Msc Thesis - Margot Weltje

Making rich insights applicable

Increasing adoption through user-centered prioritization

TU Delft

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Executive Summary

The purpose of this project has been to examine ways in which to increase adoption of a digital employee-facing tool by involving its users in the implementation. This was achieved by examining innovation, adoption and the existing theories around those, looked at through the lens of the company context and corporate challenges. The current implementation process and user involvement were examined, allowing for a comparison of the literature and reality.

Studied innovation and adoption theories include the UTAUT model, growth hacking and ADKAR, amongst others. This research revealed that relevance of an innovation to its target group is one of the most important adoption determinants, as well as its ease of use. A combined model is introduced that shows the application of user-centeredness to increase adoption.

Considering the existing implementation process includes an agile feedback loop that is focused on cultivating ease of use, a focus on expanding that user involvement is chosen. Expanding it into the decision-making level on the business side of the application's development creates opportunities to make the decisions more user-centered, causing a trickle-down effect. The design goal is reformulated as "Increasing adoption by representing user input (aided by growth hacking strategies) in the prioritization process for A2H, to help the airline achieve their goal of making operations more efficient and customer-centric through digitalization."

Focusing on this prioritization process revealed some areas for improvement regarding the current way of working, as well as a need for more evidence to support decisions. Intersecting this opportunity with the user involvement goal of the project led to the development of a framework that allows for the collection of direct user input to provide evidence for decision-making. Additionally, studies and interviews were conducted to establish whether user input in the prioritization session would yield different results than the current way of working, and it was found to have influence on the decisions made.

This framework, the 'User Value Framework', was established using insights from contextmapping, observations and interviews. It includes an intervention that supports the process of collecting user input to be used in the prioritization session. It is presented as part of a strategy to increase UX maturity in the company and move toward more explorative research and user-driven business. To achieve this, it includes a validation and expansion strategy over the long term to accommodate in-between proof of value of user-centeredness. Additionally, recommendations are made for the different levels of UX maturity beyond the presented intervention, resulting from the observations and research results.

Reading Guide

Public reading guide

Because this project deals with confidential information and describes internal processes, the company and its employees have been anonimized.

The company this research was conducted for will simply be referred to as 'the company' or 'the airline'.

People within the organization that have been spoken with will be identified by their function, not their name.

Some abbreviations and acronyms are used to protect confidential information and will therefore not be explained.

Prologue

This thesis was completed during a time of uncertainty and instability for most of the world, including the airline. Many organizations and companies are forced to find new ways of working, new sources of income or other channels through which to continue their work. Necessity is the mother of invention, and the covid-19 crisis is testing many companies, more than ever before.

The aviation industry especially has been hit by this crisis, limiting travel drastically. Although investing in innovation seems scarier than ever during a crisis, it also holds many opportunities for the future. These times of uncertainty bring, for example, the opportunity to take a moment of reflection. Looking at which aspects of work are crucial and which parts to cut back on can reveal priorities and inspire employees to innovate. While many companies are cutting back costs, it's crucial to keep investing in the right things. Research and collective decision-making can help prioritize efficiently and guide policy in difficult times.

Additionally, even though employee engagement is tested in times of crisis, the strong identity of this airline inspires people to remain loyal and help where they can. By embracing this opportunity for kindness and teamwork, bonds within companies and with employees can be strengthened further. Investing in all employees is always important, but can especially help inspire collaboration during times of crisis. A lot of new product development is focused on finding positives and looking for reasons to be optimistic. People are finding ways to take care of each other and help those that need it.

Luckily most field research for this project had been conducted before the effects of Covid became clear and had serious consequences for the workplace. Although it is based on the situation before the crisis, I believe this research can offer opportunities for efficient and intelligent investment once development of the app is up and running again.The budgets for practically all projects and innovations are smaller or non-existent in order to help the company survive, but this time can serve to start looking at the knowledge previously gained. Working towards a structure and maintenance protocol for user insights, so that efficient use can be made of the data and information that is already in-house.

Although innovation is often seen as something that requires investment and carries large risks, this crisis shows that when there is reason to do so, it can be achieved within the available resources. Finding ways to sustain the new ways of working and focus on teamwork beyond this critical period can provide inspiration for the future ambitions of the company and bring into perspective what its priorities should be.

1 Introduction

1.1 Context & Digitalization

The company, as the oldest airline still operating under its original name and just beyond its 100-year milestone, is transforming its way of working through digitalization. Starting the 'Digital Studio' department in 2016, the aim is to transform day-to-day operations through digital implementations.

Digitalization refers to the transformation of operations, business models or processes through the leveraging of new technologies. Digitization refers to moving the involved processes or documents to a digital version or platform. Digitzation is therefore a phenomenon or tool of digitalization (i-scoop, 2019).

Digitalization of businesses is a common occurrence in recent years, fitting into the global trend of digital transformation (Gillior, 2018). Digitization is a means to the end of digitalization. The digitization of data and workflow is "the transformation from analog to digital or digital representation of a physical item with the goal to digitize and automate processes or workflows"(i-scoop, 2019).

Digitalization has high potential benefits for optimization as well as opportunities to use collected data for analysis and additional insights into performance, cost drivers and causes of risk (Parviainen et al, 2017).

Within the airline, digitalization offers opportunities to make operations more efficient and productive, which results in better service. As described by the project management officer of the digital department, "our main purpose is to help our employees to do what they do best. Digitizing is of course not a goal in itself but it helps our employees to deliver the best service to our customers" (Business Chief, 2018).

