How design helps to cultivate effective suspense

Refining X!Delft's value proposition

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When I started working on my master thesis, I had little idea where it might lead. Given the enormous scope that it would inevitability come to encompass, I was fortunate to have had my own little ecosystem of people who have made the journey that bit lighter.
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I will no longer keep you in suspense, enjoy the read!

Glossary

Design Thinking (DT)   A multidisciplinary human-centred innovation approach inspired by the way designers think and work (Carlgren, 2013).

Effective suspense   Suspense that is functional, meaning, that triggers engagement in a learning process.

PACES   An approach to '**P**reserve **A**nd **C**ultivate **E**ffective **S**uspense'

Partners   How X!Delft refers to members of their innovation ecosystem. 'Industry partners' refers to the companies paying the annual fee.

Product/service offering   The services or products a company sells to its customers to deliver value

Suspense   "a state or feeling of excited or anxious uncertainty about what may happen" (Oxford University Press, 2019).

University-Industry Collaborations (UICs)   Partnerships between a university and industry, with the goal of transferring knowledge from university to industry.

Valorisation   "The process of creating value from knowledge by making knowledge suitable and/or accessible for economic and/or social exploitation and translating it into competitive products, services, processes and new activities." (Drooge et al., 2011)

Value proposition (VP)   A description of how one's product offer adds value to its intended target audience.

Value Proposition Canvas   An overview of how the 'Value Map', explaining the services and the benefits they yield, fits with a 'Customer Profile', which elaborates the needs of the target group.

Executive Summary

This report describes the results of a graduation project conducted for X!Delft, an organisation within the valorisation centre of Delft University of Technology (TU Delft). X!Delft intends to create an '**innovation ecosystem**' in which TU Delft, companies, and startups work together on "new inventions" (van Wijnen, 2019). These innovative solutions are needed to give an answer to complex and interconnected challenges our society faces, for which solutions require multi-stakeholder collaboration (Jones, 2015).

However, stimulating collaboration between multiple companies in such an ecosystem proves to be challenging. Hence, it is now predominantly used for company-specific challenges. To encourage working as an ecosystem, it is essential to **understand the partners' needs** upon entering a partnership with X!Delft. This enables the creation of a relevant **value proposition**, describing how X!Delft's service offering adds value to its partners.

A way to incorporate the needs of partners into a relevant value proposition is by means of Design Thinking (DT). DT is a human-centred innovation approach suitable for understanding and providing for people's and companies (latent) needs (Hooge et al., 2012; Carlgren, 2013). Combining the need for a refined value proposition with the opportunities offered by DT yielded the following project brief for this graduation project:

Where and how can X!Delft successfully apply Design Thinking internally and in their service offering – to reinforce its value proposition?

The project was initiated by analysing X!Delft and its current services towards industry partners. Comparison of X!Delft to other formal university-industry collaborations (UICs), revealed three compelling **points of differentiation** worth maintaining in the refined value proposition. Firstly, X!Delft establishes the partnership before projects are defined. Secondly, X!Delft moves from bilateral partnerships between one company and the university, towards an ecosystem in which multiple partners engage in shared projects. Thirdly, the focus shifts from knowledge and technology transfer towards knowledge creation.

To discover what incentivises companies to opt for a partnership with X!Delft, seventeen semi-structured interviews and three creative sessions were conducted. The **five main innovation challenges** of partners that came forward during the interviews were:

FOMO: 'fear of missing out' on new technological developments
FUTURE: bridging the innovation needs of today with those of the future
FLOW: integrating innovation into an organisation's internal structures
FAMILY: finding others with similar challenges to collaborate
FUN: stimulating excitement while innovating

These challenges are treated by the author as five manifestations of an implicit sense of **suspense**, defined as "a state or feeling of excited or anxious uncertainty about what may happen (Oxford University Press, 2019). The introduction of the term 'suspense' in this context, complements literature's description of 'uncertainty', by adding a factor of excitement and wonder, triggering an impulse to act.

Suspense originates from the observation of **uncertainty** or instability, triggering the generation of **predictions** or expectations about the future based on pre-existing knowledge. The **divergence** between the possible future scenarios envisioned, creates a sense of suspense (Lehne & Koelsch, 2015).

In order to understand how to manage suspense, the **pragmatist inquiry** proved to be useful (Lorino, 2018). In this inquiry, one moves from a situation of 'doubt' towards a future 'belief', by combining experimentation and reasoning. Similarly, **design practices** are beneficial for coming up with future-focused solutions when considering situations of uncertainty or ambiguity.

Based on these findings a new approach, **PACES**, is proposed. The approach structures and expands X!Delft's services so they **"Preserve And Cultivate Effective Suspense"**. This 'effective suspense', which incentivises engagement in a learning process, is cultivated in six phases: perceiving, putting into perspective, predicting, paraphrasing, probing and proving. PACES stimulates collecting (**perceiving**) and sharing insights to increase the collective knowledge base (**perspective**) needed to generate plausible predictions. These **predictions** are then made actionable (**paraphrasing**) based on the strategic intent of individual actors, ensuring company-specific impact through the development of experiments (**probing**) followed by long-term projects (**proving**).

To provide an idea of how to integrate the refined value proposition into X!Delft's organisation, a first ideation step is taken to translate PACES into services. These services complement the current services of X!Delft that are mainly situated in the perception, probe and prove phase.

In order to successfully implement PACES and its corresponding services into the innovation ecosystem, advice is given on the steps towards **multi-partner collaborations** and the capabilities needed within X!Delft's organisation to move forward with the development of the process and services.

To conclude, the limitations of this thesis are discussed, and recommendations are formulated regarding further research and development of the value proposition.
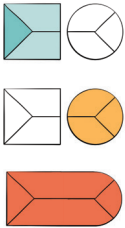
Introduction

This report presents the results of a graduation project researching opportunities for X!Delft to apply Design Thinking to reinforce its value proposition. The value proposition is refined in three steps, which will be presented in corresponding parts of this report. Where applicable, a reflection is given on how design relates to the topic at hand.

PART I focuses on X!Delft's current services towards its partners, and the benefits these services yield. **Chapter 1** provides an overview of X!Delft's organisation and its service offering. Then, the value X!Delft intends to deliver is made explicit in Chapter 2, and compared to that of traditional university-industry collaborations to discover compelling points of differentiation (**Chapter 3**).

In **PART II**, the underlying innovation challenges of partners and the underlying driver to collaborate with X!Delft are uncovered. The findings from the interviews and creative sessions, discussed in **Chapter 4**, are complemented with literature (**Chapter 5**) to provide tangible guidelines for refining X!Delft's value proposition.

Based on these guidelines, a refined value proposition is proposed in **PART III**.
Chapter 6 presents a process, providing the framework to structure and expand X!Delft's services. Moreover, a first step is made in translating this process into additional services. The integration of the process and its services into the X!Delft ecosystem, is explored in **Chapter 7**. It also discusses implications for X!Delft's organisation in developing and implementing the refined value proposition.

PART IV concludes this graduation project. **Chapter 8** contains the conclusion and explains the limitations of the thesis. Moreover, recommendations for further research as well as development of the value proposition are provided. Lastly, a personal reflection offers insights into the learnings and experiences accumulated during this challenging and captivating project.

THE STRUCTURE OF THIS REPORT FOLLOWS THE VALUE PROPOSITION CANVAS (section 2.1)

You can follow where you are situated in this Value Proposition Canvas at any time by checking the RUNNING HEADER.

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PART I

The Value Map

Chapter 1

X!Delft
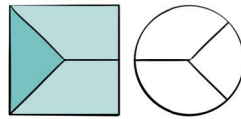
This chapter introduces the organisation X!Delft (section 1.1), the role their organisation plays within TU Delft (section 1.2) and describes the ecosystem they create (section 1.3). Section 1.4 elaborates on the services they offer to partner companies, as a preparation step to determining the value they offer. Lastly, the current role of Design Thinking within X!Delft is explored in section 1.5.

"The ambition to innovate together.
Building an ecosystem the world has never seen."
(X!Delft, 2019a)

1.1 Background

X!Delft is part of TU Delft's valorisation centre concerned with bringing the knowledge developed within the university to market through university-industry collaborations (UICs). Valorisation is defined by the National Valorisation Committee as "the process of creating value from knowledge by making knowledge suitable and/or accessible for economic and/or social exploitation and translating it into competitive products, services, processes and new activities" (Drooge et al., 2011). It was founded as part of Delft University of Technology's aim to structure strategic partnerships with industry to **impact society** through innovations. Through ground-breaking research, TU Delft intends to enable solutions for the long run by engaging in active **co-creation** and realisation. (TU Delft, 2018)

X!Delft contributes to this objective by establishing an **ecosystem** in which multiple partners collaborate to innovate in service of global challenges (X!Delft, 2019a). This mission relies on two core assumptions that partners share with X!Delft, namely that global issues require technological solutions, and that these are best developed through university-industry partnerships (see Figure 1.1).
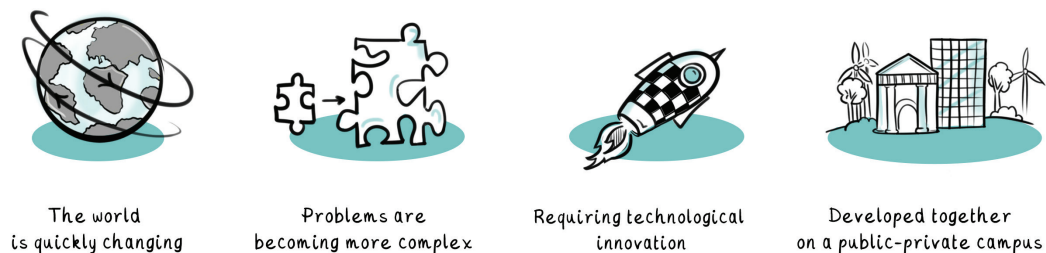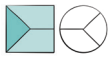
The world
is quickly changing

Problems are
becoming more complex

Requiring technological
innovation

Developed together
on a public-private campus

Figure 1.1 Global challenges require co-created technological innovations

In line with the strategic framework of TU Delft, X!Delft – rather than claiming to solve global challenges – seeks to invest capabilities and technology to enable a collaborative network of partners to introduce new solutions to market.

Currently, X!Delft is exploring how best to approach contributing to **global challenges** by taking into account the Sustainable Development Goals of the United Nations (Division for Sustainable Development Goals, 2019).

1.2 Organisational role

Although collaborating with industry is thus important to TU Delft, the university "consists of a rather loosely-coupled community of diverse and sometimes disparate stakeholders that does not take readily to corporate directives or impositions" (TU Delft, 2018). Because of the 'islands' within TU Delft, it is difficult for companies to navigate all the opportunities within the university. While companies often collaborate solely on specific topics that are closely related to their core business, they are under the impression they know what the entire TU Delft has to offer them. X!Delft wants to debunk this 'we know TU Delft' belief by broadening the scope of partnerships (Althuis, personal communications, 2019).

X!Delft is thus 'an umbrella', a central point of entry for companies to explore TU Delft, its field labs and its startups. As this entry point, X!Delft aims to **bridge the differences** in ways of working and desired outcomes in the collaboration between university and industry. They want to break down the silos in which both parties operate, and create understanding for the different interests of stakeholders.

To enable this, the X!Delft team consists of people with consulting experience as well as TU Delft employees, as to link business challenges to technological developments, so both parties benefit when pursuing innovations together.
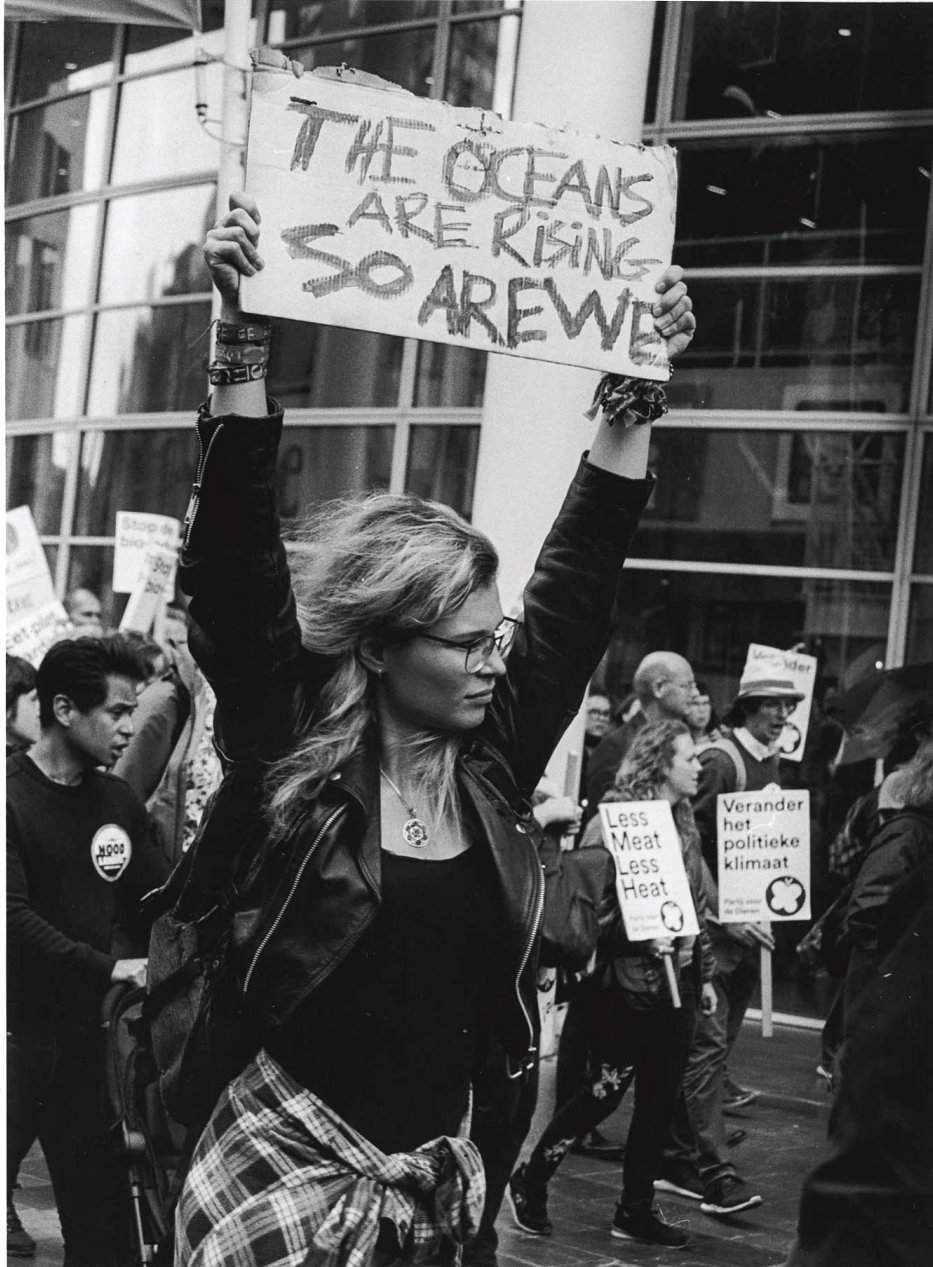
Climate March in The Hague,
September 27th, 2019
by Leonie Levrouw

Figure 1.2 The X!Delft ecosystem

1.3 The ecosystem

X!Delft aims to create a dynamic ecosystem to spark new connections between university and industry that revolves around technological innovation. In this ecosystem, partners gain access to the current collaboration opportunities within the TU Delft as well as new ways of working together through X!Delft specific services.

At the time of writing (autumn 2019), X!Delft's **collaborative network** consists of eight industry partners[1] from a wide range of industries, academics, four field labs, the YES!Delft incubator, Delft Entreprises[2] startups and a network of 180 students (See Figure 1.2). Industry partners contribute an annual fee of 150 000 euros to gain access to the ecosystem, including the Field Labs, YES!Delft incubator, and staff and students from all faculties. Two-thirds of the annual fee acts as 'kick-start money' to set up projects and innovation tracks.

Currently, the ecosystem pertains mainly to bilateral relationships between one industry partner and the TU Delft ecosystem (startups, field labs and faculties); however, the aim is to expand this to multi-partner collaborations.

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1   In this report, the term 'partner' will always refer to a player in the X!Delft ecosystem. If specified as 'industry partners', this pertains to partners paying the annual fee.

2   *Delft Enterprises* participates in innovative, early stage and technology-based spin off companies of TU Delft (Delft Enterprises, 2019)

A long-term ambition is to let all partners come together in a physical space - a **"public-private innovation campus"** - in order to create the trust needed to make the collaboration flourish (van Wijnen, 2019).

1.4 Service offering

To fulfil the role of bridging the different goals and 'languages' of universities vis à vis industry partners, X!Delft provides additional services in extension to the existing programmes and possibilities for collaboration with the TU Delft ecosystem.

X!Delft structures these services into four pillars (see Figure 1.3):

- Inspiration and collaboration
- Innovation and experimentation
- Entrepreneurship and venturing
- Talent development

The first pillar consists of activities and events to let partners connect to each other and the university. In the second pillar, multiple X!Delft specific innovation projects take place. The third pillar is an expansion of the second, bringing innovations to market through corporate venturing and collaboration with startups. The fourth and last pillar runs through all X!Delft's services by connecting and educating employees and students.

Inspiration and collaboration

When a potential partner expresses an interest to join the X!Delft ecosystem, X!Delft's account managers set up an intake procedure to discuss the company's main strategic challenges. X!Delft then links the knowledge and expertise of TU Delft to these challenges through a Discovery Day. On such an occasion, X!Delft invites multiple speakers from the TU Delft ecosystem to talk about their research or projects.
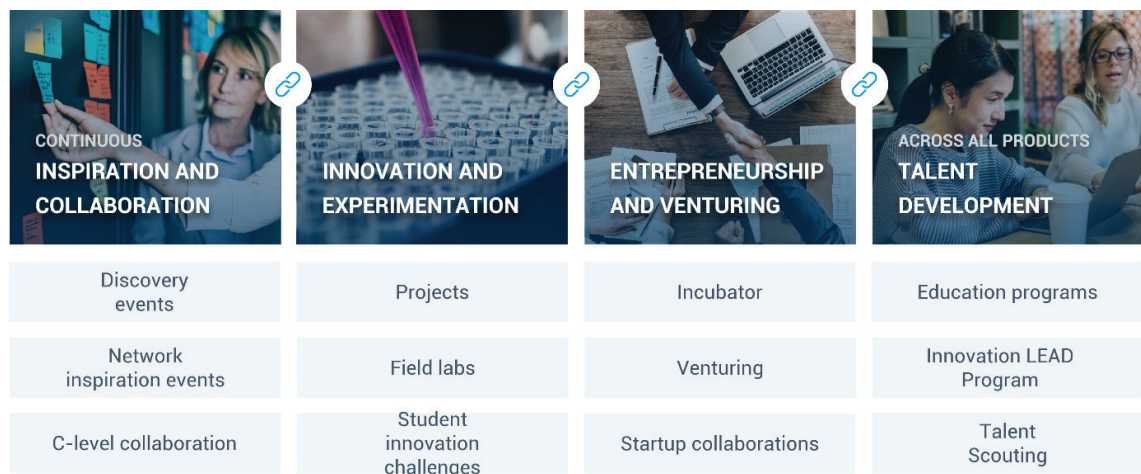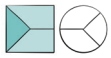
CONTINUOUS INSPIRATION AND COLLABORATION	INNOVATION AND EXPERIMENTATION	ENTREPRENEURSHIP AND VENTURING	ACROSS ALL PRODUCTS TALENT DEVELOPMENT
Discovery events	Projects	Incubator	Education programs
Network inspiration events	Field labs	Venturing	Innovation LEAD Program
C-level collaboration	Student innovation challenges	Startup collaborations	Talent Scouting

Figure 1.3 the current service offering of X!Delft (X!Delft, 2019a)

In this way, the Discovery Day provides a broad overview of how to link TU Delft's expertise in a variety of ways to the strategic challenges of individual partners.

