Spell of the Sensuous

A Shift of Attention

This work started as a personal investigation into our own practices as designers. Witnessing the climate emergency, we wanted to act consciously towards the living planet, but as interaction designers, we were not sure how to translate a more sustainable approach to our digital makings and workflow. Furthermore, we rarely extended our worldview to more-than-human beings as partners and participants in our design process. The past two years made us rethink our practice as creators and pushed us to see it in a new light, which led us to this collaborative project. As interaction designers, we saw it fit to start this shift from within our own discipline. However, since many Interaction Design (IxD) methods and underlying concepts are practised by designers in other fields, our exploration expanded to the general design discipline and theories as we moved forward.

Throughout our experience in academia, we came across several alternative approaches for designing in non-anthropocentric ways, all of which inspired us to start this reframing journey. However, we felt like there was a lack of a working non-human-centred design process in the industry that would effectively account for our entanglement with the More-than-Human world. To address this gap and while acknowledging the complexity of this topic, we aimed to bring the worlds of design theory and practice together, as both spheres offer their specific potentials and challenges. This work is meant to challenge, inspire, and spark thought in different spaces of the human-centred design process that usually only focuses on humans and excludes other beings. We invite an understanding of the unfolding relations between humans and non-humans and their capacities for enabling particular forms of connection to the natural world. Through this work, we ask ourselves how non-human beings can play a role in the design process to create a different atmosphere and shift our current values, logic, and beliefs.
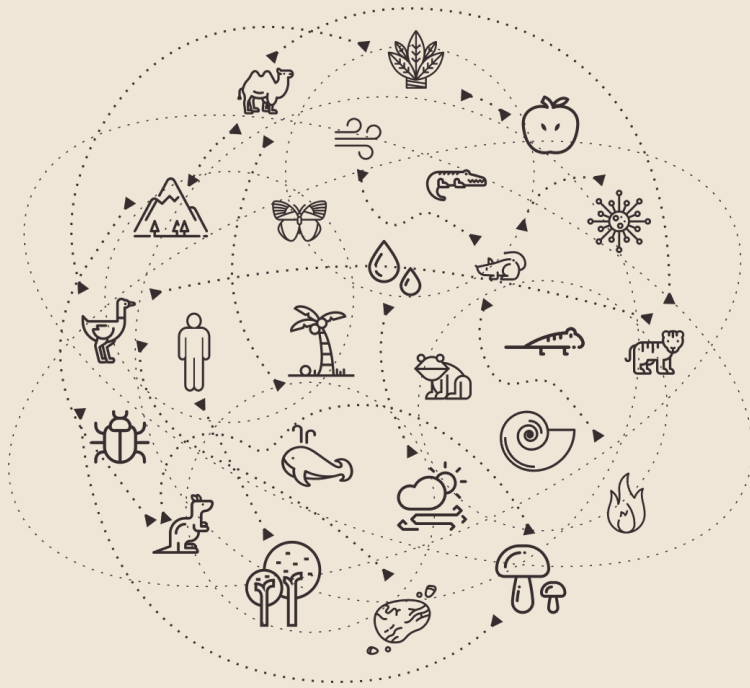
The More-than-Human World

In this project, we will use the term More-than-Human (MtH), initially coined by ecologist David Abram (1997) in the subtitle of his book *The Spell of the Sensuous* to oppose the term human-connectedness. This term was used by Abram to describe the space of human culture as a subset within a larger set. It emphasises that the human world is necessarily sustained, surrounded, and permeated by the More-than-Human World. As language carries the weight of our actions and intentions, we refer to the More-than-Human World not as an opposition to the realm of humankind but as an expression of a realm that exceeds the human and the human-made.

By more-than-human actors, we mean all the living self-originating entities of the planet. This world starts from the micro and expands to the macro and could range from small non-visible entities such as microorganisms to more noticeable flora and fauna species, natural forces that influence the weather, ecosystem (e.g. the wind or rain), the physical environments that encompass these interrelated networks and are constantly shifting in relation to them (e.g. the ocean, the soil, etc.), and humans as well. This complexity itself shows the importance of changing perspective in the design process as the so-called human-centeredness has been influencing far beyond just humans.

Context & Research Questions:
Design in the Era of Ecological Crisis

The ways in which humans perceive and interact with the More-than-Human World have undergone drastic changes in the Anthropocene era. Fueled by human exceptionalism and seeing nature as an endless resource for exploitation, humans have long overlooked the interconnectedness of their livelihoods with other beings. The climate crisis and the loss of biodiversity are perhaps the most prominent evidence of this dysfunctional relationship, showing how imperative it is for the current status to change. Meanwhile, design disciplines today are commonly involved in a service profession that works towards meeting human needs (Friedman & Stolterman, 2018); a profession that is partly responsible for the planet's ecological crisis by exploiting non-human beings, materials, and resources. In other words, design has directly contributed to this ongoing crisis by attending to human-centred values and framing out the rest of the living planet.

This research aims to be a More-than-Human exploration into the design practice. A practice whose arc in the past thirty to forty years has been human-centred – conceptualising, attending to, and prioritising human needs (Wakkary, 2021). While most human-centred approaches have been helpful to enhance human needs and wants in terms of safety, health, convenience, and pleasure, design has also been a part of a system that disrupts the dynamics of the planet and endangers the life of non-human beings (and consequently humans themselves). Although human-centred design was an improvement on the technology-centred approach in the industry, some of the negative aspects of HCD have been heavily intertwined with capitalism, consumerism, and idealism (Wakkary, 2021).

To combat the shortcomings of the human-centred and profit-driven design systems, there has been a growing body of work in the design community that offers different ways of working, creating, and moving forward in the post-Anthropocene era. A collective of these critical, speculative, and diverse ideas and reformulations has inspired us along the way. Key amongst those has been Tony Fry's take on the term futuring to argue for design's transition from human-centred ideals to sustainment ideals (Fry, 1999) and moving beyond the unsustainability of neoliberal capitalism. In the same manner, Ontological design (Escobar 2018; Wiilis 2006; Winograd and Flores 1987) invites us to see design as a world-building tool that has impacts beyond the applications of a certain tool or product. Advocates for ontological design aimed to radically reformulate human-centred design and its underlying human precepts (Wakkary, 2021). As Escobar argues: "It [ontological design] always entails reconnection: with nonhumans, with things in their thinghood, with the Earth, with spirit, and with humans in their radical alterity" (p. 134).

Similarly, Enzio Manzini (2015), has challenged us to rethink the role of design and designers in contemporary society to reimagine their relationship to addressing social innovation and building a sustainable and resilient culture. Furthermore, in a recent framework implemented at Carnegie Mellon School of Design (n.d.), "Design for Interaction" has been introduced as an overarching theme for multiple design tracks that recognize the natural world as the context for all design activities. Another key design revisionist approach has been Daniela Rosner's "Critical Fabulations" (2018), which has

offered a critical inquiry that pushes design beyond its dominant paradigms by foregrounding the long-silenced narratives of marginalised voices in the practice. Finally, we also found inspiration in the works of ecofeminist scholar Val Plumwood (2009), who has challenged the fundamental assumptions of human exceptionalism and the "forms of interaction" with the More-than-Human world. In "Nature in Active Voice", Plumwood argues that human-centred conceptual frameworks are not only a direct hazard to non-humans, but are also an indirect hazard to humans, as they create an illusory sense of agency and autonomy.

This research focuses on the nuances of modern commercial design and human-centredness in North-American and Western European industries and seeks alternative approaches in those domains. However, it is important to underline that Indigenous worldviews have advocated a harmonious way of living with nature, long before western viewpoints. Both decolonizing and Indigenous research have insisted on the need to draw on "subaltern" and marginalised ways of thinking (Noorani, Bridgestock, 2018). As Dorothy Christian, a member of the Secwepemc and Syilx Nations in BC puts it: "Indigenous perspective is very different from the Western mindset because we contextualise our physical relationship with a multidimensional point of view and with a multi-layered connection with seen and unseen beings – we relate to the land, the waters, the animals, the plants, and the spiritual realms. All beings are considered sacred" (Christian, 2013, p. 238). That said, this research was conducted in Vancouver, BC, situated on the unceded territories of Coast Salish peoples. Our relationship to this land as uninvited guests made us further reflect on our responsibility and contributions as designers throughout this work, and made space for much necessary self-reflection and contemplation.

Drawing from these collective endeavours in the realm of post-anthropocentric design, we found ourselves questioning our ways of practice. We asked ourselves, how can design take into account the needs and wishes of the planet as well as humans? In an industry where HCD in many cases leads to more profit by instrumentalizing the natural world, how can design be framed from a More-than-Human perspective? What kind of interaction(s) exist in this more-than-human space? Who are the beings that are involved in this interaction? What are the implications of this interaction, and how can they inform the design process?

To answer these questions, this research draws from the insights of More-than-Human Participatory Research (Bastian et al., 2016) which argues that our everyday social relations are always more-than-human social relations, animated by the agency of non-human forces (Bennett, 2010). One of the most recent examples of non-human agency would be the events following the COVID-19 pandemic, where many of our human activities, routines, and relations were heavily impacted by a non-human force. Acknowledging our social, environmental, and political entanglement with non-humans is crucial to recognizing the multiple points of action in a potential MtH design practice. In developing our argument, we explore how adopting a More-than-Human point of view could encourage conceptual and practical reconsiderations of certain aspects of the design process and the end result.

Pacific Spirit Regional Park, Vancouver, BC. Photo by Zahra Jalali

Literature Review

This literature review explores the role of human-centeredness in IxD and argues for a More-than-Human approach in the Interaction Design discipline. This proposed approach is inspired by the worldview of MtH Participatory Research and Posthuman Interaction Design. To better frame this design approach in relation to the applied practice, this theoretical exploration was complemented by a series of design actions that made us reconfigure our interactions with the MtH world. This critical exploration and experimentation in the IxD field acted as a foundation for the development of the rest of this work.

Human-Centeredness in Interaction Design

Many Interaction Design practitioners and scholars have attempted to define the practice in a way that encompasses all its potentials. While these definitions may differ in some ways, what many of them have in common is putting humans forward and emphasising the form of interaction with humans and digital interfaces. John Kolko articulates a relatively different description that defines Interaction Design as "the creation of a dialogue between a person and a product, system, or service" (Kolko, 2007, p. 12). Using the word dialogue in this definition and characterising it as "both physical and emotional in nature" sets the foundation for a broader interpretation that expands beyond a solely computational transaction, however, the humanistic approach continues to dominate the field of Interaction Design.

The concept of Human-Centred Design (HCD) has been around for a long time. It found its way to most design disciplines of the time, and IxD was no exception. HCD, in many ways, was an ethical improvement on the existing design methodologies of the time that were either driven solely by technology or sales (E. Bertulis, 2022, personal communication, March 16, 2022). HCD also advocated for design opportunities rather than seeing design as just a problem-solving tool, presenting a challenge to the efficiency of tech-driven products. Don Norman, who had an influential role in the development of the IxD practice, introduced Human-Centred Design as a solution by "putting the human needs, capabilities, and behaviours first, and then designing to accommodate those needs, capabilities, and ways of having" (2013, p. 8). Bill Moggridge, one of the pioneers of the Human-Centred approach, mentions that as he was struggling to come to grips with what Interaction Design was, his first principle was to think about the *people* part of the design process first: "Who are the users and What do they want from the experience? What will give them satisfaction and enjoyment?" (Moggridge, 2007, p. 665). Similarly, in one of the other most-cited texts of IxD, Thoughts on Interaction, Kolko (2007) suggests that "the value of interaction design is in the creation of human-centred designs that better the daily lives of people and in the creation of societal frameworks in which to experience these designs" (Kolko, 2007, p. 10).

As Ron Wakkary argues, while Human-Centred Design has been overwhelmingly successful in shaping human technologies to human needs and desires in the name of human progress, everything that is not human has been depleted or made extinct (Wakkary, 2021). Certainly, the ethical considerations and questions that were missing from HCD are now becoming more appar-

ent. For instance, to what extent are we willing to put human needs first, and at what price? Why are humans the only involved individuals in this process? Do we take into account the interactions that may happen afterward as a result of our design? That said, now that we have witnessed the chain of events caused by destructive human behaviour towards the environment, it is clear that HCD tends to create a relatively biassed point of view by focusing on human users only. As Kevin Slain (2016) has stated: "When designers centre around the user, where do the needs and desires of the other actors in the system go? The lens of the user obscures the view of the ecosystems it affects."

Reviewing the Common Approaches of Interaction Design

To further discuss the need for a non-human-centred view in IxD, we review some of the main approaches that guide IxD, and some of its recent alternative views. According to Dan Saffer (2010), IxD can be defined in three main approaches: technology-centred, behaviourist, and social interaction. Views such as technology-centred are perhaps outdated, limiting the notion of IxD solely to the context of users and digital artefacts. The behaviourist view responds to the psychological aspects of the field to address the qualities of being human (thought, cognition, physiology, and so on). The social interaction view offers a relatively different approach, claiming that Interaction Design is "inherently social, revolving around facilitating communication between humans through products" (Saffer, 2010, p. 5). The context of this view is still limited to human societies only.

In addition to the three approaches above, there has been a growing body of work in the field that offers different and critical perspectives on IxD. Alex Taylor (2015) proposes the idea of Interaction design as a "World-Making" tool, in which IxD has been giving form to networks that mobilise and entangle not just people and machines, but also produce what we might think of as worlds—social, technical, scientific, intellectual, organisational, political, and ethical worlds. This view starts rejecting the idea that humans should be the epicentre of the world. By embracing posthuman values, this approach turns on the outdated idea that there is a natural separation between people and things. In this view, the notion of non-humans is limited to computers and machinery, and the said "worlds" are defined by human constructs (e.g. social, technical, scientific, etc.), not extending to the natural world. Another critical piece, "Design as Participation" introduced by technology researcher Kevin Slavin (2016), calls for the inversion of human-centred design, emphasising the systems and the actors involved in it rather than privileging certain users only. Slavin's view is inspiring and presents an alternative way for designers to participate in the system alongside other beings, but it does not detail how one can pursue this form of participation in the practice. Another view offers a relatively radical addition to the field by including animals in the design. Animal–computer interaction (ACI) is a field of research for the design and use of technology with, for, and by animals (Mancini, 2017). Although ACI does not include other species of beings such as plants and natural elements, It still expands the horizon of user-computer research by pushing our imagination beyond the boundaries of human-computer interaction.

1. Slavin discusses a couple of existing projects who have had a similar approach of design as a participatory act, such as- Hy-fi, a project for MoMA/PS1 by The Living (David Benjamin), however a certain methodology is not pointed out.

MtH Participatory Research Methodology

Among non-human-centred practices, More-than-Human Participatory Research (MtH-PR) is one that advocates for collaboration beyond human participants. The recent academic endeavours in this paradigm draw on diverse traditions that challenge the Enlightenment and critique humans' mastery and exploitation of nature (Noorani & Brigstocke, 2018). While this field is relatively recent, it borrows from legacies including Indigenous research, Biopolitics, and Ecofeminism. Tehseen Noorani and Julian Brigstocke (2018) review the contributions of this growing field in their collaborative piece "More-Than-Human Participatory Research", and argue for an alternative, ecological picture of human social worlds. From this perspective, non-humans are not deemed as resources for human societies, nor as passive research objects to be studied or experimented on. Instead, they advocate researching *with* non-humans in ways that are ethical, careful, respectful, and collaborative. Proponents of MtH-PR have offered varied ways to invite non-humans as active participants or to amplify non-human agency in their research practice. Through their work, they have addressed the issues of environment, coloniality, science, and technology.

Noorani & Brigstocke argue that the field's main principles are applicable in other disciplines as well. To that end, in this research we seek to connect the worlds of design methodology and More-than-Human Participatory Research. To do so, we were inspired by MtH-PR methods and precedents that look at non-humans as participants in the research and explore the kinds of ethical and relational considerations that arise from their participation. A number of MtH-PR projects inspired our design actions and experiments presented in part 1.5. Key amongst those were projects that included extensive exploratory fieldwork, participatory workshops, and soundwalks. These types of methods aim to extend our sensory awareness into hidden aspects of the environment and deepen our understanding of non-human participants (Pigott & Lyons, 2017).

Another key aspect of MtH-PR is the notion of *empathy* and the role it plays in research. In a project that attempts to call forth empathy, artist-researcher Kat Austen (2017) focuses on creating a conversation between humans and coral, allowing us to perceive other worlds at different spatio-temporal scales. In doing so she suggests an embodied way of conveying knowledge between humans and non-humans as the first step towards empathising with other species. Furthermore, by reimagining and revising the binaries of expert/non-expert, subject/object and human/non-human, MtH-PR questions the neglect of humans in taking into account the contributions of marginalised voices (non-human participants). Arguing that communities of non-human have long been relegated to the lower regions of social hierarchies for being assumed to be mute and passive (Pitt, 2016), MtH-PR challenges our previous assumptions of competency and inclusion.

MtH-PR attempts to show the complexities and nuances of conducting research with non-human participants. This includes paying attention to our non-human social relations and questioning power relations amongst humans and nonhumans to develop methods that support more sustainable ways of living. The development of our work was inspired by the attempts of MtH-PR to conduct several design explorations and shift from the paradigms of human exceptionalism.

Towards an MtH-IxD

Interaction Design as a formal practice, while finding itself evolving in terms of definition and approach, has been intertwined with certain qualities and guidelines that forefront humans as key users and decision-makers. In other words, IxD has been acting mostly in a remedial way: improving, serving, or sometimes enriching the (human) user's interactions with the technological systems (Taylor, 2015). In doing so, it has failed to account for the wider relations that it creates within the connected network of beings in the world. Taylor's (2015), Slavin's (2016), and Mancini's (2017) views can be good starting points for decentralising humans in the IxD process, and they open up the conversation about further questioning the essence of non-human actors and their role in the field. In a more recent piece, Ron Wakkary (2021) criticises HCD and argues for an alternative approach through post-humanism.[2]

We see an opportunity for Interaction Design to adapt a More-than-Human perspective by weaving the alternate non-human-centred practices of IxD with the contributions of More-than-Human Participatory Research; one that not only acknowledges non-human beings as participants but also considers them as decision-makers throughout the design process alongside humans. This approach is meant to act as an extension of Human-Centred Design as they both overlap in taking into account the needs and wants of humans and staying with narrative design methodologies. However, it does not carry the world-view of "humans above all beings" and seeks to address both humans and non-humans as valuable individuals and decision-makers. The forms of interactions that are addressed in this view are both natural and technological, happening between networks of humans and non-humans and their surroundings. The table below summarises the key approaches of IxD and illustrates the MtH design view at the end (Figure 1).

2. In his book "Things we could design for more than human-centred worlds", by weaving together posthumanist philosophies with design, Wakkary argues that human-centred design is not the answer to our problems but is itself part of the problem. He also focuses on design as "nomadic practices"—a multiplicity of intentionalities and situated knowledge that shows design to be expansive and pluralistic.

Interaction Design View	The Approach	Design Goal
Technology-centered	Technology-Centered	Human-Technology Interaction
The Behaviorist	Human-Centered Design (HCD)	Human-Technology Interaction
Social Interaction Design	Human-Centered Design (HCD)	Human-Human Networks of Interaction
The World-Making	Posthumanism	Human-Non-Human(Computer) Networks of Interaction
Design as Participation	The Inversion of Human-Centered-Design (HCD)	Participation Within the System
Animal-Computer Interaction	Animal-Centered	Animal-Technology Interaction
More-than-Human Interaction Design	**More-than-Human**	**Networks of Human & Non-human Interaction (Natural & Technological)**

Figure 1. Table showing different approaches in the IxD practice and the proposed addition.