These benefits of digitalization can of course only be reaped when the digital versions of processes are being used by the employees. Adoption of the tools (that is, their continued use and incorporation into the way of working) is therefore crucial to ensure optimization and ROI.

This project will focus on the application A2H, used by the ground personnel working in different parts of the airport, as well as agents at international stations. These include gate agents, lounge staff and other floor employees working with passengers. The app supports their everyday tasks such as boarding passengers or upgrading seats (among many others) and moves these activities from a desktop to a tablet.

The brief for this project is to increase adoption of the A2H app by increasing user involvement in its implementation.

The interest in a design approach that involves users in the implementation fits into the increased interest in design as a tool to optimize complex processes in work environments: "applying design thinking to the design of work itself, the systems that support it, and the physical and virtual environments in which it takes place, or designing not only the customer and end-user but the employee experience, are opportunities for business and organizational leaders to attract and retain top talent, as well as to enhance productivity and operational effectiveness" (Gruber et al, 2015, p.11).

Several digital tools have been developed within the airline that are intended to digitalize and smoothen workflow for different departments. These digital applications are not yet being used to their full potential by the front-line staff. According to some, this is due to a lack of acceptance and understanding of digitalization tools and their place in the evolving workflow, influencing the adoption of the tools negatively.

1.2 Problem Definition

The adoption of A2H amongst these groups is lower than expected, and several factors are thought to influence this lack of acceptance and use. These assumptions are made by individuals on the business side of the app's development, and I will be verifying them in my research phase.

The problem tackled within this project can be defined as "the low adoption rate of A2H and its role in the digitization of workflow by front-line staff."

This leads us to the following research question:

Research question

How can we increase the adoption of digitalization (specifically A2H) through user involvement in the implementation?

1.3 Strategic fit

The company strategy is expressed in a compass to guide workplace behavior (see Appendix) that includes pillars for employees and the company in general on how to achieve their strategic goal, which focuses on customer-centricity and efficiency.

Desired customer experiences are linked to staff behavior, their optimal working climate and the leadership that creates that climate.

A yearly overview of the concrete goals, based around this compass is made every year, also in the appendix. This overview includes ambitions specifically naming the mobile, digital tools that support employees in their job and make processes more efficient.

The users of A2H are the front-line, customer-facing part of the organization and are therefore of great influence on the customer experience. Digitalization and digitization of processes within the airline is one of the measures to make operations more efficient and aid employees in serving the customers as best as possible (Business Chief, 2018).

Logically, these benefits depend on the adoption of these digital tools. Therefore we can say that increasing adoption lines up with the strategic goal of a more efficient operation which provides higher customer satisfaction.

1.4 Approach

The approach for this project is inspired by the double diamond methodology (Design Council, 2005). This iterative process follows four phases divided over two diamonds. The two diamonds each consist of a divergent and convergent phase.

Discover

In this phase, the context is explored in an attempt to understand the problem and the related issues. Literature research gives an overview of existing, relevant knowledge, followed by interviews and observations with the different involved parties to find out about the current practice. Combining and comparing the two gives a complete picture of the context. The assumed problem is critically examined and challenged to work towards understanding the underlying issues and reformulating the brief.

Define

The second phase then follows up the conclusions of the first to move towards a reformulated design goal. This phase ends with a look at the redefined solution space and criteria to guide the development of a solution.

Develop

The previously formulated design goal, research conclusions and criteria are now used to design a solution. This is done by involving the different stakeholders on both sides of the project: user and business, and working with them to iterate on a solution that suits their needs. More research is done to complement the formerly gained knowledge and shape the solution.

Deliver

The final phase focuses on the delivery of the final solution, including a plan for implementation and future development, validation and recommendations for optimal functioning.