Apart from the Discovery Day, two types of events are organised to spark inspiration and enable collaboration: networking events and executive dinners. The quarterly networking events revolve around a specific theme that touches upon the interests of several partners. At the last edition, which took place this fall (October 10th, 2019) 50 people were present – ranging from partners to students involved in projects, and startups linked to X!Delft. The yearly executive dinner engages partners at the top level and creates an open conversation about the strategic challenges their companies face.

Right now, these services are mainly a source of inspiration for long-term innovation and serve as an occasion for networking. Because of X!Delft's ambition to create close collaborations between partners, they are now searching for ways to create a dynamic community in which partners work together (**multi-partner collaborations**).

Innovation and experimentation

The services in this pillar aid the university to achieve societal impact, through the development of (technological) solutions. Most of X!Delft's activities and services revolve around innovation and experimentation. These activities include existing possibilities - such as PhDs and projects with field labs or startups – as well as newly developed offerings.

X!Delft's specific services help to bridge the long-term research focus of the university with the result-oriented mindset of industry partners. Amongst others, they offer three-month validation studies with professors from different faculties, which allows for quick and concrete results, generating the trust needed to commit to long-term research. Moreover, X!Delft has started to experiment with shared learning. For example, they have assigned ten individual MSc dissertations on a specific topic and will share the results with all ten companies involved.

While the student challenges were previously tailored to the challenge at hand, X!Delft is now working towards a set of five standardised challenges: exploration challenges, ideation challenges, design challenges, validation challenges and 'ask the students' challenges (X!Delft, 2019b).

Exploration challenge

In an exploration challenge, student teams explore new technologies and innovative developments. The exploration challenge provides a birds-eye view of the specific domain, enabling the partner to determine if, when and how to proceed in further exploration and experimentation. The typical duration of this challenge ranges from three to four months, with team sizes of about five or six students (X!Delft, 2019b).

Ideation challenge

This challenge make use of the students' fresh perspectives, to come up with new insights and concepts that the industry partner might have never considered. Using ideation techniques, students inspire partners with their creativity and develop or trigger breakthrough ideas for products, services or processes that they can explore further. The duration of this challenge ranges from one day to one week, with team sizes of about 15 to 20 students (X!Delft, 2019b).

Design challenge

In this challenge, multi-disciplinary student teams come up with a design or solution for a piece of engineering, a new product or a service. The challenge lasts for about half a year, with team sizes of about five students (X!Delft, 2019b).

Validation challenge

A small team of three to four students develops a new concept into a tangible prototype. In this way, partners can experiment with it, show it to stakeholders and create a better understanding of what the concept entails. Afterwards, this prototype can be used for validation purposes through technical tests or customer experience tests (X!Delft, 2019b).

Ask the Students challenge

This challenge is specially designed for partners wanting to conduct user research with a young target group. Through short questions or questionnaires, they can gain insights from the replies of the student community. Depending on the particular question and the number of participants needed, the student input can be obtained in very short timeframes (X!Delft, 2019b).

Entrepreneurship and venturing

For entrepreneurship and venturing, X!Delft collaborates with Delft Enterprises and YES!Delft. X!Delft partners can participate in projects or launch a startup. Currently, this pillar the least developed of the four, as there are little concrete ideas for ventures or spin-offs at partner companies. This is to be expected, considering the fact that X is!Delft is still a young organisation.
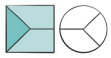
Talent development

Although talent scouting is a reoccurring topic across all pillars, there is also dedicated training for partner companies. Moreover, X!Delft is currently developing an education programme for recently graduated MSc students, the innovation L.E.A.D. programme (Lead. Engineer. Accelerate. Disrupt.).

Each corporate education programme revolves around a specific topic (e.g. Artificial Intelligence). In a few sessions, different aspects of this topic are examined. The programme provides partners with a deeper understanding of new technologies. The increased technological understanding is not only beneficial to innovation projects, but also to recruiting processes, as the new knowledge enables partners to be more specific in skills needed when hiring.

The L.E.A.D. programme is starting for the first time in February 2020. It will consist of a four-month project at a startup in the YES!Delft incubator, combined with a seven-month project at one of the partner companies of X!Delft. Throughout the one-year programme, participants will get additional training from strategic consultant Roland Berger and WeCreate (personal development and Design Thinking).

LEAD

ENGINEER

ACCELERATE

DISRUPT

1.5 Design & X!Delft

As the goal of this graduation thesis is to understand the role Design Thinking (DT) can play for X!Delft, a short reflection is given on how design is already (implicitly) present within X!Delft. Before addressing DT in relation to X!Delft, a general introduction of Design Thinking is given, based on design and management literature as well as a semi-structured interview with innovation expert Roland van der Vorst. The questions for this interview were structured around the following topics:

- What does it mean to innovate?
- How to innovate?
- What is the role of Design (Thinking) in innovation?
- What is the role of collaboration in innovation?

The complete interview guide can be found in Appendix A. As the insights from this interview relate to multiple topics within this thesis, I will refer to this interview throughout the report.

Introduction Design Thinking

The term Design Thinking came up for the first time in the 1960s in the literature on creativity methods for product innovation. Ever since, it has been expanding (and diffusing) in meaning, first within the design field and around 1990 towards management studies to describe a "multidisciplinary human-centred innovation approach inspired by the way designers think and work" (Carlgren, 2013).

Why this approach is multidisciplinary & human-centred is perfectly captured by David Kelley (founder Stanford d.school & chairman of IDEO):

"In our minds, it's a method for how to come up with ideas. These are not just ideas, but break-through ideas that are new to the world, especially with respect to complex projects, complex problems. That's when you really need multidisciplinary teams (...), and you really need to build prototypes and try them out with users "

From this, Design Thinking can be interpreted as a set of five core principles: human-centeredness, multidisciplinarity, problem framing, experimentation, and prototyping that are enacted and embodied through a number of mindsets, practices, and techniques (Carlgren, 2013). (See Figure 1.4)
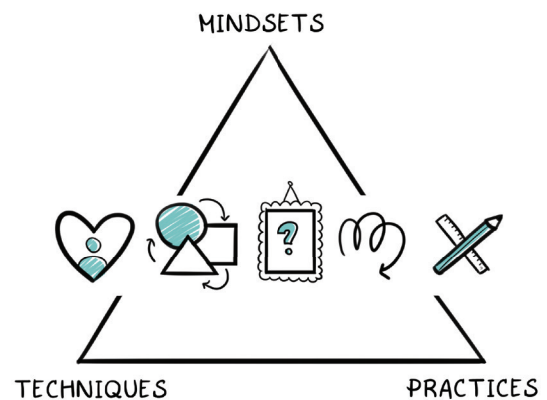

Figure 1.4 Design Thinking as a set of five principles, enacted through different mindsets, practices and techniques

Because of these characteristics, DT gives an answer to a number of flaws of stage-gate innovation processes[3] within big organisations. Firstly, the fact that little attention is paid to the customer. Secondly, the big gaps between stage-gates and thirdly the lack of iteration steps in innovation processes (Roland van der Vorst, personal communications, July 19, 2019).

However, DT also has its challenges. Because of the ambiguity of design and by extension of Design Thinking, multiple interpretations of the term co-exist, making it increasingly vague what DT is and what value it creates. By focusing excessively on skills, methods and techniques, some efforts to promote DT undermine the perceived value of design(ers) (Buchanan, 2015; Dorst, 2015).

In order to circumvent the superficial connotation of Design Thinking and truly grasp its potential for X!Delft, it is needed to go back to design principles and dive deeper into design practises (Dorst, 2015).

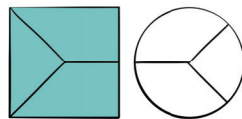## Design Thinking in X!Delft's organisation

Design Thinking is already implicitly present in X!Delft's organisation, in the explorative way in which the partnership and services are set up. However, the reflection tools and structured approach are missing to make it a strategic part of X!Delft. Design can help X!Delft in making their way of working **explicit,** which enables **reflection** on the content and form of their service offering. This enables X!Delft to give **direction** to their organisation, and (re)evaluate when partnerships are considered successful.

X!Delft already involves partners in the development process of their services, in line with the human-centred approach of DT. However, until now, this has been done after a concept was created and without explicit validation of the identified problems or solution paths. For future services, X!Delft has already taken steps to involve the partners earlier on in the process.

This designerly approach that X!Delft intuitively employs, is not reflected yet in the content of the service offerings, nor in the team composition. It is heavily reliant on the individual skills and style of its employees, as there is no structured approach yet on how X!Delft manages its partner accounts. (Although in late fall 2019, X!Delft is starting to make the best practices and general structure of the partnerships explicit.) Thus, there are still opportunities to be explored to integrate Design (Thinking) in X!Delft's organisation in a more structured and visible way.

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3   In stage-gate processes, innovation projects are divided into separate phases (stages), divided by decision moments (gates) on whether to continue the project.

Value Proposition

After the general introduction of X!Delft and its services, a closer look is taken at the value they deliver to industry partners. The Value Proposition Canvas is used as a framework (section 2.1) to explore the value offering of X!Delft. As X!Delft provides services, the value proposition is discussed in a service-dominant logic (section 2.2), and the role of design within the value proposition is explored (section 2.3). In section 2.4, the framework is applied to X!Delft's services to map the value X!Delft aims to deliver.

2.1 Defining a Value Proposition

A value proposition (VP) describes how one's product offering adds value to its intended target audience. The proposition statement communicates the target audience, product category and product benefits as opposed to what competitors offer (Strategyzer, 2019):

Our (services)
help (customer segment)
who want to (job to be done)
by (pain reliever) and (gain creator)
unlike (competing value proposition)

In a VP, it is thus important to identify what needs underpin the target group's incentive to buy your product as opposed to competitors' offerings. To do so, the VP needs to respond to the 'jobs to be done' of your customer, by relieving the 'pains' that come along with the job, and by offering 'gain' creators, making their job easier. This is summarised in the **Value Proposition Canvas** (Figure 2.1), consisting of the **Value Map** (left) and the **Customer Profile** (right) (Strategyzer, 2019).
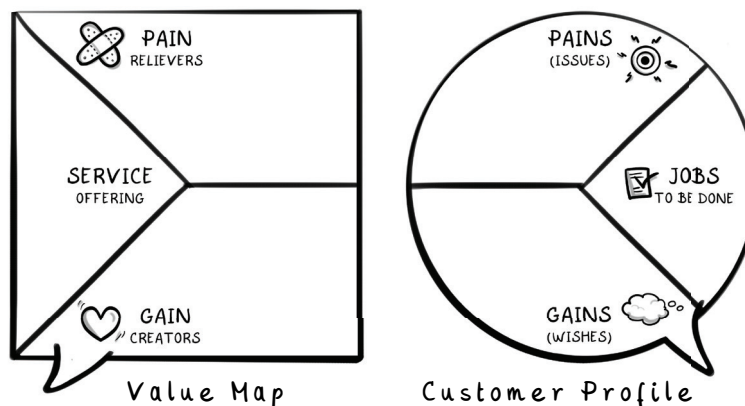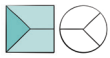

Figure 2.1 Value proposition canvas adapted from Strategyzer (2019)

The pain relievers and gain creators (also called *benefits*) should appeal to both functional and emotional needs: "Functional benefits alone, it seems, are no longer enough to capture customers or create the brand distinction to retain them" (Brown, 2009, p. 112). Therefore, it is key that the product offering appeals to underlying emotional needs (Straker & Nusem, 2019).

> KEY INSIGHT:
> The value proposition needs to appeal to an emotional need.

2.2 Value in a Service-dominant logic

The original conceptualization of a VP is firmly based on a goods-dominant logic, in which tangible *products* are delivered by a *supplier* to a *customer.* In contrast, service-dominant logic suggests that value is not delivered by one party to another, but is co-created in-use with both parties playing a role. The VP then sets expectations of value-in-use (Frow & Payne, 2011).

X!Delft's ecosystem can be seen as partnerships in which competences and capabilities are supplied that are more knowledge-based. In such partnerships, value propositions provide an opportunity for suppliers and a company to engage in substantial knowledge sharing, which is essential for co-creation (Frow & Payne, 2011).

To facilitate knowledge sharing, two "meta-competences" are required: collaborative capacity, and absorptive capacity. *Collaborative capacity* represents the ability of the organization to work with other parties in an open, truthful and symmetric manner, while *absorptive capacity* refers to the ability of the organization to absorb new information from the environment, including its collaborative partners (Lusch et al., 2006).

These two meta-competences are part of the organization's culture and need to be developed in order to implement a service-dominant logic successfully. However, as with all changes in company culture, this can be a slow endeavour. (Lusch et al., 2006)

2.3 Design & Value Proposition

Within supplier-customer business models, value propositions are traditionally created from within an organisation. However, the principle of customers' values driving value propositions from the outside-in is emerging as an alternative approach (Straker & Nusem, 2019). This approach takes into account the changing customer needs, adapting the value proposition to stay relevant over time. Achieving this requires a deep understanding of customers' latent and future

needs (Price, Wrigley, & Straker, 2015), customer involvement in the development phase, and the organisational agility to (re)design the value proposition accordingly (Straker & Nusem, 2019). Design offers a method for understanding customers and their interactions with a product, service or business model (Straker & Nusem, 2019).

To create the agility needed to update value propositions to keep matching evolving customer needs, companies must engage in trial and error (prototyping) processes – a fundamental characteristic of design (Straker & Nusem, 2019).

> KEY INSIGHT:
> Design helps to create the customer understanding needed to create a relevant value proposition based on underlying (emotional) needs.

2.4 X!Delft's Value Map

Formulating X!Delft's current Value Map

Because X!Delft never explicitly formulated a value proposition, input from X!Delft employees was gathered through informal conversations, aimed at identifying the purpose and the intended benefits behind the developed services. This is summarised in the value proposition canvas in Figure 2.2.

Target group
Although TU Delft is the key stakeholder of X!Delft, their service offering is directed at industry partners. Therefore, companies are the target group and the benefits discussed
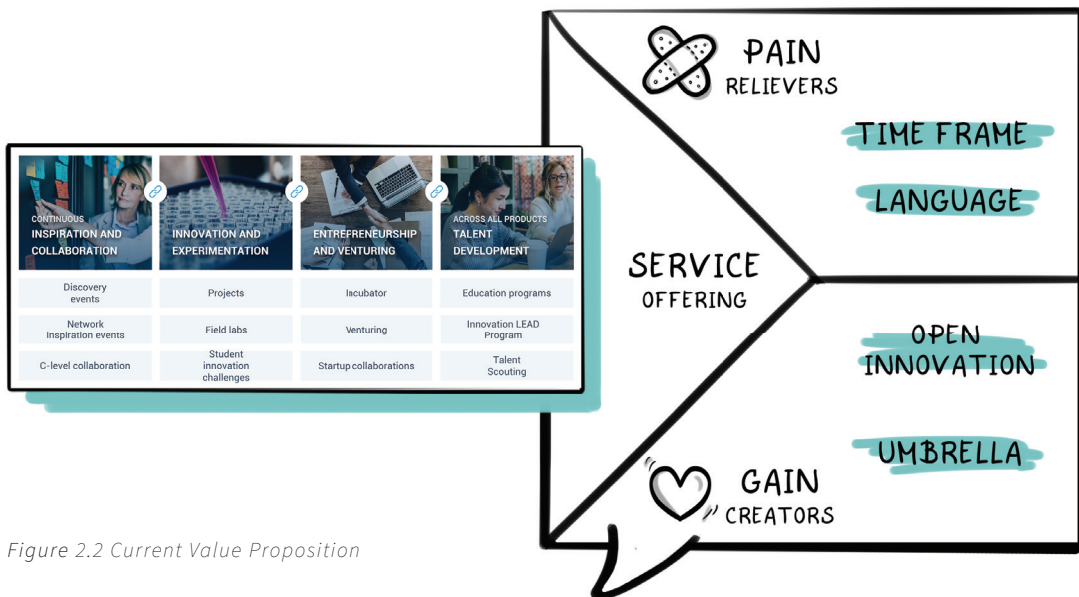

Figure 2.2 Current Value Proposition

refer to the value X!Delft delivers to industry partners. However, after proposing a new value proposition concept, it will also be specified how it contributes to TU Delft's goal to structure strategic partnerships to create an impact on society (TU Delft, 2018).

Pain relievers: Bridging gaps

Time frame

Universities and industry operate under different time frames. While universities typically employ a multi-year perspective, divided into semesters, companies make use of calendar years to plan and evaluate their activities. This can cause friction, which X!Delft addresses by creating short-term alternatives such as validation studies before a longer commitment is required.

Language

Moreover, the differences in focus and jargon make it hard for universities and industry to understand each other's goals and needs. The X!Delft team combines knowledge of the business and university context in its multidisciplinary team.

Gain creators

Open innovation

Companies come to X!Delft to give substance to open innovation and co-creation (Althuis, personal communication, 2019). The ecosystem appeals to them because it gives them room for experimentation with open innovation initiatives.

Umbrella

By providing access to TU Delft in a broad way, X!Delft allows partners to explore different forms of collaboration on a broad range of (technological) topics. X!Delft is one central point from providing an overview of what TU Delft has to offer.

Challenges in the Value Map

X!Delft creates these benefits through its ecosystem and its services, divided into the pillars: inspiration & collaboration, innovation & experimentation, entrepreneurship & venturing, and talent development. However, there are some challenges in achieving the intended benefits – as came forward in discussions with X!Delft employees. Here, some preliminary reflections on X!Delft's services (as described in section 1.4) will be discussed.

At the moment, the **inspiration and collaboration** services of X!Delft, are predominantly networking events, and spark inspiration more so than collaboration.

As X!Delft does not want to be a 'praatclub' - or an association for networking - these services need to be reinforced to include cross-partner collaboration.

The **innovation and experimentation** services of X!Delft are intended to be 'kick-starters' for innovation tracks. However, the desire for fast results sometimes gets in the way of actual

experimentation in which failure is accepted and even encouraged to speed up the learning process.

KEY INSIGHTS
There is still room for improvement in terms of stimulating cross-partner collaboration. The services of X!Delft should 'kickstart' new innovation tracks.

As mentioned before, the third pillar, '**entrepreneurship and venturing'** is the least developed by X!Delft, because of low demand from partners and its similarity to services offered by YES!Delft incubator.

Lastly, X!Delft aims to bring companies and students closer together by offering education to industry partners and young **talent**. Through 'corporate education' they create a better understanding of technology for industry partners, while the L.E.A.D. programme aspires to educate engineers on how to innovate.

Towards a refined value proposition

By formulating X!Delft's current value map and comparing it to a service-dominant logic (section 2.2) and a design perspective (section 2.3), some guidelines can be derived for the refined value proposition.

Guidelines

In a service-dominant logic, in which stakeholders collaborate to co-create value, it is not enough to base a value proposition on the internal viewpoint of an organisation alone.

2.1 The concept appeals to an emotional need.
2.2 The concept stimulates cross-partner collaboration.
2.3 The concept stimulates experimentation
2.4 The concept helps to bridge the horizon gap between TU Delft and industry partners

Therefore, to strengthen the value proposition, it needs to be clarified how X!Delft is different from other university-industry collaborations (Chapter 3), and how X!Delft's services correlate to underlying needs of partners (Chapter 4). In this process, design helps to uncover the needs to create a deeper understanding of how to respond to partners' innovation challenges..