Methodology:
Explorations of Displacement

In this part, we conducted several experiments to attempt to shift our place-ment of humans in design and take into account the nuances of interactions that exist outside of the common user-product space. To develop this shift of practice, we started from methods as they are the most integral part of many design processes as well as the drivers of our individual design practices. To challenge our existing knowledge of human-centred design and attempt to reevaluate it in an MtH context, we set out to create design experiments with the unconventional approach of including non-human participants. The seven methods we chose for these series of experiments are as follows: 1) Observation & Shadowing, 2) Sketching, 3) Personas & User Stories, 4) Em-pathy Maps, 5) Storytelling/Scenarios, 6) Interviews, and 7) User Journeys; Many of which are commonly used in IxD and other design fields as well.

While our experiments may raise the concern that we were trying to apply methods in a context where they were simply not meant to be in, we believe this intentional [dis]placement could help foreground design for a highly connected world, where human-made inventions affect more-than-humans as well. Through this methodology, we tried to explore either the success or the shortcomings of human-centred methods, and also understand in the context of an MtH Interaction Design, which methods could be adapt-ed, which could be borrowed, and which might need to be developed from scratch. While we recognize the strangeness of some of the applications of these methods, we used this strangeness as a tool to help us break away from the rigid structures of Human-Centred Design that have been built solely around human users. As Clara Mancini argues, in seeking to conduct research with species other than humans, there needs to be a willingness to explore the issues raised "with genuine curiosity, no matter how challenging or ironic they may appear" (Mancini, 2012, p. 9).

Acknowledging the importance of place-based experiences in design, we constructed most of our explorations at different locations in the local na-ture around Vancouver, BC. To identify the locations, we first had to clarify our idea of "nature" as this notion can be conceptualised in multiple ways. From

the fields of psychotherapy and ecotherapy, Martin Jordan and Joe Hinds (2016, p. 23) argue that while we use the terms "nature" or "natural" as shorthands for out-of-doors or objects or processes with minimal influence of humans, this distinction can also "cultivate a false dualism that obscures the inherent naturalness of all human cultures and endeavours". Here we also refrain from creating a certain otherness when referring to nature or seeing it as a single entity. Instead, we refer to "human experiences of nature" in the form of a spectrum (Clayton & Myers, 2009). This spectrum of nature has been expanded as the following (Jordan & Hinds, 2016), which impacted our site choices:
1. Domestic Nature (e.g. house plants) 2. Nearby Nature (e.g. parks) 3. Managed Nature (e.g. farms and agricultural areas) 4. Wild Nature (e.g. forests, animals, wilderness areas that are remote, challenging, or purposely left undeveloped), 5. Wild Processes in the Human Body (Cryan & Dinan, 2012). In addition, we also add two more: 6. Wildness (e.g. natural forces such as the wind) and 7. Sensory Representations of Nature (e.g. binaural nature sound recordings).

This series of experimental design actions allowed us to rethink the methods that are used in design, and attempt to develop alternatives that are more fit to be included in an MtH pratcise. The documentation of these place-based explorations and our reflections can be found in the next part.

Action 1.

Building New Affinities [Domestic Nature]

We identified "domestic nature" in our living room amongst the many houseplants that we interacted with on a daily basis. This action took place when we found ourselves struggling to save one of the plants alive after it was attacked by whiteflies. We first used home remedies, over and over. But as we failed and the whiteflies continued to dominate the plant's leaves, we were advised to buy a chemical pesticide to see faster results. However, knowing how chemical pesticides are toxic and detrimental to the environment, we realised that our successful attempt to help this plant ended up being harmful after all. Left with a still struggling plant, we thought about the number of interactions that had taken place amongst several humans and non-humans beings. Could we have possibly come up with an alternate solution if we had empathised with our non-human participants?

"Empathy" is one of the fundamental steps in the IxD process. Methods such as creating Empathy Maps or Personas are commonly used as a way to help us gain a deeper understanding of the users we are designing for. Whether we can "build" empathy with human users through certain methods is now being questioned, especially when it comes to addressing marginalised populations (Bennett & Rosner, 2019). But can we use tools such as empathy maps for non-human beings as a way of trying to "be with them" (rather than trying to "be like them")? (Despret, 2004, 2013, as cited in Bennett & Rosner, 2019). Beings who can not talk in our language, and tell us explicitly what they feel and see? As challenging as this was, we set out to create three different maps and personas for the main actors of this action: 1. The Plant (Canna Indica), 2. Mites (Whiteflies), 3. Us (humans)

Reflection: Empathising with the More-than-Human World

While we can never claim that we can fully understand non-human beings through empathising, this action helped us to push our understandings of what it means to relate to beings who live differently than us, and accept our unknowing. Filling out empathy maps for other beings was challenging, sometimes uncomfortable, and made us doubt our assumptions constantly. But it also made us realise how all the beings hold a unique life experience that contains interactions, actions, and memories.

In a conventional design process, when we draw empathy maps, we focus on the needs of humans only and brainstorm our solutions to respond to their goals. Drawing three different maps for three completely different beings with utterly different needs, made us wonder about the goals we address through our designs. Usually, design serves a specific group of people who share similar needs, concerns, and demographic features. But here we realised how limiting that can be when designing in a highly connected world, where our doings easily affect more than just those humans we depict in our personas.

Perhaps, the main challenge here is to find a common ground between the needs of different beings. At first glance, it may seem impossible to do so. Is it even viable to agree on one common goal? Or are we too different to find commonality? Perhaps through a human-centred point of view, it is much easier to put the needs of humans on top and justify their superiority above others. But by broadening our horizons in the design process we may be able to design more harmoniously in an MtH world. But maybe the empathy maps that were designed for humans were not supposed to work for non-humans? So, how could we change them?

Say

"You cannot easily fight me human!"

"I am gonna make it difficlut for you to save your plants."

"You are not as powerful or knowledgble to combat me."

"I can easily outnumber you and your plants"

Think

I can see no wasps around!
The human will not notice me in time.

Yay, the weather is perfect for me to thrive!

The plant is in the perfect spot, away from all their friends.

None of the plant's friends are here to help them.

I can expand my family easily here

Do

Produce honeydew

Repredouce quickly

Make it difficlut for the plant to photosynthesize

Cover the leavses entirely

Drain the juice out of the leaves

Feel

Happy - Resistant - Free

-----After Being Sprayed----
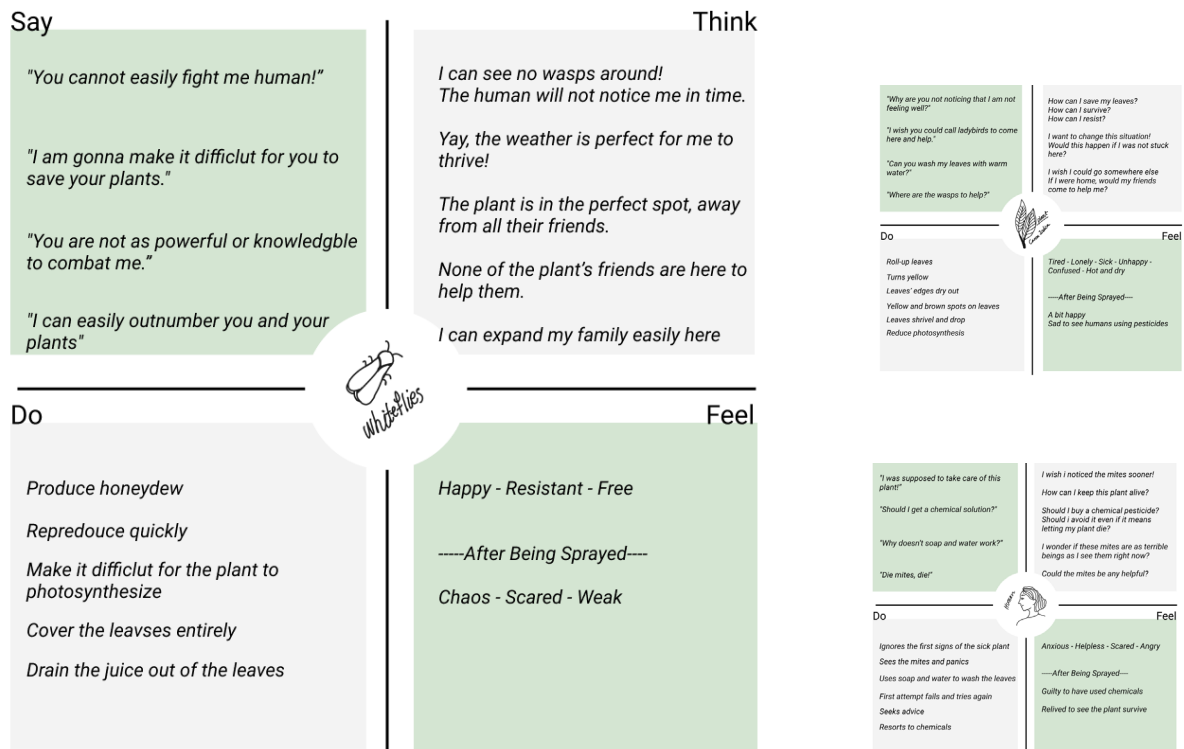
Chaos - Scared - Weak

Figurue 2-4. Empathy Maps for the plant, whiteflies, and humans
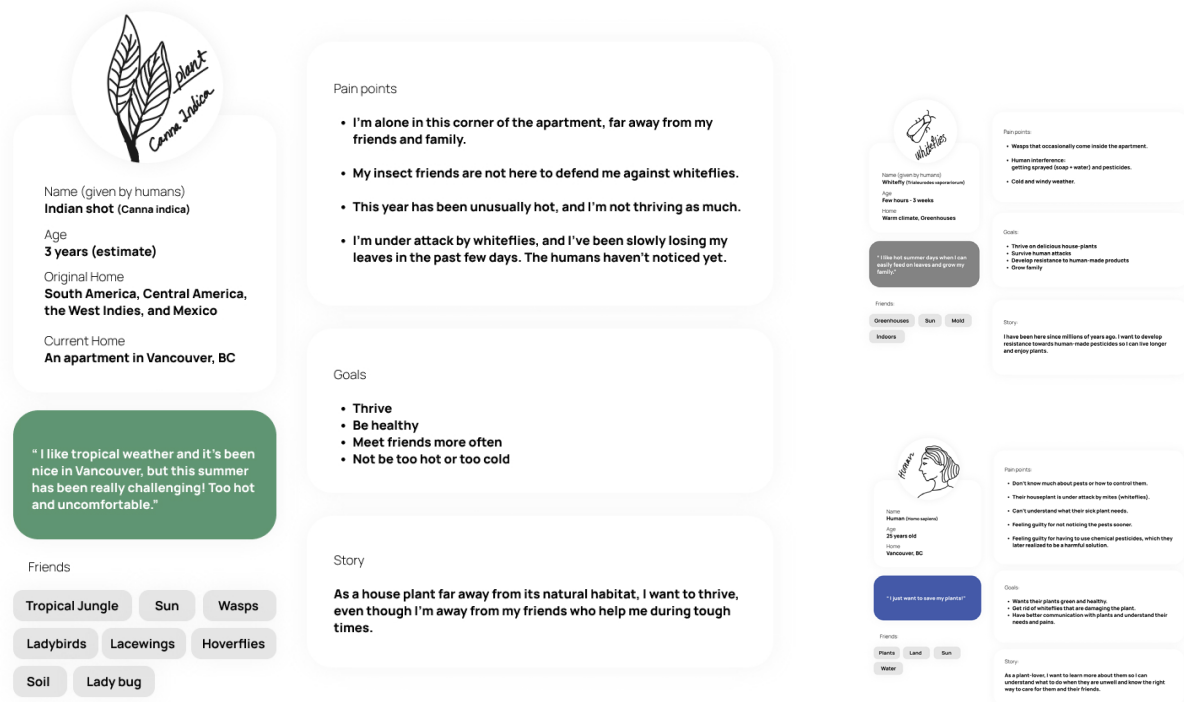

Figurue 5-7. Personas for the plant, whiteflies, and humans

Action 2.

Shadowing hidden Interactions [Nearby Nature]

For "Nearby Nature", we chose Memorial South Park. As we were spending time there, first we tried to notice how people experienced and interacted with this place. Then, we shifted our attention to the non-human beings interacting within the same environment. This activity is what design researchers call shadowing; accompanying the users and observing how they use the product or service within their natural environment. In our version of shadowing, we translated users into beings (human and non-humans), and we observed how they interacted with each other and the environment. This inter-action was identified even in the simplest of instances: like how a tree, the light, and the stone could interact through shadowplay. Using our senses more purposefully, we tried to combat the noise and the distraction of the human-built environment around the park, such as cars and traffic. Through this activity, we reflected on the different types of interactions that exist in an MtH space and how they relate to each other. We asked: how can we adapt a relational perspective to see things individually as well as connected? And how can we bring this relationality into design?

Reflection: Noticing Our Interdependence

In a fast-paced world that is in constant transition, we have become used to the speed. Amidst all this, maybe it is time for us to slow down, notice, and create meaningful interactions. In slowing down, we can notice how other beings are living among us, on our land, and even in our homes, sharing space with us. The nature of our entanglement is undeniably complex and extensive, but we can start by first acknowledging this fact, and then uncovering our sometimes hidden relationships with the MtH world. Perhaps, instead of putting the world in a hierarchical order, we can develop a meta-perspective in which we position ourselves in relation to the larger systems while being aware of all the elements involved. Slowing down and breaking down our attention could be the starting point of cultivating an MtH approach in the way we see and interact with the world.

Figurue 8-9. The park through different perspectives (human and non-human): How do different beings see the park? Memorial South Park, May 2021

Action 3.
Designing for Plant Communities [Managed Nature]

Community gardens have become popular spots of "Managed Nature" in Vancouver and other cities that bring the people who share a love of nature and gardening together. In this action, we were mainly interested in the design of the Davie Village community garden and how this design affords interaction between its human and non-human residents. By taking a closer look at the materials, layout, and the general design of the space, it was clear that this place was designed through prioritising the human users over non-human users. To practise an MtH perspective, we decided to attempt creating an alternative community garden from the perspective of a non-human resident, the rose. To get started, we chose scenarios as our main tool to describe what it will be like to use the product or service in the format of a story. In this case, we described the scenario from the perspective of a rose sprout, interacting with this community garden (as a designed artefact).

Using the scenario and following tips from a resource on companion gardening, we sketched out a new garden layout for the rose in a way that all the surrounding beings would either help them thrive or protect them from harm. While adding the final details to our rose-centred garden, we wondered if the concept of centeredness even exists in an MtH setting. This action was meant to decenter humans as beneficiaries and amplify a non-human voice. Yet, we found ourselves assigning a humanistic attribute to non-humans, which prioritise individual gain over collective growth. By centering the rose, we were yet again obscuring our point of view, overlooking the rest of the beings and creating imbalance. That said, now that we are at a point of unevenness on the earth due to human actions, can a relational viewpoint be a more relative and balanced way of approaching this problem?

Rose sprout Scenario:
A rose sprout is born on Lot number 14 of the Davie village community garden. It's a hot summer day in B.C. She can feel the sunlight brushing on her fresh new leaves. She looks up. There is a vast blue sky above her head, looking infinite. She thinks to herself, this is the best place in the world to be born at.
The sprout blooms and gets taller. Now she can see her surroundings a bit better. All around her are family and friends. All huddled to protect and care for each other. She feels safe. She feels loved.
The young rose is now one month old. She has gotten so much taller but is still hidden amongst her family. Through the small windows of her huddle, she can start to see things going on. On her right side, she sees tomato companions just starting to grow. On her left, there is a family of mint that just moved there from the lot next door. She feels happy. She has so many other friends to talk to, interact with, and learn from.
The rose is now three months old. Almost as tall as her sibling. She is tall enough to see her world from a new angle, separated from the protective bubble of her family. Above her, the blue sunny sky has been torn apart with huge chunks of tall grey cement. In front of her, she sees blurry objects zooming in and out, making loud muffled noises. Noises that are starting to disturb her. Constant and relentless.
She notices that her other side is empty, separated from other plants by a thick rubber divider that goes all the way around her family and friends. She hates how that material feels on her leaves and petals. It feels rough, ragged, and cruel. She tries to fight against it with her thorns, poking the rubber with all her power. But it won't budge. She feels trapped, in a place she doesn't belong to. A place not made for her.
She thinks to herself, is she really supposed to be here?

Reflection: Learning More-than-Human Ways of Being, Knowing, and Living

A key challenge in these actions is the fact that we are speaking to the experiences of beings we can never fully understand. We talk about the rose's way of being and knowing in the text, however, is that story perhaps associated with more human qualities than it should be? When we tell non-human stories, how can we recognize diverse capacities and ways of being that are different from humans? Can storytelling be a way forward?

When we tell stories, it is crucial to value MtH agency, and also appreciate and learn their unique non-human knowledge. But what does non-human knowledge look like? How can animal or plant knowledge contribute to our way of thinking and being, and open our minds to a broader view on life? Perhaps the first step would be to spend time with non-human beings to become more familiar with the nuances of their characteristics. In this case, visiting the garden regularly and spending time with the rose. Maybe this way, the human narration of non-human stories could have more accurate representations embedded in them.