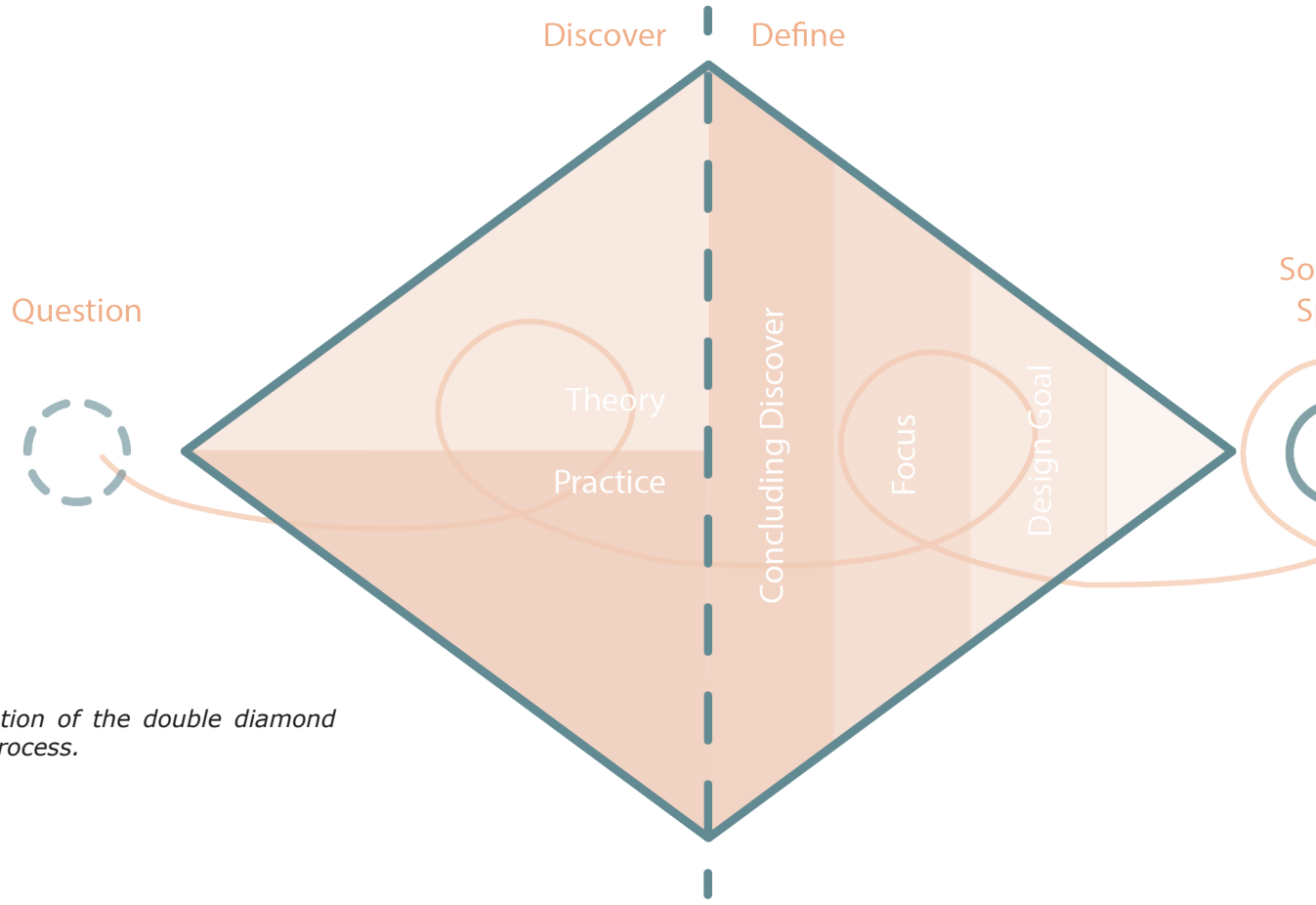


Figure 1.
Visualization of the double diamond design process.

To suit the agile way of working within the company, the process is complemented with MVP-testing in several phases. MVP stands for Minimal Viable Product, and is "that version of a new product which allows a team to collect the maximum amount of validated learning about customers with the least effort" (Maurya, 2017). These tests include a quick validation of hypotheses with the involved parties, using a mockup of a solution. Some are exploratory, that is, to reveal the requirements and wishes of the different parties and some are to validate and iterate on a concept. This is shown as an enrichment to the double diamond in the figure below, because design should be an iterative process rather than a linear one (Design Council, 2005).

Different design and research methods were used to support this project and provide insights. These are the main methods used in this project, details of methodology are provided in subsequent chapters:

Contextmapping

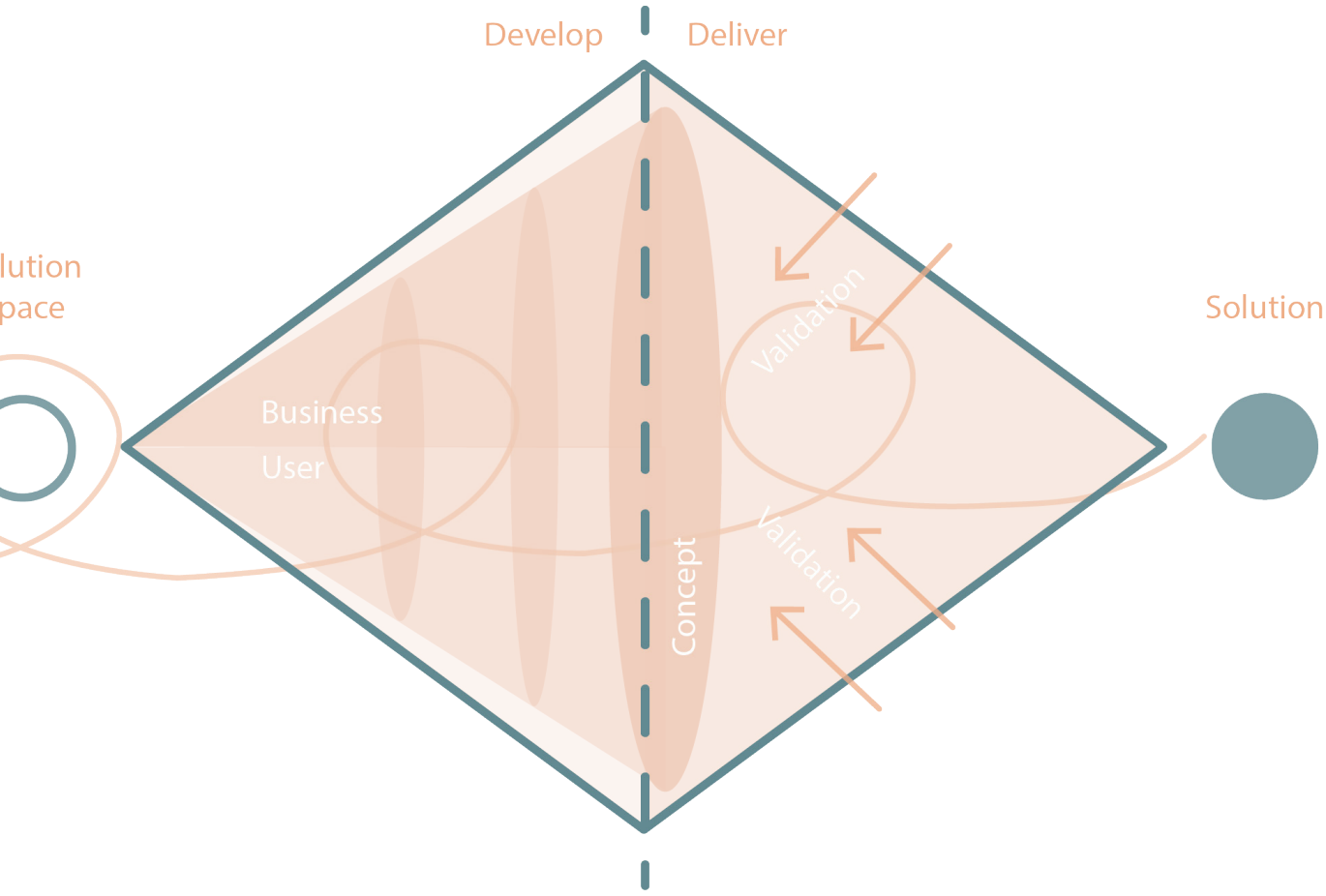
Literature research

MVP-tests

User interviews

Expert interviews

Observation



Discover

To work towards a better understanding of the problem and context, this chapter will look at the different relevant terms and clarify their meaning and role in this project.

First a literature study is conducted to examine the existing theory. Then a closer look is taken at the current A2H process to be able to compare the two and identify opportunities.

2 Literature

From the project brief and research question, we can identify several topics to investigate and define further: first, how do we define innovation and what type of innovation is A2H? Theory will be discussed regarding different types of (technology) innovations. We will look at incremental, radical and disruptive innovation and the role of research and design for those types of innovations.

Secondly, theory around the diffusion of innovations will be examined in order to understand the different factors that influence it. This is followed by an examination of individual adoption as part of the diffusion of an innovation. The UTAUT model (which combines multiple other adoption models) is studied, with some drivers discussed in detail.

Lastly, drivers for adoption and the techniques to harness them are discussed. Potential barriers for adoption are identified from the literature, as well as the techniques that can help overcome these barriers. User-centeredness is examined as a technique to increase adoption through cultivation of adoption drivers, and growth hacking is introduced as a technique to increase initial adoption. We will look at these different existing methods and compose an original, combined model to incorporate the existing theory as it applies to this project

2.1 Innovation

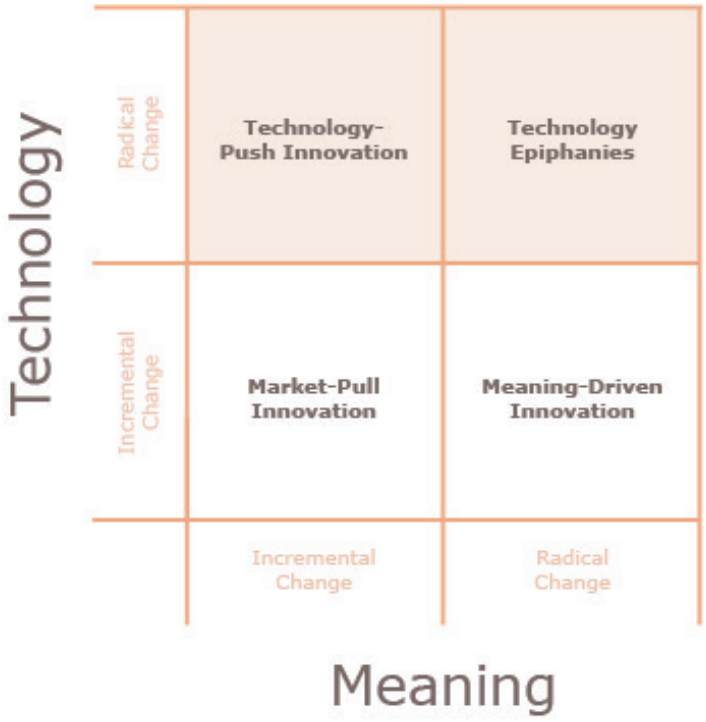
From the company itself we know that the digitizing efforts are an attempt to increase efficiency and customer-centricity, they have even stated explicitly that it is not innovation for innovation's sake. Empowering employees with innovative, digital tools will help them service customers even better and faster than current systems allow them to. To leverage these benefits however, the adoption of those tools is crucial.

The concept of innovation essentially means the introduction of something new, usually in the form of a method, device or idea (Merriam-Webster, 2020). A2H was introduced as an innovation within the company, aimed at transforming the way of working by leveraging new technologies.

2.1.1. Incremental & Radical

When it comes to innovations within companies or organizations, different types are recognized. One of the main distinctions made is that between incremental and radical innovation, where radical innovation is the complete change or overhaul of an idea and its purpose or meaning, and incremental innovation refers to improvements within an existing solution or framework. Radical innovations create new markets or expand overlooked markets, whereas incremental innovations serve the existing market to increase profitability or stay competitive (Fullagar, n.d.; BMI Lab, 2017; Norman & Verganti, 2014). Both types of innovation require different approaches when it comes to design and research. According to Norman and Verganti (2014), human-centered design methodology is best suited for incremental innovation, because insights from users and people are always limited to their current experiences and knowledge. This keeps them from revealing opportunities for radical innovation. Radical innovation, according to them, comes from a change in technology and/or meaning.