University-Industry Collaborations
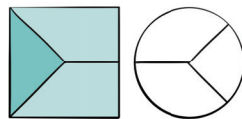
The goal of this chapter is to situate X!Delft in the landscape of university-industry collaborations (UICs). Firstly, the context of UICs is shortly explained in section 3.1. Then, to discover points of differentiation for X!Delft, motivations to engage in UICs are listed (section 3.2) and the general approach to partnerships is discussed (section 3.3). Lastly, the resulting differentiators of X!Delft are taken as input for the refined value proposition (section 3.4 and 3.5).

Universities play a crucial role in innovation through the facilitation of knowledge and technology transfer towards industry (De Fuentes & Dutrénit, 2012; Etzkowitz & Leydesdorff, 2000; Inzelt, 2004).

3.1 The context of UICs

The knowledge economy marks an era in which knowledge is essential in the creation of new goods and services. In this light, universities play a crucial role in innovation through the facilitation of knowledge and technology transfer towards industry (De Fuentes & Dutrénit, 2012; Etzkowitz & Leydesdorff, 2000; Inzelt, 2004).

This interaction between universities and industry is part of the Triple Helix Model. The Triple Helix thesis is that the potential for innovation and economic development in a Knowledge Society lies in the creation of hybrid institutions formats for the production, transfer and application of knowledge. These hybrid institutions consist of universities, government and industry. There are different formats, but in the balanced configuration, specific to the transition to a Knowledge Society, universities and other knowledge institutions act in partnership with industry and government and even take the lead in joint initiatives (Etzkowitz & Leydesdorff, 2000).

In this graduation report, I will specifically focus on the university-industry branch of the triple helix, as X!Delft operates as a mediator between these two. The government (regional, national and European) is implicitly involved in stimulating collaboration through financial benefits such as grants or tax programmes (Ranga & Etzkowitz, 2013).

3.2 Motivations for collaboration

Because of multiple pressures accumulating on universities and companies, they increasingly engage in collaboration (Ankrah & AL-Tabbaa, 2015). The partnership offers both parties stability in a rapidly changing environment, in which technological innovations succeed each other at an ever-increasing pace. For industry, this highly dynamic context has radically transformed the current competitive environment, creating pressure on most firms (ibid). Because of the need to innovate to stay competitive, companies are exploring new ways to access and interact with the knowledge needed to innovate. In this light, collaborations are crucial to obtain the external expertise needed to innovate (Haus-Reve, Fitjar, & Rodríguez-Pose, 2019).

In these collaborations, resource complementarity is sought, meaning that university and industry gain access to resources that are not internally available (Rajalo & Vadi, 2017). Companies get access to the newly created technological knowledge at a lower cost than is commercially available as well as to talent (Ankrah & AL-Tabbaa, 2015).

VALUE FOR COMPANIES IN UICS
- Resource complementarity
- Stability in dynamic & uncertain times
- Connection to talent
- Access to newly created technological knowledge

3.3 Shaping university-industry partnerships

Formal partnerships between industry and university are often set up through the valorisation centre of the university. To get a general idea of how these valorisation centres approach these partnerships, an X!Delft employee was consulted who has worked at Wageningen University and Research, and at TNO. Through an informal interview of 45 minutes, procedures, strengths and limitations of the ways of working in formal UICs were discussed. As came forward in our conversation, valorisation centres share a few general characteristics. Firstly, they both work with a multidisciplinary team, consisting of researchers and business analysts, who look at the university's knowledge, possible knowledge-extension, and market demand. Secondly, they then create a research proposition, that they subsequently send out to their industry network, in a standard acquisition process (see Figure 3.1).
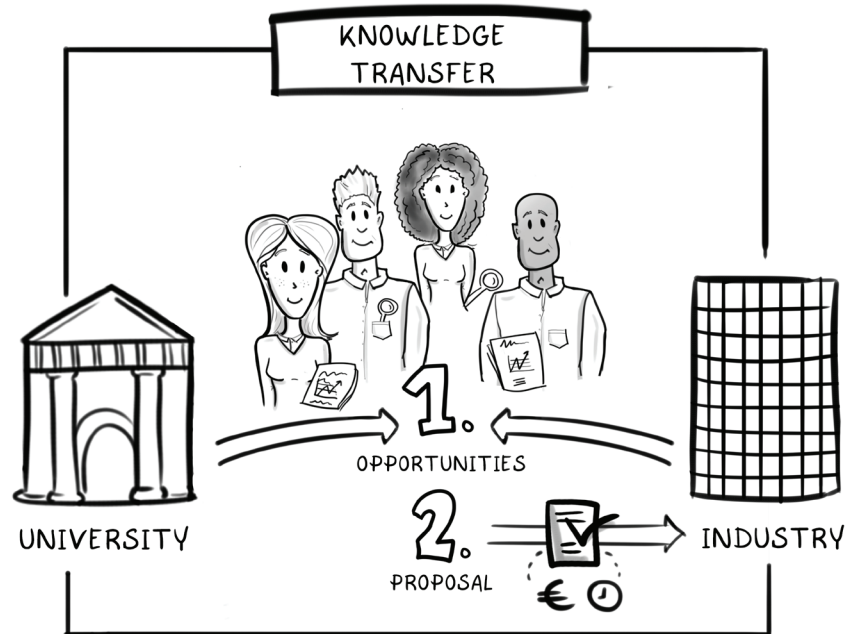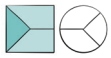
Figure 3.1 Knowledge transfer approach in UICs

Knowledge transfer vs knowledge extension

Nowadays, valorisation centres start to balance knowledge transfer with knowledge extension. The benefit of the former is the commercialisation of knowledge already developed, while the latter enables the university to get funding/create a business model for one of their core activities: research to extend knowledge.

However, most UICs still focus on knowledge and technology *transfer*. For as long as this knowledge transfer model creates continuous revenues, universities do not feel the need to expand this model towards knowledge creation collaborations.

This is also noticeable in literature, where UICs for knowledge transfer are associated with structured and formalised processes with higher strategic impact. (Ankrah & AL-Tabbaa, 2015) In contrast, there is little literature on UICs for knowledge creation, which see knowledge as a context-related object that can be codified and exchanged and is generated through an ongoing interaction between industry and university. According to Ankrah & Al-Tabbaa (2015), these partnerships are irrational, arising from individual and informal connections.

3.4 Differentiators for X!Delft

The observation by Ankrah and Al-Tabbaa (2015) is an interesting one, as it links knowledge generation directly to the style of the partnership (formal/informal, rational/irrational). However, X!Delft is trying to achieve a *formal* partnership for knowledge *creation*, leading to innovation and strategic effect - just like traditional knowledge transfer agreements. Although X!Delft is still too young to evaluate whether they indeed achieve knowledge creation; three substantial differences with other formal UIC models are already visible (Figure 3.2).

Firstly, other UICs focus on transferring knowledge from the university to industry. In this model, the university is the supplier of the knowledge for innovative application. X!Delft, however, sees university and industry as equal partners with their own responsibilities to make the partnership succeed. Secondly, companies decide to become an X!Delft partner before a specific project with clear goals and scope is set. Industry partners thus do not commit to a specific outcome, but belief in the underlying premise of 'innovating together'. Thirdly, X!Delft moves away from individual company-university relations by creating a networkwith multiple partners.

From TRANSFER to CREATION   PARTNERSHIP before PROJECT   From INDIVIDUAL to ECOSYSTEM

Figure 3.2 Main differentiators X!Delft
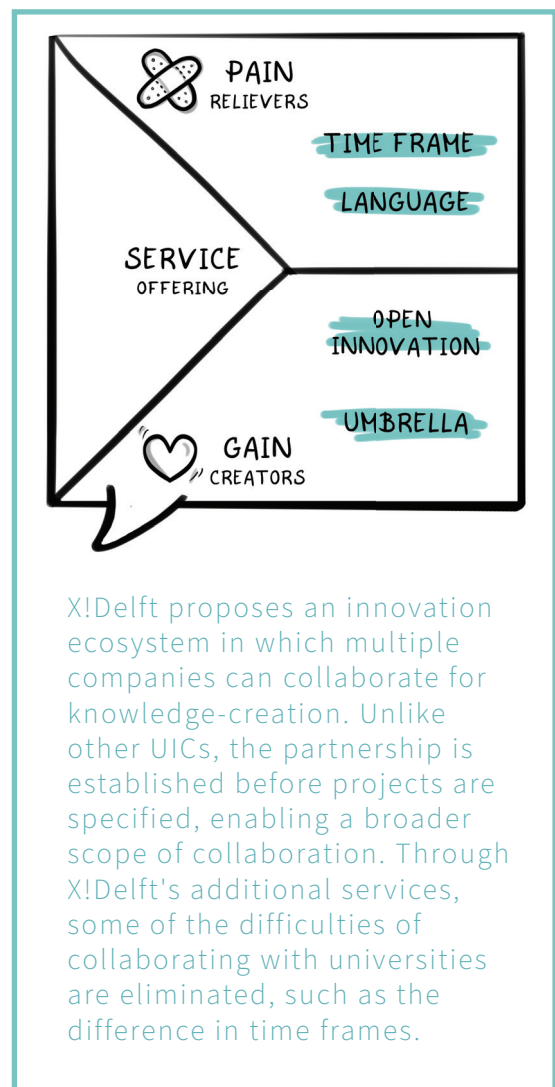
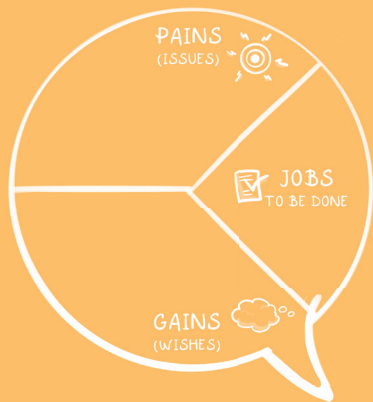## SUMMARY PART I

3.5 Towards a value proposition

Upon analysing traditional UICs, three important differentiation points of X!Delft can be found. These characteristics of X!Delft need to be preserved in the final value proposition, as it sets X!Delft apart from traditional UICs.

Guidelines

3.1 The concept stimulates
     knowledge creation
3.2 The concept helps to uncover
     interesting projects after
     the partnership is established.
3.3 The concept connects multiple
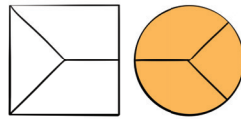   companies to create
     an innovation ecosystem

X!Delft proposes an innovation ecosystem in which multiple companies can collaborate for knowledge-creation. Unlike other UICs, the partnership is established before projects are specified, enabling a broader scope of collaboration. Through X!Delft's additional services, some of the difficulties of collaborating with universities are eliminated, such as the difference in time frames.

PAINS
(ISSUES)

JOBS
TO BE DONE

GAINS
(WISHES)
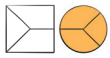
PART II

The Customer Profile

Partner Needs

This chapter describes the results of the interviews conducted with partners, in order to understand their underlying needs. It thus provides the basis for the refined value proposition of X!Delft. Section 4.1 describes the research method used, and the interview findings are discussed in section 4.2. Then, a discussion is offered in section 4.3, providing a deeper understanding of the results by the formulation of an underlying driver. The validation of the findings can be found in section 4.4.

4.1 Method

As a value proposition should respond to the needs of customers, interviews were conducted with the primary goal of understanding the innovation challenges partners face, and the benefits they seek in collaborating with X!Delft. In these interviews, overlap between the challenges was sought, to come to a shared, underlying driver underpinning the partnership.

This was done through interviews because qualitative, in-depth insights were needed to provide enough input for the value proposition. Moreover, it was accessible within the time frame available for this graduation, and it gave me the opportunity to get a feel for the people involved in the partnership with X!Delft.

Eleven interviews were conducted with participants from six different partner companies (see Figure 4.1 on the next page). The interviewees were obtained through my company mentor Zwanet van Lubek. Her personal relation to industry partners allowed me to quickly schedule the different interviews, with sufficient diversity in terms of company, function and relation to X!Delft.

INDUSTRY PARTNER	PARTICIPANT
Company A	P1
	P2
Company B	P3
	P4
Company C	P5
Company D	P6
Company E	P7
	P8
	P9
	P10
Company F	P11

Figure 4.1 Participant list

The interviews were semi-structured and followed an interview guide (see Appendix B). The questions were organised around the following topics:

• Background information: the function of the interviewee and relationship to X!Delft
• Innovation processes: how does your company innovate & the role of Design Thinking in innovation
• Collaborations for innovation: reasons to engage in partnerships
• Collaboration with X!Delft: pains & gains

The exact questions depended on the profile of the interviewee, as they had varying knowledge on, amongst others, the partnership with X!Delft. Some of the participants were not involved in setting up the partnership, while others were not involved in the day to day projects with X!Delft. When a participant was unfamiliar with certain aspects of the collaboration with X!Delft, more attention was paid to the other topics in the interview guide.

The interviews were analysed through a coding process aimed at identifying patterns and themes to find relationships between the interviewees' responses. (CESSDA Training Working Group, 2017-2018) This was done in the following five steps as visualised in Figure 4.2.

① The interviews were transcribed, and interesting quotes were selected.

② Initial codes were created for the quotes, which stayed close to explicit motivations and verbalised needs.

③ The codes were clustered into problem areas.

④ Relationships between the problem areas were sought, resulting in five innovation challenges.

⑤ A synthesis step was performed to identify the underlying (emotional) driver for the partnership with X!Delft.
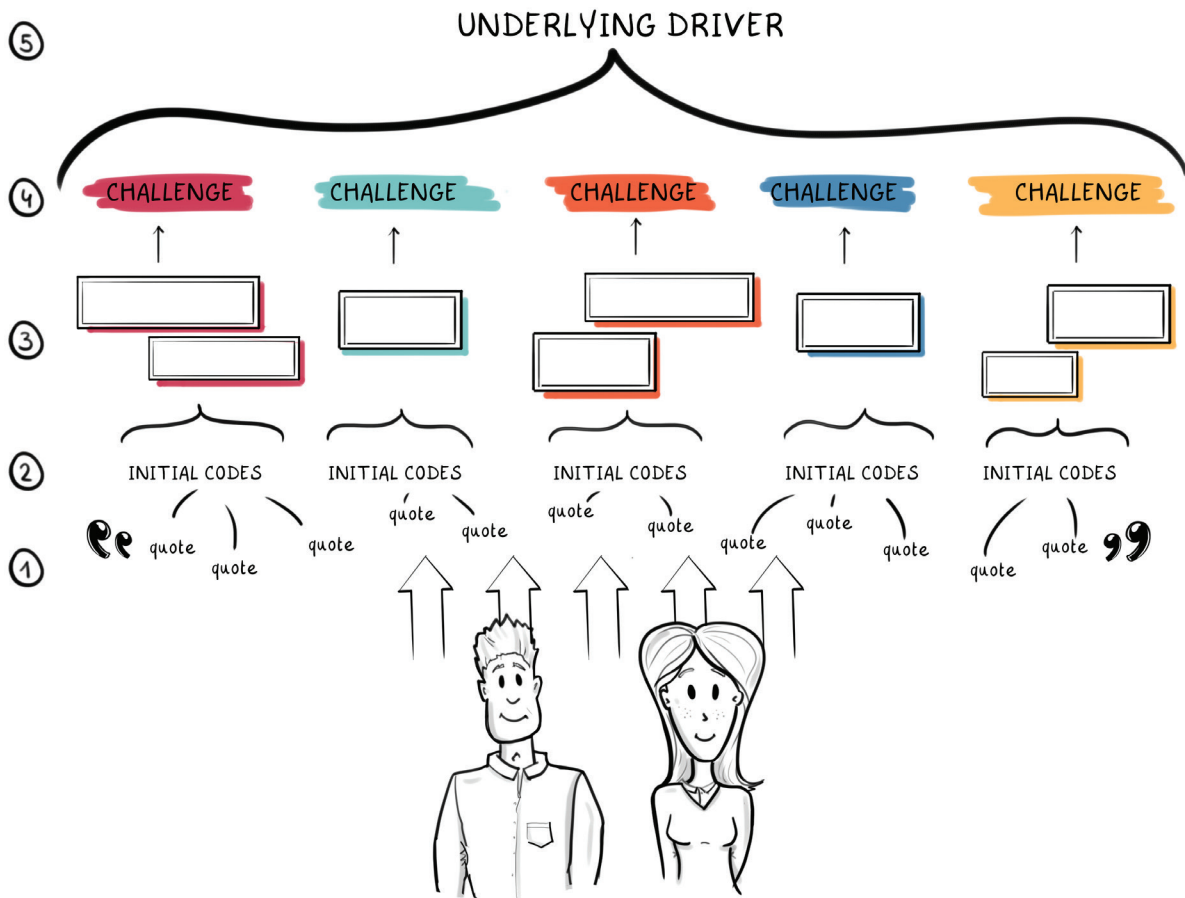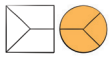
Figure 4.2 Analysis of the interviews in five steps

Note: All quoted outputs are translated from the Dutch transcript but remain within quotations marks to indicate as such. The insights from participants that did not give permission to be quoted, are used in the paraphrasing of the identified challenges.

4.2 Challenges

The problem areas identified in the interviews were synthesised to get a concrete idea of the challenges that drive the collaboration with X!Delft. In order to make them easy to use in day to day business, they were formulated using five 'F's': FOMO, FUTURE, FLOW, FAMILY & FUN.

FOMO

"How can we [spot] underlying trends or underlying currents in science that we as a company cannot yet see?" (P7)

Companies experience a 'fear of missing out' when seeking to identify the value that existing and emerging technologies could bring to their business, today and in the future.

In essence, this question is a technology push[1], asking where technology is headed and how it will relate to their company, today or in the future. As one of the most renowned technical universities, this is one of the reasons companies find it appealing to collaborate with TU Delft. A university has a broad range of expertise and is always on the lookout for long-term technology.

---

1   Technology push is when development and research of new technology takes place before there is consumer demand for a product. A market pull occurs when product ideas are produced in response to market forces or customer needs. (BBC, 2019)

Through partnerships, partner companies step in earlier in the development process of new technologies and knowledge. They expect X!Delft to link a broad array of technological developments happening in TU Delft to their business, to set up experiments for new business. Exploring what value TU Delft can bring to partners in different ways, thus proves to be a benefit of X!Delft all partners recognise.

FUTURE

One of the core issues in innovating is balancing the need to generate business today, with preparing for the business opportunities and challenges of tomorrow. "Companies are often judged on short-term results, which is in conflict with innovation." (P10) Innovations for the long run are difficult to work into a system of KPI's that are formulated for short-term returns. "If we have different metrics/KPI's for innovations on horizon one, two and three*. That's a very good question. No, we do not." (P7)

*The Three Horizons of Growth model by McKinsey, in which innovation efforts are divided into three horizons. Horizon one represents innovations around the core business, where the focus is on improving performance. Horizon two encompasses emerging opportunities, and horizon three contains ideas for profitable growth in the further future (McKinsey, 2009).

Innovating is therefore aimed at two levels: "what does the customer need today and secondly speculating on how society is changing, what are its needs?" (P5). This need to act today to solve future challenges is ever more important, as the world is changing quickly and "you can't do the same thing for ten years and it will be okay, no, in a few years the world and your business model will be different. You will need to use a lot more of your resources to respond to that." (P10).

Investing in a partnership with X!Delft addresses this, as the focus on long-term research makes a university well-suited as a partner to prepare for the future: "at a university, there is often way more fundamental research conducted. So from the partnership with X!Delft I mainly expect way more inspiration on horizon three." (P7)

In contrast to the FOMO challenge, the FUTURE challenge focuses on the changing needs of customers and society as a whole. The underlying belief is that technology could play a role in responding to these needs. This is a market pull, where underdeveloped technology is accelerated to meet market needs.