Figurue 10-12. Davie Village Community Garden, Summer 2021
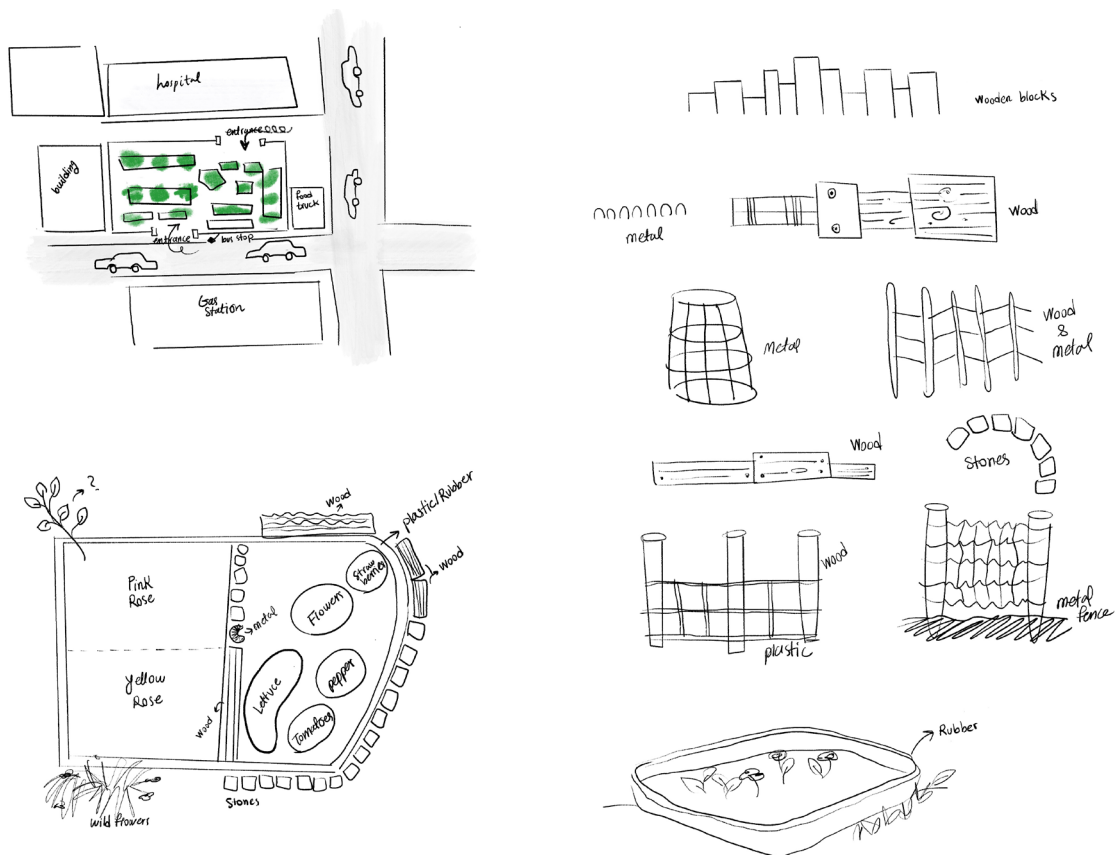
Figurue 13-15. Rough sketches of the garden layout and their materials
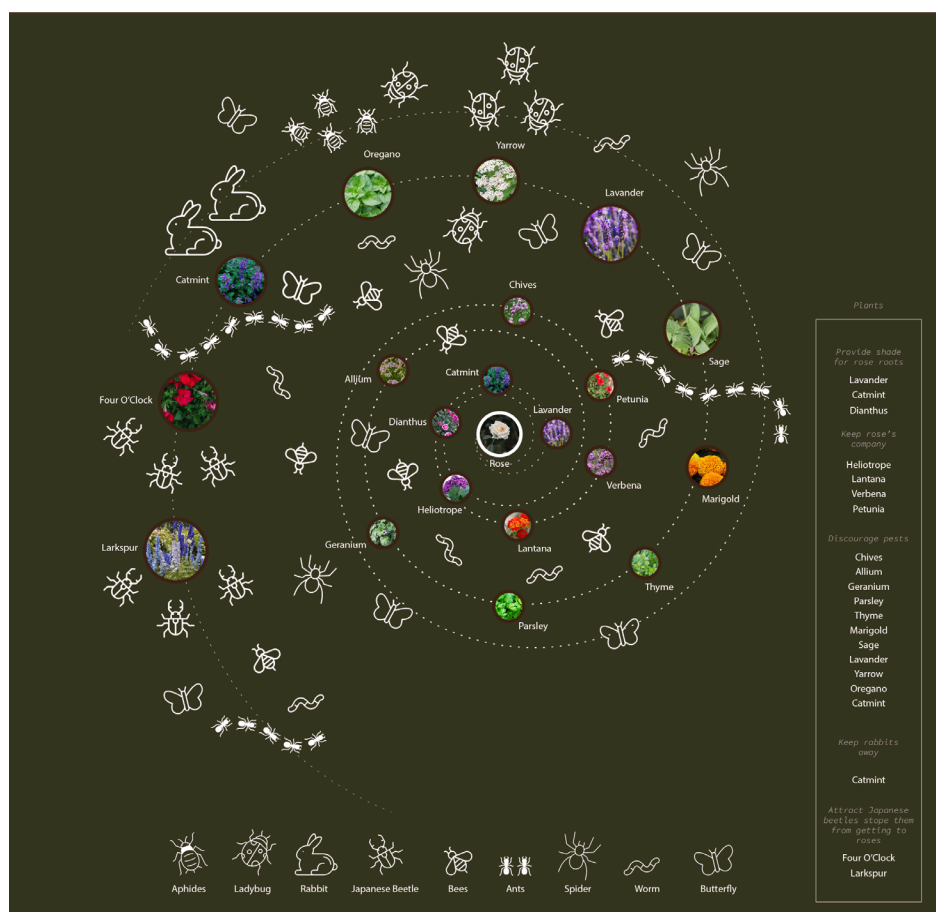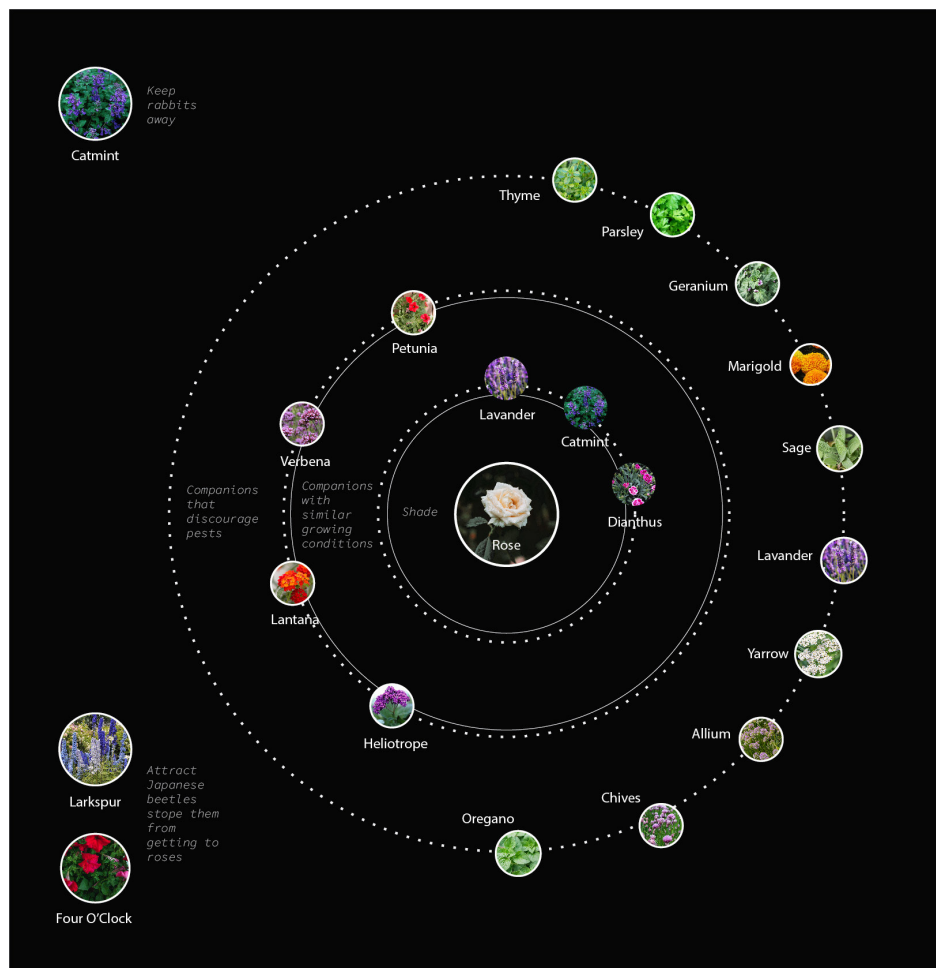
Figurue 16-17. Rose-centred garden design

Action 4.

In Conversation with Trees [Wild Nature]

At first, we were sceptical about choosing interviews as our method since we thought it was impossible to interview someone you could not have a verbal dialogue with. Then we decided to look at interviews another way; as a means of communication, not a questionnaire. So, as we walked through the Pacific Spirit jungle, we contemplated on what it could mean to interview an MtH being? Could we communicate with a tree, a sparrow, or even the sun?

Our first interviewee was with a tree in the depth of the forest. We wondered how we could start our conversation. We tried photographing them, walking around them, recording their voice, and sketching. But none of those actions felt like active communication. We were trying to capture the tree through our human perspective; the way we saw it. We wondered how we can give agency to the tree when we capture it? For example, can the tree and us make something together? As we continued experimenting, we realised the placement of the sun had changed and as it was shining over this tree, beautiful shadows were being formed on the paper we were holding in our hands. It was as if the tree was communicating with us through their shadows.

While we were interviewing the trees, we heard a sound. A bird had come close to us, ruffling the dirt, and perhaps looking for food. Being unfamiliar with this type of bird, we sketched its movements while she spent a while near us. At some point, the bird was interrupted by another bird. We did not know their relationship, but it was clear by their reactions that they were not friends. Maybe the bird who had come here first wanted to look for food without having company. Maybe if the bird could hide away for a moment, she would enjoy her search more.

This thought made us think of making a birdhouse on the ground, one that would shield her from being seen by others. We created a prototype using what we found on the ground. This was an early rough prototype for sure. We still did not know much about the birds or whether this would become useful for them at all. Of course, they are capable of tending to their needs as they have been for so long. But speculating in an MtH space, we took this chance to practice making for non-humans and non-humans only, without having humans or their needs in the picture.

Reflection: Communication with Non-Humans

As we reflected on our interview session, one thing that was clear to us was the importance of non-verbal communication, as a way of learning from non-humans. These non-verbal communications could manifest themselves through acts of watching, listening, or material engagements. Our goal with these interviews was to try and counter the assumption that non-humans are passive beings who do not have intelligent offerings. We wanted to explore ways that show trees are not only actively engaged, but also have their unique ways of being, and communicating. Although the result of our interview was a visual document, we want to emphasise that what lies at the heart of this method is silence, listening actively, and focusing, rather than using human-constructed languages. In our attempt to prototype, similarly, we were trying to listen, observe, and learn without interrupting. We created a birdhouse based on our assumptions. But were we helping or intruding? What stayed with us during this session is how communicating with non-humans requires a different approach; one that welcomes ambiguity, patience, and openness.
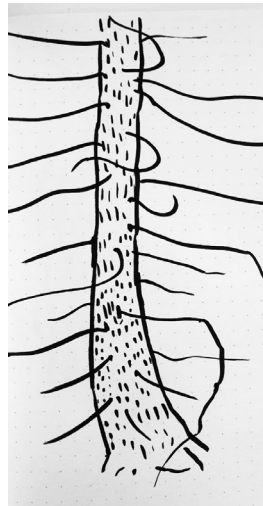
Figurue 18-22. The tree & interview documentations, Pacific Spirit Regional Park

Figurue 23-24. Sketch & birdhouse prototype, Pacific Spirit Regional Park

Action 5.
The Journey of Plants Travelling into Our Plates
(Wild Processes in Human Body)

Coming from a culture that values cooking, we are used to putting a considerable amount of time into our meal preparation every day. Reflecting on this seemingly routine activity, we found ourselves interacting with multiple natural ingredients (non-humans) in our kitchen, through the actions of cooking, making, and then within our bodies. In this action, we decided to see this story from the perspective of the Saffron spice, and track its MtH experiences.

Saffron is one of the most important ingredients of Persian cuisine. However, we had never looked at this ingredient as a significant non-human before. Seeing our relationship from a human-non-human perspective, we were intrigued by how far this spice has travelled before reaching our plates. We decided to use one of the other most common methods of IxD, user journey, to see their interaction. User journey maps are diagrams that depict the relationship between a user and an organisation, a product, or an environment over a period of time. The following diagram depicts Saffron's user journey, from the moment it was planted.

Reflection: Recognizing the More-than-Human Intelligence

Cooking is a process that is both artistic and designerly. We learn how to cook by either observing other people cook or reading recipes and watching tutorials. But the true education starts with working with the ingredients themselves. That means the real knowledge of cooking lies within the plants, vegetables, fruits, etc., which we have accumulated through interacting with them. Positioning ourselves as students of nature, even in the seemingly simple act of cooking, cultivates humility and sets the foundation for a relationship between us and non-humans based on respect and appreciation.

Seeking to understand the non-humans involved in design, we could regard the process as an apprenticeship (Pitt, 2016) with non-humans. A learning process through which an apprentice learns from multiple sources of knowledge, but mainly the non-human expert itself. Non-human beings such as plants have long been relegated to the lower regions of social hierarchies for being assumed mute and passive to have anything intelligent to share. This neglect is hugely out of sync with their significance to society and how entangled they have always been with human lives (Pitt, 2016). When designing for or with non-humans, it is important to see hands-on experience of working with them as the best way to extract that knowledge. "If plant knowledge is plant being, then we learn with plants by being with them, by increasing proximity to them through interactive relationships" (Marder 2013, p. 7).

Saffron User Journey Map

Saffron (Zafaran - زعفران) is a powerful spice that reacts to cold and hot water and turns everything bright yellow.

Action	Planting	Harvest	Preparation & Cooking	Serving & Eating
Tasks	1. Saffron onions are carefully planted into the soil by hand. (Location: Delijan, Markazi Province, Iran) 2. Onions slowly start to bloom in mid-autumn. They turn into pink flowers with orange & red stigmas. 3. Pink flowers grow into purple ones in 1-2 weeks.	1. After full bloom, the flowers are harvested by hand into wooden baskets. 2. The red stigmas are taken apart by hand and carefully placed aside. 3. Stigmas are quickly dried after extraction in open air and in moderate heat. 4. After being completely dried, they are kept in an air tight bag.	1. Dried threats are grinded by hand in pressed with mortar and pestle (made of stone) and into powder. 2. Powder is either soaked in hot water, or ice to yield color water. Sometimes threads are used directly on food. 3. Saffron's colorful solution is added to cooked rice and fried dried berries.	1. Saffron is served with the meal (Zereshk-polo) and is ready to be eaten by humans. 2. Saffron's chemicals interact with body.

Feelings quotes

Wow, This place looks wonderful!

This is starting to get tiring, I want to be picked out.

I like being picked up by hands, it cares for my delicate stigmas.

It feels sad to be separated from my flowers. And I wonder what happens to them?

I like lying under the mellow sun and drying. Its a nice feeling but if the sun is too intense, I can easily burn.

This feels weird, being crushed by a stone. I wonder why this happens. This is brutal!

It's nice to chill in cold ice after being crushed. Hot water not so much!

Seeing that color turn out is the best part of my life. So happy and accomplished.

I'm going into a dark tunnel I wonder what can I do here..

I'm gonna use my remaining power to boost this body's immunity and fight memory loss! Goodbye world!

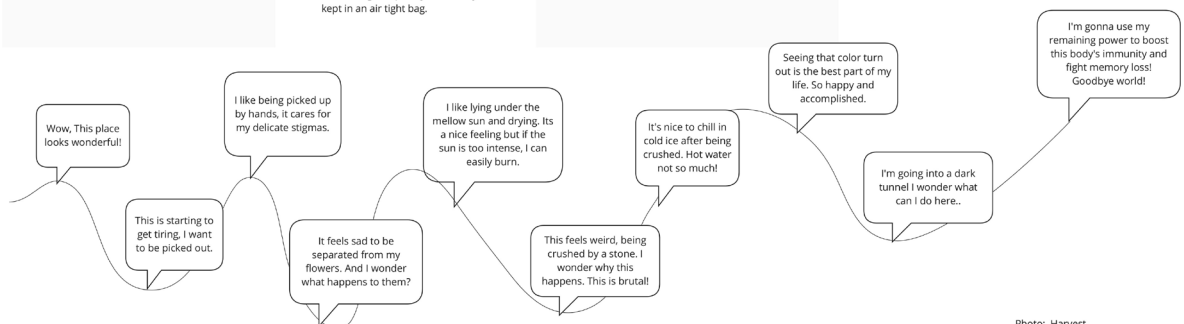Photo: Harvest (https://origiran.com/saffron-irans-red-gold-prized/)

Figurue 25-26. Saffron user journey

Action 6.

Trapped in the Heat Dome [Uncontrolled Forces of Nature]

In the middle of summer 2021, Vancouver faced an unprecedented heatwave. As temperatures went over 40, the city experienced many unexpected threats to its human and non-human inhabitants. We decided to use the context of this uncontrolled force, the "heat dome" as our next design action.
While battling with the heat in our apartment, we noticed new patterns emerge amongst many of our non-human roommates. Our plants, who were enjoying the sun at the beginning of the summer, dried up faster. To save them from the scorching sun, we found ourselves moving their pots several times during the day, according to the movement of the sun. Meanwhile, insects were thriving in the apartment. Before this, you could only spot a few of them every once in a while. Now, they were hanging from the ceilings, zooming through the kitchen, and moving up and down the walls, looking pretty unbothered. Fascinated by how differently we were all reacting to this condition, we mapped out the placement of the MtH beings in the apartment according to the heat.

Reflection: Seeking Balance and Questioning Power Relations

As we were struggling to live through the heatwave, we noticed a small-scale demonstration of shifting power relations in our house and a quest to bring some form of balance back to it. This was an interesting observation in regards to how easily power dynamics can change and accommodate some over the other. Also, how we as humans stand in a more powerful position to others, while we were arguably the reason behind that unprecedented heatwave.

Before the heatwave, we seemed to be more in sync with our surroundings (at least we thought). But as the weather became unusually hot, the balance was suddenly off. When we were thriving, the plants and insects were not. When the plants were thriving, the insects and we were not, and finally, when the insects were thriving, the plants and we were not. This shift left us wondering about the notions of agency and responsibility in a shared space with multiple actors who all have their own goals. Can we pursue a common goal? As beings who started this imbalance in the first place, what is our responsibility towards it now? Working with MtHs in the context of IxD requires becoming aware of the hierarchical power relations that could potentially exist in not only our actions but in our mindset too. By creating interactions beyond a user-product space, IxD could attempt to question our old assumptions of competency, and encourage explorations that support wider inclusions and initiate non-hierarchical power relations.
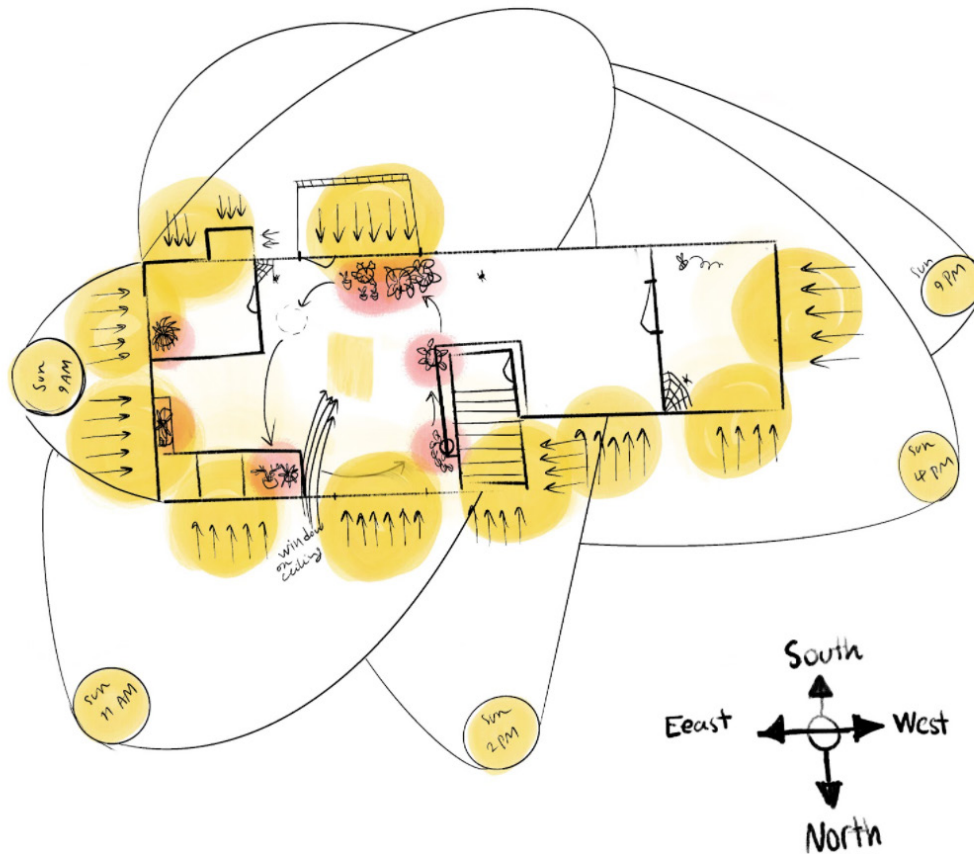
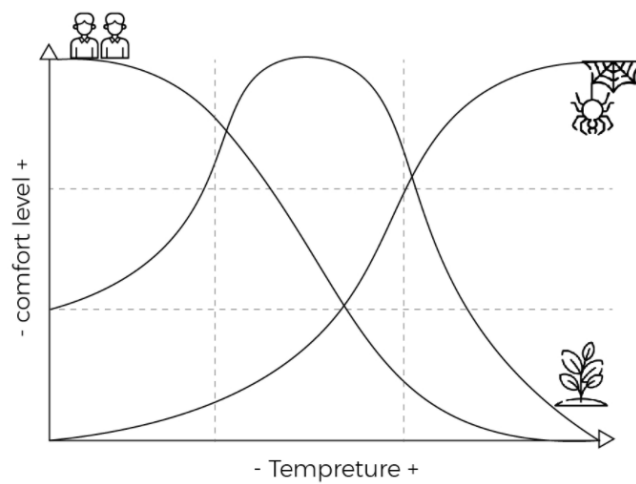*Figurue 27. Mapping the movement of the sun in the apartment*

Figurue 28. Diagram of Temperature and comfort level for three beings

Action 7.
Listening to Nature [Sensory Representations of Nature]

Interacting with nature is a sensory experience. We experience nature, not just through visuals, but we listen, smell, and touch. So, when one of the authors took a trip back home to Iran, we thought it was a great opportunity to conduct a design action via virtual mediums. For this action, we chose sounds, as a more immersive medium that has the potential to engage people deeply and emotionally within complex events. These qualities make sound an interesting medium for involving non-humans in research. But how well equipped are our listening skills to accurately interpret these voices? And can sounds evoke empathy in connecting us to the MtH world?

