

University of Tartu
Faculty of Arts and Humanities
Viljandi Culture Academy

Chahal Garg

CRAFTECH FUTURES

Speculative Futures of Craft and Technology Convergence

Master's Project

Supervisor: Dr. Elo-Hanna Seljamaa

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Acknowledgements

It was a scorching hot day in Delhi in the middle of May. My grandfather was seated in the veranda of our home with my brother and me. For the past few days, there were long and frequent power outages in the city. Even though temperatures in the day were higher, somehow it was easier to pass the day than night without a fan. My grandfather had collected some rattan fibre and we were going to weave some hand-fans to help us get through the night. My grandmother gave us some of her coloured wool so we could weave it in with rattan to create patterns. My brother and I admired our grandfather's dexterity as we sat struggling with the warp and weft, and as I praised him he said in his raspy voice, "This is not very much, but where I come from there is nothing else."

This project has been a revelation, and I am elated for the many voices and many silences that have shaped my own. I am grateful for those who saw things and directed my gaze and for those who heard and passed on the message. I am deeply grateful to Dr. Elo-Hanna Seljamaa, to be regarded by someone of her stature and ability has been the root of the hope that this project would ultimately take shape. Her composure and generosity time and again built me a temporary home in Tartu. I would like to thank Valérie Lac and Pascal Lac, who are stewards of French pastry tradition, and in equal parts - mavericks and seafarers of the modern world. Their free-spiritedness, hospitality and open-hearts have been the wind beneath my wings. I thank Ulf for teaching me to let things break and not shy away from trying to join them in new ways. This project would not have been possible without support from the Siimon Voldemar Scholarship and the Dora Plus Short-term Mobility Grant. In no small measure, I thank my family, Kaustubh and Shayad for regularly lifting the gloom off my spirit where it has a tendency to settle, Kristjan for welcoming me with apples of his Earth and Sohail for never taking his ears off my tick-tock mind and his fingertips off my words. And then Israel Palacios Fierro, who is my joy and my delight, who is me. For him I am grateful, so very grateful, in the end this is all for him. This is not very much, but where I come from there is nothing else.

Introduction

As a student of design and subsequently a design-led conservation practitioner, as well as through my own two decades of practice of pottery, I had the opportunity to learn from stalwart practitioners, engage with their reverent practices and forge authentic partnerships that guided my vision for craft futures. There were profound lessons to be learnt in the practice of craft making, a more direct way of negotiating with a situation, drawing from and simultaneously building a rich repertoire of knowledge and wisdom. It evoked in me the motivation to conceive means to perpetuate, to communicate and to deliver this creativity, craftsmanship and modesty safely into the future. India though has been left saddled with colonial institutions and ontologies and the newly independent state, still sorely in need of a decolonization, continues to perpetuate the same egregious ontologies that reinforce existing power structures, marginalizing the very environment wherein a common form may proliferate numerous varieties. Craft traditions and their conservation are laden with a mindset that posits them as fossilized communities with fixed practices, equating their safeguarding with resilience, suppressing their inherent capacity for adaptation. This is reflected in how traditional craft practices and digital technology are often construed as binary opposites, one planted firmly in the past and evoked as heritage, and the other facing the future, symbolising progress. However, as humans more prominently inhabit digital realms, issues of radical lack of diversity in human futures arising out of centralized conception and development of digital technology are being exposed. Yet, for millennia, traditional crafts practices have approached making in decentralized, humane, often idiosyncratic ways, responding to needs of local communities and controlled by them. As such, there is potential for convergence between the process of making technology and that of making craft. This MA project titled CraTech Futures explores mutual synergies between these seemingly contrasting realms, to understand how a “craft lens” may inform development of participative and principled digital technologies, and on the other hand, how exploring trajectories for a “craft thinking”¹ approach as a means to respond to contemporary issues beyond the handicraft industry could illuminate new pathways for craft conservation.

¹ I am using the terms craft approach, craft thinking, craft ethos interchangeably to denote the use of craft as a lens towards addressing situations outside the established boundaries of craft making.

CrafTech Futures has been conducted in collaboration with Maison LAC, a renowned name in the chocolate and pastry industry in the Côte d’Azur region of France. Pascal and Valérie Lac, proprietors at Maison LAC, regarded my thinking as synergetic with their intent of gaining economic advances and bolstering the social positioning of their business through adoption of technology-enabled solutions while still retaining the craft-character of their business. Through the means of addressing their business problems and Pascal’s personal aspirations of his craft practice, the project delves into a larger design-led discourse around craft and technology futures, which is meant to provide stepping stones for practitioners from diverse disciplines to further probe,

- How a craft-ethos may transcend the established boundaries of craft making and be beneficially applicable beyond them?
- How might we enable our collective technology futures to be shaped by diverse voices to advance justice in the digital realms?

A pertinent point to call out here is that while my articulation of the terrain of marginalization of craft traditions and communities is derived from my experiences in India and South-east Asia, I do not think it necessary or relevant for any solutions to be tested in the same space. Instead, the suggestion to isolate the ethos of crafts from the practice of making it renders any trials for such a solution free from the considerations of geographical location. In retrospect, Maison LAC proved to be a fertile ground to sow the seeds of my ideas for the very reason that the context was not riddled with the same shackles of thought and regulation as the context where the problem emerged to me from.

Over the next few pages, I will delve deeper into ideas and frameworks about finding convergence in craft and technology futures. This written component supplements the documentation of the practical component of the project CrafTech Futures, carried out over nearly twelve months of collaboration with Maison LAC through a Design Thinking methodology. Starting with elaborating on the terrain of crafts traditions and my personal equation with them, I will then distil and describe the essential nature of a craft practice that I suggest may be beneficially applicable towards indicating diverse and just collective technology futures. I will then discuss the choice and use of Design Thinking as the methodology for the project. In the main body of the text, I will speak about the beginning and nature of my collaboration with Maison LAC, the configuration

of their organization and the roles of various stakeholders in the project. This will culminate with descriptions of the sub-projects that together constitute CraftTech Futures, which while independently distinct and whole, simultaneously serve to inform the larger intellectual queries of this project. Appendices at the end of the document contain the project's timeline, draft interview guides and various templates that I created to invite and record participation of stakeholders at different stages of the project. I have documented the practical component of CraftTech Futures in an interactive format accessible through a weblink. The project documentation takes readers through the sub-projects of CraftTech Futures, allowing them to navigate non-linearly and to switch between cross-references amongst the projects swiftly. In the project documentation, I have explained the intent, description and methodology behind each sub-project, supplemented with research and support collaterals that I created for the respective sub-projects, followed by the final result/ solution/ prototype that the project resulted in. I urge readers to go through the written and practical component in conjunction to be able to draw the most out of the process as well as its results.

Chapter 1. Theoretical Framework

1.1. The Landscape of Marginalization

“The real threat to our heritage is not of change, but of permanence.” – Shobhita Punja

Rich and meditative arts traditions collide with shiny plastic cheapness to make the intriguing experience that India is, providing a meeting ground and breeding ground for crafts since millennia, reflecting a thought and practice that is constantly in a state of becoming. The multi-modal practice of crafts and its contribution to the intangible and the spiritual have been central to the India story (George et al. 2015: 114). A member of a family of potters in Gujarat who are the last custodians of the traditional Khavda pottery once remarked to me, “We fight the water mafia not to claim clay that we need to practice our vocation, but to reclaim Bapu² and keep his spirit alive in India’s bleeding heart.” I have grown up with stories of Gandhi’s conception of crafts to mobilize a moment of civil disobedience against colonial rule in India, going on to become the Swadeshi movement – an evoking of nationalism and shared identity to ultimately attain self-rule, a form of revolution in all spheres of life. These stories express the common and familiar practice of craft making offering a pathway to visualize the idea of a self-sufficient village that persists in India till today (ibid.:113). My own life has been lived in communion with the objects that constitute it, lyric and song woven into the Kutcchi shawl that my mother enveloped me in, the Rattan hand-fans that my grandfather taught us to make, bringing memory and respite in windless nights, the critical evaluation of form and function in choosing the hundred best diyas from seas of ceramics during Diwali. Traditional crafts have provided me with a yielding ground to create without uniformity, produce without deadlines, and to encounter the philosophy, politics, economics and ideology of our times without drying up my heart. The ecological dimension of craft making is apparent in their synchronic evolution with bioregions, improving the health and carrying capacity of land, the resilience of communities, illuminating a pathway of connecting with living systems rationally as well as viscerally (Thackara 2017).

Today, however, the inherently open systems of craft traditions have been assigned frozen identities by the stubborn inertia of sovereign systems mandating

² Bapu refers to Mohandas Karamchand Gandhi who is commonly referred to as the father (bapu) of India.

permanence of heritage, artificially positioning tradition as opposed to development, heritage as opposed to progress. The key medium that constitutes the idea of heritage is time, and top-down regulation presuming the permanence of heritage attempts to swim against the current and ‘restore’ artefacts, processes and practices to an authentic state before time’s decay could set in, or to arrest the flow of time to ‘preserve’ their qualities. The exhibit “Cronocaos” (Koolhaas 2010) organized by Dutch architect and architectural theorist Rem Koolhaas, first shown at the 2010 architecture biennale in Venice, that presciently warned the design discipline to cast a critical eye on the impulse to preserve by shedding light on the growing empire of preservation, signalled towards an alternative nature of attempt to orchestrate the passage of time and manage change, wherein a critical intent towards safeguarding heritage can release the heritage in question from occupying a monolithic meaning, instead occupying multiple temporal manifestations (Lowenthal 1989). The field of Critical Conservation as it was developed at the Graduate School of Design at Harvard University, first offered at Master’s level of study in 2010, as yet an inchoate subset within conservation, adopts a creative perspective that allows communities and cultures to become participants in the negotiation of change with time while stepping firmly into the future, rather than to ensure the static continuity of a revered past. It suggests a critical position that avoids conformity of tradition, instead proposes that safeguarding heritage first demands questioning why, what and who determines the conservation/ destruction balance, and second, reframing the conflicts inherent in the transformation of places over time to keep them alive, dynamic and capable of responding to change (Snyder 2014). While the Critical Conservation programme is primarily concerned with architectural heritage, I believe the approach of the programme provides a valuable framework in determining the ethics of intervention with regards to craft making traditions, as it can allow agendas for safeguarding cultural heritage to shift from resilience towards adaptation. The practice of craft making and its embodied knowledge transforms along with the constituent ecosystem as it negotiates time, but when ascribed to be an unchanging part of an unfolding whole, the practice loses its evolutionary capability. As such, the dominant framework that focuses on maintaining authenticity of process and application of craft making assigns it within a singular performance that is anchored in a state of ‘perfection’. The critical conservation approach then offers a way to reframe the narrative around traditional craft practices to build their capacity to adapt, and thereby contribute consequentially to the dialogue on development. In this project, I have taken this thread of thought further to distil the inherent and essential

approach of craft making, and explored its application outside the established boundaries of craft, as an approach that is,

- nurturing, not disruptive
- slow, perceptive and flexible rather than quick, agile
- responsive, not interventionist
- meaningful, even if not new

The process of the project aims to take this initial premise of what a craft approach is and anthologize emerging thoughts and insights from a series of experiments, to rectify or refine this premise.