Norman and Verganti's study also discusses the relationship between incremental and radical innovation. They pose that the two are not completely separate but in fact sequential. A radical innovation is introduced, but often its departure from the norm means a lack of acceptance from the market. This is when incremental innovations can help make the innovation more suited to the market and promote its adoption: "without incremental



Fgure 2
Adapted from Norman & Verganti (2014). The four types of innovation based on whether the technology and meaning are incremental or radical innovations. A2H can be classified as a technology-push innovation or a technology epiphany, depending on the focus of the innovation.

innovation, the potential enabled by radical change is not captured" (Norman & Verganti, 2014, p. 85).

They have formulated a framework that describes the four different kinds of innovations based on the change in meaning and/or technology. They argue that these four quadrants are the different drivers for innovations, but for an innovation to succeed it should have some aspects of all the quadrants (see figure 2).

Considering the introduction of A2H, which was a relatively short while ago (around 3 years) and involved a drastic change in technology for the users, it can be classified as a radical innovation. Because the focus was mainly on the possibilities that were created with the mobile devices, the main driver was that of a technology-push innovation (see figure 2). One of the dangers of a technology-push innovation is that it results in what is essentially a substitute for the current technology (Verganti, 2011). Avoiding that trap can be done by driving innovation from a technology-epiphany standpoint.

The technology epiphanies quadrant describe a change in meaning facilitated by the emergence of a new technology: "quiescent meaning that is revealed only when a design challenges the dominant interpretation of what a product is and creates new, unsolicited products that people are not currently seeking" (Norman & Verganti, 2011, p. 91).

This innovation of meaning is already attempted with A2H. By creating a new way of working and a new positioning of the agent in the company and in relation to customers, the meaning of the technology has changed in the progression from the legacy systems to A2H. That new technology and the meaning change attached to it has been introduced with A2H, but adoption numbers show that the acceptance is not at the desired level.

After such a radical innovation incremental innovation is needed, to increase the radical innovation's desirability, performance and acceptability (Norman & Verganti, 2014). This fits the company's observation that adoption is not yet at the desired level. They are currently working on improving and adding features in two-week sprints and rollouts; incrementally innovating the product. According to Norman and Verganti, the design method suited to incremental innovation is human-centered research, because it gives insights into the users that can be used to inform development to stimulate the afore-mentioned acceptance.

2.1.2 Disruptive innovation

Similar to the study by Norman and Verganti (2014), Christensen et al (2003) discuss the different types of innovations within companies, identifying a type referred to as 'disruptive innovation'. Similar to radical innovation, disruptive innovation describes a shift in the meaning of a product or service, through a change in technology that offers new opportunities for performance or functioning. The main difference between the two is that radical innovation gives opportunities within companies to innovate, whereas disruptive innovation describes a process focused on challenging other firms and tapping a new or underserved market (Hopp et al, 2018).

Disruptive innovation refers to a new technology or product that underperforms on mainstream attributes compared to the market leader, but possesses nonstandard performance attributes. It performs mainstream attributes to a sufficient level but the market leader progresses as well, which means the new technology does not excel. Disruptive innovation occurs when the newer technology displaces the mainstream tech despite the mainstream still outperforming it. It does so by addressing unmet needs of the market, starting with small segments of the mainstream market, niche markets that are underserved by the mainstream solution.

Considering the market that A2H seeks to engage, namely agents working on the ground, there is a current product being used by them that performs well on the existing mainstream attributes. Essentially A2H is competing with the legacy systems that are still being used and outperform A2H. Because it cannot currently match that performance on those attributes, it should instead invest in addressing needs unmet by those legacy systems.

A2H is not strictly a disruptive innovation. It is an innovation within a company and serves the same market as its predecessor. Because users do not elect to use it but have to for their job, there is no 'new market' to create or clearly underserved part of the market to engage with, since the legacy systems are the only available option (not to mention required for the users' jobs). Despite this, it can take inspiration from the disruptive strategies, by focusing on the differences between A2H and its predecessor(s), and the potential nonstandard performance attributes these differences reveal.

A2H does have potential for meeting nonstandard needs, albeit of the same market, because the technology is new to the existing market. The use of tablets and mobile devices to service customers may not be new in general, but to the market that is used to exclusively using computers behind desks, it constitutes a whole new way of working and helping customers,. It gives the users new ways of interacting with their tasks, information and the passengers.

"It is rare that a technology of product is inherently sustaining or disruptive. And when new technology is developed, disruption does not dictate what managers should do. Instead it helps them make a strategic choice between taking a sustaining path and taking a disruptive one" (Christensen et al, 2015, p. 9). A2H can benefit from the approach of disruptive innovation to ensure they do not end up developing a lesser version of the existing legacy systems.

2.1.3 User Research

The theory of radical and disruptive innovation have in common that they do not seek to replace current technology with a newer version, but instead leverage the opportunities a new technology brings and increase its acceptance and desirability. In disruptive innovation this means serving unmet needs, and in the case of radical innovation it means making the innovation more suited to the market to increase its adoption by employing incremental innovation.

In regard to disruptive innovation, to understand which nonstandard performance attributes will help the innovation grow, an understanding of the users is crucial. Gaining knowledge regarding their behavior and usage of current technologies as well as other information about their needs and desires can help give direction for innovation. "A business plan predicated upon asking customers to adopt new priorities and behave differently from how they have in the past is an uphill death march through knee-deep mud. Instead of designing products and services that dictate consumers' behavior, let the tasks people are trying to get done inform your design" (Christensen et al, 2003, sect 4).