The premise of the action was to listen to nature recordings and sketch out the first idea that came to mind, identifying specific sounds, and imagining the setting, with no prior information. The goal was to see how well we were familiar with recognizing non-human voices and experiment in sound sketching. No specific IxD methods were involved in this action. Sketching and visualisation (in broader terms) were our tools.

Reflection: Tuning our Ears to the More-than-Human World

Learning from nature as an inherently interactive ecosystem can be a powerful way to become more familiar with the MtH world and develop empathy towards it. But in an era where we may interact with digital gadgets and devices more frequently than our physical and natural surroundings, how can we perceive the natural world and better understand the MtH world through these senses in different socio-temporal scales? How would this sensory experience inform our relationship with them?

Perhaps, we could find alternative modes of communication with MtH beings through rediscovering our senses. The act of listening is considered one of the least intrusive ways of taking part in a conversation, although it is most definitely not as passive as it may seem. Listening has agency, it has certain responsibilities and ethics embedded within it. While "giving voice" to more-than-humans can sometimes fail and lack substance, listening can sometimes be more balanced and suitable. IxD can be a catalyst that advocates communication beyond words by facilitating interactive experiences with more-than-humans. Exploring and evoking our senses more purposefully in a MtH context may help us uncover our forgotten bonds and help us strengthen our relationship with nature.

Figurue 29. Sound sketches

Part 2: *Re-imagine*

"We don't have to figure everything by ourselves, there are intelligences other than our own, teachers all around us."

Robin Wall Kimmerer, Learning the Grammar of Animacy

Re-imagining Design
from an MtH Perspective

We commonly refer to Design as a problem-solving tool or finding an opportunity for improvement and change. To do so, designers usually follow a set of inquiries, such as learning about the problem space and targeted users, coming up with ideas, testing out and prototyping, etc., all in hopes of achieving the appropriate solution. In short, this process guides the designer by providing tools and showing a roadmap. Although there is no definite meaning to what a design process is and it can be different for different individuals, for many designers working in the industry, it is both a productivity tool and what enables them to be creative and intentional at the same time; making it an integral part of their workflow. It is important to notice how this process itself is essentially a designed artefact; a tool that carries certain ideas, assumptions, and beliefs. On that note, a worldview that prioritises humans above other beings produces a design process that applies the same notions in practice, directly or indirectly. These points clearly illustrate the capacity of the design process as a tool that leads to creating certain situations and shaping the world. Therefore, to move towards a More-than-Human Design, we first start by bringing our design values forward. These values help us mirror our human-nonhuman entanglements in the design practice, and later guide the making of the MtH Design Process and tools.

MtH Design Values

The MtH design values listed below have been derived from Part 1 of this thesis: "Re-frame". These values act as a manifesto for this approach and helped shape what in the end came to be known as the MtH Design Process.

Relating
While the notion of Empathy has a great role in developing recognition of non-human agency, we can never claim to fully understand the lived experiences of other beings. To attempt to move towards an inclusive design, we refer to empathy as "a creative process of reciprocation" (Bennett & Rosner, 2019). This is a way for us to relate to MtH beings and pay attention to "the interplay of similarities and differences in our encounters with them" (Noorani & Brigstocke, 2018). This relationality will in turn inform our understanding of those beings as collaborators in the design process to help us come up with an outcome that would benefit the key "users" without harming the other involved beings.

Unlearning
To better understand, experience, and learn from the More-than-Human world, we must look past many of our human-centred values. Unlearning is crucial in valuing the agency of the MtH world, and recognizing their unique ways of being. "As active and knowledgeable contributors to social life, there is potential for non-humans to participate in research" (Pitt, 2016).

Agency
To acknowledge our interdependence and the power of our actions, it is imperative to look beyond human communities and learn from more-than-human beings as experts of their knowledge. In an MtH design practice, the non-human beings are not considered as objects of study or resources, but beings of agency that we can communicate and collaborate with.

Active Communication
While we use our words and means of communication to interpret and document our thought processes and observations, it is clear that communicating with non-humans requires a different approach; one that welcomes ambiguity, patience, and openness. We believe what lies at the heart of this communication is silence and active listening. "Different modes of listening afford different ways of speaking, thus opening conversations to, between and with the human and more-than-human" (Heddon, 2016).

Reciprocity
The dominant design culture in the Anthropocene era is heavily dependent on the profit-based industry and prioritising human needs over the planet. MtH design attempts to build futures in which humans and non-humans live in harmony through reciprocity and acts of care. This means designing for/with the MtH world as the key participants or bringing reciprocity in the forms of offerings, gifts, and daily rituals. As Robin Wall Kimmerer (2013) states, as opposed to commodities, this way of living celebrates our kinship with the world and opens us to ways of living in gratitude, richness, and generosity.

Openness
Collaborating and working with MtH beings may seem strange in some of the applications of the design methods as we are used to working within human communities, but this strangeness could potentially ignite imagination to help us break away from the rigid structures of design in an industry built around human users.

Case Studies

Devising the MtH values allowed us to shape our approach more clearly. To see how those values could potentially alter design outcomes, we conducted a few comparative case studies on existing products on the market. We purposefully chose products that were directly or indirectly involved with non-human individuals to better identify their approach of inclusion in the design. In these case studies, we re-imagined how these products could be developed through an MtH lens, by implementing the MtH design values in their concept and function.

These products were all chosen from the field of Interaction Design (website, app, plugin, service) that are currently in the market and have an engaged audience:

1. Pl@ntNet: Developed by Cirad-France (2013)
2. Google Maps/Google Earth: Developed by Google (2005, 2001)
3. Ecosia: Developed by Christian Kroll (2009)
4. Portal: Developed by Portal Labs Ltd (2019)

Case Study Report

1. Pl@ntNet

PlantNet (https://identify.plantnet.org) is an application developed by Cirad-France in 2013 that allows users to identify plants simply by photographing them with their smartphone. PlantNet's photographs are collected and analyzed by scientists around the world to better understand the evolution of plant biodiversity and to better preserve it. PlantNet's primary purpose is to create a visual inventory by encouraging people to submit pictures of different plants.

This case study includes a general analysis of the target audience, and identifying the problem space within this platform based on secondary research and user feedback. Then by integrating some of the values of the MtH design, we tried to envision an alternate app. This app would not only help users identify plants, but also encourages further hands-on interaction to build a stronger relationship. The new user flow focuses more on storytelling, exploring histories, and would treat plants as active members of a community. Encountering a new plant is like encountering a new person; exciting, intriguing, and thought-provoking.

An alternate app with a MtH approach:

- Does not solely focus on visual clues, but encourages users to explore more sensory ways of knowing using sound, motion, smell, and touch.
- Avoids scientific classification & typology, focuses on a more relational description based on observation and imagination.
- Sees plants as the experts of their own knowledge, not as subjects of study: encourages more hands-on experience.
- Is based on stories and histories.

Figurue 30. Pl@ntNet Current App userflow. from left: 1.User takes a photo of an existing plant and uploads it into the app, 2.The app gives the user the option to choose between leaf, flower, fruit, and bark, 3.The app identifies the plant through its data bank and presents the user with an initial name of the specie, 4.The app asks user to confirm their identification or improve it by providing more pictures, 5.After confirmation, users can either browse through the pictures provided by other users., 6.Users also get directed to websites such as Wikipedia for further readings.
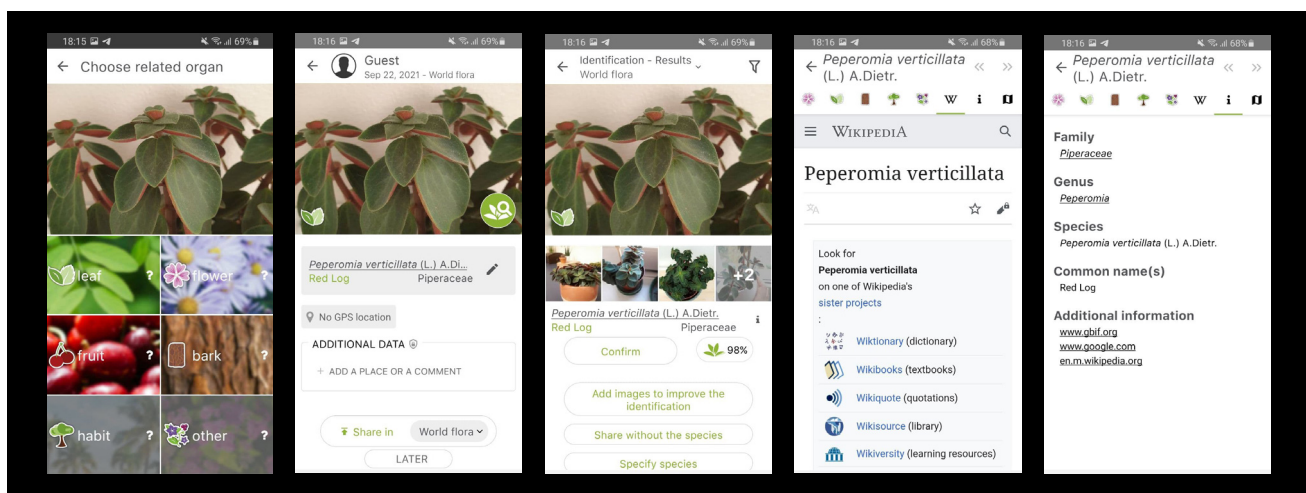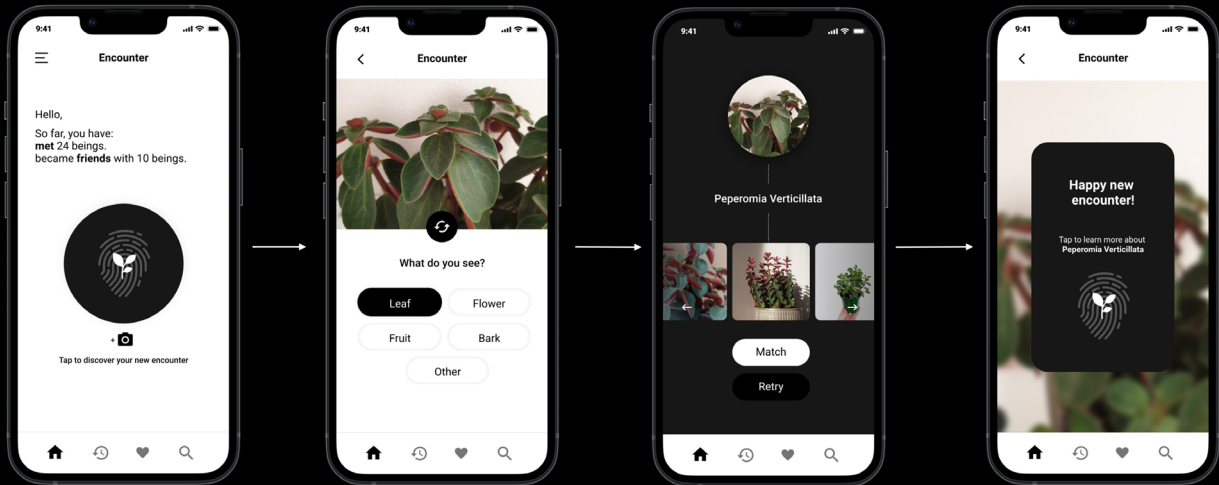
Re-language: Framing the plants as beings that users may meet or become friends with rather than objects of study

Allowing the user to do a bit more investigation while matching the plants

Emphasizing on creating a network as you encounter more and more plants, similar to as meeting people.
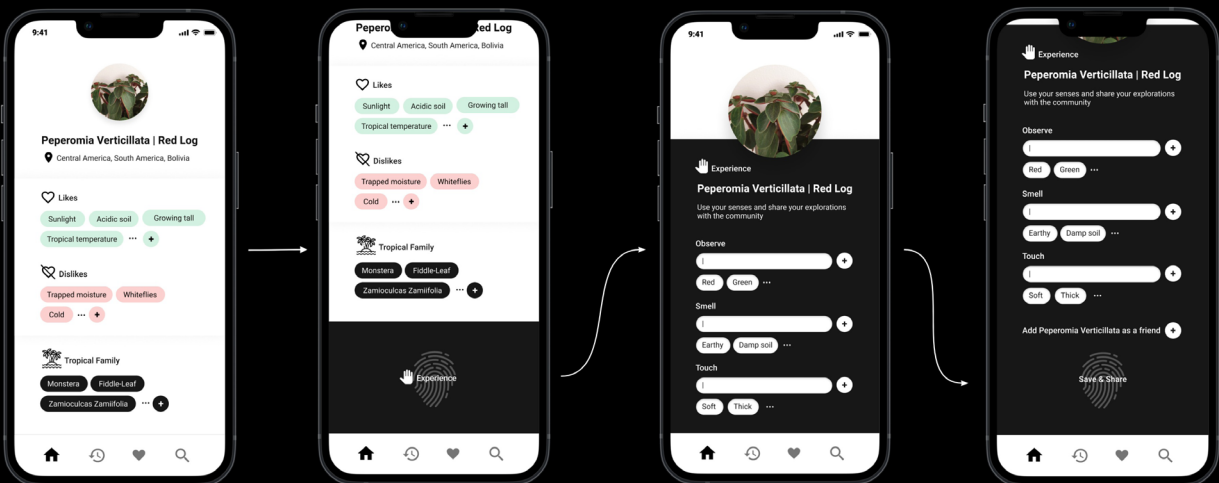
Giving a more **relational** (and less objective) description of the plants: Naming what they like/dislike/and talking about their network of support.
Having the attributes in the keyword format makes them searchable so users would discover other beings with these characteristics as well. They can also add their own entry.

Experience: Emphasize on multi-sensory learning experiences rather than just including written information by prompting users to engage with the beings in the physical setting and not relying on the app fully.

Figurue 31. The final results of the Pl@ntNet application being redesigned using MtH values

Case Study Report

2. Google Maps & Google Earth

Developed by Google, Google Maps (https://www.google.ca/maps) is a platform that allows users to navigate their world through real-time GPS navigation, traffic, and transit info. It also allows users to explore their local neighborhoods. Google Maps offers satellite imagery, aerial photography, street maps, 360° interactive panoramic views of streets, real-time traffic conditions, and route planning for traveling by foot, car, air, and public transportation. The other product of Google, Google Earth (https://www.google.ca/earth), renders a 3D representation of Earth based on processed satellite imagery. This platform does not give out real-time data but rather provides a relatively recent and more realistic visual report based on satellite imagery acting as a form of a visual archive of the Earth's surface.

By studying the target audience of these two platforms, and creating proto-personas we tried to identify the problem space of these platforms in relation to MtH values. Google Maps and Google Earth are two different software packages with different objectives but they share a similar function; they locate the users in the world and allow them to explore their surroundings. This ranges from the built (restaurants, shops, and etc.) to the natural (Mountains, sea, jungles, and etc.). Google Maps however is more popular, because it deals with peoples' everyday activities (commuting to work, shops, etc. and general way-finding). While Google Earth is less "practical" on a daily basis, it is still used for entertainment and/or by users who have a deep interest in exploring environmental and geographical data.