1.2. Craft as a Lens

“Putting a craft lens onto a situation is the antithesis of, firstly, an ascribed form of perfection; secondly, the notion of something being ‘finished’, and thirdly, of passive consumption.” – Jayne Wallace

In the context of this MA project, the usage of craft as a lens emerges from the glaring gap between slow and considered making vs. the reckless speed of technology development. Two projects that I worked on in the past especially inform my understanding of craft as a lens in the context of reimagining our collective technology future. First, in the years 2014 and 2015, I worked in the Vidarbha region of Maharashtra, India through a collaborative project between the International Innovation Corps, the University of Chicago and the National Skills Development Corporation of India, aiming to curb farmer suicides by exploring approaches at the intersection of technology and tradition, wherein I explored how technology-enabled solutions may be locally designed to vertically integrate farmers in the cotton production value chain. Second, my involvement with the UnBox festival in Delhi between the years 2011–2014 and then in 2017, a creative festival that conducts critical inquiry at the intersection of design, technology and business was instrumental in shaping my thoughts. Through the festival I explored how the decentralized nature of craft traditions could inform technology development to be shaped by diverse voices and thus redirect the agenda of technology development towards extending the right to people to access technology in their own language and on their own terms. I gathered through these experiences that making with

a craft approach reverses the design principle³ of going from the general to the specific. Adopting craft as a lens to problem solving is not driven by problematizing as in design, but by settling into a situation, examining relationships, and making things fit, as opposed to design's view towards fixing things.

My ideas of a craft ethos are further influenced by Gillian Crampton-Smith, a pioneering proponent of Interaction Design, who has described the practice of designing the right thing – and designing the thing right. Her ideas are about designing arguments where physical and virtual worlds converge, and she proposes an imagination wherein our interaction with connected objects is informed by craft (Crampton-Smith and Tabor 2006: 118-120). She has pointed out that, “In the past, humans interacted with machines which explained themselves to humans through their form and the affordances they offered” (Rogers 2017:17) and offers visual, physical and sonic perceptual clues as involved in craft as a solution towards making visible the hidden dimensions of digital devices. John Thackara, renowned author and design critic whose work talks about the missing value benchmark in the development of the Internet of Things (IoT) has also helped me configure what a craft approach could be. He argues, “We have created a global infrastructure that is brilliant on means, but unambitious when it comes to ends” (Thackara 2015). He further questions how we might build technology that considers the true cost of production while respecting human dignity and repairing the earth, and goes on to suggest that we have a lot to learn from non-literate and indigenous practices such as traditional crafts in this regard, as the way ahead will be dependent on knowledge systems that are local, direct, contextual and embodied (ibid.). Additionally, The India Report, written by American designers Ray and Charles Eames for the Indian Government in 1958 still resounds prominently with both digital cultures and contemporary craft cultures. The report talks about the Indian Lota: a small, spherical vessel used for a myriad of purposes in Indian culture, from carrying to keeping and that has been designed and redesigned by the billions of people who have been using it.

³ I am comparing a craft approach to a design approach here for two reasons. First, my qualification and comfort with design helps me to use it as a frame of reference towards problem solving; and second, over the last 20 years or so, Design Thinking within the broader field of design has proved its beneficial application in areas outside the boundaries of design such as governance and business. This approach started gaining traction after Tim Brown's article in Harvard Business Review (Brown 2008), and such application of Design Thinking can help contextualize the equivalent challenge for craft thinking within the broader field of craft.

“A simple vessel of everyday use, stands out as perhaps the greatest, the most beautiful. (...) But how would one go about designing a lota? First, one would have to shut out all preconceived ideas on the subject and then begin to consider factor after factor... Of course, no one man could have possibly designed the lota. The number of combinations of factors to be considered gets to be astronomical—no one man designed the lota, but rather many men over many generations. Many individuals represented in their own way through something they may have added or may have removed or through some quality of which they were particularly aware” (Eames and Eames 1958: 4-5).

The report describes craft as a methodology as well as a process. This understanding about the ‘crafty’ evolution of the Indian Lota, when applied to the development of IoT suggests how a craft thinking approach could enable the creation of technology that is tethered to lived experiences of diverse people, and stems from insights attained through prolonged engagement leading to discovery and incremental changes. Lastly, the ideas of Andrew Prescott, former chair of Digital Humanities at King’s College London, about the craft approach of medieval architects and masons in constructing imposing buildings serving valuable insights into what a craft ethos applied to the development of IoT might look like, inspire my own conception of the applicability of craft as a lens to diverse fields. He quotes the example of the World Wide Web as a prominent organic, ‘crafty’ development, and goes on to suggest that the central features that supported medieval cathedrals – the social institutions, the craftsmen guilds, fraternities of laymen – are perhaps the social structures that need to be built to support the development and sustenance of the internet and connected devices (Prescott 2017: 52). These influences have helped me to assimilate what it means to use craft as a lens/ what craft thinking entails and expand on the previously identified features of a craft approach in the following manner,

- nurturing, not disruptive – human values, communities and their welfare are important; the voice of the individual is valid and involves putting all materials of a situation in conversation with each other (people, objects and data); transmits care in the process of creation and the creation can transmit this care further.
- slow, perceptive and flexible rather than quick, agile – realization comes from extended engagement, not reliant on at-scale industrial operations; it is continuous and does not consider the point of sale/ delivery to be the end of ‘becoming’.
- responsive, not interventionist – all things can be altered to better fit the context they are in, there is no wicked problem to solve; the right to mend/ cure is granted.

- meaningful, even if not new – acknowledges the complex and messy nature of being human but aspires for beauty and enchantment; utilizing local resources prevail over the idea of perfection.

This is the broad sense of craft thinking that serves as an over-arching approach to the MA project methodology, subject to further refinement through the experiments in the project. However, this does not indicate that craft has been viewed only as an ethos and not a practice during the project, instead, I have attempted to bring into play craft as a practice where ethos and activity are not divided.

Chapter 2. Methodology

“They will tell you that design thinking is not about making things different, but about making things better. You ask them, better for whom? You cannot expect to do the same thing and end up better, you will have to find ways to do things differently and ask the people who you are doing them for if it is any better.” – M. P. Ranjan

Given my educational qualifications and professional design practice, it was organic for me to consider if Design Thinking could be the principal methodology to tackle the nature of the challenges that Pâtisseries LAC and I were looking to address for the purpose of the MA project. I realized that while the problems stated by Pâtisseries LAC were primarily business problems, they had a human-centered core. There was a human need behind the business frame of these problems, whether they be the need of LAC’s customers (for example, to be offered relevant, customized products), members of the organization (for example, to develop cognizance of the ethical dimensions of their work) or those of the proprietors (for example, feeling a sense of freedom through the practice of craft). The human-centered approach of the design thinking process brings focus to the people that solutions are being created for (IDEO 2015: 3-10). The Design Thinking methodology simultaneously considers what is desirable from a human point of view, what is feasible from a technology perspective and what is viable from an economic frame of reference (Norman 1988: 8-10). This made me confident of using this methodology for the project. Additionally, I was aware that the problem brief we had for the project was not a doubtlessly articulated problem, but a set of latent desires, indeterminate visions and zealous curiosity. There was no clear boundary marking the end of one stated problem and the beginning of another, rather, they eddied radially around the current business practice of Maison LAC, which could require jumping back and forth across these problems, repeating steps many times and the inherent non-linearity of the process of Design Thinking (IDEO 2015: 25) made me certain of its suitability for the project.

2.1. Conceptual Influences

Over the years of practicing design, I have encountered approaches and processes that have influenced the forms of inquiry in my own practice in significant ways. The approach of Critical Design, the concept of Antidisciplinary and the object classification of Knotty Objects are three such influences that had an acute impact on how this project

took shape. It is difficult to point demonstratively as to how and when these influences were operative, rather they served as an added word in one's vocabulary does, gradually assimilating into the language one uses to think, enabling the process of thinking itself.

2.1.1. Critical Design

The term 'Critical Design' was first used by Anthony Dunne in the book *Hertzian Tales* (Dunne 1999) and refers to the practice of using design as critique for the purpose of raising awareness, highlighting underlying assumptions in thought processes, encouraging action as well as entertaining (Dunne and Raby 2013: 34-36). Using Critical Design more as a position than as an approach, I formulated various segments of the project to make the activity of design visible, open to debate and discussion so as to challenge design's reinforcement of status quo. For example, in the project *Craft Outside the Box*, I shared a set of Analogous Inspirations⁴ I had gathered through secondary research with Pascal, Valérie and Ulf, which we discussed fervently to be able to evaluate their social impact, not just business impact. In the project *Tinkering with Technology*, I created an evaluative worksheet⁵ which was shared with participants, alongside the prototype solutions designed in the project that guided them to reflect critically on the designs.

2.1.2. Antidisciplinary

Former director of MIT Media Lab, Joi Ito describes states Antidisciplinary to be distinct from interdisciplinary, as something or someone that doesn't fit within traditional academic disciplines – a field of study with its own particular words, frameworks, and methods. Ito critiques that architectural confines of disciplines lead to a dynamic where the focus of research becomes impressing a small number of experts leading to hyper-specialization, making cross-disciplinary dialogue difficult, which can be overcome by Antidisciplinary practice (Ito 2014). The concept of Antidisciplinary was a recurrent theme in the Ideation and Implementation phases of the project wherein I invited feedback and reflection on designs from members of teams across the business verticals at Maison

⁴ Analogous research or Analogous inspirations is a commonly used tool in the design process. It is a way to find solutions in a context that is different from the context one is working in, but that may inspire or still be applicable to the challenge at hand. I have explained its usage in section 3.3.1.

⁵ The worksheet is produced in the documentation of the practical component in the *Tinkering with Technology* section.

LAC, who contributed with their diverse outlooks driven by their professional roles at Maison LAC.⁶

2.1.3. Knotty Objects

Writer, architect and curator Paola Antonelli⁷ coined the term Knotty Objects inspired by the knot theory in mathematics, wherein knots are closed loops with no ends at which they can be unknotted (Oxman 2016). Architect and former MIT professor Neri Oxman⁸ describes knotty objects as “objects for which conception, design, manufacturing, use, and misuse are non-linear, non-discrete. They entangle practices, processes, and policies. When successful, they transform material practice, manufacturing culture, and social constructs” (ibid.). Knotty Objects may then be considered a material manifestation of Antidisciplinary hypothesis crafted through a Critical Design practice. At times during the project when I grappled with the sense of disappointment in the process not immediately leading to useful products, the awareness of Knotty Objects helped me to see value in the process leading to consideration and reconsideration of both the problems and solutions at hand, renewing the goals and areas of interest of my design practice.

Besides these three conceptual influences, the influence of science fiction writers Ray Bradbury and Stanislaw Lem played a pivotal role on the project. Science fiction writing has over many decades presented vivid and thought-provoking portrayals of future societies, becoming a tool for social commentary and for exploring different ways in which emerging technologies may be integrated into future societies. The work of Bradbury and Lem especially uses science fiction writing as a means to explore the complexities of the human experience and potential of technology to shape our future, without the binary construction of techno-utopias promised by real-world scientists and techno-dystopias predicted by science fiction (Dinello 2005: 2). During the project, I often discussed situations from *The Martian Chronicles* (Bradbury 1950) and *Solaris* (Lem 1970) with Pascal, Valérie and Ulf to trigger dialogue about the demeanour of

⁶ Such feedback often came through informal discussions when the team members at Maison LAC could spare time in-between carrying out their professional tasks.