The same goes for the incremental innovations that make a radical innovation more palatable. Understanding why people are resisting the innovation and which changes will make it more acceptable to them is necessary to innovate relevantly.

Additionally, user research can offer insight in how people interact with technologies and give meaning to them, which can also expose directions for a change in meaning to go along with a change in technology. According to Verganti, the possibilities for technology epiphanies emerge when a design-driven approach is taken to innovation of meanings and how they interact with technologies (Verganti, 2011). This is again shown in the framework for innovation types in the quadrant 'technology epiphanies', which are changes in meaning enabled by changes in technology (Norman & Verganti, 2014). The new way of working that the company aims for brings A2H from a purely technology-push innovation into the technology epiphany quadrant, because it gives a new meaning to the technology. As described, it gives new possibilities for customer interaction.

Although the purpose and form of the technology have already been established for A2H, looking at the general needs and desires of the target group (not just those served by the current solution) can give a broader sense of the possible meanings of the technologies, as well as reveal opportunities for incremental innovation.

2.2 Adoption

The article by Norman and Verganti (2014) refers to the acceptance of innovations and how to stimulate that acceptance by using incremental innovation to increase desirability. This acceptance of innovations and their subsequent use is called adoption.

Adoption refers to the actions of a customer when they decide to purchase or obtain a new innovation and use it (Hall & Khan, 2002). For organizations and companies it is also used to describe the process of acquisition and use, except in those cases the decision is not usually made by every single person who will be using it, but instead by a select few higher up in the organization. The new technology then diffuses throughout the population, spreading slowly to more and more users (Hall & Khan, 2002).

The term adoption therefore covers a few different stages, from obtaining a technology to using it regularly and becoming a regular user, and is essentially a term used to describe the process from the former up to the latter. Quite a few different models exist describing the process of adoption and acceptance of new technologies.

Diffusion theory is introduced, which describes the journey toward total market saturation and the different groups within that market that adopt an innovation. Therefore, diffusion describes the group phenomenon of individual adoption. We will examine some of the characteristics that have been found to influence adoption and look at adoption's potential barriers as well as its drivers.

2.2.1 Collective diffusion

The concept of diffusion has been studied in different fields and with different applications. Everett Rogers synthesized the previous studies in his own that defined diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2010, p.5).

Rogers also defines the five stages of this process: Knowledge, Persuasion, Decision, Implementation and Confirmation. The completion of these stages is crucial for the diffusion to be successful (Rush, 2019).

This process can be completed by individuals or other decision-making units, such as for A2H (see figure 3). If it is done by a decision-making unit, the involvement of all stakeholders is necessary to complete the process, because even though diffusion takes place as a whole, it is made up of individuals that adopt.

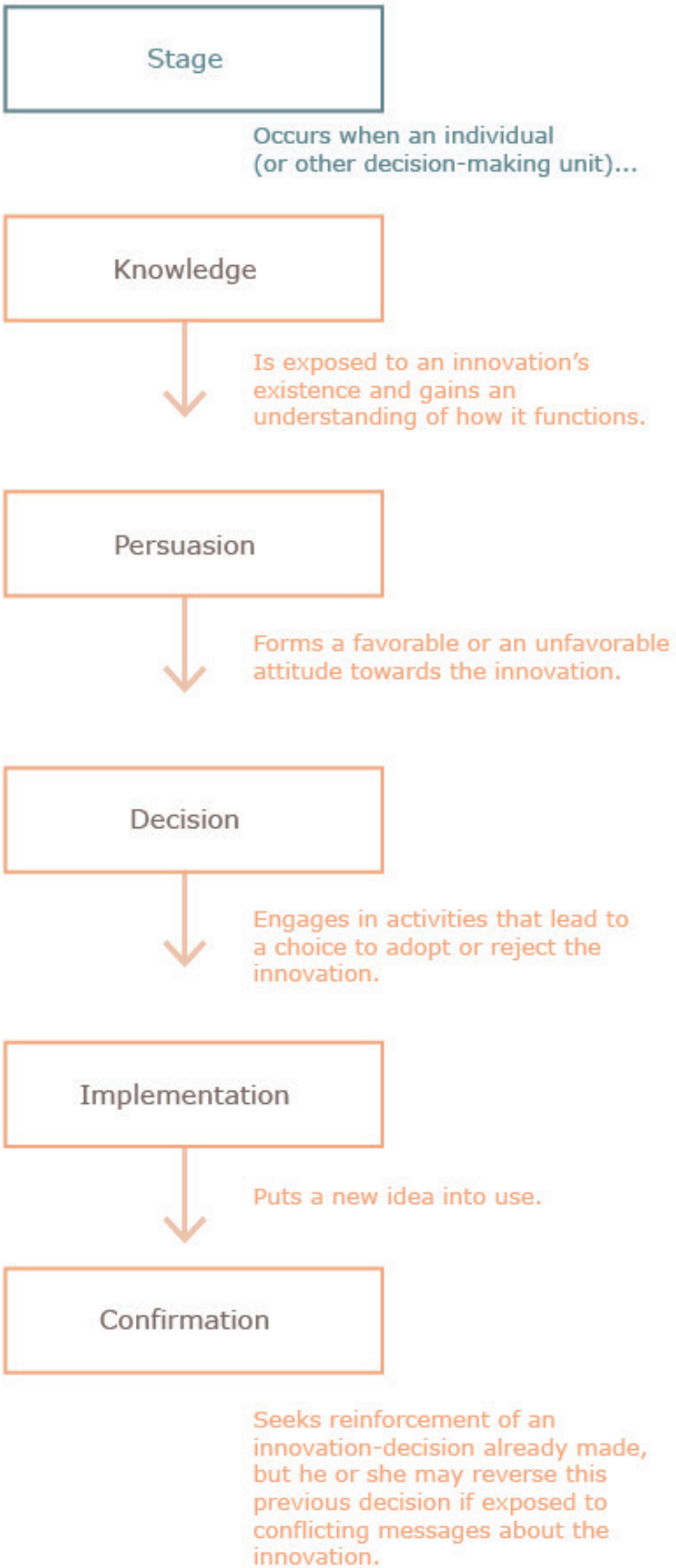


Figure 3.
Adapted from Rogers (2010).
The different phases of the diffusion process that describes the adoption of an innovation.