Bridging the two different functions of these platforms was the objective of our redesign. We wanted to create an alternative Google Map platform in which users still benefit from the practicality of an online map while simultaneously engaging with natural and environmental data that Google Earth is partially offering. This way, exploring and interacting with nature would not have to be a separate activity but rather embedded in the user's daily routine, just like the real world. By integrating some of the values from the MtH design, the design of an alternative platform would incorporate non-human activities on the platform, and would try to embed the real-time data from non-human beings into the everyday life of users, alongside the already existing urban data. The goal of this redesign was to bring MtH interactions into the user's day-to-day life by engaging with the map.
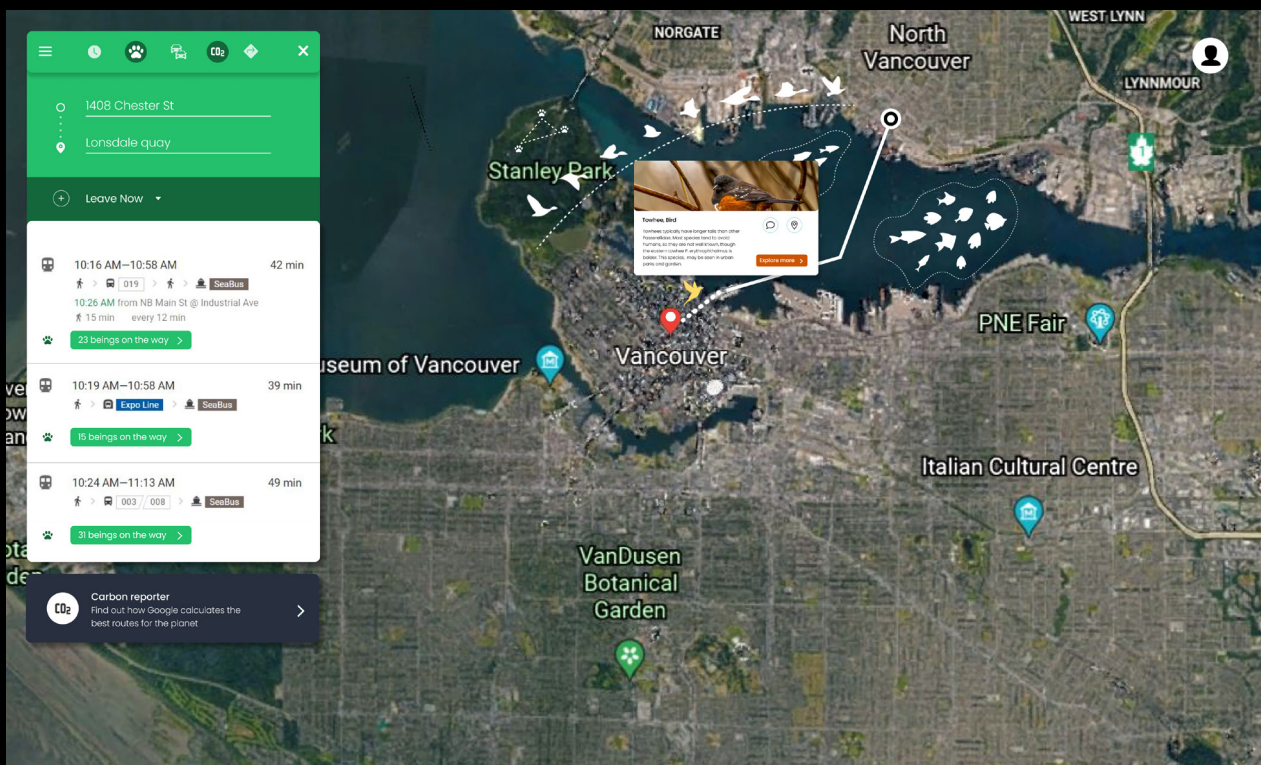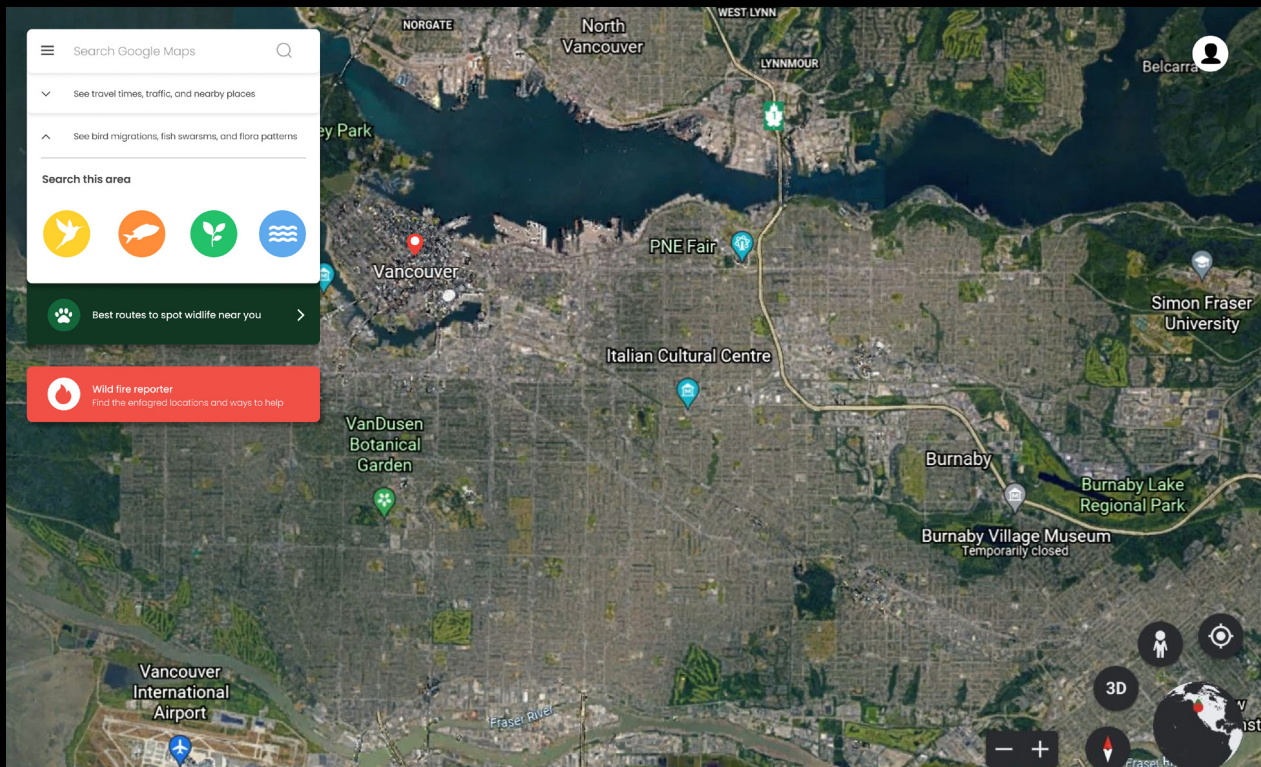
Figure 32. Google Maps being redesigned using MtH values

Case Study Report

3. Ecosia

Ecosia is a free search engine (https://www.ecosia.org) based in Germany that launched in 2009 and uses their profit to plant trees and support reforestation-focused organizations. This browser extension provides a search engine for users, and as they search and surf the web, the platform uses the profit to plant trees where they are needed the most. By prioritizing biodiversity hotspots, bird migration routes, and environmental crisis zones, Ecosia has partnered with farmers and local communities across the globe to support climate action. Ecosia advocates for transparency by publishing their financial reports on the main page.

Based on the information gathered from secondary research, and user feedback, the users are rather satisfied with their experience with Ecosia. However, from a MtH perspective, there are two different approaches that can help guide the redesign process:

1. How can we improve the existing experience while considering the agency of trees as well?

2. What stops other users from not using this platform? How can we address this?

Ecosia is a great example of a digital product that aligns with MtH design values. It is an everyday product that many use, but it is also designed in a way that initiates pro-environmental activities as well. There are several ways in which this platform can improve and communicate even better to its audience.

An alternate Ecosia platform that embodies MtH design values might include the following:

- Users are able to track their contribution to the reforestation projects, and be notified of the location of the tree(s) that are planted.
- Has a personalized profile that shows users' daily achievements and the ability to set up goals. (e.g. to plant certain numbers of trees)
- Boosting community interactions through showcasing a live data-set.

Improving the search engine's accuracy and usage flexibility. As of now, compared to Google Search, Ecosia doesn't provide the same quality which may result in some users switching back to Google when they are searching for multiple resources. Apart from technical improvements, being able to turn the Ecosia search engine on and off quickly may help users to easily switch back or even compare the two sets of results.
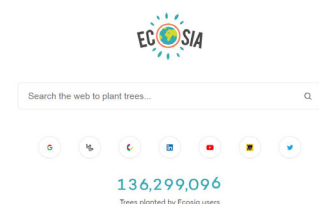
Figure 33. Screenshot of the Ecosia search Engine, released in 2009

Case Study Report

4. Portal

Launched in 2019 by Portal Labs Ltd (https://portal.app), this application brings nature into your surroundings through cinematic visuals, 3D audio and smart light integration. Portal operates based on the fact that spending time in nature is critical to our mental and physical wellbeing. Being aware of the environmental crisis that is ongoing, Portal points out the importance of environmental wellbeing for people and the planet, and attempts to facilitate nature experience through its digital platform.

Portal provides an immersive nature experience for people who may not have direct or immediate access to nature. According to the current users, this app manages to provide a relaxing and enjoyable experience. Overall, this app has proved to be effective in delivering immersive experiences and keeping up with its mission. However, from the MtH perspective, there are several points that could be addressed:

• Are users encouraged to interact with nature outside of their screens as well?
• Do the users learn about/from the present MtH beings through their content?
• Is the agency of the recorded beings considered throughout the app?
• How is *nature* perceived through this app? Is it narrowed down to a wellness tool?

Although Portal is aligned with MtH values in many ways, there are still a few steps that could be incorporated into its design to better represent MtH beings and acknowledge their agency. To start with, the overall design and messaging of the app implies that nature is in a separate realm from humans which further encourages human-nature divide. A MtH lens would point out the interconnectedness of all beings and highlight the existing relations, no matter the physical distance, by pointing out that nature does not necessarily have to be found in the wild.

Secondly, while interacting with nature is embedded within the app features, it is important to not objectify the MtH world as a tool that enhances the quality of our wellness. What should be pointed out throughout this experience are different ways in which we can connect with the MtH world and build relationships with them. One approach would be adding more information and details about the present sounds and the recorded videos, besides the provided geographical location: Who are we listening to? Where do they live? How are they doing? Answering these questions could evoke empathy and shift this experience.

Practicing reciprocity outside of this platform is another factor missing from the Portal app. Now that we feel better through this experience, how can we give back to nature and beings? How can we contribute to their wellbeing? Living in the time of climate emergency, it is important to bring attention to the wellbeing of the planet when we are addressing them in the design. While it may be challenging to incorporate this action-point within the app itself, Portal could use their user-base and promote pro-environmental activities among individuals.
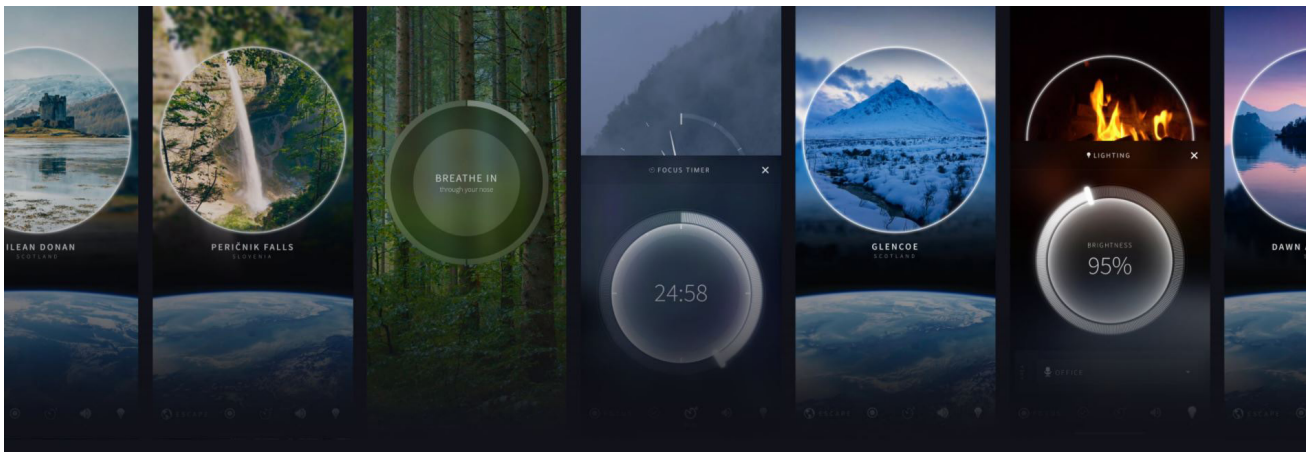
Figure 33. Screenshots of the Portal app, released by Portal Labs Ltd in 2019

Part 3: *Re-build*

Making the MtH Design Process

In Part 1, we reframed the Interaction Design practice to view it from an MtH perspective. Our work in reframe, left us with a series of questions and reflections, but we were yet to translate those visions into an MtH design practice. In Part 2, we aimed to reimagine an alternate practice through recognizing our MtH values and worked on a few redesign case studies. Insights from the previous parts paved the way for us to begin making the MtH design process. However, devising a structure that can potentially function in the existing industry is challenging in many ways as the infrastructure itself is limiting. To that end, instead of coming up with a new structure, we sought to intervene in different spaces of an existing design process to re-build it from an MtH perspective. Thinking about human-centred design processes and their use cases in the industry, we immediately landed on "Design Thinking" as one of the most dominant frameworks that is present in both industry and academia. Prompted by the potential and the challenges that are presented in "Design Thinking", we decided to use that as a basis for our work.

Building off of Design Thinking

Design Thinking (DT) is a strategy that aims to solve complex problems through a user-centred approach. It originally came about as a way of teaching non-designers such as engineers and C-level executives how to invite designers to participate in C-level meetings, facilitate workshops and apply design methods to a range of business activities including engineering and financial planning (E. Bertulis, 2022, personal communication, March 16, 2022). With the rise of Human-Centred Design in the 80s and the formation of design consultancy IDEO in the 90s, Design Thinking became increasingly popular. By the start of the 21st century, many design disciplines, including Interaction Design started utilising this approach to achieve practical results and solutions (Stevens, 2020). This process finds solutions that respond to human needs and desires that are communicated through user feedback. People, not technology, are the drivers of innovation, so an essential part of the process involves stepping into the user's shoes and building genuine empathy for your target audience. According to IDEO, Design Thinking brings the elements of technical feasibility, economical viability and desirability (for people) together (IDEO Design Thinking, n.d.).

According to the proponents of Design Thinking, this approach has proven to be a valuable addition to the design industry when it comes to creating practical and enjoyable products for a particular group of human users. However, by going through the process (Empathise - Define - Ideate - Prototype - Test) and its outputs, it becomes clear that DT does not encourage designers to consider non-human beings in their process. Additionally, although DT claims to work in tackling complex problems (e.g: environmental issues), it does not reflect and implement the MtH values discussed above. While some companies and designers attempt to tailor the process by adding more constraints and guidelines, the process itself does not advocate by default for these principles.

The Role of Place in MtH Design

Design Thinking keeps people at the centre of the process (IDEO, n.d.). According to IDEO, a human-centred designer will arrive at optimal solutions as long as they stay focused on the humans they are designing for. Similarly, the tools of empathise, define, ideate, prototype, and test orbit around the targeted human user – a user that is momentarily detached from their surroundings and their relationality to the MtH world. In contrast, MtH design starts by situating the project and its involved beings in place and recognizing the numerous place-based forms of relationships between the user and the rest of the beings.

By bringing attention to place (rather than the user), MtH Design emphasises the series of interactions and impacts that are caused by the design output or process. These impacts are intertwined with the locality of the design, meaning the place from which a design emerges (place of origin) and/or the place its impact reaches. Recognizing and learning about these areas helps us identify the human and non-human participants of the design, and also the affected systems that encompass all the involved beings. Therefore, MtH design advocates a practice that is relational to place. This relationality also means that the responsibilities, constraints, and opportunities embedded within each place are different and can also change over time.

Having that said, it is important to consider how some of the current digital products or platforms are widely spread across the world or have decentralised operations, which makes them hard to ascribe to certain locations only (e.g. Google Maps). In this case, there are still factors such as physical infrastructure (e.g. server warehouses) and energy usage that pins down their physical footprint. Additionally, places of impact can be much more abundant than the place of origin or could be drastically different in terms of environment or beings. On that account, this research encourages a dynamic practice that allows designers to collaborate across the local and global region and recreate, adjust or modify the MtH design process according to the place and the involved more-than-human beings.

Mapping MtH Participants

In MtH Design, participants are considered to be all the beings (human and non-human) that have interactions and relations with the design. MtH Design acknowledges that the design's impact always reaches beyond human societies. In other words, we are always designing for the MtH world, even if our design is targeting human users. Therefore, it is crucial to acknowledge all involved individuals throughout the process. When it comes to designing for human users, MtH Design continues to borrow from HCD tools to understand their pain points and needs, but what it aims to add is an expansion of our attention to all the living beings that are affected by the outcome, or during its process.

The visualisation below illustrates the varied range of participants in the MtH design. These individuals are visualised in a spectrum based on their level of involvement or interaction with the design (Fig. 34). The user (human or non-human) usually has the most interaction with the design, but that does not mean that the rest of the individual beings are any less important or irrelevant throughout the design process.
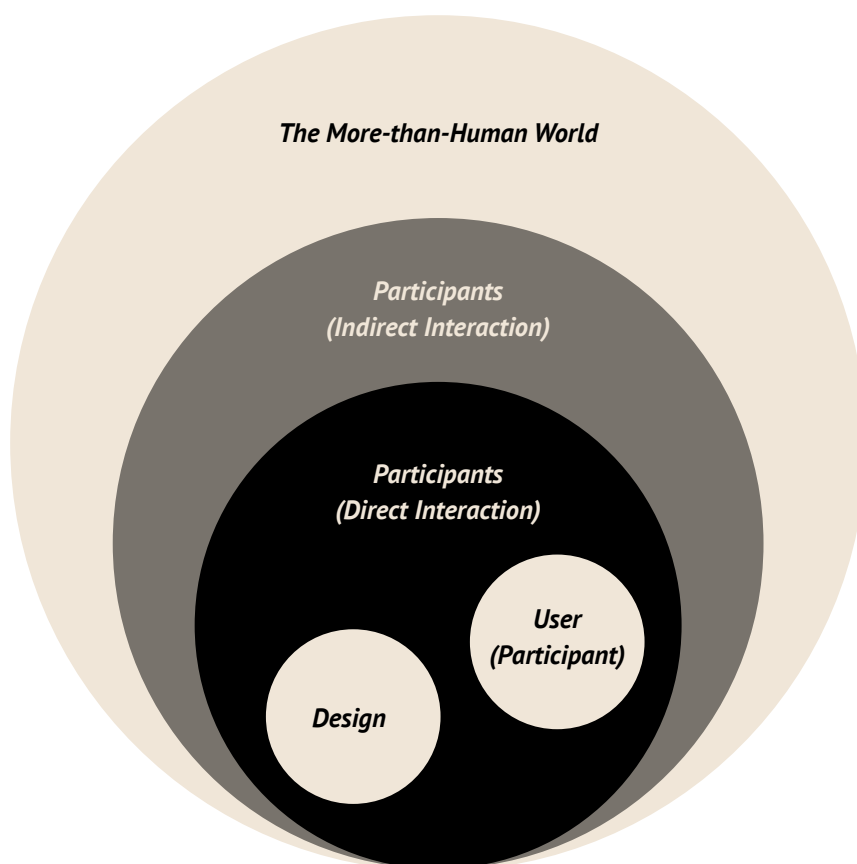
Figure 34. Diagram showing the impact of design beyond users, affecting the participants who have direct and indirect interaction with the design/design process, all situated in the MtH World

The MtH Design Process

Here is the outline of the MtH design process and its steps. Each step includes several tools and methods to navigate through the MtH design. These tools are categorised by the involved individuals: human, non-human, and both (MtH) to pave the way for mapping out human and non-human interactions. Some of these methods are inspired by the common Interaction Design tools, however, they can potentially be used in other design disciplines as well. While these tools are offered as a part of the design process, we do not claim them as the only resources that can serve this goal. On the contrary, we encourage this library to be open-ended so others could come up and share their own tools. Collaboration is an integral part of the MtH design process, both in the actions, and also in the formulation of the process itself. Therefore, we want this process to be an ever-evolving piece that welcomes change and improvement according to the MtH world. The iterations and the documentation of the making of the process could be found in Appendix A.

1.	2.	3.	4.	5.
Encounter	**Learn**	**Plan**	**Map**	**Build**
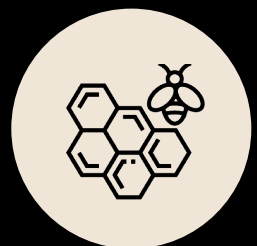
1. Encounter
The More-than-Human World

In the first stage of the MtH design process, the designer tries to situate the project within the environmental/social and geographical context, and recognizes all the affected individuals including but not limited to targeted users.

Situate:
Situate the project in the place. Find out where it is located and how far its impacts will reach. Reflect on the responsibilities and ethical considerations within this place.