⁷ Paola Antonelli is currently the Senior Curator of the Department of Architecture and Design as well as the Director of R&D at the Museum of Modern Art, New York City.

⁸ Neri Oxman led the Mediated Matter research group at MIT Media Lab, working on art and architecture that combines biology, computing, materials engineering and design.

humans as future technology recipients. We read the short story by Bradbury, *The Veldt*, together while trying to identify Pâtisseries LAC’s core values preceding the creation of the Values Booklet.⁹ I was able to use the story’s addressal of the consequences of attachment to fervent technological development in disrupting personal ethical standards to draw parallels with the task of identifying not only the core values that Pascal and Valérie hold essential in the present, but those that will be indispensable for them in the future as they adopt advanced technological processes.

2.2. Phases of Design Thinking

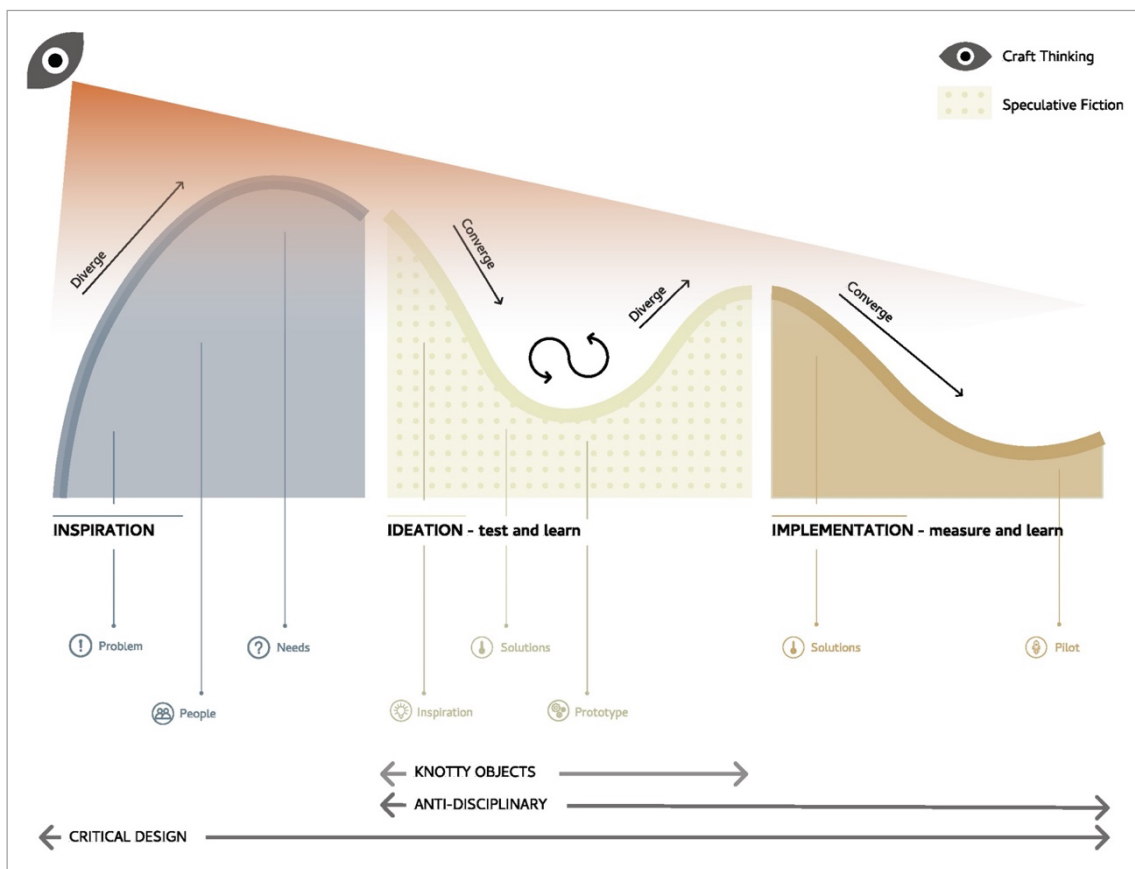


Figure 1. Visual representation of my MA Project methodology. I have used IDEO’s representation of the phases of Design Thinking,¹⁰ building on it by illustrating any overarching approach and more specific methods used within a phase.

⁹ The prompts inspired by *The Veldt* are produced in the documentation of the practical component under The Values Booklet section.

¹⁰ IDEO is a design consulting firm founded in California in 1991, renowned for its human-centered approach to design for business and social impact. <https://www.designkit.org/human-centered-design>.

In this section I will discuss the three phases (Inspiration, Ideation and Implementation)¹¹ of the Design Thinking methodology that I followed for this MA project. While I will elaborate upon the significant steps included under each of the phases, and any crucial approach followed across the three phases, the specific methodology that I followed for each of the sub-projects is discussed in section 3. CraftTech Futures, along with details of any courses I took to prepare for the project taken or specific references used. Again, it is imperative to mention here that Design Thinking is a highly iterative and non-linear process, and while it was the principal methodology for the MA project in its entirety, I also used it repeatedly for each of the sub-projects which although connected with the larger project goals, had their own particular objectives as well.

2.2.1. Inspiration

This phase helped answer the following questions:

- How can I get started?
- Who are the people involved, who are the people I should talk to?
- How can I keep these people and their needs, desires at the centre of my research?
- What tools or methods can I use to understand these people better?

The Inspiration phase of the project was about understanding the spoken and latent desires, needs and aspirations of the people I was engaging with. For this, I created an ecosystem chart¹² of the stakeholders of the project and the nature of their inter-personal engagement and with the larger ecosystem of Maison LAC. I interviewed Pascal, Valérie, Julien and Ulf¹³ several times over the period of engagement, and held focus group discussions with a few members from Pâtisseries LAC and Laboratoire LAC.¹⁴ While I had prepared interview guides for the interactions,¹⁵ I used them to guide the flow of the conversation and strived to enable my collaborators to speak freely, tangentially, anecdotally so as not to restrict the scope of the conversation. In cases where interviewing

¹¹ This naming of the phases of Design Thinking is based on IDEO's representation of the process.

¹² See Appendix 2

¹³ Their roles at Maison LAC and in this MA project are explained in detail in section 3.1. The Lac Story.

¹⁴ The organizational set-up of Maison LAC is discussed in detail in section 3.1. The Lac Story.

¹⁵ See Appendix 3

people was important but restricted due to a language barrier, Valérie or Pascal graciously translated for me. During certain interactions I presented the participants with case studies that I created or shared existing work by other practitioners as prompts to enrich our conversations by bringing focus to elements highlighted in these works that I believed could advance our own project further. One such example is the case study of the Utah Teapot¹⁶ I created that illustrates the work of early computer graphics researcher Martin Newell in digital translation of a physical object and vice versa. I created the case study for the project Form Follows Fiction for a discussion with Pascal and Ulf to aid a shared understanding of physical-to-digital-to-physical making and to use the case of the teapot to reflect on their own concerns with regards to utilizing technology for redesigning the physical form of their products. Similarly, for the project Tinkering with Technology, I created a one-page summary of Romit Raj's article "Line of Sight" (Raj 2017: 145-149)¹⁷ on the dimensions of IoT technology that remain hidden from view but have serious social and environmental consequences, to form a basis for our imagination of idea design solutions. Other than interviews, I shadowed Pascal on a day at work, observing his activities and interactions, intervening with questions, bringing up doubts as they came along. Pascal and Valérie accompanied me on a guided tour of their facilities – the retail environments, the kitchen and lab spaces, the central dispatch unit and warehouse. They introduced me to members of Relais Desserts¹⁸ in Nice, Laurent Le Daniel¹⁹ and François Payard²⁰ (interviewed telephonically) whose generational experience in French pastry helped me to form a refined understanding of the industry. I also spent a weekend at the Lac winter home in Saint-Gervais-les-Bains where they introduced me to Joel – one of their milk-products supplier, talking to whom at his cheese making facility furthermore supplemented my knowledge of the ecosystem. Pascal and Valérie hosted me at their residence for the duration of my fieldwork which was instrumental in allowing us enough informal time with each other to develop a sense of comfort resulting in finding ease and authenticity in our conversations. I maintained hand-written/ digital notes for the

¹⁶ The case study is produced in the documentation of the practical component in the Form Follows Fiction section.

¹⁷ The case study is produced in the documentation of the practical component in the Tinkering with Technology section.

¹⁸ I have written about the organization Relais Desserts in section 3.1 The Lac Story.

¹⁹ Laurent Le Daniel's is a renowned French pastry chef. He is the winner of the Meilleur Ouvrier de France, 1997 and current member of Relais Desserts. <https://www.Pâtisserieledaniel.fr/fr>

²⁰ François Payard is a third generation French pastry chef, honoured with the Ordre du Mérite Agricole by the French government in 2004, and member of Relais Desserts. <https://www.payard.com>

interviews conducted and summarized them in a debrief template²¹ recording surprising thoughts, emerging patterns for the interviews that lead to what I considered a breakthrough for the project. I also voice recorded some of the interactions, with permission to store the data for a maximum period of six months. I have duly deleted all interview recordings that have passed the six-month duration. As a supplement to the primary data, in this phase I also started maintaining a database of Analogous Inspirations in the form of web-links, of people and projects around the world that are addressing challenges similar to the ones we were tackling, in their own unique circumstances and through innovative approaches. This phase led to the redefining of early problem statements based on deeper understanding of the people, their interactions, the ecosystem they operated within and the social, political, and ideological influences on this ecosystem.

2.2.2. Ideation

Having gathered primary data and supplementing secondary research material in the Inspiration phase, in the phase of Ideation I sought to do the following

- Make sense of the data gathered to assimilate learnings and turn them into opportunity for design.
- Create solutions and decide the best way to prototype them in a sharable format, gather feedback and refine the solutions.

I was sensitive to the fact that the questions we were asking through this project needed an approach that expanded the design practice of the Ideation phase towards imagination and diverse visions of possible scenarios in the future. I thus chose Speculative Fiction as the approach to this phase as it differs from traditional practices in the way that it offers alternatives that are not only essential for the world today, but more importantly, the world of tomorrow (Mitrović et al. 2021: 70), as the project demanded.

Speculative Fiction

“The ideal is an ideational construct contradictory in itself and in contradiction with reality, but it has an irresistible power. The ideal is a practical fiction.” – Hans Vaihinger

²¹ See Appendix 4

Physical and biological limits differ from social limits of possibility. In the case of social limits, beliefs held by people systematically affect what is possible. Systematic and compelling accounts of viable alternatives to existing states of being and institutions of power and privilege may thus be an approach towards a process that can change the perceived social limits on achievable alternatives (Dunne and Raby 2013: 131). Speculative Fiction is an approach to design that creates such alternatives as it deviates from the consumerist approach of traditional design (Mitrović et al. 2021: 71), leaving the marketplace and market pressures to enter the realm of the fictional, restoring design's foundations of discursiveness in reflection, analysis, examination and anticipation (ibid.). In using Speculative Fiction in the MA project, I did not start designing solutions with the intent of producing market-ready solutions, but by imagining issues that are probable to arise as the research moves into everyday life, and moving to design plausible proposals that embody such issues, hopefully leading participants to arrive at an imaginary of preferable futures. Moral philosopher Susan Neiman pointed out, "Ideals are not measured by whether they conform to reality; reality is judged by whether it lives up to ideals. Reason's task is to deny that the claims of experience are final – and to push us to widen the horizon of our experience by providing ideas that experience ought to obey" (Black 2015). Inspired by her words, I used speculative design as a method to achieve ideological plurality in the proposed design solutions.