FLOW

This is a challenge about internalising new technologies, whether as product/service innovations or as part of a new process. Integrating innovation is complicated by culture, processes and internal structures, restricting innovation more often than facilitating it. At TU Delft, they can experiment with new ways of innovating, gaining a new perspective on possible alternatives for their ways of working.

"It's mainly the process that isn't working." (P4) One of the main issues of the standard innovation processes partners use, is that they don't include user validation until a very late stage or that development times outlast the validity of the user tests performed. "Because our trajectories take quite long, you notice naturally that at a given time our project becomes more internally focused and before you know it is one year later, and the world around us has changed and you still don't know whether the project is going to succeed or fail." (P5)

To counter these issues, companies set up experiments to validate the riskiest assumptions. This early validation approach is currently still far from a standard reality: it is "always the same story: [a product is] taken into production too quickly." (P3) Developing ideas into complete propositions to put on the market is one of the fundamental challenges of innovating. (Conversation between P3 and P4) "The ideas are there" "Yes, but they are all a bit mediocre" "Do you expect product developments then?" Some of the processes, especially the creative approaches, are not organised to facilitate implementation steps ("It is a bit of a valley of death" – P4).

Implementing new ways of working to create an innovative company "is also a culture change. We have a lot of visions and mission statements
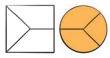
about being consumer-centric, but in the basis, we still have a culture in which we formulate it [the problem and requirements] ourselves: this is the target group and innovations must comply with this." (P2)

It is thus quite a change to adopt a new way of working as a company, and companies have different approaches towards it. While some go for an entire restructuring to become more agile, others set up an innovation lab, and leave it up to the individual initiative of employees to make use of the facilities and tools offered there. "They are free to do it, but they have to arrange it themselves with their managers." (P3; P7) However, this innovation lab structure has its drawbacks, too. "Ideation with people from the company only does not yield creative ideas. People are in their own reality, a horizon one reality." (P7) The ideas developed are not always high enough in quality, and if they are, it is hard to develop them further into market-ready solutions.

FAMILY

As mentioned before, partners realise that ideation with internal people only does not yield creative ideas. Therefore, partnerships are generally found useful to "make sure we also keep doing external things, and then we keep that external focus". Especially "where the innovation team is very small, it is nice to have a partner to which you can go to with your innovation questions. Who can think along,

has extra resources at their disposal, but also knowledge and expertise." An essential step in setting up the partnership is thus to identify how the strengths of TU Delft could contribute to the strategic challenges companies experience: "[We proceed with the partnership] if we first have clarity on whether the strengths of the different faculties of TU Delft are in line with what we think the strategic challenges are in the coming years for our company in particular, that we think we should tackle with external innovation." (P2) Partnerships thus allow companies to stay true to its core while keeping up with changes by attaching partners with relevant expertise.

The appeal of an ecosystem where both companies and academics are able to provide a fresh pair of eyes is thus apparent; a 'family' can help to tackle some of the challenges in a company's 'flow'. In accordance with interviewee comments, such a 'family' would be particularly well-suited to tackle innovation issues shared by other X!Delft partners. One of those is the implementation of new ways of working, such as Design Thinking. "I am interested, but you know, if you start talking about it internally in companies such as ours, you often come across certain barriers, and that is not only true for our industry."(P5) Not only did interviewees mention there might be individual problems other partners recognise, but also that there might be opportunities to respond to shared, societal issues: "How can we, bluntly said, decrease the carbon footprint of the Dutch market."(P7)

FUN

Relating to the human aspect of excitement for novelty and discovery, this search for a pleasant innovation journey is closely linked to the new way of collaborating X!Delft propagates. Partners find it challenging to balance safeguarding results, with stimulating excitement and engagement in innovation projects, e.g. through an innovation lab. "If you say that everything is possible here, then people will do it just for fun and we don't want that. But if they are intrinsically motivated to start a project, and they have arranged with their boss to get the time off, then they already went through a long internal process and really want to do this." (P3) Alternatively, employees might be granted autonomy in the undertaking of new innovation projects: "I only ask them some critical questions, because actually, we want to capitalise on the fact that people are enthusiastic and want to experiment." (P1)

KEY INSIGHT
Although partners express that they want to seize "the opportunity to do it [innovating] together with all companies affiliated with X!Delft", they only research whether the strengths and focus areas of TU Delft itself match theirs, instead of building on the entire ecosystem – which is the original aim of the X!Delft initiative. Thus, the main focus is still on gaining access to the TU Delft ecosystem, and especially its students. The desire to attract talent stems from the realisation that rapid technological developments will impact their business, and companies will need new skills to respond to these changes.
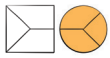
SHORT SUMMARY

During the interviews, five innovation challenges were identified (Figure 4.3).

While the acceleration of emerging technologies, results in a 'fear of the unknown' and even a 'FOMO', the interesting part is the human excitement that comes along with it (FUN).
The accelerated development of technology brings along **high levels of uncertainty** about the future. Thus, an ecosystem built around a university is a logical partner in addressing this uncertainty, as its research focus makes the university FUTURE-focused.

Although companies might feel resistance towards change, humans enjoy discovering and exploring new solutions. X!Delft is an excellent party to bridge this excitement and anxiety, as their access to a TU Delft combined with their strong business knowledge through the collaboration with Roland Berger, enables them to focus on a learning and exciting innovation process that yields business opportunities.

Not only does X!Delft connect companies to the university, but they also allow for cross-partner collaboration. This is desirable as the overarching belief is that accelerated technology brings challenges that are shared across industries. Close collaboration might help to resolve internal issues with FLOW, through sharing experiences and experimenting with different ways of innovation in the partnership with X!Delft. Therefore, the ecosystem should be optimised to enable partners to learn with and from each other (FAMILY).

FOMO
"How can we (spot) underlying trends or currents in science that we as a company can not yet see?"

FUTURE
"You can't do the same thing for ten years and it will be okay, no, in a few years the world will look differently and your business model will be different."

FLOW
"It's mainly the process that isn't working."

FAMILY
"the opportunity to do it (innovating) together with all companies affiliated with X!Delft"

FUN
"I like creating new things, and I also like to see other people creating that get energy from it"

Figure 4.3 The five challenges with interviewee quotes by way of illustration

4.3 It's a matter of Suspense

When observing the interview findings, the 'uncertainty' implied in the literature - as a result of rapid technological change - can be identified across the challenges. Uncertainty then pertains to which technologies are being developed (FOMO), the value they could add to their business in the FUTURE– and how these technologies could be integrated into their organisation (FLOW).

However, as there is an element of excitement in this uncertainty, I introduce the term *'suspense'* in this context.

Suspense can be defined as "a state or feeling of excited or anxious uncertainty about what may happen (Oxford University Press, 2019), capturing the interesting tension between the anxiety and excitement that uncertainty brings.

The five challenges mentioned above are then regarded as manifestations of this underlying suspense. FOMO, FUN and FUTURE generate suspense, while FLOW and FAMILY can hinder or facilitate successful management of suspense. (Figure 4.4) The concept 'suspense' and its relation to the five challenges will be further elaborated in Chapter 5.

FOMO   FUTURE   FLOW   FAMILY   FUN

SUSPENSE
'a feeling or state of excited or anxious uncertainty about what may happen'
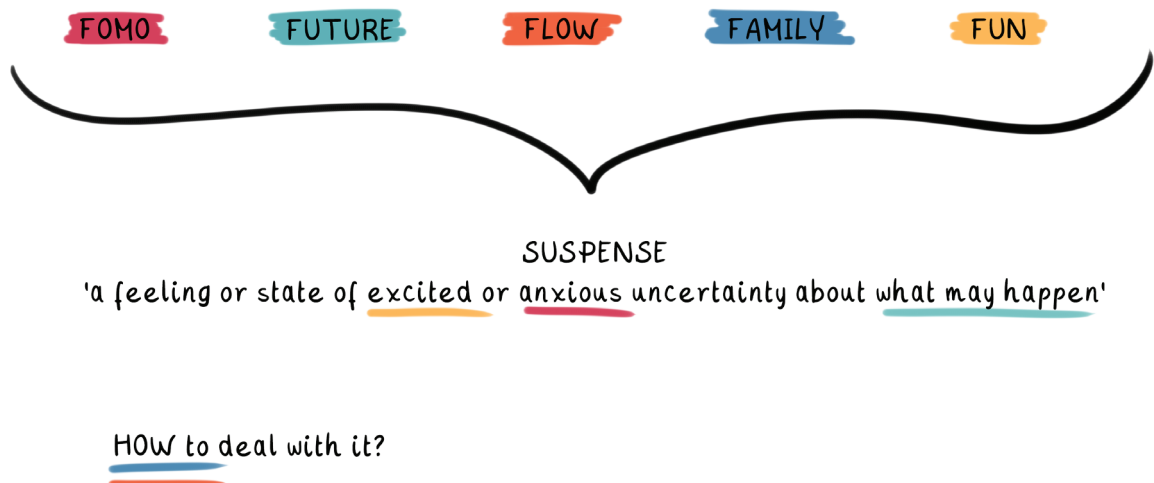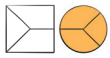
HOW to deal with it?

Figure 4.4 The 5 F's in suspense

4.4 Validating the findings

The five identified innovation challenges and the underlying driver 'suspense' were validated with X!Delft employees and partners. The validation was done in three different steps (see Figure 4.5).

(1) **Validating the problem areas** in a creative session with X!Delft employees, to see which problem areas they identify independently of the interview findings.

(2) **Validating the five challenges** through a creative session with the management team (MT) of X!Delft. This session started with a debrief of the interview findings, to which the management board reacted.

(3) **Validating the feeling of suspense**: A session with four partner companies was held in collaboration with the faculty of Industrial Design Engineering and two external professors, in which I had the opportunity to present my results and receive feedback.
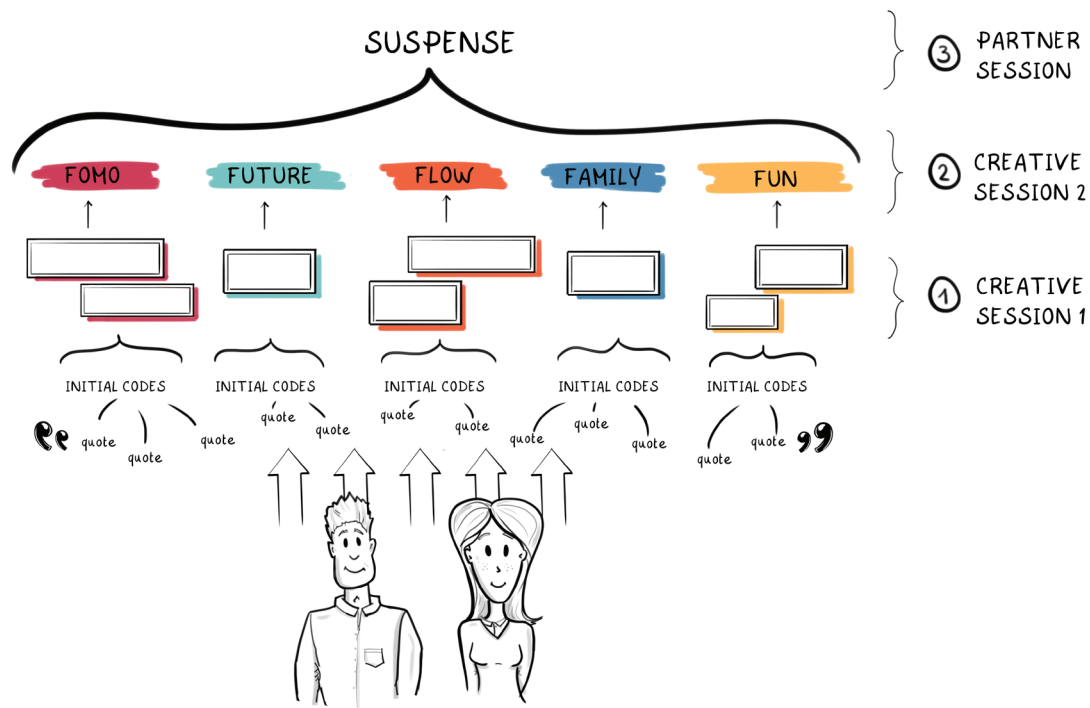

Figure 4.5 Validating the interview findings in three steps

Validating the problem areas

In a three-hour session with eight (X!Delft/ TU Delft) employees, innovation challenges of partners were identified – independent of the interview findings - and possible solution areas for X!Delft were briefly explored. The preparation and wrap-up of this session can be found in Appendix C.

Through different ideation exercises, participants were stimulated to empathise with partners and reflect on the innovation challenges partners face. In accordance with the interviews, the main identified issues were: the culture of 'measuring', implementation in innovation, attracting and retaining talent and the paradox of sticking to core strengths vs innovating.

Culture of measuring
X!Delft formulated it as a culture of measuring, in which innovation metrics are focused on short term results, resulting in a lower capacity for future-oriented innovation. Although companies tend to be 'buzzword activated', their processes focus on repeating success through structure and efficiency.

Implementation
Internalising an external proposition is a universal and fundamental problem in innovation. Because of lengthy and costly development processes, ideas can become too big to fail, and no one dares to take the initiative to take down the entire project.

Talent attraction and retention
Matching talent to companies is difficult because recent graduates might struggle to formulate what they are searching for in a job, and companies struggle to utilise their talent. In order to utilise talent, it is required to understand what is needed for the job, and how to evaluate whether graduates have the right qualifications. When new employees are overqualified, and their talent is not utilised, this can result in difficulties to retain them, while it makes it needlessly expensive for companies to hire them.
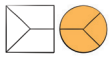
Core vs innovating
The paradox between staying true to one's core business, while also reinventing oneself to stay up to date, is a challenging endeavour, as it touches upon questions of corporate identity.

CONCLUSION
Across these identified challenges, an underlying commonality was found through guided discussions between employees. What came forward is the sense of *uncertainty, the unknown,* and how underlying systems are not organised in an agile way to deal with this. The different goals and needs have to be expressed in money to fit into the measurement culture, although most can't be expressed as monetary value when it comes to innovation.

Most interestingly, the main focus in this session stayed on problem areas related to FOMO, FUTURE and FLOW. FAMILY was briefly

mentioned, but the discussion was primarily concerned with talent attraction and retention. FUN was the most neglected, as no problems that surfaced related to this challenge. This is particularly striking as the explorative ways of collaborating through X!Delft lend themselves perfectly to address the challenge of finding a family and stimulating fun.

Validating the challenges

The second validation session took place after the synthesis of the interviews and the first creative session had been completed. It was organised for the management team (MT) of X!Delft. The two members who could not attend were briefed beforehand and gave input for the session. The preparation and results of the session can be found in Appendix D.

The presentation of the five innovation challenges sparked a rich discussion, in which the management team reflected on whether they recognised all five challenges in their partners. 'FOMO' and 'FUTURE' were regarded as universal, while 'FLOW', 'FUN' and 'FAMILY' are more specific for X!Delft partners. Although partners give different weight to each challenge, the management team could see how their partners relate to all five. They stated that it was easier to establish fruitful collaborations with partners that are clearly driven by all five: "Yesterday I had a conversation with a new potential partner, and I recognise them all. It makes organising the Discovery Day very easy."

Moreover, the presentation of the challenges made the MT reflect on how the services they offer relate to the innovation challenges. X!Delft's initial idea started out with an implicit idea of the FOMO and FUTURE challenge. For FOMO, X!Delft strongly relies on the knowledge and expertise of TU Delft. However, the focus has shifted more towards building a FAMILY, and the internal change that is needed to achieve this multi-partner collaboration. FUN is provided in the network events and through the way services are delivered. Lastly, FLOW is only taken into account when projects are not running smoothly, but not on a strategic level.

Validating the feeling of suspense

In collaboration with the faculty of IDE, a session was held about 'innovating the way we innovate'. In this session, eight employees from four partner companies were present. Through a presentation and interactive canvasses, feedback was collected on whether they related to the concept of suspense (See Appendix E).

The companies recognised suspense as an important driver of innovation (4,25/5), although the feeling of suspense in their company was perceived as slightly less noticeable (3,625/5). Some specified the difference between employees in innovation departments, and the employees focusing on the daily business. Moreover, if suspense is felt, the emotion of fear is sometimes stronger than the excitement,

especially for those not involved in innovation. Suspense is created by anticipating disruptive changes, impacting their internal processes. Amongst others, participants expressed digitisation, servitisation and attention to global challenges as important influencers of their company's future direction.

4.5 Towards a value proposition

The Customer Profile

The five challenges as described above can be interpreted as the pains and gains of partners 'innovating in suspense', to which X!Delft's value proposition must respond (Figure 4.6). Underlying each innovation challenge (pain), there is a wish for a solution (gain) and vice versa. Therefore, the distinction is made based on whether there is something 'wrong' (pain), or something 'missing' (wish). From these pains and gains, additional guidelines for the future value proposition can be deducted:

Figure 4.6 The Customer Profile: Jobs, Pains & Gains

Towards a fitting Value Map

In a strong value proposition, the service offering provides benefits that are linked to the jobs, pains, and gains of customers. X!Delft's services should thus be adapted to help partners deal with 'suspense' and its five manifestations. To understand what a suitable way is to deal with suspense, the concept is elaborated on in Chapter 5.

4.1 The concept helps partners to overcome 'fear of missing out'
4.2 The concept bridges today's innovation needs with those of tomorrow
4.3 The concept inspires partners to change their innovation processes
4.4 The concept increases the excitement for creative problem solving
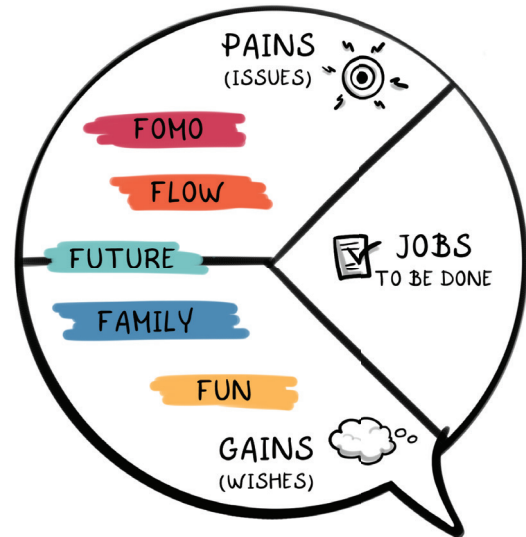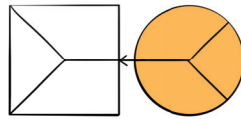4.5 The concept helps partners to deal with suspense

Suspense

In order to better understand how suspense arises, grows, and can be managed, a literature study was performed. In section 5.1, a closer look is taken at how suspense arises as discussed in the context of narratives (e.g. films or books). Section 5.2 addresses how to engage with suspense, through the study of the pragmatist inquiry and design principles. The takeaways for X!Delft's value proposition are then summarised in section 5.3.
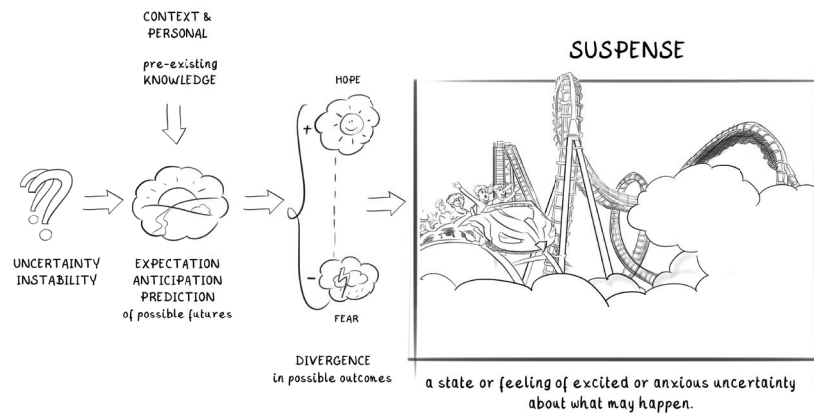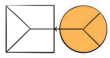
Figure 5.1 A general mechanism of suspense, adapted from (Lehne & Koelsch, 2015)

5.1 How suspense arises

In narrative plots, the creation of suspense is a literary technique aimed at generating **emotional engagement** in a story. Suspense is often generated by confronting the protagonist with a situation of conflict which potentially results in significant consequences for one of the characters (Lehne et al., 2015). By presenting a series of events and postponing the outcome, it creates a **desire for more information**. (Literary-Devices.com, 2019) The uncertainty regarding the outcome raises (implicit) questions about what may happen and thus triggers processes of **prediction and anticipation** (Lehne et al., 2015). In doing so, it contributes to the suspension of disbelief (Delatorre, León, Gervás, & Palomo-Duarte, 2017).