2.2.2 Individual adoption

Within adoption literature, a review and comparison of eight of the most-used models led to the formulation of the UTAUT: 'unified theory of acceptance and use of technology', a model that combines parts of other models and outperforms them by explaining up to 70% of the variance in usage intention (Venkatesh et al. 2003).

This model formulates four determinants (visible in figure 4) that influence acceptance and usage behavior as well as four moderators. These determinants were constructed using the characteristics described in different models (figure 4). The drivers that form the basis for the different determinants are explained on the next page.

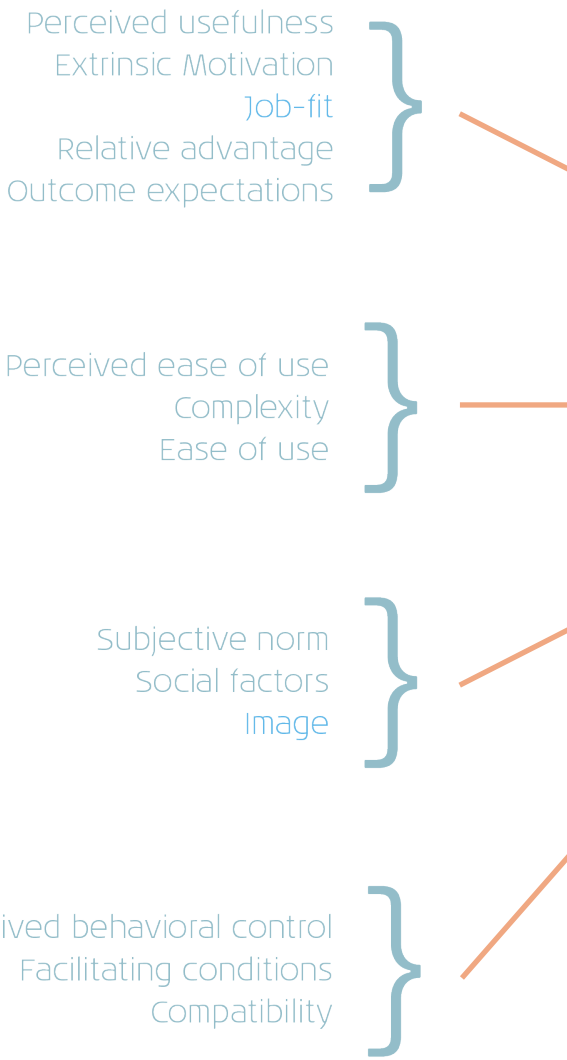
The UTAUT model divides the adoption-driving characteristics into four categories. Of those, the first two have to do with the content and functions of the technology. The latter two surround the facilitation and social engagement with the technology.

One of the studies included in the UTAUT model is by Tornatzky and Klein (1982). They looked at an aggregate of innovation studies as they relate to adoption and attempted to determine which innovation characteristics had a positive correlation with adoption. These studies also included Rogers', who popularized the aforementioned diffusion model.

The result from this study indicates that compatibility ("the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of the receivers" (Rogers and Shoemaker, 1971)) has a significant positive correlation with adoption. However, this result is based on an aggregate of different studies in which compatibility was assessed in differing ways.

Relative advantage ("the degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers and Shoemaker, 1971)) yields a similar conclusion. After all, the definition of 'being better' is unclear, and the studies use their own definitions and inference strategies. The recurrence of characteristics synonymous with this one does however indicate its importance.

A study by Davis (1989) concluded that perceived usefulness was positively correlated with self-reported system use. This means that if users feel that the new system is useful for them and their work processes their adoption of it will increase.



Performance Expectancy
These aspects refer mainly to the experience of the application by the user, specifically usefulness (the relevance and fit). It also includes their expectation of its benefits.

Effort Expectancy
The ease of use of the application determines the effort needed to use it. This aspects is connected to the interface and functions of the application.

Social Influence
This aspect involves the number of colleagues using the application, the management's & organization's support of the usage of the system and the status of people using it. It is also influenced the people that are important to the user: whether these people think that the user should use the application.

Facilitating Conditions
Guidance, resources, instruction and compatibility are important elements of this determinant.