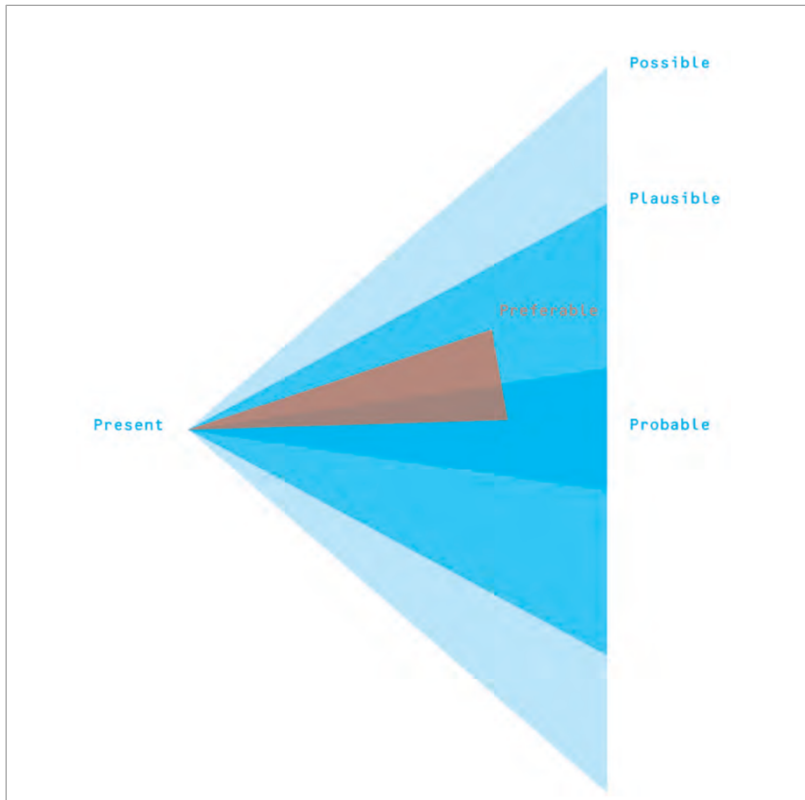


Figure 2. Visual representation of Speculative Fiction approach (Dunne and Raby 2013: 5) that helps imagination and critique of preferable futures at the intersection of plausible and probable futures.

The set of debrief notes I had created as I was interviewing stakeholders for the project proved to be a functional reference tool as I tried to make sense of what I had heard and observed, helping to keep the data accessible. I converted the emerging patterns regarding what was desirable for the people involved into brief ‘How might we....?’ Statements²² that indicated where/ how the insights from the data could be made actionable. These statements then served as actionable prompts, for which I sketched rough solutions. At this stage, the solutions were free from considerations of technical feasibility or economic viability, rather they highlighted many possible directions that the prompts could lead us to. I took these solutions to the collaborators for the particular project, and together we discussed aspects that could or could not work. The Analogous Inspirations gathered in the Inspiration phase helped us to stretch our thinking and provided a reality check when our flights became too fanciful. Collaboratively, we narrowed down the solutions that corresponded most with what was desirable, and additionally showed a promise of becoming a balanced breakthrough of desirability,

²² See Appendix 5

technological feasibility and economic viability. This process was highly iterative, repeating the cycle of ‘design-refine-design’ many times over until we were confident or curious enough about a particular solution to take it to the prototyping stage. I found prototyping to be the most rewarding activity in the course of the project. Often done collaboratively with Pascal and Ulf, prototyping enabled us to think through making, becoming a way to refine ideas. We followed a hands-on and hearts-on approach, experimenting with new materials, forms and functions. I personally discovered new possibilities and opportunities through prototyping that may have not been apparent through purely conceptual thinking. On the other hand, prototyping also revealed limitations and forced confrontation with ethical and technical issues that we had not yet addressed. The techniques I used for prototyping varied greatly with the nature of the design and the scope of the sub-project. For example, I created the design solutions for the project CTRL + ALT + DELiberate that were digital documents using simple graphic design tools like Adobe Illustrator and Adobe Photoshop. Creating prototypes for the project Tinkering with Technology was a more advanced process, in some instances requiring the sketches of design solutions to be 3D for better understanding of the viewer, in which case I collaborated with Ulf and we created low-fidelity prototypes using simple materials like paper and clay, or digital 3D models. On the other extreme of prototyping experience was the project Form Follows Fiction, for which I had to try out a few 3D modelling and simulation software and quickly gain working knowledge to prototype the designs.²³ Ulf made his extensive knowledge in DIY electronics, interactive prototyping and a spatial set-up with 3D printing and scanning facility available to me for the task and was instrumental in accelerating my learning about 3D printing and scanning to create high-fidelity prototypes using complex processes of digital fabrication for the project. In the projects where so required, I shared the prototypes with immediate/ extended collaborators with supplementary worksheets that had prompts to guide their response or feedback. I was able to incorporate urgent feedback into some designs, and in other cases I documented it for future iterations of the designs.

²³ The details of the software tried and eventually used are provided along with the detailed description of the sub-projects in section 3. CraTech Futures.

2.2.3. Implementation

In the third phase of the Design Thinking methodology, the questions I was attempting to answer were,

- How can we take these solutions to market?
- What other avenues than markets can be eventual destinations for the designs, where they can propel further thought?

During this phase, I consolidated feedback, redesigned solutions and detailed out design as required to make them ready for designing a plan for a pilot.²⁴ It was only the project Form Follows Fiction that extended to this stage, wherein I worked closely with Ulf over several rounds of fine-tuning the prototypes and the process of 3D manipulating and printing them, and subsequently assisted him as he took the lead on calibrating the process with the equipment at Laboratoire LAC. In the case of this project, the actual roadmap towards execution of the project extended for many months in which I was closely collaborating with Ulf and Pascal, although remotely for the majority of the time, until we could transform the design into market-ready solutions. For the rest of the projects, this phase primarily comprised consolidating the work into easily accessible formats that could be revived for future contemplation.

²⁴ A plan for a pilot pays attention to the technological feasibility and economic viability aspects of a solution, enumerating how an organization may execute the design, comprising a roadmap illustrating what capabilities, partnerships they need to accumulate on the way.

Chapter 3. CraTech Futures

3.1. The Lac Story

I was first introduced to Pascal Lac and Valérie Lac in August 2018 at a coffee estate in Chikmagalur in the south of India. They were in India to establish ethical sourcing channels for tea, coffee, and spices for their business in France – Maison LAC, dealing in gourmet chocolate and chocolate products, outlet Pâtisserie and educational workshops for apprentices and amateurs. We got talking about the perils of trans-continental supply chains, a burden they bore to uphold the quality of their products. Pascal spoke about his passion for crafting ‘*bark to bar*’ chocolates and how that would require radical reimagination of how they worked and what they did. They spoke about having recently relaunched a former business division, Laboratoire LAC, to be an experimental research division with Pascal’s personal ambition to dedicate resources through this lab to revive forgotten ambitions and infuse back a sense of adventure in him with regards to his craft practice. We had found common ground! We spoke excitedly and animatedly about Indian craft traditions, the heritage of French pastry and the potential such traditions held for revolutionizing how we thought about production-consumption cycles in modern cultures. With ample food for thought, we promised to stay in touch for future opportunities to collaborate over shared interests. I reached out to them in March 2021 again as a student at University of Tartu with the suggestion to collaborate, and over the period of the next three months, we were able to develop a project brief for our engagement that eventually shaped into my MA project, titled CraTech Futures. I was invited by them to Nice, where their central operations and residence are, in July 2021, again in December 2021, and we remained closely connected over the project between August 2021 – July 2022.

Born in Lyon, Pascal began training to be a chocolate craftsman under his uncle, a professional pastry chef at the age of eight. He formally studied chocolate and pastry craft at the Lycée François Rabelais Hotel School in Dardilly, going on to work as a pastry chef at the Hotel Alpenrose in Schönried, Switzerland. Pascal and Valérie returned to settle in Côte d’Azur, where they ran a hotel in Beaulieu-sur-Mer for seven years. Of these seven years, Pascal spent two years in Paris and held the position of pastry chef at

Three Star Michelin restaurant La Tour d'Argent. He returned to Beaulieu-sur-Mer in 1995 and took over the business 'Les Gourmandises de Beaulieu' and renamed it Pâtisseries LAC. He was invited to be a member of Relais Dessert in 2006, a prestigious group of hundred exceptional pastry chefs across 19 countries and is now in charge of new admissions to the group. He has won the award for the "best of the best" chocolate makers in France by the Club des Croqueurs de Chocolat thrice, and the "Incontournable" award among the 20 best chocolate makers in France.²⁵ He has contributed to numerous cookbooks and is renowned to be experimental with pastry craft, having created wearable and installation art with chocolate, or provoking consumers with unique combinations of flavours and styles of presentation. Since its launch in 1995, Pâtisseries LAC has grown into Maison LAC, a renowned brand contemporizing traditional French pastry technique through innovative products. They launched Laboratoire LAC at La Trinité in 2006, conceived initially as an industrially equipped kitchen to centralize the production of chocolates and macaroons. Currently, Maison LAC operates six boutique pâtisserie under the division Pâtisseries LAC in France, a brand of gourmet chocolates named LAC Chocolatiers and Laboratoire LAC – reconfigured as an experimental research division dedicated to infuse creativity and a sense of freedom in Pascal's practice of craft and to eventually inform product development for Pâtisseries LAC. Maison LAC has a core team of ~50 employees, which varies tremendously during different phases of the year and can go up to ~200 employees in the months between October and January. They are in the process of expanding the team at Laboratoire LAC from the current five members to up to ten members, including dedicated technologist roles. Maison LAC is affiliated with the renowned French Compagnons du Devoir, a traditional mentoring network of craftsmen and artisans providing apprenticeship for transmission of craft skills. It was inscribed in UNESCO's List of Intangible Cultural Heritage 2010 (UNESCO 2010). While Pascal Lac serves as the President at Maison Lac and steers the creative direction for the organization, Valérie Lac supervises operations and brand collaborations. Their son Julien Lac joined the family business in recent years and has been administering digitization at the organization, increasingly sharing responsibilities with Valérie.

²⁵ The information about Pascal Lac has been provided by Julien Lac and is part of the standard bio that Maison LAC uses for Pascal for business purposes.