Although suspense is predominantly discussed in a field-dependent way in academic outlets (e.g. suspense in movies or suspense in books), Lehne & Koelsch (2015) have laid the foundations for a general psychological model/mechanism underlying suspense. Their framework (see Figure 5.1 above) describes a general process that offers valuable insights into how suspense arises.

Suspense[1] arises when an initiating event is presented, potentially leading to **significant consequences** (Lehne et al., 2015). When this 'initiating event' is perceived, predictions about possible futures are made based on pre-existing knowledge. As time evolves, events are constantly compared to the predictions made, which then are updated to anticipate new events.

Whether the future is expected to be positive or negative, depends on personal characteristics such as optimism, but also on the context of the individual. In case of a positive outlook, hope is experienced, while fear is the main emotion when developments in the future are seen as a threat. These emotions often co-exist as both positive and negative scenarios are possible. The divergence between the possible future scenarios and the significance of the anticipated effect contribute to the extent to which suspense is sensed (Lehne & Koelsch, 2015).

In relation to X!Delft, there are two significant differences suspense in narratives and that of partners. Firstly, the uncertain situation is **occurring naturally** because of accelerating technological change. Because it is not deliberately created by the writer of a narrative, it is less defined and constricted to a pre-existing frame – thus even increasing the possible outcomes.

Secondly, suspense in narratives is beneficial because it engages and immerses the reader in the story. Therefore, the main focus in literature is on suspense generation, while little attention is paid to managing suspense (from the perspective of the reader). This makes sense as the reader, although able to anticipate different future scenarios, has no influence on the occurrence of events. However, in the case of X!Delft, partners do not only experience suspense but have decided to act upon it instead of waiting for events to occur. In this instance, suspense has provided a strong **impulse to act** (Figure 5.2), preparing the organisations to react appropriately when the future arrives (Lehne & Koelsch, 2015).
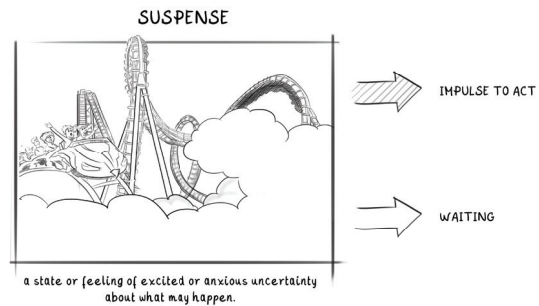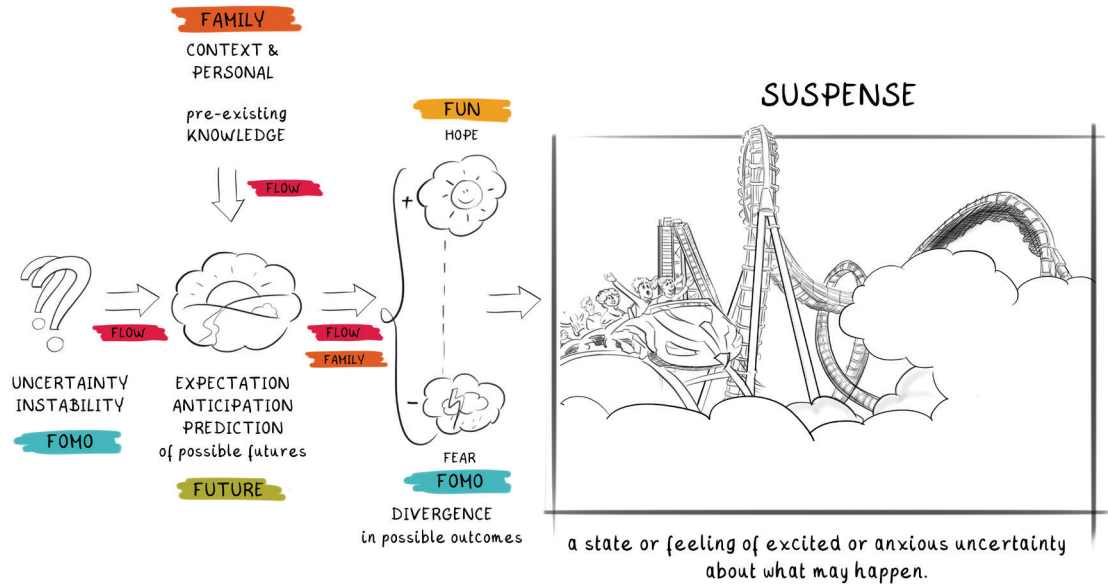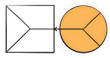

Figure 5.2 Suspense as an impulse to act

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1   Lehne & Koelsch (2015) present an underlying model for 'tension' and 'suspense'. They define suspense as a state in which two clearly opposed outcomes are anticipated, in contrast to 'tension' being a more diffuse state of anticipation. However, in the context of this graduation report, this distinction adds little value. In this report, the term suspense refers to a diffuse anticipation of a myriad of possible futures.

FAMILY
CONTEXT &
PERSONAL

pre-existing
KNOWLEDGE

FLOW

FUN
HOPE

+

?
?
?

FLOW

UNCERTAINTY
INSTABILITY

FOMO

EXPECTATION
ANTICIPATION
PREDICTION
of possible futures

FUTURE

FLOW
FAMILY

-

FEAR

FOMO

DIVERGENCE
in possible outcomes

SUSPENSE

a state or feeling of excited or anxious uncertainty
about what may happen.

Figure 5.3 Fitting the 5F's in the suspense framework as proposed by Lehne & Koelsch (2015)

Despite the differences between purposefully created and naturally occurring suspense, the psychological model correlates with how suspense is experienced as came forward in the five manifestations found in the interviews.This is visualised by integrating the five innovation challenges into the framework, as can be seen in Figure 5.3.

'Suspense' starts with a feeling of FOMO, which leads to asking questions about the FUTURE. This is exciting and FUN as well as nerve-wracking and makes companies want to look for ways to resolve this tension. This can be done by finding peers to accompany them on this journey as a FAMILY, to help each other out, as well as by finding ways to internalise coping mechanisms through the development of an appropriate FLOW.

5.2 Engaging with suspense

Suspense can be a source of excitement that is not easily experienced in equilibrium. When using suspense as an impulse to act, the resolution might result in a more favourable situation than the pre-suspense position (Lehne & Koelsch, 2015). Engaging with suspense can be unpleasant because it is "often associated with situations in which an individual's model of the world (i.e. previous knowledge and expectations) is challenged, providing an environment for learning in which the model of the world is expanded" (Lehne & Koelsch, 2015).

> Acting upon suspense elicits an *exciting learning process* leading to novel opportunities for resolution. Thus, the goal is not to eliminate suspense, but to cultivate what I call *effective* suspense.

Effective suspense

I consider suspense to be effective when it incentivises companies to engage in a learning process in order to find a resolution to the initial uncertainty. To trigger this continuous exploration and learning, a base level of *general* suspense should be sustained. General suspense is here defined as the overall feeling stemming from the acceleration and the increased complexity of technological change. However,

through exploration and learning, *thematic* suspense, revolving around a specific topic, will decrease. Over time, learnings are accumulated on this specific topic, uncovering opportunities for resolution (Figure 5.4).
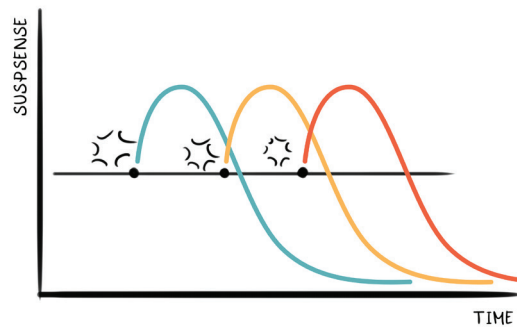

Figure 5.4 Through the exploration of general suspense, specific topics surface, starting a subprocess in which the thematic suspense is resolved.

My hypothesis states that, throughout the learning process, the level of suspense will vary based on where the participant is situated in the stages of competence as described by Noel Burch (unconscious incompetence, conscious incompetence, conscious competence and lastly unconscious competence). This is similar to the Dunning-Kruger effect, explaining how one reaches a peak of confidence when in the first stage of competence ('Mount Stupid'), which is followed by a complete lack of confidence in the 'Valley of Despair'. The assumption here is that when confidence is low, suspense is high. The correlation between the stages of competence and the sense of suspense is visualised in Figure 5.5.
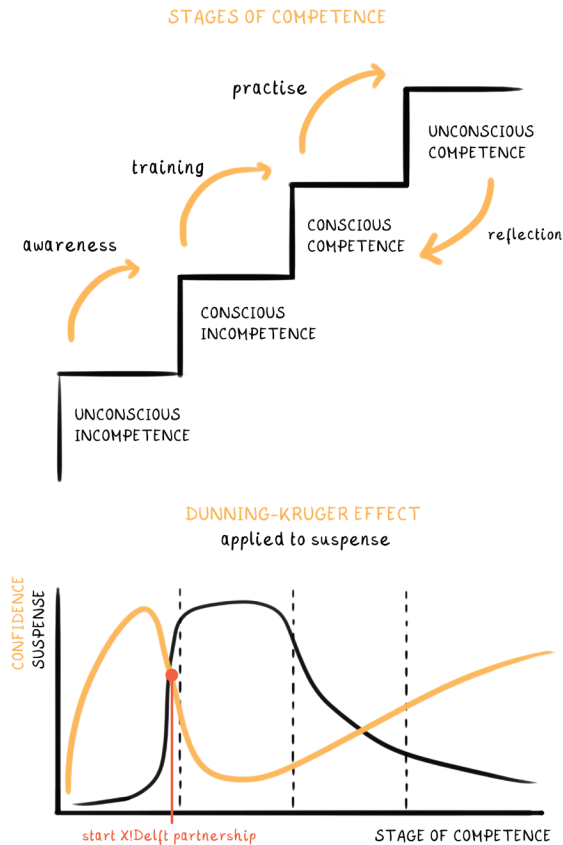
Figure 5.5 The correlation between the stage of
competence and the suspense felt

The starting point of the collaboration with X!Delft is at the end of the first stage, when awareness about ignorance on technological changes is starting to rise. In order to proceed in the learning process, awareness needs to be increased about the incompetence, followed by training to create competence and lastly repeated practice is necessary to reach the last stage.

The desired level of competence (and the intensity of the thematic suspense) will depend on how closely related the topic is to a company's core business. On some themes, companies could choose to stop when they reach a level of conscious incompetence, enabling them to understand what knowledge they need to acquire (through hiring/partnerships) in order to deal with new technology. In other areas, they might need to become experts because it is closely related to their business. They then choose to not only be aware of the level of competence they have, but to get training and practice in order to internalise the technology for application purposes.

In order to understand how to move between these stages, starting from an uncertain situation and arriving at a resolution, a closer look was taken at the pragmatist inquiry and design practices. Both describe processes that are exploratory in nature, deal with uncertain situations with many loose elements of which one has to make sense, and aim to arrive at a resolution in which these loose elements are unified.
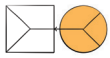
The pragmatist inquiry

AN INTRODUCTION TO PRAGMATISM

Pragmatism is a philosophical tradition in which **practice and theory** are conceived to be inseparable. This core belief is interpreted in many ways, including that all theoretical concepts should be tested via **scientific experimentation** (Stanford Encyclopedia of Philosophy, 2008). Pragmatism emerged in the United States around 1870. Its key ideas sprouted at the 'Metaphysical Club' at Harvard and were further developed by Charles Sanders Peirce, who first defined and defended pragmatism. Together with other philosophers such as William James and John Dewey - also referred to as the 'classical pragmatists', the tradition grew and diversified (ibid). Since 1970, pragmatism is gaining popularity again and is reinterpreted by philosophers, as well as linked to **organisational theory** by, amongst others, Philippe Lorino and Barbara Simpson.

Pragmatists describe a process starting with an indeterminate or doubtful situation which prompts an inquiry to come to a belief. This can be compared to the steps in suspense literature by Lehne & Koelsch (2015). While suspense focuses more on the predictions made when uncertainty is perceived, pragmatism focuses more on the inquiry (see Figure 5.6).

This inquiry is a knowledge-seeking endeavour and is exploratory in nature (Stanford Encyclopedia of Philosophy, 2008). Starting from an indeterminate situation in which the different elements that are perceived seem unrelated, an inquiry begins in order to arrive at a determined situation, converting the loose elements of the indeterminate situation into a unified whole (Stanford Encyclopedia of Philosophy, 2008; Lorino, 2018).
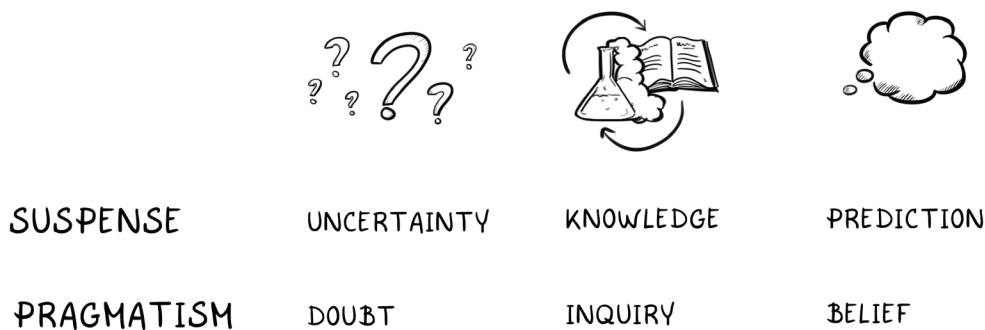
SUSPENSE   UNCERTAINTY   KNOWLEDGE   PREDICTION

PRAGMATISM   DOUBT   INQUIRY   BELIEF

Figure 5.6 Suspense literature and pragmatism superimposed

Inquiring is a collective and social endeavour, carried out by a 'community of inquiry'. All actors that are significantly concerned by a given inquiry should take part in it, to frame the situation, and agree on the subsequent course of action. As the inquiry progresses, new issues are covered, requiring participation of additional actors. Thus, new actors step in to tackle emerging issues and express fresh points of view (Lorino, 2018).

The inquiry consists of different phases: problematising, hypothesis building, reasoning, experimenting, and analysing experience feedback. Whereas the literature on suspense focuses mainly on the first two of these phases, the last ones might be of interest in the light of dealing with suspense, as they align as previously shown in Figure 5.6.

For X!Delft, this would mean that attention is paid to untangling a situation full of loose elements, to crystallise a problem about which a hypothesis is formed. This hypothesis is tested by combining the focus on reasoning and research of the university with the practice-oriented industry partners in the X!Delft ecosystem. Then, through reflection on the learnings of experiments and developed theory, the hypothesis is updated in order to improve the predictions made.

Ignorance management in the inquiry

Innovation processes are inherently uncertain, as one is trying to come up with an, as of yet, unknown solution to a complex problem. This uncertainty is often seen as a significant risk; hence companies try to decrease this risk as soon as possible through 'knowledge management'. However, this gathered knowledge for innovation is often too focused and results in knowledge silo's (Simpson, personal communications, 2019). Therefore, Simpson suggests focusing instead on '*ignorance management*'. Here, ignorance is seen as an opportunity to innovate.

If ignorance is seen as an 'invitation to innovate', it breaks down knowledge silos by creating a common denominator: the realisation that 'there is something we don't know yet' (Figure 5.7).
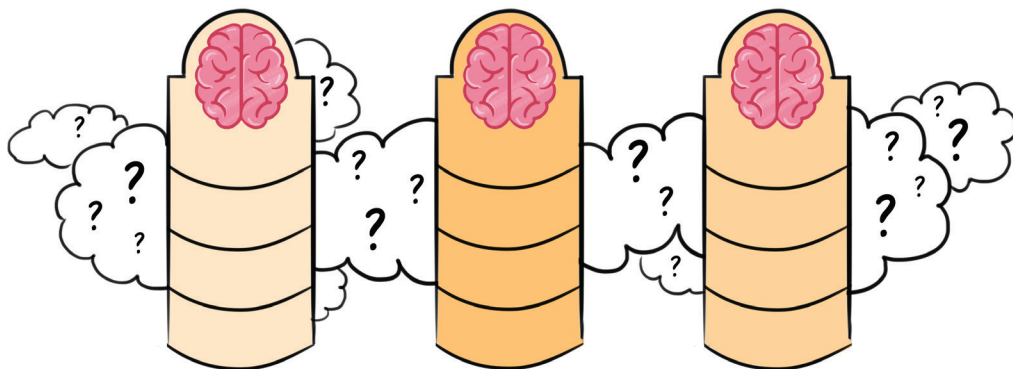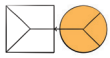

Figure 5.7 Ignorance connecting all knowledge silo's

Shifting towards this mindset of 'ignorance management', requires *collaborative leadership*. Simpson and Buchan (2018) present three actions that are necessary to achieve collaborative leadership: dialogue, improvisation, and daring.

Dialogue

Dialogue is a conversational process, but it is much more than conventional conversation or discussion, in which actors defend their opinion or want the 'opponent' to adopt a certain belief. Empathy enables the initiation of a generative process of collaborative leadership, in which new insights emerge. Through **generative dialogue**, we come to appreciate alternative perspectives on the world that then allow us to make different choices (Simpson & Buchan, 2018).

Improvisation

Improvisation is a creative process, which makes something new out of what already exists by seeing previously unanticipated connections that invite new ways of acting in the present situation (Simpson & Buchan, 2018). It is a social accomplishment that arises within dialogue when people build on each other's ideas in a constructive way.

Daring

Innovating for an uncertain future inevitably involves risk-taking. Organisational structures and processes, however, aim to avoid uncertainty and risk. Collaborative leadership challenges these uncertainty-reduction mechanisms, calling instead for a more enabling environment that learns from risk-taking and celebrates mistakes (Simpson & Buchan, 2018).

Design & suspense: a creative inquiry

Design can be linked to all three phases in suspense as defined in suspense literature and pragmatist inquiry. In literature, it is described as an apt way to deal with uncertainty and ambiguity, as a creative inquiry and as future framing. Thus, for all these three phases, it will be discussed how design can contribute (see Figure 5.8).

Uncertainty & ambiguity

"I think it works especially well if you have little knowledge about or little feeling for the solution, then it's just a very nice way to go through it" (P11).