Recognize:
Identify all the MtH participants (humans and non-humans) besides the user who may be affected throughout this design process and/or after its implementation in a real-world context.

Questions to explore:
- Where does this project take place?
- What are the responsibilities & ethical considerations within this place?
- What are the constraints and limitations within this place?
- How far will the environmental impacts of this design expand?
- Can you identify all the MtH participants of this design? How?
- Have you recognized what types of animals, plants, elements, or non-human beings could be impacted by this design (throughout the design process and afterward)?

Supporting Tools

Non-Humans	MtH (Humans & Non-Humans)
Action-oriented prompts Natural Probes Natural Humility	Seek collaboration Identify participants Land histories & stories

2. Learn
from The More-than-Human World

In the second stage of the MtH design process, the designer attempts to empathise with all the key MtH participants and identify their relation to each other. The goal of this stage is to define the project based on common goals between involved/affected participants and the targeted user(s).

Empathise:
Empathise with the MtH (human & non-human) participants and learn from them as experts of their knowledge. We reiterate that empathy is cultivated not by trying to become another but by focusing on the similarities and differences in our encounters with non-human beings (Noorani & Brigstocke, 2018), and the ways we relate to them.

Define:
Define the problem space, project scope, considering the individual and shared goals of all participants.

Questions to explore:
- How can you empathise with all the human and non-human participants of your design?
- How can you communicate with your non-human participants? Did you learn from them as experts of their own knowledge?
- Can you define the problem space, project scope, and identify the individual and shared goals of all involved beings?
- Can you identify spaces of conflict and tension amongst your participants?
- Can you identify mutual benefits between all participants in a competitive situation?
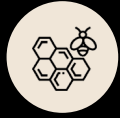
Supporting Tools

Non-Humans	Humans	MtH (Humans & Non-Humans)
Non-human communication Personification MtH Narratives Experience Map	Interview Personas Scenario & Storytelling Journey Map Cultural Probes Competitive Audit	Mindful Shadowing MtH Empathy Maps Mapping MtH Relations

3. Plan
with The More-than-Human World

In the third stage of the MtH design process, the designer ideates for potential design solutions, while including all MtH decision-makers -human and non-human- in order to come up with an inclusive design.

Ideate (MtH alternative thinking):
Ideate through an MtH lens; reevaluate your ideas and make sure they are not addressing certain users while being destructive or ignorant to the rest of MtH participants.

Questions to explore:
- Have you come up with a multitude of inclusive design ideas?
- Did you speculate using the question of "What if?" to think about alternate situations?
- What sensory modes of design might be most effective in this project?
- Is co-design helpful in this project? How can you plan a co-design session with your participants?
- Can this design benefit from decentralisation, diversity, and redundancy to increase resilience?

Supporting Tools

MtH (Humans & Non-Humans)
Brainstorm MtH Sketching Sensorial Ideation MtH Storyboard MtH Provocation Co-creation
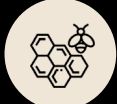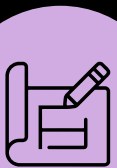
4. Map
More-than-Human Futures

In the fourth stage of the design process, the designer speculates about alternate futures or systems that may affect the design and reevaluate the design accordingly.

Speculate:
Speculating about the alternative systems and worlds in which the design would exist helps us identify potential future hazards and prevent unwanted results when the product enters the world.

Reimagine:
Evaluate your design based on the insights you gained from the "speculate" step and go back to the planning stage if necessary.

Questions to explore:
• How would your design exist in alternate worlds and futures?
• How might the launch of this design affect the current ecosystem?
• How might this design affect the other beings that inhabit the environment? (people, animals, plants, natural elements, etc.)
• Did you leave room in your design for re-considerations? What kind of changes can be made in your design?

Supporting Tools

MtH (Humans & Non-Humans)
Future Pathways Alternate History

5. Build
for The More-than-Human World

In the final stage of the design process, the designer starts building the design and testing it out for further feedback and iteration. After final revisions, a Production & Time Guideline is devised to make sure the future implementation and developments are in line with the MtH design goals & values.

Prototype & Test:
Be mindful of prototyping and testing. Consider the MtH participants who may get affected by this design, but are not present during the test sessions. Make sure that the design will perform in an interconnected world affecting humans and non-humans.

Production Guideline:
The development and production of any design artefact may involve materials, tools or methods that are not necessarily covered throughout the design process. Furthermore, the production may be handed over to another team in many cases, which makes it harder for the design team to stay involved. To help navigate the building phase, create a production guideline to make sure that the development will comply with the values of the MtH design as much as possible (e.g. using more sustainable resources, etc.). As the projects may be multidisciplinary, involving experts and consulting other collaborators are highly encouraged throughout this step.

Future Timeline:
The conditions in which a design has been created will change at some point and the design outcome is not to remain the same. Set a timeline for re-evaluating the design in future. Analyse emerging situations and adjust the design accordingly.

Questions to explore:
- What are the development strategies of this project? Regarding Resource use, waste systems, and production management?
- What are the project's guidelines around data protection and privacy? (If applicable)
- What is the timeline of evaluations for your project?
- Have you chosen the best design option based on the criteria from the previous stage? If not sure, the MtH design encourages iterations. Go back and revisit your design decisions.

Supporting Tools

MtH (Humans & Non-Humans)	Humans
Low to high fidelity prototyping Production Guideline Future Timeline	Concept Testing Usability Testing A/B Testing Guerrilla Testing Wizard of OZ

The MtH Design Toolkit

The MtH design toolkit was created as a pedagogical tool for instructors and students to explore the MtH methodology. This toolkit makes the application of this process easier by offering a card set and a guiding booklet. The cards span the steps of the design process, summarise the goals for each step, and review the suggested methods in separate cards. This card set can also be used by individual designers or in design teams who either want to apply the MtH Design Process step-by-step or simply try out an alternative approach in their practice. The accompanying booklet (Appendix C) provides an in-depth description of the design process and its steps – Encounter, Learn, Plan, Map, Build – and gives detailed instructions for each of the suggested methods. We hope to enrich this booklet by adding tangible case studies and examples in the future.

Figure 35. MtH Design Cards

Comparison:
Design Thinking vs. MtH Desgin

The MtH Design Process was created based on Design Thinking. While these two share some similar features such as following narrative-based design methods and focusing on steps like Ideation, prototype, and test, there are distinguishable differences between the two. Firstly, MtH Design recognizes all affected beings as participants, while DT actively focuses on humans as its key decision-makers. Consequently, the MtH Design Process situates the project in the environment and attempts to acknowledge socio-cultural and historical backgrounds in the first step. Furthermore, understanding the needs and wants of different beings is a necessary step to find the common goals and identify the problem space. Meanwhile, DT mainly focuses on the insights generated from human users to define this space. DT encourages an iterative approach so we could achieve a minimum viable product in the end. However, MtH dedicates more time to analysing the ideas from an MtH lens and speculating about different systems and situations that may affect the design in the future, especially witnessing the climate emergency. The attempt to come up with adaptable solutions is also pursued after building the design in the final steps of the MtH process: production and time guidelines. This step could be done with different levels of detail according to the project scope and involved disciplines, however, this is another attempt to keep the design team involved in the implementation phase and make sure the MtH values are carried out accordingly. Finally, creating a timeline for future iterations ends the MtH design process, another emphasis on the ever-changing conditions of the world and countering the notion that a design outcome should last forever.

	Place	Participants	Collaboration	Decision making	Result
Design Thinking	Universal - There are no specific place implication	Human	Human collaboration across different disciplines	Human-Centered	A minimum viable product
MtH Design	Relational to the MtH world and place-based	Human & Non-Human	Interdisciplinary human collaboration & More-than-Human collaboration	Non-Human-Centered & based on MtH common goals	Adaptable outcome + production guideline & future timeline

Figure 36.   DT vs MtH Design Process comparison

Design Thinking   vs.   MtH Design

Seek to understand Observe and engage with **people** to understand their experiences and motivations as main participants.	Empathize	**1**	Situate Recognize	*Encounter the MtH World* **Situate** the project within an environmental/social/geographical context, and **recognize** all participants, beyond people.

Encounter the MtH World

Situate the project within an environmental/social/geographical context, and **recognize** all participants, beyond people.

Define the problem
Focus on analyzing observations and synthesizing them in order to **define** a problem statement in a **human-centered** manner.

Define **2** *Empathize* / *Define*

Learn From The MtH World

Empathize with all the involved MtH participants to build an understanding of them, this allows us to **define** the problem statement based on MtH **common goals**.

Ideate divergently
Generate ideas to come up with new, and alternate out of box solutions to address **user[human] needs**.

Ideate **3** *Ideate (MtH lens)*

Plan with the MtH World

Ideate with a MtH lens while including all the key participants (human or non-human) in order to come up with **inclusive designs**.

Investigate the solutions
Create prototypes to investigate solutions. They are either accepted, improved and re-examined, or rejected on the basis of the **users' experiences.**

Prototype **4** *Speculate* / *Re-evaluate*

Map MtH futures

Speculate about *alternate futures* or systems that may affect the design, **reevaluate** the design accordingly, and go back if necessary.

The final stage
Test the prototype and use the generated result to refine the design, problem space, and inform the understanding of users. The final goal is to create a MVP.

Test **5** *Prototype & Test* / *Production & Time Guideline*

Build for the MtH World

Prototype and test the design for iterative feedback and revisions. Finally, devise a **production & time guideline** to make sure the upcoming developments are in line with the MtH values and the design will be revisited accordingly later on.
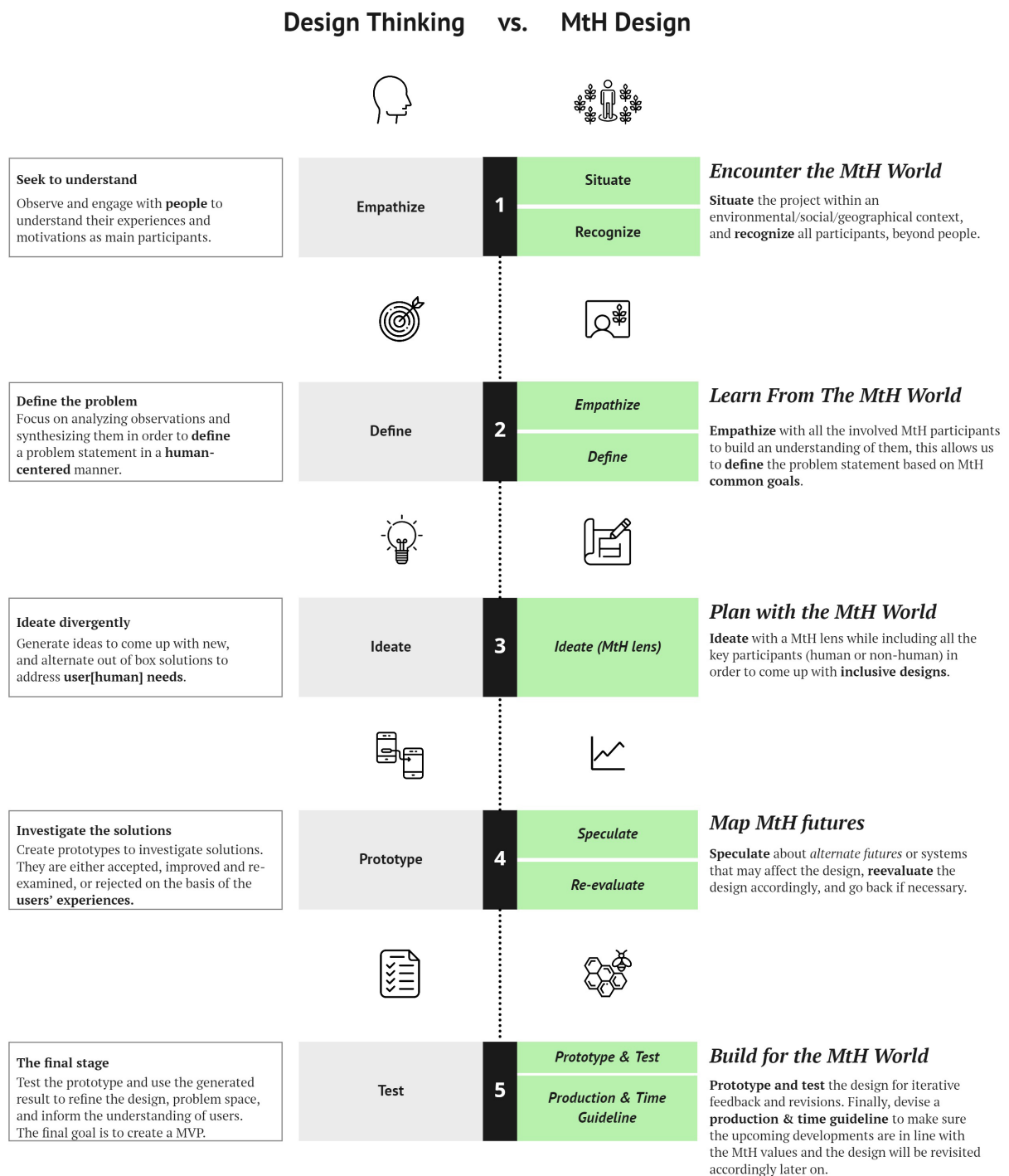
Figure 37. DT vs MtH Design Process - steps comparison

Part 4: *Re-connect*

"Opening oneself to the wild world and describing what one finds with love and passion is itself a political and spiritual act."

Peter Reason, Transformations of time on ecological pilgrimage

Implications of MtH Design

While working on creating an MtH Design Process, one of our main challenges was coming up with ways to bring these ideas outside the academic space and into the outside world, which is often much more constraining. Having worked in the industry and on time-sensitive projects that follow a rapid workflow, we knew how difficult it would be to implement a slower (and more mindful) way of working in this system. However, we strongly believe that change can start small in a gradual process. That is why we think of MtH design as an adaptable process that encourages designers to modify it to fit their own way and pace of working to create small yet effective pockets of change in the system.

We acknowledge the challenges that will possibly come with adopting the MtH approach, which would require breaking away from the systems that encompass and affect us in various ways. These challenges can be identified in two main categories: 1. Financial challenges, and 2. Systematic challenges. Working in our current profit-driven design system is not only easier but is also more financially viable. If designers are willing to make this shift to work towards an MtH practice, being aware of the financial matters of their work is required to make an informed decision. While making this transition is clearly harder for some than others, it is important to keep in mind the small changes that can be made from within the system. From the industry's perspective, shifting to another workflow may seem costly or unnecessary, but having seen the recent environmental crisis, adapting an MtH approach could lead to long-lasting stability that benefits all participants rather than a short-term profit that benefits only a particular group of humans. Systematic challenges are another barrier for designers when trying to transition to this alternate process. Working in larger systems or corporations means less and less independence for individuals who have to operate based on strict company guidelines and policies. We again acknowledge that making this shift will not be easy and practical for all individuals, and for those who do, it certainly would not come without a price. However, we believe that an MtH perspective can be brought into the design industry gradually, incrementally, and on different levels. Finally, even though we know that the conditions of today's industry are constraining and limiting, what MtH Design encourages is taking smaller steps and moving forward.

MtH Design Community

Design practice constantly evolves both in industry and academia as part of a community that strives to make a change and empower the design practice. Acknowledging this community, it is essential to make space for MtH design as well. There are many ways to approach this goal, however, academic institutions can formally bring this community together. Introducing a More-than-Human perspective into design pedagogy provides a platform for engagement among emerging designers which will, in turn, streamline a transition in the industry. Emily Carr University of Art + Design has been working towards this goal by devising classes that amplify the livelihood of more-than-human beings and forefronting place-based practices, land responsibility, and indigenous knowledge.

Throughout this research, we also facilitated two workshops in collaboration with Marcia Higuchi (MDes 2022) in Fall 2021 and Spring 2022, supported by the DESIS Lab at Emily Carr University. These workshops aimed to highlight the role of non-human beings as potential participants and partners in the creative process. From contemplation to tangible making, facilitating these workshops presented the value of active inquiry, group engagement, and open exploration in the MtH world. Having gathered valuable insights and feedback from these sessions, we think workshops can be a great way to introduce the MtH process in a class setting or even in a design studio.

Workshop

My Creative Partner | Reflecting on Our More-than-Human Interactions

In March 2022 we facilitated a workshop with Marcia Higuchi, supported by the DESIS lab in Emily Carr university. This workshop was meant to encourage participants to practise creating, in partnership with MtH beings. On the day of the workshop, as participants entered the room, they encountered a big table filled with rocks, leaves, sand, sea water, and ect. who were our MtH guests. Participants were prompted to choose one of the beings as their creative partner for the workshop.

This workshop had been broken down to three main parts: 1. a short guided meditation followed by storytelling 2. filling out an MtH empathy map for their MtH partner. 3. practising making as an act of care towards the MtH world. The meditation was meant to bring attention to the sensory and tactile experiences and guide participants to reflect on their memories or previous encounters with their MtH partner. The participants shared personal stories about why they chose a certain being and what they discovered from them as they held them during the meditation. Filling out the empathy maps was challenging for many, as we assumed it would be. However, the group were creative in their approach and ended up with varied ways of expressing MtH empathy and relationality. After a discussion with the group, we concluded that there was power in acknowledging contradictions and accepting our lack of knowledge towards the MtH world. This also helped us recognize more-than-humans as beings who have unique life experiences, histories and interactions.

In the final part, the participants were presented with a range of making materials to choose from. All materials were driven from natural resources. This prompt was focused on the act of making as a way of freely practising reciprocity and creating in collaboration with an MtH partner. Some chose to make symbolic offerings: a water slide for the sea water, or a container that held the soil (since the soil usually supports and "holds" other beings). Others recreated the forms and shapes of the beings, as a way of learning and being guided by their MtH partners. In the end, we discussed how having space for exploring with MtH beings as collaborators encourages experimenting and active learning without having to worry about a potential "design" solution. We were inspired to see how everyone engaged and related to their MtH partner in their own unique ways and contributed to the workshop by embracing the unknowing. In the end, the participants left their makings behind so all the beings could be brought back to where they were found, and the materials to be recycled. Leaving behind the makings was another attempt to acknowledge how we were not to "own" any of the beings or the creations, but to encounter them, collaborate with them, and part ways.

Figure 38. Participant choosing their MtH partner, photos by Yun Xiao

Figure 39-43. Workshop documentation, photos by Yun Xiao

Conclusion & Next Steps

This thesis is an exploration of a More-than-Human approach in the design practice. An exploration that heavily relied on collaboration and partnership, not only because of the complexity of the topic, but also because of the humble role we play as designers within the entangled network of humans and non-humans. This research was a collaboration between the two of us, with our peers and faculty, and with the non-human beings who we learned from throughout the process. This work could not have happened without these forms of partnership and shared knowledge. As designers and researchers, we strongly feel that there should be more space and encouragement for collaboration in design research, and we hope this co-authored piece highlights the potential and possibilities of this type of work. We hope to be able to share this work online and continue to evolve and grow through forming more collaborations.