3.1.1. Drawing Venn Diagrams

To determine the brief and scope of our collaboration, Pascal, Valérie and I engaged in several conversations remotely between March and May 2021. I elaborated to them my personal research interest about synergetic convergence of craft and technology, and shared details about my educational qualifications and professional background, which developed a shared understanding of the nature of capabilities I could contribute to the collaboration with. They enumerated three spheres of concern that they wished to address through the collaboration,

- infusing playfulness in Pascal Lac's personal craft practice
- discovering new innovation-led strategic directions for their business
- catalyzing technology enabled research at Laboratoire LAC to design new product offerings for Pâtisseries LAC

Discerning a hopeful intersection in the Venn diagram of our interests and abilities, we developed a project brief, aware and in agreement that the brief was not a binding promise to measure success against, but a beginning of an exploratory journey together. For the purpose of the MA project, my primary points of contact at Maison LAC were Pascal and Valérie, who I had the privilege to spend quality time and indulge in consequential dialogue with. They hosted me twice in 2021, helped me understand the nuances of their business, introduced me to stakeholders in their business ecosystem, and spoke freely about their fears and hopes about their personal futures and that of their business within the society. They introduced me to Ulf Schillig, who became a regular participant in our work together. Besides being a family friend and an old collaborator of the Lacs, Ulf is a social worker, an avid DIY technology enthusiast and active maker with interest in digital fabrication, cyber risk and security and process automation. He divides his time between Germany and France and is quite familiar with India, having visited at least once every year for the last 25 years (pre COVID-19 pandemic). He has been instrumental in reconfiguring Laboratoire LAC as an experimental research division and advising Pascal and Valérie on investment on equipment and human resources. I also engaged regularly with the teams at Patisserie LAC and Laboratoire LAC, initially through group discussions in July 2021, then remotely over the course of the project over specific activities.

Pâtisserie LAC's current business strategy lays emphasis on investment and development of Laboratoire LAC, their research division to advance new product development division as a means to increase profits, forge their social positioning as well as serve as a space to underpin Pascal Lac's personal vision of innovation with his skill and craft. Through the lab, they aspire to explore ways to maintain the craft character of traditional French pastry in their product-service portfolio as they attune to technology enabled processes that forefront the brand authentically, rather than them serving technology and grappling to adapt to emerging technology trends haphazardly. My collaboration with Laboratoire LAC was envisioned as a free-form exploration seeking ideas and concepts that could serve as both inspiration and warning, eventually informing their strategic plan as they strive for economic advances, social positioning and creative distinction. These explorations are meant to help them gain clarity regarding future investments for an integrated brand positioning, terms of engagement with their production and consumption ecosystem, and aligning these with the personal creative agendas of Pascal Lac. This engagement resulted in the development of three sub-projects nestled under the umbrella of CrafTECH Futures: 1. CTRL+ ALT + DELiberate, 2. Tinkering with Tradition, and 3. Tinkering with Technology

3.2. CTRL + ALT + DELiberate

"...the story of humanity's repeated attempts to colonize the red planet...more rockets arrived from Earth, and more. People brought their old prejudices with them, and their desires and fantasies and tainted dreams." – Ray Bradbury

Langdon Winner (1986: 106), the philosopher of technology writes about the flights of utopian fantasy that the advent of new technology commonly provides. Alternatively, science fiction is brimming with scenarios wherein emergent technologies enable flights of dystopian horror. Data science, machine learning and connected products can undoubtedly help design intelligent systems to serve business needs, however, behind every binary expression, every data point, function and formula, are actual human beings. A lack of understanding of the values and needs of these humans coupled with a blind belief in the goodness of technology can give rise to thorny ethical issues.

The project titled CTRL + ALT + DELiberate addresses Pâtisserie LAC's concerns about not losing the craft character in how the organization is configured as they

become more playful with technology, keeping in mind that there are regulatory dimensions to the adoption and deployment of technological systems. The project resulted in the creation of a Values Booklet that serves as a stepping-stone towards building technology enabled processes and services that are more beneficial to the organization and its customers than they are harmful, by identifying the core values that the organization wishes to uphold in the future. The second result of the project was the outline for an Ethics Workshop which serves as a practical tool for members of the organization with varied outlooks towards technology, ranging from enthusiasts to sceptics, to convene over a meaningful dialogue in the face of imminent change.

3.2.1. The Values Booklet

“The ethics of science is a matter of methods, not of objectives.” – Stanislaw Lem

Format: 340 X 680 px, booklet style, print ready PDF

Tools: Adobe Illustrator, Adobe Photoshop

The Values Booklet cumulates the core values of Patisserie LAC as reflected in discussions with Pascal and Valérie²⁶ that stem from the organization’s self-identification as a crafts-lead practice and aims to help them remain craft-centered while designing data-driven, intelligent offerings. The booklet comes from a place of acknowledgement towards the tendency of businesses to deprioritize ethical considerations, as well as a place of optimism about the rewards of abiding by a principled code of conduct. Developed between July and December 2021, the booklet maps these identified core values to a set of statements and prompts to stimulate reflection and dialogue around ethical considerations the organization would navigate in the face of technological upgradation.

The approach of acclaimed science fiction writers Ray Bradbury and Stanislaw Lem towards technology, philosophy and the human experience imparted a rich strain of inspiration and introspection for Pascal, Valérie and I as we were thinking about Patisserie LAC’s concern regarding building an ethics framework around their adoption of

²⁶ Brainstorm map about LAC’s core values is produced in the documentation of the practical component under The Values Booklet section

technological practices. We read together the science fiction short story *The Veldt* that portrays a futuristic home where technology has gone awry and taken over the lives of its inhabitants (Bradbury 1972). Rather than creating a techno-fetishist portrayal of a perfect future or an apocalyptic cautionary tale of technological progress, two views commonly taken by science fiction writers (Winner 1986), Bradbury's work humanizes a spectacular technological future by simply describing it as one where, as recipients of future technology, people will still be people and be driven by the same complex aspirations, desires and idiosyncrasies. I utilized this approach in the short story to create prompts²⁷ about technological futures at LAC, which inspired our brainstorming and identification of the non-negotiable values that Patisserie LAC aspires to walk into the future with, which were a reflection of what they believe constitutes the craft character of their business. Two courses taken at the University of Tartu deepened my understanding of the subject at hand. First, Introduction to Digital Humanities (HVHV.00.002) that discussed the underlying subjectivity leading to 'blind spots' in technological processes; second, Solving eHealth Challenges: Internet of Things, Artificial Intelligence and Ethics (FLFI.02.178) that considered the ethics involved in the use of Artificial Intelligence and Internet of Things in solving healthcare needs of the elderly. The second course awarded me an internship opportunity with Technosens²⁸ for two weeks in the summer of 2021, an e-health solutions developer based in Gr noble, France where I had the opportunity to interview S bastien Rebaudo,²⁹ an interning data scientist from the National School of Computer Science and Applied Mathematics of Gr noble and conduct a focus group discussion with the team at Technosens lead by Benjamin Bouilliez. These discussions were instrumental in understanding the conditions under which ethical implications are discussed and decisions made in an organization developing technological solutions, which I could present as a case to Patisserie LAC to compare potential processes for themselves against. I also interviewed Joel,³⁰ a supplier of milk products to LAC on a weekend trip to Saint Gervais-les-Bains with Pascal and Val rie and his inputs enriched my understanding of the ecosystem of a craft business. I designed the final booklet digitally, as a compilation of the identified values of Patisserie LAC as a business,

²⁷ The list of prompts is produced in the documentation of the practical component under The Values Booklet section.

²⁸ <https://www.technosens.fr>

²⁹ Excerpts from interview with S bastien in the documentation of the practical component under The Values Booklet section.

³⁰ Excerpts from interview with Joel in the documentation of the practical component under The Values Booklet section.

combined with a set of a statement and a question devised by me that considered future scenarios of the application of these values, as well as a set of prompts I wrote to enable richer thought regarding the particular value in decision making processes.

3.2.2. The Ethics Workshop

“Ethics is not a discipline, but a perspective.” – Stephen A. Sherblom

Format: Suggested structure for a ~160 minutes participatory workshop

The Ethics workshop was suggested by me and agreed upon by Pascal and Valérie as a means to further the core values of Pâtisserie LAC into the future operations of Laboratoire LAC through practical ways of finding correspondence of actions to the values. This sub-project suggests a workshop agenda that designed by me to engage participants with diverse capabilities and from various divisions³¹ within the organization to come together and partake in active dialogue about use of smart devices and building of connected systems. Divided into five participatory segments, the workshop aims to provide a platform to inspire creativity and co-creation at the intersection of craft and technology, to develop curiosity about ethics in technology and to generate new thought and encourage reflection about the team members’ individual relationship with technology and that as a professional group.

In the research phase leading to the design of the workshop, I conducted interviews with team members at Pâtisseries LAC and Laboratoire LAC, headed by Pascal, Maeva and Julie respectively at the La Trinité facilities of the organization. During these discussions with the two teams, we had noticed great enthusiasm and simultaneously sharp scepticism regarding the prospect of becoming more technology driven in the future.³² While the enthusiasts were brimming with ideas about the promise of technology in terms of efficiency, innovation and their business value, the sceptics on the other hand were wary of change and self-identifying as artists, they were not cajoled by the prospect of being machine driven. Given the impending organizational changes

³¹ The business verticals at Maison LAC, as discussed in section 3.1 The Lac Story

³² Excerpts from these discussions produced in the documentation of the practical component under The Ethics Workshop section.

that were already in the company's strategic planning pipeline, it was vital for the teams to get thinking together. In this regard, the workshop concept draws from the anti-disciplinary hypothesis (Ito 2014), seeing ethics as complex and multifaceted at the outset, not the purview of particular people or departments within the organizational structure, but as a subject demanding fluid and dynamic collaborations between people with a range of perspectives and agendas. The idea of including an activity including examination and rethinking of an actual IoT product was inspired by science fiction and its depictions of emergent technology through an embodied form through which its dark potential is communicated, allowing participants to base their investigations in the tangible form of a product with its constituent sensory features. The workshop agenda is supplemented with a craft manifesto,³³ a list of principles developed after discussions with Pascal and Valérie that brings together their perspective about what a craft characteristic entails. I compiled the manifesto as a digital one-page supplement is suggested to be used as a reference tool to guide the thinking of workshop participants towards a crafty way of approaching the problem at hand. The craft manifesto is envisioned to evolve constantly, providing guidelines for the proceedings of the workshop, in turn being shaped by issues made visible through the workshop.

3.3. Tinkering with Tradition

“Tradition is not the worship of ashes, but the preservation of fire.” – Gustav Mahler

The project Tinkering with Tradition was borne out of Pascal's expression of how his experience of his craft varies between Laboratoire LAC and Patisserie LAC. Quoting him from an excerpt from my field-notes³⁴ on July 22, 2021 “When I work in the lab, I meet my craft like new every time. It is like spending time with a new person that day, who has his own interests and knowledge, and we get to know each other.” He went on to explain that while running a business at-scale, the performance of the craft gets contained within a perimeter that concurs to the business, while in the Lab, his practice is free of such constraints.

³³ The craft manifesto is produced in the documentation of the practical component under The Ethics Workshop section.

³⁴ Excerpts from interview with Pascal and Valérie are produced in the documentation of the practical component under Tinkering with Tradition section.

Tinkering with Tradition was aimed at finding reasons and pathways to dismiss the vehement association of their craft with tradition, even in their own business. We set out wanting to leverage the attributes of self-reliance, control over production and an acknowledgement of human messiness that crafts grant and use these to reimagine Laboratoire LAC's as one that empowers craft to take on myriad and divergent forms.