The increasing popularity of the Design Thinking approach "is, in large part, a response to the increasing complexity of modern technology and modern business" (Kolko, 2015). In order to deal with this complexity, people need to be able to find meaning in seemingly disconnected and dynamic elements. This creation of meaning
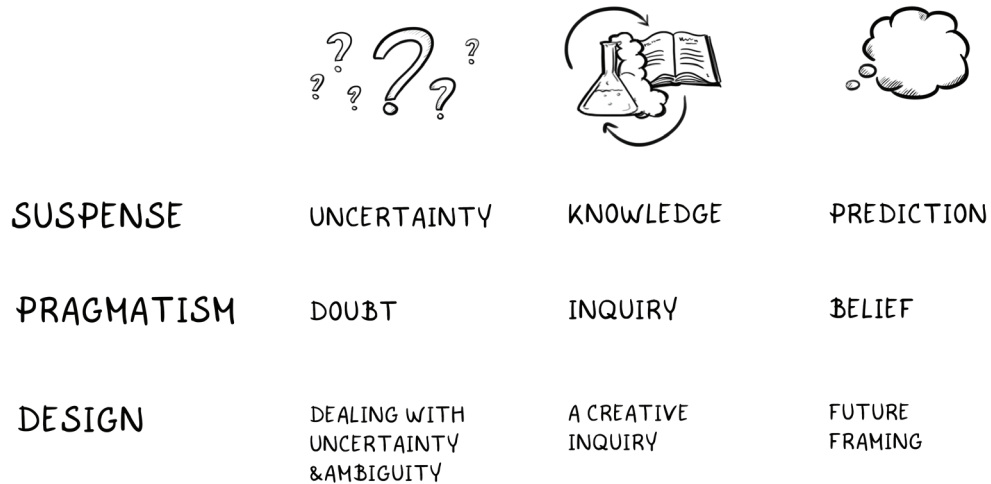
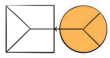|			
SUSPENSE	UNCERTAINTY	KNOWLEDGE	PREDICTION
PRAGMATISM	DOUBT	INQUIRY	BELIEF
DESIGN	DEALING WITH UNCERTAINTY &AMBIGUITY	A CREATIVE INQUIRY	FUTURE FRAMING

Figure 5.8 Design and how suspense arises

in uncertain and ambiguous situations is at the core of designing. The term 'design' originates from the Latin de + signare, meaning 'making something' or 'giving it significance' and can thus be interpreted as sense-making (Krippendorff, 1989). As open, complex problems have for a long time been the starting point of design processes, elaborate design practices have been developed to deal with uncertain situations (Dorst, 2011).

This makes design highly applicable to innovation processes, as these require to deal with uncertainty and ignorance (Carlgren, 2013), accepting more ambiguity and embracing risk (Kolko, 2015).

In dealing with open-ended problems, boundaries and constraint are valuable as they give orientation and direction to the creative process (Buchanan, 1992; van der Vorst, personal communications, July 19, 2019).

Future framing

In order to create a novel future direction for the uncertain situation at hand, the sensemaking as described above, is combined with 'future framing'. A 'frame' consists of a synthesis of the perceived problem and adopts new concepts that underpin the key thesis for the solution (Dorst, 2011). The process of making these frames is a cross-disciplinary activity aimed at creating a shared perspective on how to proceed (Stompff, Smulders, & Henze, 2016). By reinterpreting the problem at hand, opportunities are created to arrive at novel solutions. After establishing a frame, participants explore and reflect on the expected outcome, hence initiating an inquiry. This inquiry revolves around the solution as well as the problem: the problem is not fixed before a solution is found, but a co-evolution takes place with constant iteration to come up with the problem and the solution space (Dorst & Cross, 2001).

A creative inquiry

Design Thinking can also refer to 'Creative Inquiry', (Buchanan, 2015), in which central questions are asked and answered through analysis (**discovery**) and synthesis (**invention**) (Beckman & Barry, 2007; Owen, 1998), similar to the pragmatist inquiry of reasoning and experimentation. While designing, one moves between these two spaces by translating practical learnings into abstract ideas and then concretising them to artefacts (e.g. products, services or business models). Reflective practice is necessary in order to move between these spaces and move forward in the design process.

As the act of designing consists of exploring both **problem and solution**, the creativity needed is not solely aimed at discovery, as in science, but also at invention. Inventive creativity requires a broad knowledge base, as this generates inspiration (Owen, 2006).

5.3 Towards a value proposition

The predictions made after an initiating situation is perceived as described in the suspense literature, is comparable to what pragmatists call moving from 'doubt' to 'belief'. Pragmatism describes how these beliefs can be made more accurate through venturing into an explorative inquiry in which theory and practice are combined. This approach shows many similarities to the design process, in which uncertainty and future-directed problems are

tackled. The balance between reasoning and experimenting in order to come to a justifiable belief is particularly useful for X!Delft in order to bridge the academic desire for fundamental research (reasoning) and industry's wish for concrete results (experimentation). In order to successfully bridge these two worlds, it is of concern to actively stimulate 'generative dialogue', while creating an understanding that the X!Delft partnership entails improvisation – which requires courage. Partners have to be prepared to deal with unknowns and uncertainty, and treat this as an opportunity to innovate and learn.

From the suspense, pragmatist and design literature, a few guidelines for the value proposition concept can thus be extracted:

5.1 The concept cultivates *effective* suspense

5.2 The concept helps partners to move from 'uncertainty' to a plausible 'future'

5.3 The concept facilitates a creative inquiry combining experimentation & reasoning

5.4 The concept encourages to treat 'ignorance' as an opportunity to innovate

5.5 The concept facilitates shared sensemaking through dialogue, improvisation & daring

5.6 The concept facilitates reflection in order to improve future predictions

SUMMARY PART I & II

The concept cultivates *effective* suspense

The guidelines, accumulated in the previous chapters, ensure that the refined value proposition are in line with X!Delft's own strategic intent (Chapter 2), distuingishes them from other UICs to make their offering unique (Chapter 3) and provides the right fit with the underlying needs of partners (Chapter 4).
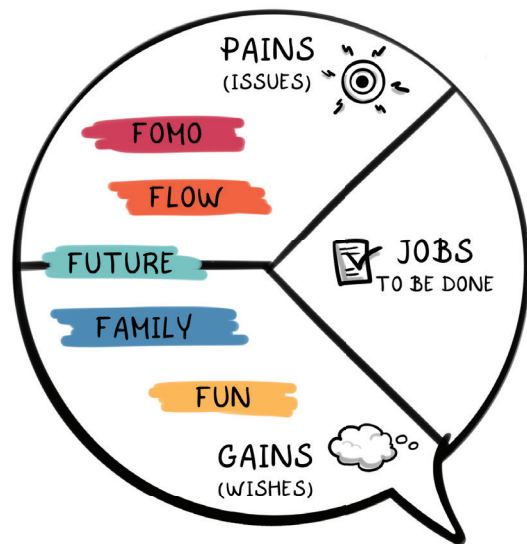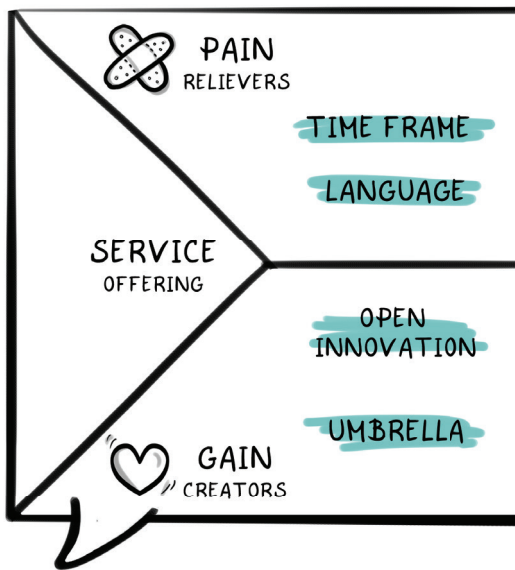
2.1 The concept appeals to an emotional need.
2.2 The concept stimulates cross-partner collaboration.
2.3 The concept stimulates experimentation
2.4 The concept helps to bridge the horizon gap between TU Delft and partners

3.1 The concept stimulates knowledge creation
3.2 The concept helps to uncover interesting projects after the partnership is established.
3.3 The concept connects multiple companies to create an ecosystem

4.1 The concept helps partners to overcome 'fear of missing out'
4.2 The concept bridges today's innovation needs with those of tomorrow
4.3 The concept inspires partners to change their innovation processes
4.4 The concept increases the excitement for creative problem solving
4.5 The concept helps partners to deal with suspense

5.1 – 5.6 See guidelines on the left page
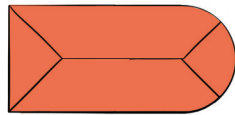
PAIN
RELIEVERS

P-S
OFFERING

GAIN
CREATORS

PAINS
(ISSUES)

JOBS
TO BE DONE

GAINS
(WISHES)

PART III

The Value Proposition

Cultivating effective suspense

X!Delft's PACES approach creates innovation potential with and for the innovation ecosystem, through the cultivation of effective suspense.

In this chapter, a value proposition for X!Delft is presented, based on the guidelines summarised before. By adapting X!Delft's Value Map to cultivate effective suspense, a fit is created with the Customer Profile. This is achieved by designing a process built on the insights from the general framework provided by Lehne & Koelsch (2015), the pragmatist principle of inquiry and the design principles of dealing with ambiguity and future-focused projects. The process defines the basis for X!Delft's value proposition, as it provides the framework to structure and expand its service offering. A first step is made to create services complementing X!Delft's current offering. To summarise, the Value Proposition Canvas is filled in with the refined value proposition, showing how X!Delft's services provide the pain relievers and gain creators that respond to partners' needs.
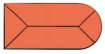
6.1 Towards a process to cultivate effective suspense

Cultivating suspense

By combining the theories discussed in Chapter 5, a few steps can be identified that can be used to create a process for suspense cultivation (summarised in Figure 6.1): perception, predicting, inquiring and resolving.

The suspense literature, the pragmatist inquiry and the design principles discussed thus far explain how to move between these phases. After observing an uncertain situation, pre-existing knowledge is consulted to generate predictions. In order to start an inquiry based on the prediction, a translation step is necessary, in which the future prediction is made actionable and relevant for the role a company wants to play, as formulated by Roland van der Vorst:

When dealing with grand challenges that you see for the future "you have to translate that what you think is important in the future, to what it means for today." Mobility is needed between two sub-optimal perspectives: rear-view mirror thinking, and the telescope principle. One pulls it too far into the past, and the other pulls it too far into the future, so you cannot achieve relevance for today. By shifting between them, the gap between today and the future can be bridged. A strategy needs to be created that anticipates a role that you see for your company in the future. In creating a strategy, it is crucial to not only take into account major developments within relevant domains for your business but also to indicate a role. And that role sorts on the distant future, but at the same time, a proper role can give you the opportunity to change your behaviour today (van der Vorst, personal communications, July 19, 2019).

Lastly, the iterative process of experimenting, reasoning and reflecting enables the re-framing of the future prediction, until a resolution is attained.
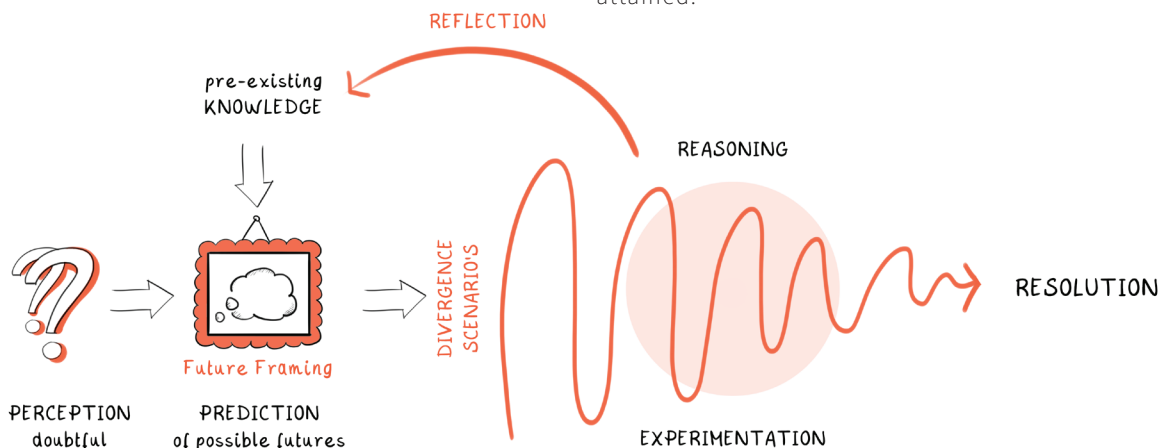

Figure 6.1 Steps distilled from combining of suspense theory, the pragmatist inquiry and design practices
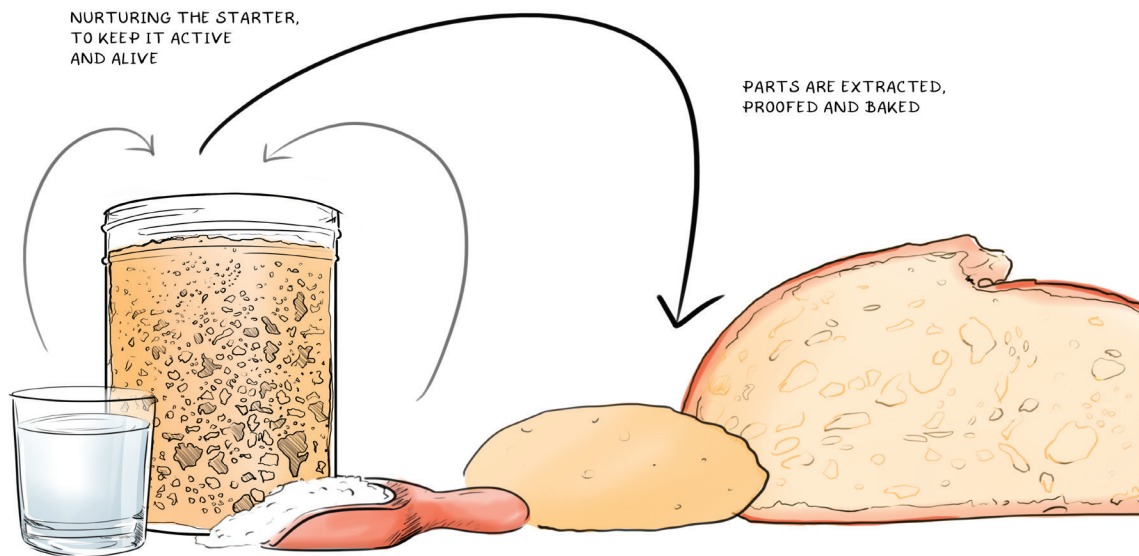
NURTURING THE STARTER,
TO KEEP IT ACTIVE
AND ALIVE

PARTS ARE EXTRACTED,
PROOFED AND BAKED

Figure 6.2 The sourdough starter as a source for new loaves of bread
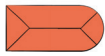
Cultivating effective suspense

In the previous section, a start is made in creating a process that deals with suspense. However, for suspense to be *effective*, general suspense needs to be sustained (so engagement in the process is maintained), while thematic suspense is decreased (to arrive at new solutions). In order to visualise the interplay between general and thematic suspense, suspense cultivation is compared to the making of sourdough bread, for which a starter is sustained in order to cultivate the basis for bread (Figure 6.2).

Just like a sourdough starter, general suspense needs continuous nurturing in order to stay active and alive. If a sourdough starter is kept well-fed, then it will keep providing the base for new loaves of bread. Similarly, if general suspense is sustained, it will keep partners engaged and eager to participate in learning processes.

Through exploration in the learning process, partners will discover themes that are of potential value for their companies. They then enter a proofing process in which the theme is developed further into (opportunities for) innovations. In an iterative process, they work on the theme, then take a step back to let it rest, and decide on the next steps. Multiple themes can be explored simultaneously, and some might be discarded if they do not show enough potential.

Thus, the steps as identified when combining literature, cultivate *effective* suspense when
- There is a **continuous** perception of uncertain situations, providing the input needed to incentivise a learning process.
- From this broad perception, **specific themes** are distracted, for which the suspense is decreased through a creative inquiry.

6.2 Putting partners through their PACES

PACES

Preserving And Cultivating Effective Suspense

PERCEIVE · PERSPECTIVE · PREDICT · PARAPHRASE · PROBE · PROVE
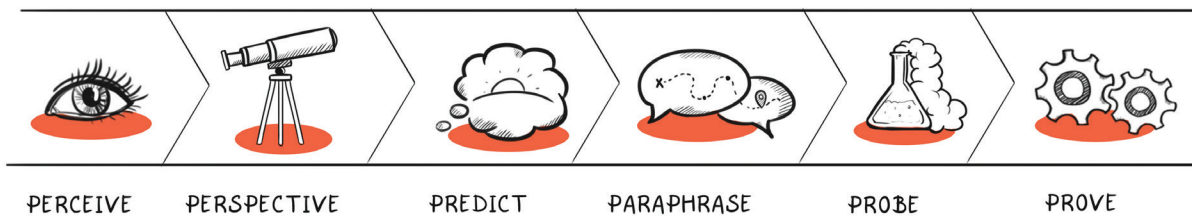
Figure 6.3 The six overlapping stages in the process to cultivate effective suspense

The proposed process to Preserve And Cultivate Effective Suspense (PACES), consists of six overlapping phases (see Figure 6.3). PACES can be carried out at the general level of suspense, to identify interesting topics, as well as at the level of thematic suspense, to distil innovation opportunities. The first three steps focus on gathering **input** into the ecosystem's shared knowledge base, while the last three focus on the **output** towards innovations. By reflecting on the output, new input is given to the ecosystem. Together, the six steps cultivate *effective* suspense.

Note: The phases are presented in a linear fashion for the sake of the narrative. However, activities from different phases will be carried out in parallel, but with a shifting focus.

In order to evaluate how PACES provides the required benefits for partners, that are unique in comparison to other UICs and in line with X!Delft strategic intent, the guidelines for the concept that came forward throughout this report, are restated where the proposition addresses them.

2.1 The concept appeals to an emotional need.

4.5 The concept helps partners to deal with suspense

5.1 The concept cultivates *effective* suspense

Perceive

In order to cultivate effective suspense, a combination of continuous perception and knowledge stimulation is crucial. Enlarging the knowledge base is necessary for inventive creativity, to generate inspiring and plausible future scenarios, and to boost confidence in an enterprise's capability to adequately react to the expected events. However, overconfidence decreases the tendency to stay open to new and less probable events, creating blind spots in which future events are not anticipated. Therefore, continuous perception is necessary to stay open to new perspectives and possibilities for the future.

X!Delft's ecosystem is an appropriate platform to offer this broad and continuous perception, as it connects academics, students, startups and industrialists in one network for innovation. This increases the amount of information that can be collected and decreases the fear of missing out ('FOMO').

4.1 The concept helps partners to overcome a 'fear of missing out'
5.4 The concept encourages to treat 'ignorance' as an opportunity to innovate
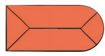
Perspective

Not only does the ecosystem increase the amount of information gathered, but also the different angles in which this information is perceived. To create meaningful predictions about the future, the perspective offered by outsiders is crucial. Through 'generative dialogue' (as described in chapter 5), blind spots are revealed, viewpoints are challenged, and beliefs can be updated.

This phase fits with X!Delft's core belief that the issues we face today and tomorrow are too complex to be solved individually. Different perspectives and expertise need to be combined to create an intelligent solution. To varying degrees, X!Delft partners express this desire to work together on grand challenges, as described in 'FAMILY'.

2.2 The concept stimulates cross-partner collaboration.
3.3 The concept connects multiple companies to create an ecosystem
5.5 The concept facilitates shared sensemaking through dialogue, improvisation & daring

Predict

After gathering multiple perspectives, future scenarios are generated. In these scenarios, partners voice expectations for the future, and by selecting and synthesising the information of different actors in the ecosystem, predictions are made on what the future might entail. In building future scenarios, the contribution of a university – with its long-term focus – is valuable.