In this thesis, we re-framed the IxD practice from an MtH perspective, re-imagined the ways in which we can develop an MtH design practice, and re-built the design process to address the entanglement of the MtH world. In re-connect, we talk about the implications of this type of methodology and the role of the design community in giving voice to alternative approaches. We will continue our endeavours by enriching these preliminary methods to create a more extensive guidebook for the MtH Design Process in the future. We hope that by sharing and building upon this work, we will continue testing out, revising, and refining what it means to design for an MtH world. As we continue working in this community, we will keep asking questions and work to discover more meaningful and insightful ways of navigating our practice in these urgent times. We can always talk about a certain future where we have the right tools and means to practise an alternate way of design; where profit does not lead the industry, and humans are not the only group of individuals determining the livelihood of all beings. No matter how reassuring it is to envision an ideal time when other ways of practice are welcomed, that is not the time we are living in. As Donna Haraway argues, "staying with the trouble" does not involve future times, but it is to be truly present. "Our task is to make trouble, to stir up potent responses to devastating events, as well as to settle troubled waters and rebuild quiet places" (Haraway, 2016, p. 1).

Final Words

This collaborative project was an insightful journey for me to situate myself as a designer and position my practice in relation to the More-than-Human world. There are many questions that have not been answered yet, but what matters is to keep searching and exploring. This can be particularly difficult as design students are often taught to work in certain ways unquestionably, but fortunately being in this program equipped us with the means to think beyond the said paths and even build our own. Design has the power to shape our world, for better or worse, and what we aimed to achieve in this project was to envision a design methodology that serves all beings, not just humans. We are still faced with many uncertainties, but I hope what we presented here as the MtH Design Process encourages more individuals to reevaluate the systems that directly or indirectly affect our efforts, and not to be overwhelmed but to intervene. I am excited to share this collaborative work and continue to learn and unlearn as we move forward.

Zahra Jalali

This project started as an individual exploration into the ways in which we perceive, understand, and act towards the climate crisis and how designers can help build a world that is more than just for human exploitation. I started out by asking "What is my role as designer in the era of ecological crisis?" and "What does this mean for me as a designer?" To investigate this topic and offer a path forward for designs who like us found themselves at a point of uncertainty, we worked through a series of collaborative work and research. At the end, we took Design Thinking as a framework and extended it through a More than Human approach: the ending result is a design methodology that helps designers explore non-human-centred methodologies. This work has been hugely challenging and yet inspiring. I believe this work helps distribute our findings in a clear way, and I look forward to finding new ways of growing and working though this new path.

Kimia Gholami

Appendices

Appendix A
Making the MtH Design Process

Design Thinking Process

empathize → define → ideate → prototype → test

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history   local community   responsibility   local environemnt

Situate → empathize → define → ideate → prototype → test

---

non-human beings   Acknowledge   MtH agency

situate → **recognize** → empathize → define → ideate → prototype → test

---

situate → recognize → **empathize** → define → ideate → prototype → test

humans and non-humans — common goals

---

situate → recognize → empathize → define → **ideate** → prototype → test

humans and non-humans — common goals

MtH lens

---

situate → recognize → empathize → define → ideate → **speculate** → prototype → test

humans and non-humans — common goals

MtH lens

alternative worlds/ situations

Diagram 1

situate → recognize → empathize → define → ideate → speculate → **Reevaluate** → prototype → test

- empathize → humans and non-humans — common goals → define
- ideate → MtH lens
- speculate → alternative worlds/ situations → Reevaluate

Diagram 2

situate → recognize → empathize → define → ideate → speculate → Reevaluate → **prototype** **test**

- empathize → humans and non-humans — common goals → define
- ideate → MtH lens
- speculate → alternative worlds/ situations → Reevaluate

Diagram 3

situate → recognize → empathize → define → ideate → speculate → Reevaluate → prototype → test → **Production + time guidelines**

- empathize → humans and non-humans — common goals → define
- ideate → MtH lens
- speculate → alternative worlds/ situations → Reevaluate
- Production + time guidelines → Planning for future

Appendix B

MtH Design Process Guiding Booklet

1. Encounter the MtH World

In the first stage of the MtH design process, the designer tries to situate the project within the environmental/social and geographical context, and recognize all the affected individuals.

Situate .... **Recognize**

Situate the project in the place. Find out where it is located and how far its impacts will reach. Reflect on the responsibilities and ethical considerations within this place.

Identify all the MtH involved individuals who may be affected throughout this design process and/or after its implementation in a real world context.

Seek Collaboration

Partnering with other creatives, scientists, professionals, and non-humans is key in the MtH design process.

Encounter   **More-than-Human**

Time:
1-2 weeks

Materials:
Field explorations
Communication tools

Note:
It is important to recognize that each project demands a specific group of experts, which goes beyond the design team.

Steps

1. Define the scope of the project.
2. Locate your project in the larger field of design by answering these questions:
- Where is this project located?
- What kinds of design direction does it address? (Ex: Interaction, service, product, & etc.)
- What kinds of material does this design include? (Ex: Wood, Metal, Digital material, etc.)
- What are its key features?
3. How does this project relate to other practices? Think beyond the design discipline and map out the broader professional community.
4. Locate the geographical context of the project.
5. Seek out experts, professionals, and other creatives who can collaborate or provide consultations for this specific project. Prioritize the people who are working within the same region and ask for collaboration and partnership.
6. Think about the non-human beings in the region that could inform your design process. They can be your participants or possible collaborators as well!

Application

Keep the network of your collaborators throughout the process and reach out to them as often as necessary.

Why:
The complex issues of our time require multidisciplinary collaboration. Designers can gain so much more insight through partnering beyond their field of practice.

Next Methods:
- Identify MtH participants
- Land Histories & Stories

Identify MtH Participants

Recognize all the human and non-human beings who are affected by the project and its outcomes, and consider them as decision-makers.

Encounter   **More-than-Human**

Time:
1 week

Materials:
Field explorations
Mapping & Analysis
Research

Note:
It's easy to think of the individuals who are already present in the project scope. Don't forget to look beyond the obvious and think of the beings who might be affected indirectly by the design.

Steps

1. Define the scope of the project.
2. Locate the societal, geographical, and environmental context of the project.
3. In your team, investigate and map out all the beings that may be affected by the project (In the contexts mentioned above). These beings might be involved during the design process, or affected after its completion.
4. Research the identified beings. Acknowledge their origin, culture, and different ways of living, and have them in mind as the project moves forward.

Application

Create your MtH participant chart and keep it as a reference for the next stage of the design process to empathize with them.

Why:
The impacts of design travel beyond certain human users. It is important to recognize all the involved beings, human or non-human, and include them in the MtH design process.

Next Methods:
- Land Histories & Stories
- Action-oriented Prompts

Land Histories & Stories

MtH design advocates a practice that is relational to place. It is important to recognize the land your project is situated on and the place(s) it may affect, and define your responsibilities towards it.

Encounter   **More-than-Human**

Time:
1-2 weeks

Materials:
Field Explorations
Conversations
Research

Note:
Most places have rich histories embedded in them, regarding both humans and non-human citizens of that place. It is important to see if what are the responsibilities of designing in that place and with its citizens.

Steps

1. Define the scope of the project
2. Define the geographical/environmental context of the project.
3. In your team, investigate about the land this will project will take place on. This land may be used during the design, or the land the design will be implemented on eventually, if applicable (e.g. where will the products be manufactured / if the design is digital, where are the data centers & etc.)
4. Investigate about the histories and stories of that land. Become familiar with it and define your responsibilities, and your limitations, constrains, and opportunities. (e.g.: If the land is built on toxic soil, what can the design team do to make sure the toxins will not cause more damage)

Application

Keep a record of these results throughout the project. Implement them both in the "Empathy" and "Production & Time Guideline" step.

Why:
MtH design advocates a practice that is relational to place; This means that the responsibilities, constraints, and opportunities embedded within each place are different than others.

Next Methods:
- Action-oriented Prompts
- Natural Probes

Action-oriented Prompts

MtH design encourages exploration, play, and reflection. Take this time to bring your studio outside and immerse yourself in hands-on experiences.

Encounter **Non-Human**

Time:
1-2 weeks

Materials:
Material Engagement
Field explorations

Note:
Considering ourselves as part of nature is the start of designing in the More-than-Human World. These small prompts will help to reconnect us with the natural world that we have felt apart from for so long.

Steps

After recognizing your non-human participants, plan a couple of actions that involve hands-on experience and sensory engagement with them. These actions could be done in simple ways of material engagement or other reflective actions.

Sample Prompts:
1. Go outdoors and engage with your non-human participant in person. How can you learn about them? Use your senses and think beyond common ways of communication. Listen, Observe, touch and feel. Try to capture your learnings in writing, sketch form, or through simple makings.
2. Use sound sketching, material explorations, making with natural materials, drawing with non-humans, co-creating a prototype, and journaling as ways of engagement.
3. Reflect on your interactions. How does that action inform your knowledge of the participants? What did you learn from them?

Application

Action-oriented prompts open up the space for reflection and exploration. Use these slow prompts to reconsider your relationship to the MtH World. Synthesize your findings. Think about how you can incorporate your learnings during the "Empathize" step of the process.

Why:
Interrupting the typical demanding and fast-paced process of design, makes room for slower considerations and reflections towards the non-human world and how our designs can impact them.

Next Methods:
- Natural Probes
- Natural Humility

Natural Probes

Exploring Natural Probes is a way to understand the key non-human participants of the project through field explorations and journaling.

Encounter **Non-Human**

Time:
1-7 sessions
[Approx 20' each]

Materials:
Hands-on Experience
Field explorations
Journaling

Note:
The MtH design process values hands-on and sensory engagement as ways of learning and empathizing. In-person engagement with non-humans provides ways of understanding that cannot be achieved over the screen or books.

Steps

1. Identify the geographical context of your project.
2. Choose a *place* or a *natural location* that your project could affect or take place in.

3. Plan a field exploration in that location and try visiting that place a couple of times.
4. While you are there, try to recognize different non-human beings or natural probes. They could be rocks, plants, animals, elements, or the land itself.
5. Capture your explorations in a journal. Document these participants and their offerings. (e.g.: The ocean brings to shore different materials and beings. Those materials could say a lot about the ocean).
6. Repeat this action a few times.
7. Go over your journal and reflect on your findings. What did you learn? How did your explorations inform your understanding of non-human beings?

Application

Create a report of your findings based on the natural probes you discovered or the non-human beings you encountered. You can use this information in the next stage of the design process "Learn from the MtH World", while creating "MtH Experience Maps", "MtH Narratives", etc.

Why:
Interrupting the typical demanding and fast-paced process of designing, makes room for slower considerations and reflections towards the non-human world and how our designs can impact them.

Next Methods:
- Action-oriented Prompts
- Natural Humility

Natural Humility

Natural humility is an interpersonal way of reflecting on our relationship with non-human beings and seeing the natural world differently.

Encounter   **Non-Human**

Time:
1-7 days

Materials:
Self-reflection
Journaling

Note:
The objective of this method is to change the way we look at, interact with and acts towards nature. This method is self-reflective. It encourages the designer to slow down and take time to reflect on their relationship with the natural world.

Steps

1. Think about the non-human participants of your project (You can refer to "Natural Probes", "Action-oriented Prompts" or "Identify MtH participants"), and build a community of learning with your non-human participants.
2. Exercise an act of *care* through the notions of *gifting* and *offering*, rather than problem-solving. Internalize this practice and cultivate reciprocity for the more-than-human beings in your daily practice.
3. Try to reflect on these questions regarding the non-humans in your practice:
   - How are you connected with each other?
   - How do your actions affect them?
4. This practice is meant to be only beneficial to non-humans, as a way of exercising natural humility and seeing yourself as part of a broad and connected network of beings, not as an independent being.

Application

Use your insights from this step to inform your practice as designers and your worldview towards the natural world. The results of this method might not be applied directly in the project, however, that is not the intention of this self-reflective exercise.

Why:
MtH design encourages the building of personal relationship with the natural world. Change occurs in small steps, and it starts from us.

Next Methods:
- Action-oriented Prompts
- Natural Probes

Encounter the MtH world: *Completion Checklist*

If you can answer the questions below, you are ready to go to the next design stage.

- Where does this project take place?
- What are the responsibilities & ethical considerations within this place?
- What are the constraints and limitations within this place?
- How far will the environmental impacts of this design expand?
- Can you identify all the MtH participants of this design?
- Have you recognized what types of animals, plants, elements, or non-human beings could be impacted by this design?

Next: ***Learn from the MtH World***

2. Learn from The MtH World

In the second stage of the MtH design process, the designer attempts to empathize with all the key MtH participants and identify their relation to each other. The goal of this stage is to define the project based on common goals.

Empathize · **Define**

Empathize with the MtH (human & non-human) participants and learn from them as experts of their knowledge.

Define the problem space, project scope, and identify the individual and shared goals of all stakeholders.

Mindful Shadowing

Shadowing provides key insight into the participant's lives as the researcher follows them closely within their natural environment.

Learn **More-than-Human**

Time:
1 day - 1 week

Materials:
Observation
Note-taking
Photographs
Sketches
Recordings

Note:
While the common shadowing method usually refers to observing humans and a certain product/service, in MtH design process, shadowing non-human participants is also considered an important way to learn about them without interference.

Steps

1. In the geographical context you have defined, go back to your list of MtH stakeholders once more, and make a list of your key participants and the places you want to explore and understand better.
2. Before getting started, make sure the participants are aware of your presence and be mindful of their personal space and privacy (consent).
3. Document participants' patterns, routines, behaviors, and decisions in their natural setting.
4. Be mindful:
- **Slow down:** In a fast-paced world that is in constant transition, we might need to intentionally slow down to be able to notice the meaningful interactions in front of us.
- **Break down:** In a complex world, our attention naturally goes to see the whole or a group of systems, but try to see if you can take a moment and start seeing things separately as well as connected? Break down your perspective and focus on smaller portions.

Application

Use what you learnt from this step to create your "Empathy maps", "Personifications", and "MtH narratives".

Why:
Carefully observing participants provides us with details that could not have been collected otherwise.

Next Methods:
- MtH Communication
- Personification
- Interview
- MtH Narratives

Non-human Communication

This tool looks at the importance of non-verbal communication as a way of learning from the More-than-Human world.

Learn | **Non-Human**

Time:
1 week

Materials:
Observation
Note-taking
Photographs
Sketches
Recordings

Note:
Communicating with non-humans requires a different approach; one that welcomes ambiguity, patience, and openness.

Steps

1. Identify a non-human being as a participant you want to communicate with. Visit them in their natural environment.
2. What lies at the heart of this method is silence, listening actively, and focusing, rather than using verbal tools or human-constructed languages. Focus on ways you can interact with that being through sensory engagements, listening, walking, sitting down, and observation.
3. Prompts to get started:
- Think about the different ways you can get to know a being like a tree.
- Look around the being: Who are they sharing space with? How are they supporting each other? (for instance, the soil near the tree or other species like birds)
- Think beyond what is in front of you. How are other elements interacting with each other and with your participant? (Light, water, insects,...)

Application

Use what you learnt from this step to create your "Empathy maps", "Personifications", and "MtH narratives".

Why:
This method attempts to counter the assumption that non-humans are passive or inanimate beings who do not have the means of communication. MtH communication helps the process of recognizing and knowing about non-humans as active and engaged participants.

Next Methods:
- MtH shadowing
- Personification
- MtH narratives
- Interview

MtH Empathy Maps

Empathizing with all (human & non-human) participants is an attempt to create an inclusive design that would benefit the key users without harming or overlooking the other beings in the process.

Learn | **More-than-Human**

Time:
1-2 days

Materials:
Writing Material

Note:
Through a human-centered point of view, it is easier to prioritize human needs, but by broadening our horizons in the design process and empathizing with both humans and non-humans involved in the process, we can start to take their goals into account as well.

Steps

1. Identify all the main participants (Human & non-human) of your design project.
2. For each participant, draw an empathy map (See reference here).
3. Specify three categories in your empathy maps:
- What do they think?
- What do they do?
- What do they feel?
4. Analyze all the empathy maps and find out where they *overlap* or *differ*.
5. Define shared goals between multiple participants, if there are any.
6. Define the spaces of conflict and tension.

Application

Turn your analysis into actionable insights to use in the next steps of the design process.
e.g.: Personas & Personification, Journey & Experience Maps

Why:
A design can benefit one user but harm another. MtH Empathy maps help to recognize different needs or actions between More-than-Human partcipants and come up with an inclusive design.

Next Methods:
- Personification
- MtH narratives
- Experience map

Personification

Creating MtH personas via personification helps decenter humans from a design process by taking into account non-human participants specifically.

Learn **Non-Human**

Time:
1-2 days

Materials:
Writing Material

Note:
Moving to an understanding of non-humans as beings of value and participants requires finding ways that support both empathy and imagination.

Steps

1. Identify the key non-human participants of your design project.
2. For each participant, create personas for them as if they were human participants.
3. Attempt to define the participant's pain points, goals, stories.
4. Use either secondary research or hands-on research you have done in the previous step (e.g. Action-oriented prompts, natural probes, etc.) to help you define your non-humans personas.

Application

Use the results of this step to define user stories and the problem space. Use the multiple maps you have to define the project's shared goals. through a human-centered point of view, it is much easier to prioritize human needs, but by broadening our horizons in the design process and empathizing with humans and non-humans involved in the process, we can start to take their goals into account as well.

Why:
Personification helps us recognize the agency of non-human participants and to see them as experts of their own knowledge, not as objects of study.

Next Methods:
- MtH empathy maps
- MtH narratives
- Experience maps

MtH Narratives

MtH narratives is a way to investigate non-human perspectives through storytelling imagination, and speculation.

Learn **Non-Human**

Time:
1-2 days

Materials:
Writing Material

Note:
Attributing human-like characteristics to non-humans helps us better understand and empathize with the MtH world. But in doing so, it is crucial to value their agency, and appreciate and make sure we are not just considering human-built constructs and languages.

Steps

1. Choose a non-human participant in your design project.
2. Reflect on how you might design your product/service/etc. for them as the key users. Imagine what would be different? Think about their past, present, and possible future. Use your insights from the last stages of the MtH design process to better picture their condition.
3. Create a fictional story from their perspective. The goal is not to be realistic but exercise to open your imagination beyond human needs.

Application

After finishing the story, share it with your team and have a discussion. Reflect on this action as another tool of empathizing and use your insights to create experience maps and refine the problem space.

Why:
We write scenarios to better understand how humans may encounter a problem and to identify spaces of improvement. In the same manner, to embody the experience of a non-human being, we resort to storytelling as a way to better empathize with them.

Next Methods:
- Experience Map
- Mapping MtH Relations

Experience Map

Experience Mapping for non-human participants uncovers stories and pain-points and helps us identify ways we can embed human/non-human interactions in our design more meaningfully.

Learn   **Non-Human**

Time:
1-2 days

Materials:
Writing Material
Photography

Note:
Similar to "Journey Maps", this method investigates the interaction between a being and their environment. However, experience mapping focuses on non-human interactions in an environment.

Steps

1. Choose a non-human participant in your design project.
2. According to the Personification that you have created for them, draw a map to demonstrate the experience they will go through, or a condition that is related to your design. (e.g. Mapping out how an indoor plant may experience the change in the temperature throughout the day)
3. Analyze the map and identify your participant's key interactions and pain points.

Application

Reflect on your analysis and come up with the ways that can turn pain points into opportunities for improvement within your design that would not only benefit the human users but also benefit the non-human participants.

Why:
Experience mapping helps us immerse ourselves in ways that non-human participants are affected by the problem space and gain more insight from their perspective.

Next Methods:
- MtH narratives
- Mapping MtH Relations

Mapping MtH Relations

Mapping relations helps us analyze our findings from journey maps and experience maps to identify points of conflict or common goals.