The project developed in two stages. First, Craft Outside the Box, wherein, we tried to imagine the possible areas where craft intersects with what is not craft, questioning where such intersections may lead to, leading to a curated research repository of how such convergences are currently occurring across the world. Second, Form Follows Fiction, which was an applied experiment about how Laboratoire LAC's open-crafts³⁵ practice could help to resolve a practical need of the Patisserie LAC business. It drew on the learning from Crafting Outside the Box to imagine crafts outside disciplinary constraints, using a set of digital fabrication techniques to develop a technology-enabled system to diversify the product range offered by Patisserie LAC.

3.3.1. Craft Outside the Box

“Crafts not as handicraft defines contemporary craftsmanship but craft as knowledge that empowers maker to take charge of technology.” – Neil Gershenfeld

Format: A curated visual research repository in digital format

Craft Outside the Box is a digital research repository that locates current occurrences across the world that serve as instances of craft practices meeting non-craft practices, extending the horizon of how craft is perceived and utilized. To create the repository, I began by pairing craft with a non-craft industry and formulating key questions about what such a pairing may entail, if there is any value generated on the journey and for whom. Under each pairing, I have listed a few examples, curated from a long list of secondary research, of how these interdisciplinary interactions are taking shape across the world. This repository of prompts and examples suggesting the viability of such synergies is meant to help Pascal draw inspiration for making his own practice

³⁵ Pascal's thoughts on an *open-crafts* practice can be understood from excerpts from an interview with him and Valérie produced in the documentation of the practical component under the Craft Outside the Box section.

more open, to catalyze richer discussion on the subject, and serve as a ready precedent when in doubt about the pragmatism of such thought and evaluating its applicability.

The activity was inspired by the concept of Analogous Inspirations in the process of Human-Centered Design (IDEO 2015: 53-57), that isolates the elements of an experience (product/ service/ interaction) and shifts focus to a different industry/circumstance where such elements' functioning in a compelling way may inspire its role in one's own situation. The Analogues Inspirations emerged from a mix of secondary research, and telephonic conversations with Ayaz Basrai, a practicing architect and my former colleague in India, whose work focusses on Heritage Conservation and Futures research.

3.3.2. Form Follows Fiction

“Craft is the act of experimentation made visible.” – Heston Blumenthal

Format: Exploration of physical-to-digital-to-physical making

Tools: Photogrammetry (Agisoft Metashape software³⁶), Processing (an open-source environment for creating digital art), Grasshopper 3D (plugin for the computer graphics and computer-aided design application software Rhino3D to create parametric models and generative designs), 3D scanning and printing, Floraform System (a generative design system developed by Nervous System)

The intent for Form Follows Fiction was set by the business frame of Patisserie LAC, stated by Pascal Lac as, “to redesign the physical form of products to tell stories, to reflect the process and to share the spirit of the products.” Form Follows Fiction is a practical experiment conducted to Generative Craft and other potential processes and their applicability to develop a technology-enabled system to generatively diversify the physical form of the product range offered by Pâtisseries LAC. Through the experiment, we sought to explore if and how an open-crafts practice at Laboratoire LAC could cross over to serve Pâtisseries LAC's business intent for diversified product form.

³⁶ A software that performs photogrammetric processing of images and generates 3D spatial data to help digitally recreate an object/ shape. <https://www.agisoft.com>

Generative craft uses algorithms, computer programming, and other forms of computation to generate patterns, forms, and other design elements in the context of craft and handmaking practices. The process involves combining the precision and flexibility of digital tools with the care and individuality of traditional craft techniques to create unique, customizable works. Since the process can be used to automate form-generation, and create organic variations to avoid repetition, I tried some explorations³⁷ to try to understand if this could be an applicable method for creating new forms for LAC. The blog – Generative Hut³⁸ that features interviews and examples of generative art and design and the YouTube channel Maker’s Muse³⁹ with videos discussing use of 3D printing and digital fabrication formed the basis of my understanding of Generative craft. While the concept holds a lot of promise, I found the learning curve to be steep, and it would require a long time to figure out how to translate these forms from computer software to chocolate, and thus I decided to move on to try other alternatives. Next, I drew from the Analogous Inspirations collected in Craft Outside the Box to understand what approaches, processes, software may become anchors for the experiment. Author and active electronics hobbyist Dr. Simon Monk’s playful and imaginative approach to maker-culture where physical and digital making inspire each other (Monk 2015) influenced my own approach by helping me reframe the business intent behind the project into playful and anti-disciplinary prompts for the experiment,

- a. Can craft be freed from form?
- b. Can the materiality of crafts be converted into 0s and 1s?
- c. Can digitally enabled expressions of craft products help to convey new meaning, values and stories?

I designed the experiment together with Ulf as a Critical Design practice (Dunne and Raby 2013: 34-36) to make a tool that would make visible underlying assumptions in Pâtisseries LAC’s process of designing form for products and finding ways to challenge these assumptions. Ulf was a key collaborator in the translation of the project prompts into corresponding steps, contributing his knowledge of digital-to-physical making tools

³⁷ Generative craft explorations are produced in the documentation of the practical component under Form Follows Fiction section.

³⁸ Generative Hut. <https://www.generativehut.com>

³⁹ <https://www.youtube.com/@MakersMuse>

and techniques. He also provided the 3D printing equipment required for the project. The steps involved⁴⁰ in the experiment were (in correspondence to the questions listed above):

- a. First, in consultation with Ulf, I understood about software and techniques available to convert a physical object into a digital artefact. In this step, I created a case study of the Utah Teapot, a 3D computer graphics reference object (Kilgard 2002: 16-17) for Pascal, Ulf, and I to reach a common understanding of physical-to-digital and reverse conversion, and to set expectations for the experiment. Next, we chose a terracotta matka,⁴¹ a rounded vessel that Pascal and Valérie had bought from India on one of their visits into a digital artefact using 3D scanning⁴² and Photogrammetry,⁴³ examining the 3D model for its unique features and asymmetries in comparison with the physical object.
- b. Second, I tested the file transmission of the 3D model across different digital manipulation tools such as Adobe Photoshop, GIMP, Adobe Lightroom to render different surface and material finishes on the 3D model, helping understand the scope of manipulation. Here I also created a few 3D models in varied forms digitally from scratch and tried to apply different textural finishes on them to replicate the surface imperfections of the photogrammetric model, which helped to understand the responsiveness between digital making and physical objects.
- c. Next, we wanted to explore if it was possible to automate the process of generating variations of the 3D model created, to be able to offer highly unique designs to customers. For this, I tried to learn about the process of Differential Growth as it occurs in nature, wherein governed by environmental factors, areas on a surface grow differently forming macroscopic shapes as a result of underlying cellular processes and material mechanics (Nervous System 2015). I chose to study this form of growth for its ability to enable the creation of notoriously different structures like the corals, with Designer Neri Oxman's use of Differential Growth simulated forms to create wearables adding sustenance in harsh environments (Oxman 2014) providing evidence of scope. After I had grasped the basic theory

⁴⁰ The steps are documented in detail with the practical component under the Form Follows Fiction section.

⁴¹ We chose a matka simply because it is an object with a simple shape and was available at the time we were making the choice.

⁴² 3D scanning is a process that uses simple tools like a 3D scanner to analyze an object or environment to collect data on its shape and appearance, which can then be used to construct digital 3D models of the object or environment.

⁴³ Photogrammetry is the science of obtaining reliable measurements and information about physical objects and environments through the use of photographs, commonly used in surveying, geology etc. These photographs, captured from different angles are analyzed to extract precise data.

about the process, I tried the software Grasshopper and Processing, whose interface I was already a little familiar with, to try to make Differential Growth simulations for simple shapes. However, the process was very time consuming and required more advanced skills than I possessed. Instead, we decided to go ahead with 3D printing the models we had created in different materials such as epoxy resin, Polyactic Acid to observe the limitations of the process.

Gathering the learning from this experiment, we were able to understand the dynamics involved in such digital-to-physical-to-digital making, refine our selection of tools and techniques to carry it out, and to fathom the scope and limitations of this process in redesigning the products made by Patisserie LAC. The activity was conducted in December 2021, and since then, Laboratoire Lac has been able to configure equipment in the lab to generate forms for unique products. This enabled Pâtisseries LAC to extend their offerings in the Enterprise and Event categories with tailor-made offerings and customizable packaging. The Introduction to Programming course (MTAT.03.036) I had taken at the University of Tartu had helped me through this project. The project evoked enthusiasm for 3D printing and scanning in me that lasted beyond this project, and I was able to formally study at Pallas University of Applied Sciences in Tartu during my 3rd semester in the course title 3D Printing and Scanning (SE.29.11).

3.4. Tinkering with Technology

“Technology is neither good nor bad, nor is it neutral.” – Melvin Kranzberg

Format: Digital prototypes of speculative product designs

Tools: SketchUp (3D design software), Adobe Photoshop

The project Tinkering with Technology emerged from a free-flowing discussion with Ulf and Pascal, during which Ulf, Pascal and I participated with our proficiency in technology, craft, and design respectively to imagine the convergence of these disciplines⁴⁴. Considering Amazon’s IoT product Echo Dot and voice activated virtual assistant Alexa as an archetype to build our conversation, we discussed ideas such as treating data as craft treats its materials, designing technology using a human-centered

⁴⁴ Excerpts from this conversation are produced in the documentation of the practical component in the Tinkering with Technology section.

design approach, and the degree of identity in IoT products and networks. Excited by the discussion, we developed a speculative project wherein we could further test and explore our ideas through prototypes. The project had no direct relevance for the business of Pâtisseries LAC, however it was relevant to Pascal to understand how the concerns raised in our discussion could indicate ways to modify future concepts of technology enabled products at Laboratoire LAC. I must clarify, though, that Tinkering with Technology was predominantly driven by my larger research interest in how craft-thinking can influence technology making and given the access to Ulf and Pascal between July – December 2021, who were ideal collaborators for the investigation, I impelled and could convince them to participate. The project built on our discussion about how the aesthetic and functional choices behind the Echo Dot reflect the values of designers in Seattle who are trying to design for the global market, catering to a standardized imagination of a global consumer (Crawford and Joler 2018) and resulted in speculative digital prototypes that depicted ways of asserting ownership over the product by varying the level of control at different touchpoints in the product-service’s ecosystem. It contemplated how the approach used in making crafts could be used as an approach to reimagine Echo as a product, if and how the primary considerations behind the product would alter by opting for a craft approach. The speculative prototypes provided a means to share our ideas with other creative practitioners/researchers to invite their participation, and the process of making them turned out to be an opportunity to reflect on and refine our ideas of a craft-thinking approach, through making. The key questions that this project seeks to invite speculation on are:

- a. How might Echo Dot reflect the personality and principles of those who use it?
- b. How might we assert agency over how the Echo Dot fits in our life?
- c. Can craft be an approach to individualize the industrial design ethos behind the Echo Dot?