Future-directed projects are built on high levels of uncertainty and ambiguity, which means multiple iterations need to be carried out to come up with relevant solutions. These projects can be short-term to create early tangible outcomes necessary to build trust and engagement from partners, whilst ensuring continuity because the future vision cannot be obtained in one step, and will eventually need a long-term commitment. Creating future scenarios thus helps to bridge the horizon gap between university and industry, and helps partners to prepare for the FUTURE.

2.4 The concept helps to bridge the horizon gap between TU Delft and partners
5.2 The concept helps partners to move from 'uncertainty' to a plausible 'future'


Paraphrase (position & path)

In these scenarios, multiple partners should co-exist in a meaningful way. It is important to know the strategic intent of each company to understand which role they want to play in the predicted future. From this **position**, the vision can then be translated into actionable directions (**paths)** consisting of multiple experiments that are testable and leave room for failing and learning.

Through backlogging (reasoning back from the future vision), actionable projects are set up, bringing the business of today one step closer to the one of tomorrow. It gives direction to innovation efforts and clarifies how the future vision relates to each company.

2.3 The concept stimulates experimentation
3.2 The concept helps to uncover interesting projects after the partnership is established.
4.2 The concept bridges today's innovation needs with those of tomorrow
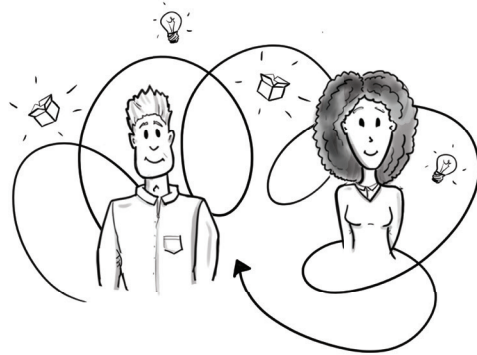
Probe

The defined projects are carried out in an explorative way to increase learning. Because many unknowns are still present in the future vision, the expectation is that some experiments will fail, creating the learnings necessary to set up improved experiments. Thus, it is important that the goal of the project is not formulated exclusively in terms of performance, but also in learnings accumulated over several experiments.

The diversity of resources hosted within the ecosystem can be keenly exploited in experimentation. By combining an academic focus on reasoning with the experimentation means available through collaboration with field labs or students, new conceptual and practical knowledge is obtained. Such knowledge can then be employed to reassess the predictions made beforehand. By experimenting in different ways within the ecosystem, the partners experience an alternative way of innovating, sparking excitement (FUN) and inspiration to change the FLOW of their organisational processes.

X!Delft has already experimented with different ways of collaboration, in which the partners can explore the TU Delft ecosystem. By extending the ecosystem to include multi-partner collaborations, even more possibilities for experimentation are created.

3.1 The concept stimulates knowledge creation
4.3 The concept inspires partners to change their innovation processes
4.4 The concept increases the excitement for creative problem solving
5.3 The concept facilitates a creative inquiry combining experimentation & reasoning
5.6 The concept facilitates reflection in order to improve future predictions

Prove

Lastly, learnings from the experiments yield opportunities for further development, such as PhDs, ventures or new field labs. This further development requires a long-term commitment and results in tangible innovation concepts, that can then be implemented by the company. In this phase, X!Delft is slowly retracting from the innovation process, giving the responsibility back to the partners to create viable innovations. Because of the perspectives and learnings accumulated, multiple validations will already have taken place, making it easier to establish whether the innovation will succeed. In this phase, technological innovation needs to be integrated into the FLOW of the organisation.

2.4 The concept helps to bridge the horizon gap between TU Delft and partners
3.1 The concept stimulates knowledge creation
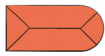
6.3 Towards services

Structuring the current service offering

With 'suspense' as the underlying drivers for partners to participate, X!Delft's current services are divided into the PACES phases as presented before (Figure 6.4, black text). This reveals the relationship between all services, and clarifies how every service contributes to the goal of cultivating effective suspense. The L.E.A.D. programme and corporate education serve as supporting services, enabling fruitful communication by bridging the language and knowledge gap between companies and academics/students.

Superimposing X!Delft's services onto PACES reveals that the most significant gap in X!Delft's is situated in the 'perspective' and 'predict' phase. Often, the paraphrase step takes place immediately after 'perceiving' (in an individual Discovery Day), resulting in partner-specific and short-term oriented projects. This jump is partly explained by the fact that companies prefer to go straight to probing, rather than languishing in uncertainty. However, it also has to do with the approach of X!Delft's account managers, whose

PACES

Preserving And Cultivating Effective Suspense

PERCEIVE	PERSPECTIVE	PREDICT	PARAPHRASE	PROBE	PROVE
Discovery Day	Network Events	Future Scenario Workshop	Positioning	Projects	Venturing & startup collaborations
Deep Dive	Perspective Session		Pathfinding	Reflection session	Setting up Field Labs
					PhD's

Student Challenges

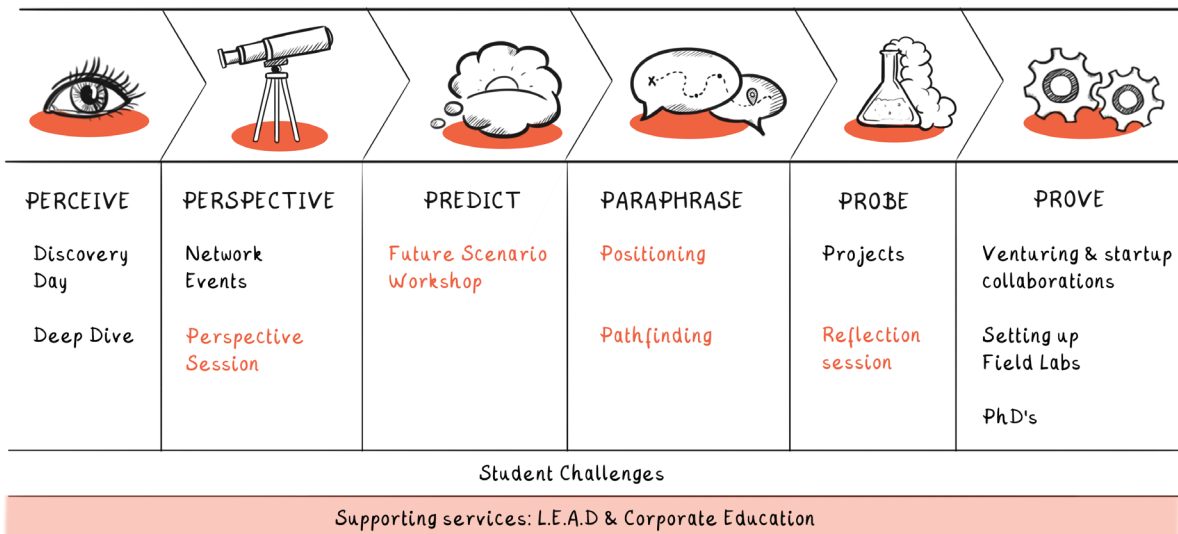| Supporting services: L.E.A.D & Corporate Education |
|---|

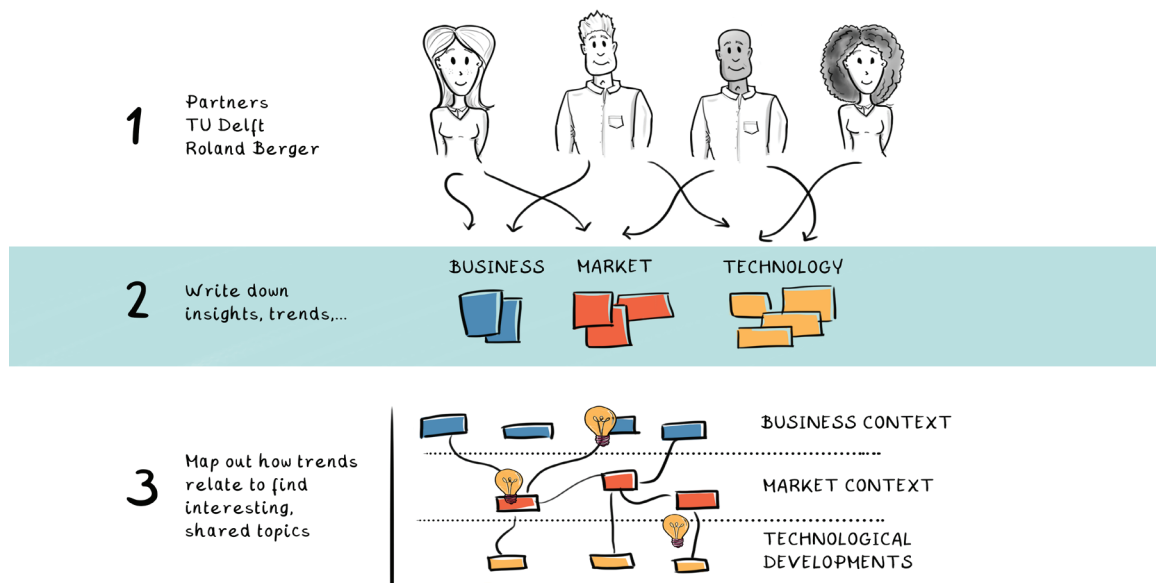*Figure 6.4 Proposition elements per PACES step*

Figure 6.5 A first ideation into the perspective session as an example.

background is more in consulting, who translate strategic challenges directly into opportunities by matching them to research/technologies available at TU Delft. Therefore, new services need to be added to the offering to assist X!Delft in taking an extra leap into future framing to ensure shared and long-term trajectories.

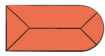## Complementing the service offering

To integrate the entire PACES process into the service offering of X!Delft, a proposal is made by combining current services offered by X!Delft and adding new activities that fill the gaps to complete the proposition. The newly added services are marked in orange in Figure 6.4. A short description of the added services is provided to give an idea of what the service might entail.

The Sharing Platform

As continuous perception is crucial in order to sustain general suspense, a sharing platform could be set up in which all actors affiliated with X!Delft can share insights and inspiration. The goal of this platform is to spark connections without the explicit mediation of X!Delft.

Perspective Sessions

In a perspective session, partners, employees from TU Delft and consultants from Roland Berger participate. Information and insights are shared in order to discover a potential overlap between the identified market trends, technological developments and strategic challenges of partners (Figure 6.5). This overlap serves as the base for the future scenarios that will be developed next. By combining the business perspective of Roland Berger with the market view of the partners and the technology-driven attitude of academics, themes are identified that are relevant for all stakeholders involved.

Future Scenario Workshop

After gathering multiple viewpoints on the information gathered in the ecosystem, future scenarios are created. These are important as they provide the long-term perspective needed to give direction to the different projects that are carried out during the partnership, whether in parallel or in sequence. In the **future scenario workshop***, partners are invited to think about possible futures, taking into account the different roles technology could play for them.

These scenarios focus on exploring the themes discovered in the perspective session together, in order to create a coherent **prediction** of what the future could look like. For this design practice, a rich imagination is needed to come up with inviting scenarios. The outcome of the session is a broad vision which is shared between partners, but which leaves room for individual roles and industry-specific elements.

Positioning

In order to start **paraphrasing** the abstract future vision into a mission to give direction to concrete experiments and projects, it is of importance that the role and position of a company are made explicit. This is done in conversations with the account managers of X!Delft, whose experience with consulting can help the partner to formulate the strategic intent of their company. If partners prefer to do this step internally, canvasses or guidelines could be provided to facilitate this process, and to make sure the position and role of the company are well-structured.

Pathfinding

After solidifying the position of each actor in the ecosystem, a plan is made in order to translate the abstract future vision into experiments. These experiments aim to provide the learnings necessary to accomplish the long-term vision. In order to make sure the individual needs of companies are satisfied, the division of responsibilities and the objectives of every actor need to be specified.

These goals should include not only key performance objectives (KPI's) but also key learning objectives (KLI's). In order to stimulate thinking about roles and learning goals, similar sessions to the ones held internally with X!Delft could be created to invite partners to think about where they want to go and what function they want to fulfil.

Reflection sessions

In order to capitalise on the learnings accumulated in the experiments, **reflection sessions*** should be provided, aiming to think back on past activities as well as adjust the future direction if necessary. An excellent starting point is the learning objectives specified during the paraphrasing phase, as well as the predictions made about the future. The intention of these sessions is then to re-evaluate prior predictions in light of subsequently acquired knowledge.

SUMMARY VALUE PROPOSITION

X!Delft's PACES approach creates innovation potential with and for the innovation ecosystem, through the cultivation of effective suspense.

Value for partners

X!Delft's refined value proposition cultivates effective suspense through PACES, an approach to 'Preserve And Cultivate Effective Suspense'. It is X!Delft's response to partners' feeling of suspense, which drives the collaboration. This suspense manifests itself through five innovation challenges, which are addressed by extending X!Delft's service offering to take into account all phases of PACES: perceive, perspective, predict, paraphrase, probe and prove.

Value for TU Delft

As explained in Chapter 2, a value proposition focuses on the benefits created for the target group of one's services. X!Delft's services are directed at industry partners; however, the aim of X!Delft is to contribute to TU Delft's third mission of impacting society. Therefore, a brief reflection is given on how PACES can positively influence the collaboration for TU Delft.

Identifying research gaps

Combining the viewpoints of a wide range of actors in the ecosystem uncovers market trends and customer needs which may identify potential gaps in TU Delft's current research portfolio.

Opportunities for technological applications

By including a technology perspective in the 'perspective' and 'future scenario' workshops, new opportunities for technological applications surface, that are grounded in market and business trends/needs.

Ensure long-term perspective

The future scenarios add a long-term ambition to the innovation efforts of industry partners. Hence opportunities for fundamental research are created, while experimentation ensures short-term results.
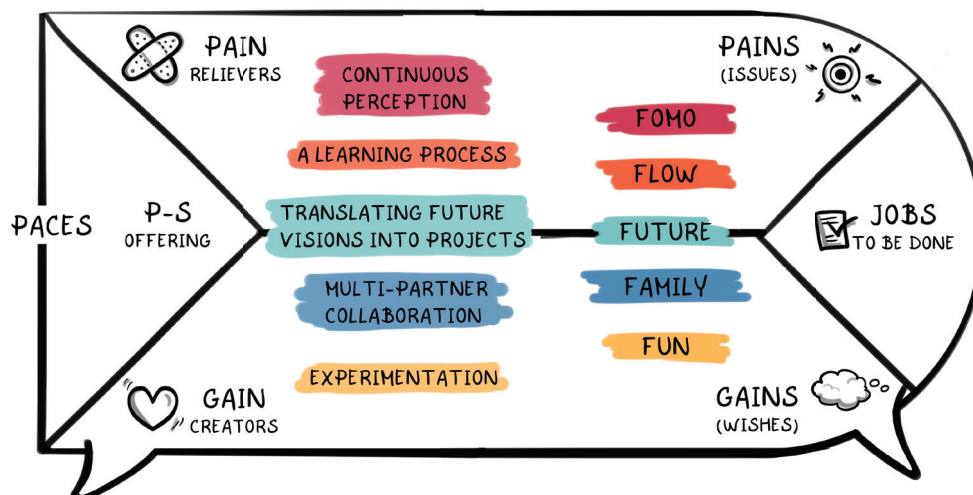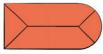
6.4 Validating PACES

To validate PACES, X!Delft employees and partners were asked for feedback. In the validation session with partners as described in section 4.4, not only 'suspense' but also X!Delft's response through PACES was tested. Moreover, professor Barbara Simpson, who was present during this session, also provided valuable insights into the limitations of PACES. Lastly, employee input was gathered through individual conversations, in which the implications and challenges surfaced.

The validation with partners was done through a canvas in which participants were asked to reflect on how they related to suspense, how important each phase in the process was, and to what extent they thought X!Delft could contribute herein. The results varied greatly per company, and even within companies. Whereas some found 'perception' to be one of the most important areas in which X!Delft could help their company to deal with suspense, another partner stated this should happen internally (see Appendix E).

Despite the differences in terms of importance given to each element in the process, partners expressed genuine interest in and enthusiasm for 'suspense' and the process presented. This was noticeable through the productive discussions in which they engaged, and the willingness to share their experiences and opinions with others. Some participants asked for the presentation slides,

so they could evaluate internally how their company was currently dealing with suspense.

Because of the variance in priorities, flexibility is needed in order for partners to create a partnership that feels relevant to them. This flexibility enables partners that join at different times or pursue conflicting goals to collaborate more easily. Thus, open transitions between phases are needed, enabling different possibilities for partners to explore the service offering in the ecosystem. The need for open transitions was also recognised by Barbara Simpson, who expressed her doubts to visualise the process in a linear fashion, as the flow of the process is dynamic and phases may not be interpreted as separate stage-gates. Moreover, she pointed out that a process alone is not enough to tackle suspense, and that attitudes and behaviours are essential to facilitate PACES. Therefore, her act(ion)s 'dialogue', 'improvisation' and 'daring' (see section 5.2) are important to take into account when considering X!Delft's innovation ecosystem. They touch upon fundamental social parts of the collaboration they intend to foster and are easily lost with trying to structure a process.
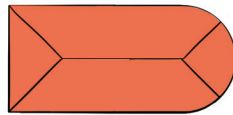
It is thus important to not only develop the process, but also consider how it should be integrated into the collaboration. Chapter 7 explores what the ecosystem could look like, and how services can be implemented to facilitate this.

PACES
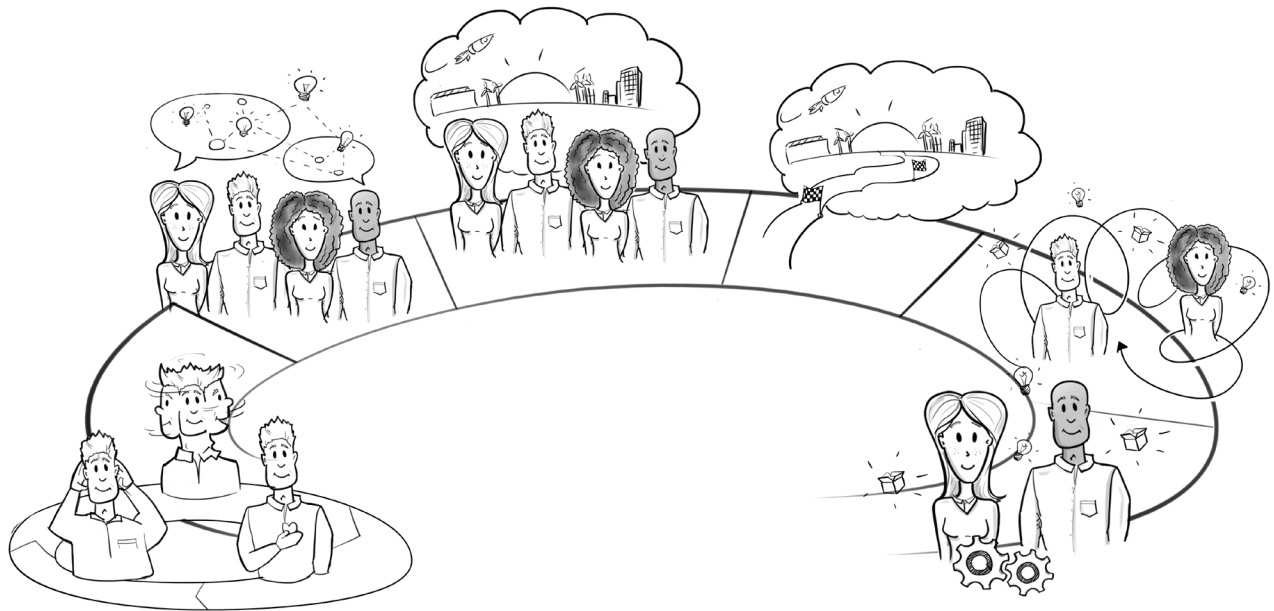
Integrating the value proposition

The value proposition concept, as presented in Chapter 6, needs to be developed further in order to be implementable in X!Delft's innovation ecosystem. Here, advice will be given on how to proceed with the process and services. In section 7.1, the vision for the ecosystem in its entirety is discussed, as well as the role X!Delft plays in this ecosystem. The ecosystem is important as it was the starting point for X!Delft, it accommodates the inquiry & future framing as a 'social endeavour', and it supports a service-dominant value proposition, in which value is created *with* partners. In section 7.2, the integration of the process within the ecosystem is considered. To do so, PACES is discussed in the context of multi-partner collaborations. Section 7.3 discusses what needs to happen internally to enable this ecosystem.
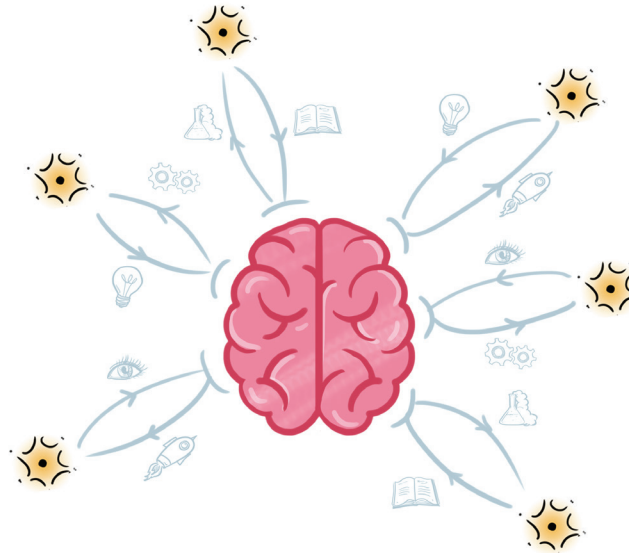
Figure 7.1 A nervous system for innovation

7.1 Vision: a nervous system

The dream is to create a *'nervous system'* similar to the brain: a learning system, in which actors communicate and build on previous experience in order to generate new solutions to current or future problems. Different sensors collect information and send it to the brain. In the brain, this information is processed, and after learning how to respond to the input, a suitable response action is sent to the appropriate members (See Figure 7.1).