Learn   **More-than-Human**

Time:
1-2 days

Materials:
Mapping
Analysis

Note:
Design tools are never neutral. Every design empowers one group and dismisses another. The point of this exercise is to minimize the hierarchical power relations. Through this tool we can question our old assumptions of competency, and encourage explorations that support wider inclusions.

Steps

1. Go over your research so far about all your key MtH participants.
2. Based on the project, think about the key attributes that both human & non-human participants may experience throughout the design. You may refer to User Journey (human) and Experience Journeys (non-human).
3. After identifying the key attributes, map out your participants over a chart or a table, in any format of your choice.
4. Reflect on the relations. Are there spaces of conflict? Are there points of exclusion amongst your participants? Have any of these participants been historically underrepresented or marginalized? Are there any shared experiences amongst them?
5. Think about how you can **amplify** the shared goals and **minimize** the conflicts and spaces of harm or tension.

Application

Use the results of this step to define the problem space, project scope, and identify the individual and shared goals of all participants.

Why:
Mapping MtH relations help us analyze the key insights from MtH participants and use them purposefully in the next phase to reimagine our design solutions or spaces of intervention.

Next Methods:
- Experience map
- MtH narratives

Learn from the MtH world: *Completion Checklist*

If you can answer the questions below, you are ready to go to the next design stage.

- Did you try empathizing with all the human and non-human participants of your design?
- Did you try communicating with your non-human participants? How? Did you learn from them as experts of their own knowledge?
- Can you define the problem space, project scope, and identify the individual and shared goals of all participants.
- Can you identify spaces of conflict and tension amongst your participants?
- Can you identify mutual benefits between all participants in a competitive situation?

*Next: **Plan with the MtH World***

3. Plan with the MtH World

In the third stage of the MtH design process, the designer ideates for potential design solutions, while including all the key participants-human or non-human- in order to come up with inclusive designs.

Ideate with a MtH Lens

Ideate through a MtH lens, or Ideate divergently and then evaluate them through a MtH lens based on the experiences and learnings from the previous step.

Brainstorm

Brainstorming helps us think of a ray of ideas spontaneously and it is the first step in planning our design outcome.

Plan **More-than-Human**

Time:
<1 day

Materials:
Writing Tools

Note:
Think of "no action", "undesigning" or "undoing" as potential solutions as well. Sometimes a design solution includes re-evaluating the existing products and systems rather than creating new ones.

Steps

1. Gather an inclusive team with diverse participants to help make the ideation step as inclusive as possible.
2. Pose the problem statement/question/prompt you want to work with to the team.
3. In your team, come up with as many ideas as possible.
4. Think freely and spontaneously but also stay focused on the needs of your MtH participants and the scope of your project.
5. In the end, choose the ideas that best match the shared MtH goals. Which ones the best address their needs?
6. Cross the ideas that hugely benefit certain participants but harm others.

Application

Take note of the ideas that address the MtH participant's common goals and develop them further. You may use MtH sketching, MtH Storyboard, or Provocation and discuss them again in your team to troubleshoot and filter out the ideas.

Why:
We are used to prioritizing human participants while thinking of solutions. The MtH design process encourages brainstorming through an MtH lens to make sure all participants (human or non-human) are involved.

Next Methods:
- MtH Sketching
- Sensorial Ideation

MtH Sketching

Sketching is a tool for starting to conceptualize your ideas. It allows for freely thinking through drawing or making to capture early stage design concepts.

Plan **More-than-Human**

Time:
1 day - 1 week

Materials:
Drawing material
Low-fid making materials:
e.g. paper, markers, wires, ...

Note:
Expand your idea of sketching. Besides 2D hand drawings a sketch could incorporate messy makings/crafts, digital visualizations, photography, collages, and sound makings as well.

Steps

1. Choose a few ideas you want to explore more.
2. Gather your preferred making materials in your studio or if possible, bring your studio outside.
3. In your team or individually, try to visualize your ideas. If that's through sketching on a paper do it, but think of other ways of making with low fidelity material as well.
4. Think of sketching as an extended ideation process. If you come up with new ideas while making, take note of them and incorporate them in your sketches.
5. After you're done, share your creations with your team and discuss them. Do you recognize new ways of improvement? Have you changed your mind about some of the ideas?

Application

After discussing the sketches, choose the ones that had the most potential according to your team. Next, you can develop these ideas even further and potentially turn them into prototypes.

Why:
Visuals have the potential to communicate ideas far better than words sometimes. Use this method to have richer conversations with the design team about your ideas.

Next Methods:
- Sensorial Ideation
- MtH Storyboard

Sensorial Ideation

Sensorial ideation helps generate ideas that will engage all our senses, rather than just focusing on either visual, auditory, or tactile.

Plan   **More-than-Human**

Time:
2-3 days

Materials:
Writing Material
Field explorations

Note:
Modern design has been focused on visual engagement far more than our other senses. Use this opportunity to experiment with multi-sensory ideas as they have the power to engage user more deeply in an experience and provide better accessibility features in a design.

Steps

1. Define the problem scope you want to investigate.
2. Prepare writing/drawing/making materials.
3. Consider nature and MtH beings as sources of inspiration for your sensorial ideation. Especially, if your project involves non-human beings as key participants, try to visit their natural environment while doing sensorial ideation.
4. Use your senses as your main outlets and develop 5 ideas for each (25 in total).
5. See if any of your ideas can be developed further and filter out the ones that don't address the problem space well.

Application

Discuss your sensory-generated ideas with your team and choose the ones that have the potential to be explored further and be turned into prototypes.

Why:
Each of our senses can inspire different ideas. The MtH world constantly engages all our senses in an immersive way. Through sensorial ideation, we will be able to approach the problem space from multiple angles.

Next Methods:
- MtH Storyboard
- MtH Provocation

MtH Storyboard

Storyboards help to visualize all key steps of a design experience or let us focus on a certain interaction within the design.

Plan   **More-than-Human**

Time:
2-3 days

Materials:
Writing Material
Sketching

Note:
Storyboards can demonstrate beyond the common user-product narrative. For example, visualizing interactions between MtH participants may unveil potential conflicts or on the contrary spaces of commonality.

Steps

1. Considering the project scope, select one of the ideas that you have generated before.
2. Identify all the key participants, human and non-human, and make sure to include all of them in your storyboard.
3. Use your insights from the "Learn from the MtH World" stage to be mindful of your key participants' needs and pain points.
4. Think of a narrative or a specific interaction that can best demonstrate your idea.
5. Sketch out your story in the format of a Storyboard.
6. Explain the Storyboard to your team and ask for feedback.

Application

After discussing the storyboard(s) in your team, reflect on the feedback and think of the ways you can improve your idea.

Why:
Storyboards not only help you refine your ideas, but it will also show who will use it, where, and how, by visually representing it in a sequence. The goal here is to make something rough as a way to help you think through ideas and refine them as you go along.

Next Methods:
- MtH Provocation
- Co-creation

MtH Provocation

MtH provocations is a space for thinking about more radical ideas. Allowing the designers to think outside of human-centered values.

Plan **More-than-Human**

Time:
2-3 days

Materials:
Writing Material

Note:
It is important to highlight that through these methods, we are not offering an accurate representation of the subjective experience of more-than-human beings but rather a way to develop insights into how the experience of these entities could be brought into our awareness.

Steps

1. Choose a few of the design solutions you have come up with so far. (Choose a wide range of ideas)
2. For each idea try to think radically about it and its main stakeholder. Use provocations such as "What if?" to guide your ideation:
- Imagine if the user of the design were different than your intended audience. They could be from a different culture, background, and have different abilities. How can they interact with your design? Is their experience different? How would they design it?
- Think about your non-human participants. How would they interact with it? How is their experience different? How would they design this concept?
3. Share your ideas with the team and see how others have come up with alternative scenarios.

Application

The ideas from this method might not have real world applications but they will provide insights into how you can steer away from overlooking people or beings in your design process and come up with inclusive solutions.

Why:
MtH provocation is a space for imagination, openness and creativity. A way to bring non-humans into our awareness. Don't be stopped by thinking your ideas are too radical to be implemented in real world projects.

Next Methods:
- MtH shadowing
- Personification
- MtH narratives
- Interview

Co-creation

It is always better to design with your participants than design for them. Co-creation allows you to involve your participants in the design.

Plan **More-than-Human**

Time:
1 - 7 days

Materials:
Writing/Drawing Material
A place to meet

Note:
While we actively amplify the presence of marginalized populations in the design process, it's important to remember that non-human beings and nature have also been treated as a marginalized group, whose voices were eliminated from the design process through ignorance and unequal power relations.

Steps

1. Identify who you want to co-create with. Your collaborators might be a specific group of people from your potential final users. They can also be from your non-human participants.
2. Make sure you think about who takes part in research and who is left-out (historically). Invite marginalized groups into the design process. The ones whose voices have rarely been heard.
3. Invite them to join and set up a co-creation session.
4. In your co-creation session, you can use some warm-up exercises, such as brainstorming, rapid prototyping, and role-playing to start the conversation.
5. Facilitate the session and familiarize the group with the problem space using questions or prompts.
6. Remember that your co-creators are experts on this subject, so Keep the prompts open-ended to have more space for creativity (Depending on where you are in the project). Sometimes the problem needs to be redefined.

Application

Gather the insights and ideas from the collaborators. You can have more sessions if needed to generate more ideas, develop some of them further, or even create prototypes together.

Why:
The goal of co-creation is to bring participants into the design process. Everyone is the expert of their own knowledge and this value should be acknowledged throughout the MtH design process. Making participants feel welcomed gives the design so much insights.

Next Methods:
- MtH shadowing
- Personification
- MtH narratives
- Interview

Plan with the MtH world: *Completion Checklist*

If you can answer the questions below, you are ready to go to the next design stage.

- Have you come up with a multitude of inclusive design ideas?
- Did you speculate using the question of "what if?"
- What sensory modes of design might be most effective in this project?
- Can co-design be helpful in this project?
- Can this design benefit from decentralization, diversity, and redundancy to increase resilience?

*Next: **Map MtH Futures***

4. Map MtH Futures

In the fourth stage of the design process, the designer speculates about alternate futures or systems that may affect the design and reevaluate the design accordingly.

Speculate ···································· **Re-evaluate**

Speculating about the alternative systems and worlds in which the design would exist helps us identify potential future hazards and prevent unwanted results when the product enters the world.

Re-evaluate your design based on the insights you gained from the "speculate" step and go back to the planning stage if necessary.

Future Pathways

Future Pathways includes the mapping and the analysis of the systems and resources that the design relies on or can get affected by in future.

Map **More-than-Human**

Time:
1 day - 1 week

Materials:
Research
Analysis

Note:
Future Pathways is a multidisciplinary fact-based analysis. Make sure to collaborate and seek consultations from experts. As a designer, you will analyze the information according to the project, and turn them into actionable insights.

Steps

1. In your team, map out all the resources that your design will use or can impact.
2. Next, think about the systems that encompass your design in the present time. They could be ecological, societal, digital, or a combination of multiple systems.
3. Now that you have your systems and resources, do research on how those factors are going to change in the years to come. Seek out experts to have reliable information.
4. Analyze the information you have gathered, and map out your project's Future Pathways.
5. Study your pathways: How does it look like? Do you have to make changes in your design?
6. Prioritize the changes you have to make in order to address the most urgent ones (It might not be feasible to address all of them).

Application

After analyzing the Future Pathways, turn your findings into actionable insights. You can also complete the Alternate Reality and then go back to the "Plan with the MtH World" stage to reiterate on the design.

Why:
We are not just designing for the present, we are designing for the future as well. Living in the era of climate crisis and a world facing wicked problems, we should factor the systems and conditions that are yet to come and could impact our design.

Next Methods:
- Alternate Reality
- 3P Analysis

Alternate Reality

Alternate History is a tool that allows for the re-imagination of the design in different types of futures or unpredictable situations.

Map **More-than-Human**

Time:
1 day

Materials:
Writing Tools

Note:
Alternate Reality is a way of thinking beyond the common existing frameworks to be mindful of possible unprecedented scenarios that could affect the design (production or function), or the way users experience it.

Steps

1. Make sure you have done the "Future Pathways" exercise before starting this.
2. Set up a team meeting and have your design solutions and your Future Pathways report ready at hand.
3. Starting from the Future Pathways report, think about unpredictable situations (or alternate realities) that may happen in the future. These situations could be short-term (a temporary power outage) or more extreme (water shortage, internet shutdown, lockdown, etc.).
4. Discuss the Alternate Realities and brainstorm about the different ways your design can be affected.
5. Come up with strategies that could possibly prevent the potential damages or even intervene in those situations. How can they be embedded in your design in advance?
6. Prioritize your strategies.

Application

After prioritizing your strategies, add them to your actionable insights from the Future Pathways. Go back to the previous stage "Plan with the MtH World" and reiterate according to your findings.

Why:
We are living in a fast-changing world facing transitions in different aspects of life. In such a world, it is important to account for the types of future this design could exist in.

Next Methods:
- Future Pathways
- 3P Analysis

3P Analysis

Analyze your project through three perspectives: planet, people, and profit.

Map   More-than-Human

Time:
1 Day

Materials:
Writing Tools
Analysis

Note:
This method has been inspired by the "People Planet Profit" method used in the digital society school's design toolkit.

1. https://toolkits.dss.cloud/design/method-card/people-planet-profit/

Steps

1. Create a chart with three columns for people, planet, and profit.
2. Pick out a few of your ideas and for each one write down how this idea will benefit the three categories above.
3. Rate each benefit from 1 to 5 (5 being the most beneficial). Sum up all the scores for each column.
4. Analyze each column first separately and then collectively. Consider spaces of improvement and compare your ideas to each other.

Application

This method is helpful when you want to choose your top ideas to prototype and move forward with. Use this to reconsider the ideas that might be economically beneficial but harmful for the people and the planet.

Why:
Design ideas have impacts that go beyond the individual user. They have huge societal and environmental impacts, and identifying those impacts sooner in the project will help designers develop their ideas more mindfully.

Next Methods:
- Alternate history
- Lo-high fid prototyping

Map MtH Futures: *Completion Checklist*

If you can answer the questions below, you are ready to go to the next design stage.

- How would your design exist in alternate worlds and futures?
- How might the launch of this design affect the current ecosystem?
- How might this design would affect the different species that inhabit the environment? (Animals, plants, elements, etc.)
- Did you leave room in your design for re-considerations?
- Have you evaluated your design based on the 3p analysis?

*Next: **Build for the MtH World***

Build for the MtH World

In the final stage of the design process, the designer starts building the design and testing it out for further feedback and iteration. After final revisions, A production & Time Guideline is devised to make sure the future implementation and developments are in line with the MtH design goals & values.

Prototype & Test · Production & Time Guideline

Through mindful prototyping and testing we will make sure that the design will perform in an interconnected world affecting humans and non-humans.

- **Development Considerations:** Making sure that the product development will comply with the values of design process.
- **Time considerations:** Set a time limit for the design (based on the project) and check the design again in that time to re-evaluate it.

Low-High Fid Prototyping

Prototyping gives us a tool to make our design more tangible and gather valuable feedback to troubleshoot and reiterate.

Build **More-than-Human**

Time:
1 day

Materials:
Low-Fid Craft Material
(paper, clay, etc.)
Digital Wireframe Software

Note:
No prototype is complete without test. Make sure your participants are from a diverse background. These could be the people you had amongst your participants from the initial stages of the design or you can recruit new ones. It is better to have both groups in the final stage.

Steps

1. Identify aspects of your project you want feedback on content, form, structure, tone, key functionality, vocabulary, etc. (Start with the aspects that are more unique to your specific project)
2. Develop a lo-fi prototype of your design. This could vary depending on what your project is. Some options are paper prototype, clay, video, digital wireframe, etc.
3. Gather a team of participants to test your prototype with. Make sure you are as inclusive as possible when recruiting and that the participants fully represent your key participants.
4. Conduct the test and gather insights. There are different types of user tests based on the project and its state of it. Refer to the "user test cards" to see which one is more suitable.

Application

After you have gathered your feedbacks, go through them with your team and synthesize insights based on them. If needed, go back to the "Plan with the MtH World" stage to reiterate on your design and test the new prototype afterwards. Repeat this as many times as necessary until your design is usable and functional to the users. Build up the fidelity as you move forward.

Why:
Prototyping provides an easy and inexpensive way to test the design with potential users before building the final product. The feedbacks may validate many aspects of your design or on the contrary, show weaknesses and space for improvement.

Next Methods:
- Production Guideline
- Re-evaluation Timeline

Production Guideline

This tool allows designers to making sure the product development will comply with the values of design process.

Build   **More-than-Human**

Time:
1 day - 1 week

Materials:
Research
Analysis

Note:
This is multidisciplinary tool to conduct. Make sure you seek collaboration and ask experts and professionals in other fields to guide the design and development team. At this stage, it is all about collaboration.

Steps

1. Have the final design at hand.
2. Meet with the production/development team and ask them to walk you through their process and their plans.
3. Analyze their process and assess them based on their energy use, geographic location, human resources, material resources, machinery, waste distribution, transportation, etc.
4. Make sure the plan complies with the _MtH values_.
5. If needed, seek out experts for more specialized consultation, and come up with alternative methods or resources with the development team.
6. Analyze the findings and create the new production guideline as a reference for the production team.

Application

Production Guideline will be used by the production and development team, however, they are a valuable asset for future design reevaluations as well.

Why:
Designers are rarely involved in the production of their design. However, there are many decisions that have to be made after the design has been prototyped and tested. MtH design process encourages designers to be more engaged in the production and create a series of guidelines that have to be followed through.

Next Methods:
- MtH Sketching
- Sensorial Ideation

Re-evaluation Timeline

This tool allows for the design to be reconsidered and potentially change over a period of time, in order to adaptable in future scenarios.

Build   **More-than-Human**

Time:
1-3 day(s)

Materials:
Writing Tools
Analysis

Note:
No design is meant to stay the same throughout time. We have to make changes to our designs as we go for them to be adaptable. In some cases, we may even question the existence of a design/product and choose to eliminate or "undesign" it.

Steps

1. Make sure you have done the "Future Pathways" exercise before this step.
2. Have your "Future Pathways" report ready and have a meeting with the team.
3. Discuss the changes and transitions that might occur in future as your design exists in the world, and create a timeline of reevaluations for the design ahead of time.
4. Make sure these reevaluations are not surface level changes to the interface of the design but rather encourage changes to the concept, function, and production of it. If needed, indicate specific points of inquiry in the timeline.

Application

Make sure to distribute the Reevaluation Timeline across all the teams involved in the design research and development and also the decision makers/client/company so everyone is on board and plan ahead.

Why:
We live in uncertain times. Although we can assume how some things will look in the years to come, we can never truly predict the impact of our design in the future or how it would perform in unknown conditions. This tool allows for us to revise our designs and make changes accordingly.

Next Methods:
- Production Guidelines

Build for the MtH World: *Completion Checklist*

If you can answer the questions below, you have successfully finished the project!

- What are the development strategies of this project? Regarding Resource use, waste systems, and production management?
- What are the project's guidelines around data protection and privacy? (If applicable)
- What is the timeline of evaluations for your project?
- Have you chosen the best design option based on the criteria from the previous stage? If not sure, the MtH design encourages iterations. Go back and revisit your design decisions.

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