I drew understanding of Amazon’s data collection practices for the purpose of this project from Serbian researcher and artist Vladan Joler’s work examining the company’s collection of personal data and its environmental and social impact (Joler and Moll 2018). Joler’s work on hidden infrastructures that underpin the Internet, the vast amount of data generated by IoT devices, and the challenges of managing the electronic waste they produce inform the understanding of materiality of a product through its lifestyle (Joler 2017) as considered in the project. Further, I drew from views of John Thackara, a renowned author and critic whose work talks about the missing value benchmark in the

development of the Internet of Things. Thackara argues that we have created a global infrastructure that is brilliant on means, but unambitious when it comes to ends (Thackara 2015), and further questions how we might build technology that considers the true cost of production while respecting human dignity and repairing the Earth (Thackara 2015: 372-384). In creating the digital design of the prototypes, I took inspiration by The Busride Design Studio's visual examination style of the Amazon Echo in their project titled *Our Re-assembled Future* (The Busride 2019). The steps involved⁴⁵ in the experiment were (in correspondence to the questions above):

- a. I brainstormed with Ulf, Pascal and Valérie about 'covering up' the device through cosmetic intervention as a means to allow aesthetic ownership through control of the visual and tactile nature of the product. I created sketches and short descriptions of the concepts that we shortlisted together.
- b. Next, we discussed and debated ideas for 'covering up' the device through product augmentation intervention that could alter the abilities of the device as a means to allow functional ownership over the product, then creating sketches and descriptions for the selected concepts.
- c. Third, we explored ideas for 'covering up' the device through intervention in the form of hacks that would reconfigure how the device is perceived and developed, thereby allowing ownership over the product's ethos, and then proceeding to create sketches/ digital low fidelity prototypes for promising concepts.

The three projects turned out to be fulfilling exercises for me personally and helped reveal some organizational insights for Patisserie LAC with regards to their concerns towards adopting technology-led processes for the business. These explorations led to interesting discussions with my collaborators. We shared the prototypes with a few members of the team at Laboratoire LAC and my former colleagues at Technosens to invite dialogue on the speculative designs by practitioners of diverse disciplines. Their responses were recorded in worksheets that comprised of some prompts to help the recipients engage better with the prototypes. The project provided me a means to channel previously scattered ideas through a fun and imaginative activity. A few months later, studying courses on Theories and Methodologies of Information and Data Science (INT7165.DT)

⁴⁵ The steps are documented in detail with the practical component under the Tinkering with Technology section.

and Collective Intelligence in Socio-Technical Systems (IFI7401.DT) at Tallinn University, I was able to reflect back on the project's speculations more academically to realize how interventions at the product configuration level, not only at the product-system level, in the design of the prototypes could have enhanced the quality and scope of discussions that the prototypes enabled.

Conclusion

The three projects comprising the practical component of this Master's project turned out to be fulfilling exercises for me personally and helped reveal some organizational insights for Patisserie LAC with regards to their concerns towards adopting technology lead processes for the business. We were able to build some assets that could be updated and used periodically to keep the discussion of ethics linked with technology adoption alive at the organization. In the case of Form follows Fiction, the results of the project could be directly utilized to develop into a market offering, responding to their articulated need to attain economic advances and strategic positioning. A project like Tinkering with Technology was highly speculative in nature and we could not map it to any immediate business benefit, however it was an enriching investigation for all participants and in the words of Pascal Lac, "...winked with the promise of a pathway".

I personally experienced a movement both in my skill and my thought process regarding craft-thinking and its contribution towards emergent technology futures, much of which I attribute to the unencumbered atmosphere of exploration and speculation that the collaboration with Maison LAC not only accepted, but actively encouraged. In the end, as I look at the identified characteristics of craft-thinking that we had set forth in the project with, I realize that a very compelling attribute that I missed out on investigating has been that of beauty and enchantment as inherent in craft practices. Although, during the course of the project, I brought up the topic of care transmitted into the process of craft making and through the outcomes of these processes, into the lives of the users, I now see that the attributes of beauty and enchantment demand a sense of care from the user, rather than it having to be imbued into the process, which can lead to a new way of looking at cycles of production and consumption altogether, where there are no rigid boundaries between who produces and who consumes, rather there is a multi-sided involvement in relishing of beauty and enchantment. However, I am content in the credence that a work whose end winks with the promise of a pathway has been a worthwhile journey.

Resümees

Magistriprojekt „*CrafTech Futures: Käsitöö ja tehnoloogia konvergentsi spekulatiivsed tulevikud*“ uurib käsitöö ja infotehnoloogia sünergia võimalusi mõistmaks, kuidas käsitöömõtlemine või -eetos võiks toetada inimkesksete, osalusel põhinevate digitaalsete tehnoloogiate arengut ning kuidas tehnoloogiat saaks kasutada käsitööl põhinevate tegevusvaldkondade uuendamiseks ja nende konkurentsivõime tugevdamiseks, ilma et loobutaks käsitööstegemisest ning sellega seostuvast meisterlikkusest ja individuaalsusest.

Projekt on sündinud autori koostöös Prantsuse Rivasas asuva kondiitriäriga Maison LAC, mis kuulub Prantsusmaa meisterlikke käsitöölisi ühendavasse *Compagnons du Devoir* võrgustikku. Aastal 2010 kanti Prantsusmaa *Compagnonnage* süsteem UNESCO inimkonna vaimse kultuuripärandi esindusnimekirja. Perefirma omanikke motiveeris magistriprojektis osalema soov oma käsitöösikusi mänguliselt arendada, võtta kasutusele innovaatilisi tehnoloogiaid ning arendada nende toel oma laboratooriumis uusi tooteid oma äri tarbeks. Neist eesmärkidest ajendatuna kavandati ja teostati 2021. aasta märtsist 2022. juulini *CrafTech Futures* koondpealkirja all kolm alamprojekti, mille dokumentatsioon moodustab antud magistriprojekti praktilise osa. Projekti autor külastas Prantsusmaad kahel korral ning tegi lisaks Maison LAC-ile koostööd e-terviseteenuseid arendava Grénoles'i firmaga Technosens.

Töö teoreetiline osas koosneb kolmest peatükist, mis annavad ülevaate projekti teoreetilistest ja metodoloogilistest lähtekohtadest, firmast ning kolmest alamprojektist. Kirjaliku osa lisadest leiab magistriprojekti teostamise ajakava Gantti diagrammi kujul ning alamprojektidega seotud materjale.

Esimene alamprojekt *CTRL + ALT + DELiberate* oli kantud Maison LAC-i soovist areneda ja võtta kasutusele infotehnoloogilisi lahendusi, kuid ilma, et loobutaks äri omasest käsitööstegemisest. Ajurünnaku, intervjuude ning Ray Bradbury lühijutust „The Veldt“ („Rohtla“) saadud inspiratsiooni tulemusena sündis firma põhiväärtusi sedastav voldik ning plaan eetikaemalise töötoa läbiviimiseks, mille juurde kuulub ka käsitöö manifest. Ka teine alamprojekt *Tinkering with Tradition* koosnes kahest osast. Esimeses etapis „Craft Outside the Box“ koguti andmeid käsitöö innovatiivsete kasutuste kohta arhitektuuris, teaduses, ökoloogias valitsemises ja mitmetes teistes eluvaldkondades, mida traditsiooniliselt käsitööga ei seostata. Teises etapis „Form Follows Fiction“ uuriti 3D-printerite toel käsitöö materiaalsuse, immateriaalsuse ja digitaalsuse suhete kaudu vormiliste uuenduste võimalusi ning mõned neist uuendustest on firma tänaseks ka kasutusele võtnud. Kolmas alamprojekt „Tinkering with Technology“ oli mängulisema ja spekulatiivsema iseloomuga, kasutades käsitöömõtlemist ja -eetost kujutlemaks uuesti ja kavandamiseks ümber Amazoni virtuaalne assistent Alexa ja nutikõlar Echo Dot.

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Appendix 1: MA project timeline

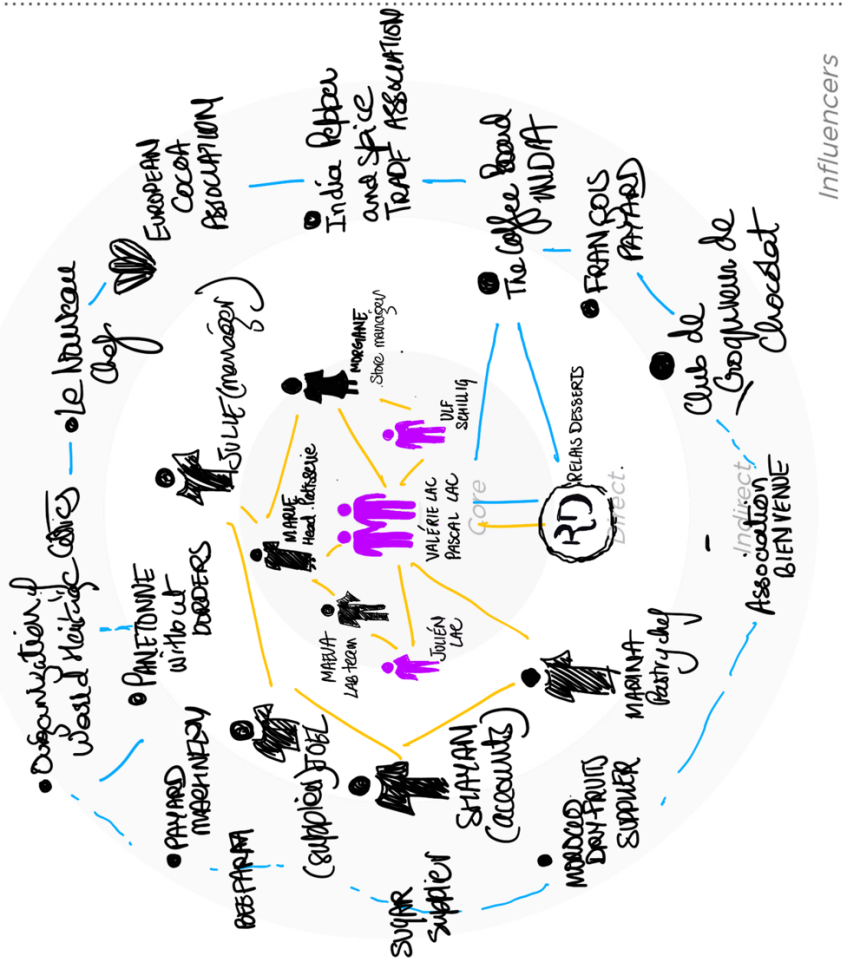


Grant/ Scholarships In-person Remote

Appendix 2: Project ecosystem stakeholders

STAKEHOLDERS INVOLVED

- PASCAL LAC - PRESIDENT / CREATIVE HEAD
- VALÉRIE LAC - PROPRIETER, OPERATIONS
- JULIEN LAC - OPERATIONS, WEBSITE
- VIE SHILLIG - ADVISOR - LAB LAC
- MARIE - Head Pastry chef
- MARIEVA - Head Laboratories' LAC
- MARINA - Head Pastry chef (G)
- MORGANNE - Store manager
- JULIE - Job + close manager
- SHAYAN - Laboratorial Accounts
- JOEL - Cheese supplier
- RELIAS DESSERTS - HE is very embedded, local responsive for new admissions.
- Panettonne without borders - for animal participation - tech inspirations.
- FRANÇOIS PAYARD - competition / tech inspiration
- EUROPEAN COCOA ASSOCIATION - planning for BRUK to work with them



Appendix 3: Interview Guide

Lines of enquiry

1	Lives & Lifestyle Individual's life and livelihood, relationships, routines, aspirations, needs and frustrations, community and social behaviour, impact of COVID and ramifications.
2	Craft and Technology How they perceive craft and technology, what are similarities or differences in the concepts and their applications. What are the advantages/disadvantages of either.
3	Business Values, needs, aspirations and dreams associated with the business. The role of technology and craft at present and in future. Capabilities, associations and investments.