Just like the brain, the innovation ecosystem consists of actors working together to perform tasks. Every actor brings along unique experiences and expertise (Kelley, 2016). This is necessary because "we now have completely interconnected issues (…) These are not requisite conditions for organisation-centred change, but require multiple stakeholders committed to future betterment" (Jones, 2015)
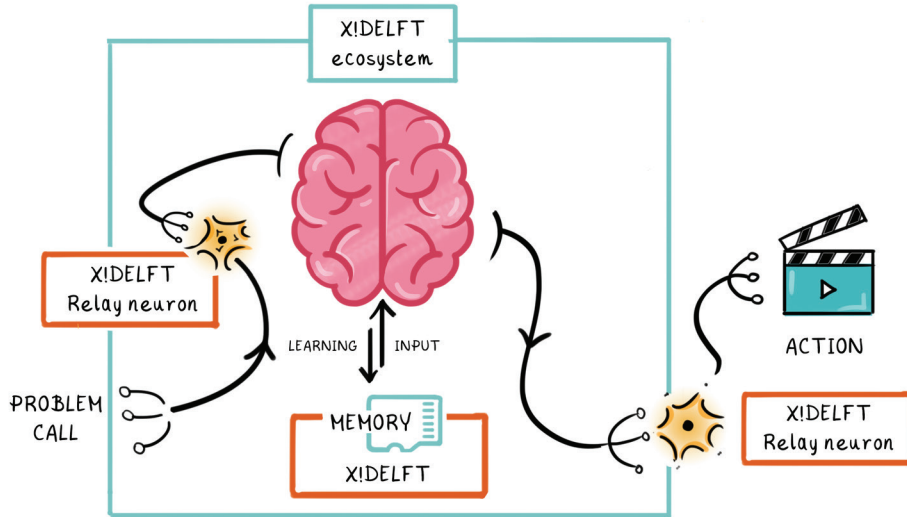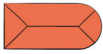
Figure 7.2 The role of X!Delft in this nervous system

In this nervous system, X!Delft fulfils the role of "adding things, making connections, depending on what the system needs" (MT X!Delft, personal communications, 2019). Employing the terminology of neuroscience, I would argue X!Delft's function in a neural innovation network is comparable to a brain's relay neurons linking the receptors (individual actors) to the processing centres (learning community), which then transforms it into an appropriate response. Furthermore, X!Delft performs the function of the memory, retaining the knowledge accumulated by the ecosystem, and recalling it when new projects might benefit from previously gathered information (Figure 7.2).

Design assists X!Delft in its role, by performing the function of a connector; aligning the different stakeholders and bridging 'reasoning' and 'experimentation'. It can thus be compared to the corpus callosum in the brain's nervous system, connecting the two hemispheres (Figure 7.3).
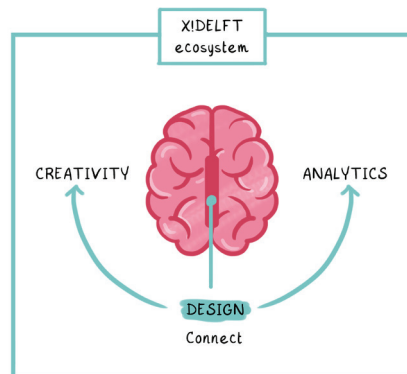

Figure 7.3 Design in the ecosystem of X!Delft

7.2 Integration in an ecosystem

PACES and the added services, as proposed in Chapter 6, can be carried out with multiple partners. However, the hypothesis is that further down the process, when the content becomes more specific, the focus will shift towards bilateral projects between one company and the university. When a specific topic stays relevant for multiple industry partners, joint ventures or other shared initiatives might still exist, making multi-partner projects possible even in the last phase (see Figure 7.4).

Perceive: All actors give input to the ecosystem, enlarging its knowledge base.

Perspective: By searching for connections between the collected data from multiple actors, underlying themes emerge in the ecosystem.

Predict: Collectively, actors in the ecosystem formulate a vision for the future.

Paraphrase: This vision is broken down into individual steps, and a plan is made to carry out the steps.

Probe: Through experimentation, the ecosystem builds capabilities and gathers new insights.

Prove: The learnings accumulate into a proof of concept that is now ready to be developed further (often individually).

When looking from the perspective of the ecosystem, the first three phases are mainly focused on giving input and creating new connections, while the emphasis is on creating tangible output in the last three phases. This output is then absorbed again by the ecosystem, hence providing new input.
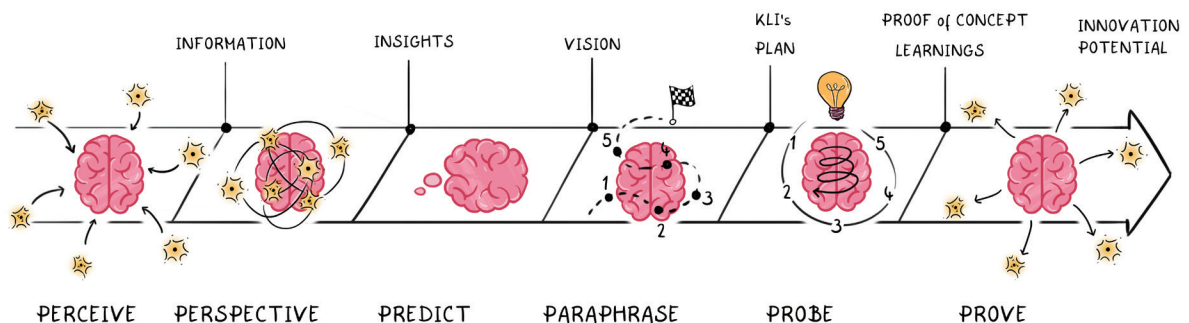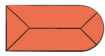

Figure 7.4 PACES from the perspective of the ecosystem

Currently, most of the projects are still individual, and interaction between partners remains on the level of sharing insights, not collaborating in projects. In the process of implementing the services requiring shared action and joint knowledge creation, some challenges are expected.

Trust, communication and commitment play an important role in facilitating a fruitful collaboration (Rybnicek & Königsgruber, 2019). These values are needed to deal with the ambiguity of the 'output', namely the reaction on suspense as well as with the openness the ecosystem requires when working together with other companies. Especially for new partners, creating trust is essential before asking them to share insights or resources with other industry partners. There is a vast literature on how to generate trust, which is considered to be outside the scope of this project but must be paid attention to when moving forward with a proposition that is focused on co-innovation.

Trust is vital since shared processes also result in shared Intellectual Property (IP). Currently X!Delft has included a clause in their contract stating that for all knowledge and technology that is developed in the partnership, there is shared ownership between the company and TU Delft. Even though the IP is currently not yet shared with other industry partners, it is already proving to be an obstruction as companies prefer not to publish results of their project/studies. Thus, the next step of sharing IP rights between commercial companies makes the creation of an ecosystem challenging.

Therefore, a gradual shift towards multi-partner collaborations is proposed (Figure 7.5).

Intermediate steps
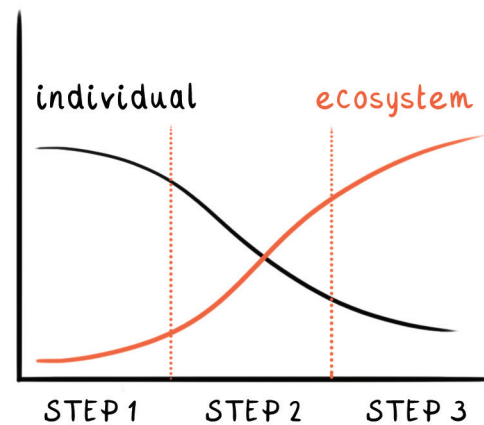
Figure 7.5 Intermediate steps

STEP 1: Shared visioning

In the early stages, it is advisable first to offer shared sessions as a (recommended) option and reward 'daring' partners. For partners that are not keen on sharing sensitive information, the **perspective session** could be held exclusively with Roland Berger and TU Delft employees, with a facilitator focusing on bringing out the latent goals and desires of the company. As a first step towards sharing with other industry partners, **perspective sessions** could be extended to include other partners, while keeping the focus on getting the perspective of TU Delft and Roland Berger on future developments, in the hope this sparks discussion and creates a willingness to share insights. Alternatively, a reward system

could be created for partners that decide to join a shared trajectory to gather perspectives and create future scenarios.

After the introduction phase in which partners are offered a choice, collaboration could become part of the standard process, but stay limited to **perspective, prediction** and **paraphrasing** phases. Partners can then go their own way when more specific experiments start – which is where most of the knowledge creation takes place.

STEP 2: Extend to shared reflection

When partners have experienced the value of sharing insights, the collaboration is extended to include shared learning. The reflection sessions become open events in which multiple partners can share their experiences and learnings through 'generative dialogue' (on, e.g. a thematic scope).

STEP 3: Include shared projects

Ultimately, when PACES has proven its potential, the goal would be to participate in shared projects, as creativity and innovation take place where different viewpoints and expertise unite.

7.3 Implications for X!Delft's organisation

Different capabilities are needed within X!Delft to develop, adapt and adopt the process and services needed to cultivate effective suspense in the innovation ecosystem.

As developing the services is a design process, an iterative approach should be taken. I suggest to focus first and foremost on developing the perspective session and the scenario-building workshop, as the 'perspective' and 'predict' phase are otherwise not represented in X!Delft's offering. Through prototyping and collecting feedback, the workshops can be refined in order to create the right balance between individual gains and collective knowledge and technology creation. Following discussion with X!Delft, it was agreed that the development of the scenario-building workshop should take priority.

A pilot for this service will take place in February with a potential partner - who independently requested a workshop on future scenarios from X!Delft. Upon completion of my graduation, I will join X!Delft to continue the development of the service in preparation for this initial pilot.
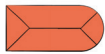
For the development of services, designerly skills such as creative facilitation[1], workshop planning, and visualising need to be internalised. This is also recognised by X!Delft, and as the role of X!Delft might change when adopting the new value proposition; more people with a background in design should be added to the team.

As discussed in Chapter 2, value propositions should be continuously adapted to the changing needs of customers (partners), in order to stay relevant. The human-centred focus should be maintained throughout the development of services, as well as throughout the partnership, to adapt the services. Up until now, X!Delft has involved partners in the development process, but only after a concept was created based on a problem perceived by X!Delft. By involving them earlier on, to validate problems and explore a solution, a broader view is created on the problem as well as on the range of solutions. In this sense, the process of service development follows a similar path to PACES in the value proposition. A service is developed when a problem is **perceived**, partners are involved to create a broader **perspective** on the problem as well as possible solutions, a vision is created on how the problem could be tackled in the **future**, and through iterations of **experimentation** and **reflection,** services are developed that bring **resolution.**

1   **"**Creative Facilitation is the art of leading a team through a creative process in order to solve problems or generate new shared visions and opportunities for organizations. Getting everyone on the same page in an open and trustful atmosphere of creative collaboration demands special care and attention." (TU Delft, 2019)

However, the attention to the partners' needs should not be the only guiding principle, but X!Delft should make its own strategic intent more explicit, in order to align all employees on the direction to take. This is necessary to adopt an 'X!' way of working which is endorsed by all employees, structuring the partnership and thus creating trust. Creative tools can stimulate reflection and guide discussions, to arrive at new insights and create a shared view on the future of X!Delft (as was done in the first creative session with employees, see Appendix C).

PART IV

In conclusion...

Chapter 8
Conclusions

PACES
'Preserving And Cultivating Effective Suspense'

8.1 Conclusion

The overall objective of this master thesis was to explore how design (thinking) could contribute to X!Delft's organisation and value proposition towards industry partners.

In order to achieve this goal, Design Thinking was used as a human-centred and iterative approach, to create a deeper understanding of partners' needs and adapt the value proposition accordingly. Throughout the research, guidelines were formulated for the value proposition concept, to ensure a fit with the partners' needs as well as with X!Delft's strategic intent.

This resulted in a value proposition in which the service offering of X!Delft was structured and expanded in order to respond better to the 'suspense' felt by industry partners. By linking suspense theory to the pragmatist inquiry and design practices, the PACES approach was created; a process which 'Preserves And Cultivates Effective Suspense'. Effective suspense is cultivated when a general sense of suspense is sustained, while thematic suspense is decreased through a learning process aimed at creating innovation potential.

PACES consists of six phases:
- Perceive
- Perspective
- Predict
- Paraphrase
- Probe
- Prove

A first step is taken in integrating PACES into an innovation ecosystem with multi-partner collaborations. The creation of an ecosystem in which academics, consultants and enterprises collaborate, offers an excellent opportunity for partners to gain a broad **perception** and fresh **perspectives** for future **predictions**, through the combination of market, business and technology viewpoints. These perspectives, combined with a strategic position of each company, then uncover potential avenues for industry partners, which can be **paraphrased** into missions and accompanying mission experiments in which different actors from different sectors collaborate. Through **probing**, the explorative projects create new knowledge and concepts, challenging current predictions and thus offering opportunities for learning. These learnings can then be used to create innovation outcomes (**proving**). Throughout this process, design practices enable shifting focus between reasoning and experimentation, reflection and future framing.

Although PACES takes into account the guidelines as accumulated during this research, the concept needs to be further developed and validated before evaluating the effectiveness of the refined value proposition. Therefore, Chapter 8 focuses on the limitations of this thesis and the implications for future research and implementation.

8.2 Recommendations

Research

This thesis touched upon multiple literature fields, which could not all be explored within the time frame available for a graduation project. When proceeding with the concept of 'suspense' within the context of innovation (ecosystems), more parallels can be drawn to the suspense literature discussed in Chapter 5. For example, the concepts 'imminence', 'foregroundedness', 'confidence' and 'importance' as discussed in Doust & Piwek (2018), could be used to determine how strongly a partner experiences suspense on a specific theme. This might help to evaluate which projects add the most value for industry partners, and should thus be prioritised.

Moreover, the literature on innovation ecosystems could add valuable insights on how to enable fruitful multi-partner collaborations. The importance of absorptive and collaborative capacity in this regard was shortly mentioned in Chapter 2 but should be elaborated upon. Similarly, it would be valuable to research how the trust, required to create an openness to share, can be created within X!Delft's ecosystem. Lastly, as X!Delft aims to contribute to societal challenges, the role of the government or civil instances within the ecosystem could be researched, to enrich the perception base and increase the width of the perspectives gathered even more.

Design

The value proposition concept PACES has been briefly validated with four partner companies. However, more in-depth validation is needed to understand if and how PACES achieves the intended value. As PACES should be integrated into X!Delft's ecosystem, all stakeholders involved should participate in this session. Involvement of all parties ensures that PACES adds value for industry partners as well as academics, field labs and startups within the TU Delft.

As the intended 'impact on society' is only achieved when innovations come to market, it is also necessary to research how the value (i.e. the innovation potential) created within X!Delft's ecosystem, is successfully implemented. Implementation poses a fundamental challenge for innovation, and the initiation of joint projects complicates it even more.

Implementation of PACES

In the development of PACES, an iterative and human-centred approach should be taken. Through iterative prototyping and validation with partners, the services can be improved to fit with partners' changing needs.

Upon implementation of PACES in X!Delft's service offering, special attention should be paid to the implications of IP sharing. It is suggested to involve partners in this discussion, to create ownership of the agreement, and it sets the tone for an open environment in which trust is built. To conclude, X!Delft's strategic intent and role within the ecosystem must crystallise further to create alignment within X!Delft on the direction of the organisation when scaling.

8.3 Personal reflection

After spending the last half a year on this graduation thesis, it is time to close the book. It has been an intense yet satisfying journey, in which I learnt a lot. Not only about innovating in an ecosystem but also about myself as a designer.

Stakeholder management
Firstly, this was the first individual project I undertook as a strategic designer. Although I enjoyed the freedom to explore in my own way, I found it difficult not to be able to collaborate with other designers throughout the creative process. Luckily, I had my own ecosystem with stakeholders around me, who were able to share their minds and expertise. Hence, I am grateful I got to do this project, not only for but with X!Delft. Considering my goal was to add value to their organisation, I wanted to align the concept with the expectations of X!Delft. What I noticed during this project was that it was difficult to balance keeping track of my own progress and deadlines and communicating my results to all stakeholders involved. Sometimes, the close collaboration with X!Delft, in combination with the expectations from the TU Delft, made it difficult to establish my own direction throughout this project. However, I found a way to make this project feel true to myself as a designer whilst also taking into account the requirements of my 'client'; and as such, I have ultimately found it a very engaging and fulfilling endeavour.

Communicating the value of design
During this project, I was curious to trial different ways of communicating the value of design to X!Delft. By conducting creative sessions, I had the opportunity to have the X!Delft employees experience a way of working that I find energising and inspiring. It was a delight to share my enthusiasm for designing creative tools to help X!Delft analyse and reflect on their organisation – when put through their PACES. Through these tools and sessions, I was pleased to notice how X!Delft came to appreciate how my visualisations and metaphors might expand their scope of thinking.

"Courage is not the absence of fear, but rather the assessment that something else is more important than fear." – Franklin D. Roosevelt

I think it is fair to say that this project was an exercise in "eating the fear before it eats you". As with all design projects, there was no clear path laid out for where to begin and where to go. It was intimidating at times to set aside my fear of failure and to simply press on without knowing where it might lead – if anywhere. In that sense, it is quite fitting – and perhaps a little ironic – that my graduation project ended up revolving around 'suspense'. By gathering knowledge and the perspectives of X!Delft partners, employees, mentors, family & friends, I believe I have created a clear sense of future direction for X!Delft in the form of the PACES framework. With this project now in its 'probe' phase, I look forward to continuing my work in the coming months as I return to X!Delft to be part of the team.

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