This includes

- Background, relationships & vocation
- Routine, responsibilities & influences
- Social, digital choices & behaviour
- Scenarios, experiences on crafts
- Scenarios, experiences on technology
- Reflection on relevant experiences
- Framing of business intent
- Breakdown of intents for verticals
- Existing and desired resources

Appendix 3: Interview Guide

Lines of enquiry

Draft discussion topics

Lives and Lifestyle

1. Tell me about yourself and what you do
 - Typical day in your life
 - Who do you live with
 - How are roles and responsibilities divided
 - Exciting and boring parts of the day
 - How you spend free time
2. What forms of social activities you enjoy
 - When and how often do you do it
 - With whom
 - What makes it enjoyable
3. Tell me about your social behaviour
 - What networks and communities are you part of
 - What do you like or dislike about it
 - Interests and hobbies
 - Most used websites, apps, what stands out
4. What does an ideal day look like for you
 - Alone time vs. company of friends/ family
 - What changes would you like to bring in your life and what is stopping you from doing that
 - What could help in making these changes

Craft & Technology

1. Craft
 - How do you define craft
 - What do you value/ not value about it
 - Can you relate instances/ memories related to craft, what makes them special or stand out
 - What are your concerns
 - What would you like to change
 - What would be the impact of change and on whom?
2. Technology
 - How do you describe your relationship with technology
 - What makes it special/ satisfactory?
 - What would you like to retain/ change
 - Can you relate a memory or incident involving technology
3. Craft and Technology
 - Points of intersection
 - What is it that could be interesting
 - Have they seen this somewhere?
 - Likes and dislikes
 - Good and bad experiences
 - Surprise encounters, avoidable situations
 - Information sources and decision making

Business & Society

1. Business
 - Vision for the future, inspirations
 - Commonly faced issues, plan for addressal
 - Comparisons and Distinctions
 - Attitude and Temperament
 - Customers and their desires
 - Employees/ employers and desired
 - Expectations mismatch?
 - Worst day at work, what was wrong, what could have been done differently
 - Memory of a great day for the business, what enabled it? What would make it possible again?
 - Most audacious wish
2. Society
 - Role of business in society
 - Perceived responsibilities
 - Self evaluation
 - What would bring pride
 - What would bring shame
 - Who can we learn from
 - Most audacious dream, what are the barriers to achieving them
 - Construct an ideal image
 - What must be avoided

Appendix 4: Template for interview debrief

Project LAC - Interview Debrief Form

Date & Place:

Participant's name:

Participant designation/ role:

Interviewers:

Interesting stories/ moments

Surprises

Contrast and compare

Quotes

Appendix 5: 'How might we...?' statements to articulate needs

CHALLENGES IDENTIFIED

- The team members at the different ventures under MAISON LAC do not share a common vision with regards to purpose of adopting advanced technology
- be able to pinpoint what could be the ethical implications of this tech-adoption given personal and regulatory matters and not let it go against their craft-character.
- Embrace/imagine new-age ways through events/events
- Client investments in the HR, final business benefit

DESIRED EXPERIENCES

- To experience a sense of freedom of expression and non-conformist practices of pastry and chocolate craft.
- Provide space to EAT chocolate in the region. Figure out local supply chains for the same.
- Much more collaboration between teams at both sides like and innovative like to get closer to the voice of the customers.

01 How might we **CREATE A PLATFORM / OPPORTUNITY** for **LABORATOIRE LAC** and **PATISSERIE LAC** in order to **OPENLY SHARE THEIR ENTHUSIASM AND SKEPTICISM** ?

02 How might we **NOT GET CARRIED AWAY WITH TECHNOLOGY** for **MAISON LAC (and PASCAL personally)** in order to **RETAIN THEIR CRAFT CHARACTER** ?

03 How might we **DIS-ASSOCIATE CRAFT MAKING FROM HERITAGE** for **PASCAL LAC** in order to **FEEL A SENSE OF FREEDOM, CREATIVITY and OPENNES**

04 How might we **CREATE "CRAFTY + TECH" OFFERINGS** for **MAISON LAC** and **PASCAL** in order to **CONTINUE TO BE RELEVANT WITH CHANGING TRENDS AND CONSUMER PREFERENCES**

Appendix 6: Respondent worksheets for Tinkering with Technology – 1

<p>Respondent Name: SHAYAN ROY Respondent Organization: Lab LAC Respondent Designation: -</p>	
Prompts	Response
Which speculation do you have strong reactions for and why?	Disguise dot because it changes the power dynamics.
What are your thoughts about it?	It does not fully change power dynamics but also gives some benefit of the unauthorized data collection to the buyer of Alexa
Is there a memory, incident, thought that you can relate it to?	I was talking to my friend asking what is Cibil score, it was first time in life that I had heard of the Cibil score, while I was still talking to my friend, I received an email on Gmail saying something like “Improve your cibil score.” That makes me relate to this design.
Have you seen this/ or something similar somewhere?	Not Disguise to make it listen to your friends. But I have seen different kind of cases like Hulk inspired case which makes the sound also better.
What do you think are the good/ bad features about the design?	The good thing is that the consumer is going to be losing privacy in any case, so if they can listen on others, maybe they feel better about their own condition. But bad thing is that it is creating a monster in the society, can be used for so many illegal things.
If you could change something about it, what would you change?	I don't like the flower case, it can be some other kind of disguise.
What would be the impact of this change?	It will be more discreet. I think the Avenger and Disguise design are opposites of each other in a way. Maybe they are by competitors, good cop and bad cop style.
Which speculation is not interesting for you and why?	The turn-table one is not so interesting to me, it is not very new.
What would make it interesting for you?	-
Is there one/more speculations that you did not understand?	I understand them, but all of them are not usable
Do you have any other comments/suggestions?	-

Appendix 6: Respondent worksheets for Tinkering with Technology – 2

Respondent Name: Kaustubh Khare
 Respondent Organization: Central Square Foundation
 Respondent Designation: Design

Prompts	Response
Which speculation do you have strong reactions for and why?	Goddess Alexa as it flips the idea of technology serving humans. Here humans are trying to garner favour/ blessings from technology.
What are your thoughts about it?	Very refreshing approach to understanding technology and brings our power relations with technology into focus.
Is there a memory, incident, thought that you can relate it to?	I remember listening to a description describing Google as 'Google Baba' as it was like a wise man with answers to any queries which can almost be trusted blindly.
Have you seen this/ or something similar somewhere?	No
What do you think are the good/ bad features about the design?	Good: Presents technology in a culturally rooted way both in physical perception (throne, brass) and psychological perceptions ('Goddess').
If you could change something about it, what would you change?	User having to select an existing God to be 'Alexa's' personality and voice.
What would be the impact of this change?	Creates possibilities for new ways of marketing where companies can piggyback of the religious/ cultural connotations. Risk of Alexa having developing it's own cult following of religious fanatics.
Which speculation is not interesting for you and why?	Disguise dot. Spying technology for the same is already available which is probably cheaper, smaller and more discreet than an echo dot.
What would make it interesting for you?	If the use case was not spying but something more like an always on walkie talkie.
Is there one/more speculations that you did not understand?	No
Do you have any other comments/ suggestions?	No

Appendix 6: Respondent worksheets for Tinkering with Technology – 3

Respondent Name: Mario Rivas Respondent Organization: Technosens Respondent Designation: Developer	
Prompts	Response
Which speculation do you have strong reactions for and why?	Disguise Dot. Technology especially phones and cookies already spy on us. I don't want a product that encourages this further.
What are your thoughts about it?	Uncomfortable but seems inevitable. Big Tech companies like Amazon, Meta and Google are anyway spy masters. Now they will encourage us to spy on each other making it tougher for humans to trust each other and be authentic.
Is there a memory, incident, thought that you can relate it to?	Reminds me of James Bond movies where some new fancy technology is introduced to eavesdrop on enemies.
Have you seen this/ or something similar somewhere?	Cookies on the web, Apps asking for full-access to camera and microphones.
What do you think are the good/ bad features about the design?	Good: Nothing. Bad: Echo Dot is very big. Even in a disguised form it will be quite noticeable. Unless the disguise is like an invisibility cloak where the size of the thing being hidden becomes quite immaterial.
If you could change something about it, what would you change?	Some strict regulation around when this can be used by whom and who authorizes it. Similar to law enforcement agencies requiring permission form courts to install wiretaps.
What would be the impact of this change?	Accelerate the development where technology knows more about us than we do and becomes like the omnipresent eye of Sauron from Lord of the Rings.
Which speculation is not interesting for you and why?	Avenger Alexa. Seems like a complicated way of asking and trusting the devil to protect us from itself.
What would make it interesting for you?	If it could protect my privacy not just from itself but form all technology products in the vicinity. Even those that I am unaware of.
Is there one/more speculations that you did not understand?	No
Do you have any other comments/ suggestions?	No

Appendix 6: Respondent worksheets for Tinkering with Technology – 4

Respondent Name: Tarun Dev Sharma
 Respondent Organization: Independent practice
 Respondent Designation: Architect

Prompts	Response
Which speculation do you have strong reactions for and why?	Goddess Alexa. Feels strange that something as ancient, abstract and traditional as the concept of 'Divine' can also become integrated with modern technology.
What are your thoughts about it?	For religious institutions and preachers, this can simplify their life greatly. They have new way to position their "god" as all-knowing even in the modern age of science. It's almost like the conflict between science and religion for authority over truth is resolved. In this way, science and religion work together.
Is there a memory, incident, thought that you can relate it to?	Earlier, my grandmother used to remember and recite all the prayers and devotional songs on festivals. After youtube, none of us remember these songs. At a family gathering recently, there was a dispute regarding the wordings of one of these songs and to resolve the dispute, we turned to technology (google + youtube) and not a priest or temple.
Have you seen this/ or something similar somewhere?	Reminds of a project by ISKCON temple in Los Angeles that had installed few robots to recite verses from Hindu scriptures and there were two robots that were representing mythological characters from Mahabharat.
What do you think are the good/ bad features about the design?	Good: Making it in Brass and putting it on a small throne will make it seem like it's a natural fit for family temple room or cupboards. Bad: It needs to be form-wise very similar to pre-existing god figures. The oval disc like shape is very out of place for a god.
If you could change something about it, what would you change?	I would offer it in the form of 3-5 popular Hindu gods (Ganesha, Shiva, Lakshmi etc.) and not call it Alexa at all. Instead, the trigger word would be the name of the god whose shape it is in.
What would be the impact of this change?	People in distress looking for words of wisdom nd hope from God will have long conversations with this object to calm their fears.
Which speculation is not interesting for you and why?	Avenger Alexa. No point of this. Technology already knows everything about us. It's a lost cause which there is no point trying to fight.
What would make it interesting for you?	Not sure
Is there one/more speculations that you did not understand?	Disguise dot.
Do you have any other comments/ suggestions?	For goddess alexa, if it can become waterproof then it can be integrated in many festivals where goddess idols are created and then immersed in a lake or river. The goddess can sing songs/ give blessings during the festival and then thank the devotess from underwater later.

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Chahal Garg

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