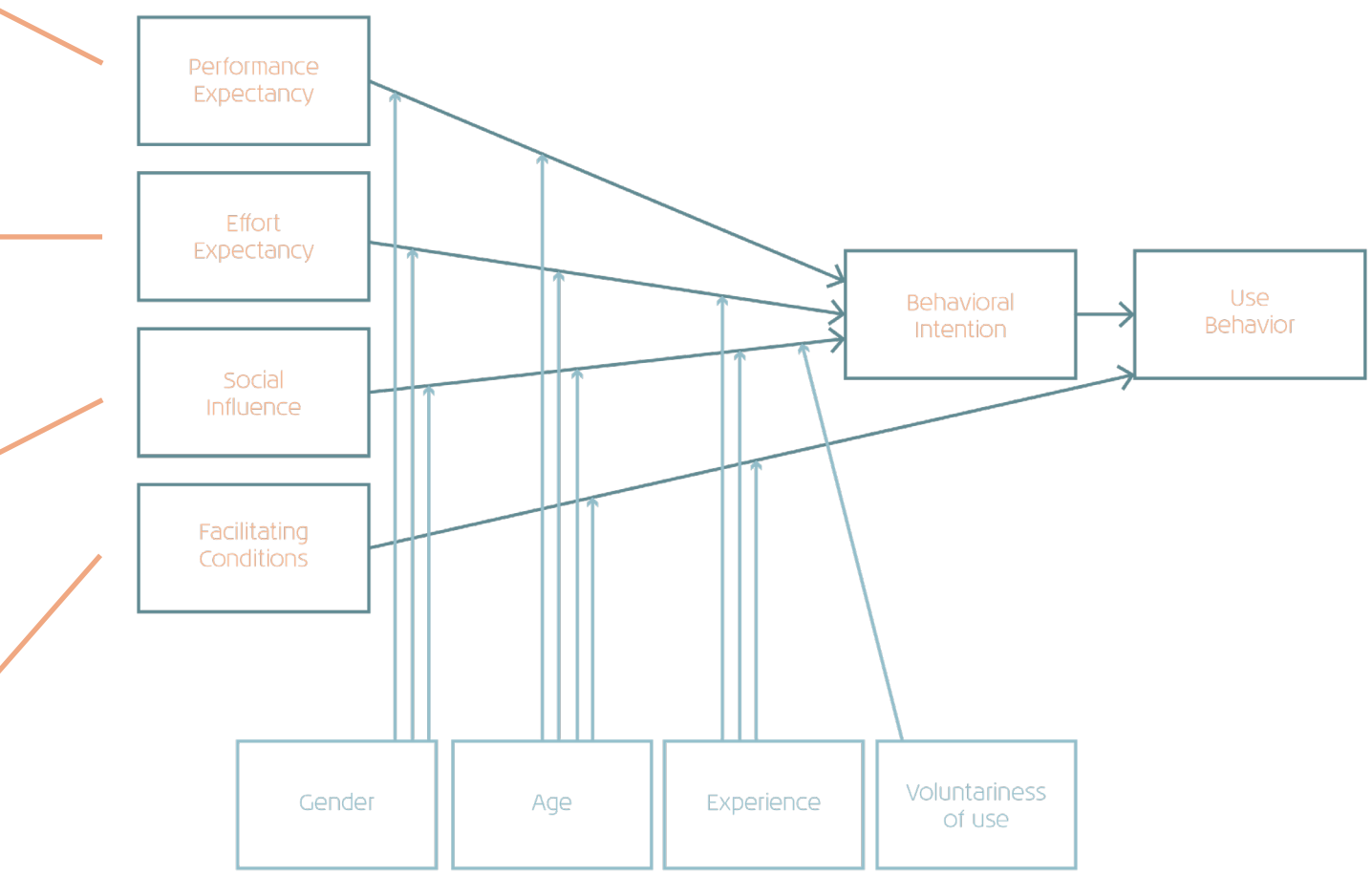
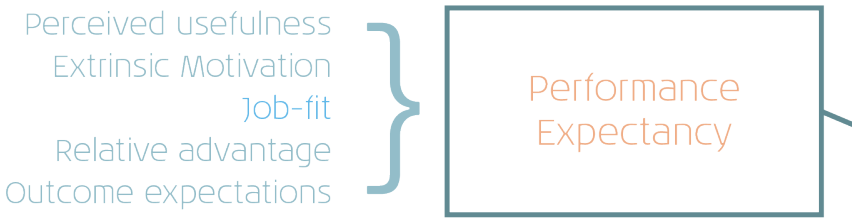


Figure 4.
The UTAUT model as developed by Venkatesh et al, 2003. The left shows the four main contributing determinants for the behavioral intention and use behavior.The bottom row shows the moderators.

Relevance
The afore mentioned contributing characteristics (compatibility; relative advantage; perceived usefulness) can be boiled down to relevance of the product to the user group. The product should fit into the existing context and user needs, and offer benefits that the previous system did not. These can be found in the first determinant of the UTAUT model: Performance expextancy. This corresponds with the conclusion drawn from radical and disruptive innovation, where a focus on user needs can aid acceptance. In this study we will therefore from now on refer to suitability of the innovation to the user needs and desires as **relevance**.

Achieving this relevance can be done through user-centered design and co-creative design practices. The role of design practices in increasing relevance is described in section 2.3.2.



Ease of Use
The study by Davis (1989) also found that perceived ease of use had a positive correlation to adoption, albeit less strong than that of usefulness. Ease of use relates to aspects such as complexity and interface design, amongst others. These correspond mostly to the second determinant of the UTAUT model: Effort Expectancy.

Looking at A2H, this indicates that relevance and usefulness of functionalities of the app are even more important than the ease of use, but both contribute to adoption. Therefore, investment in both of these aspects will most likely drive up adoption and use.

Figure 5.
Two of the four main contributing determinants for the behavioral intention and use behavior and the factors they include.

2.3 Techniques

Now that we have examined the influential factors for adoption, we will look at techniques to aid adoption and overcome resistance.

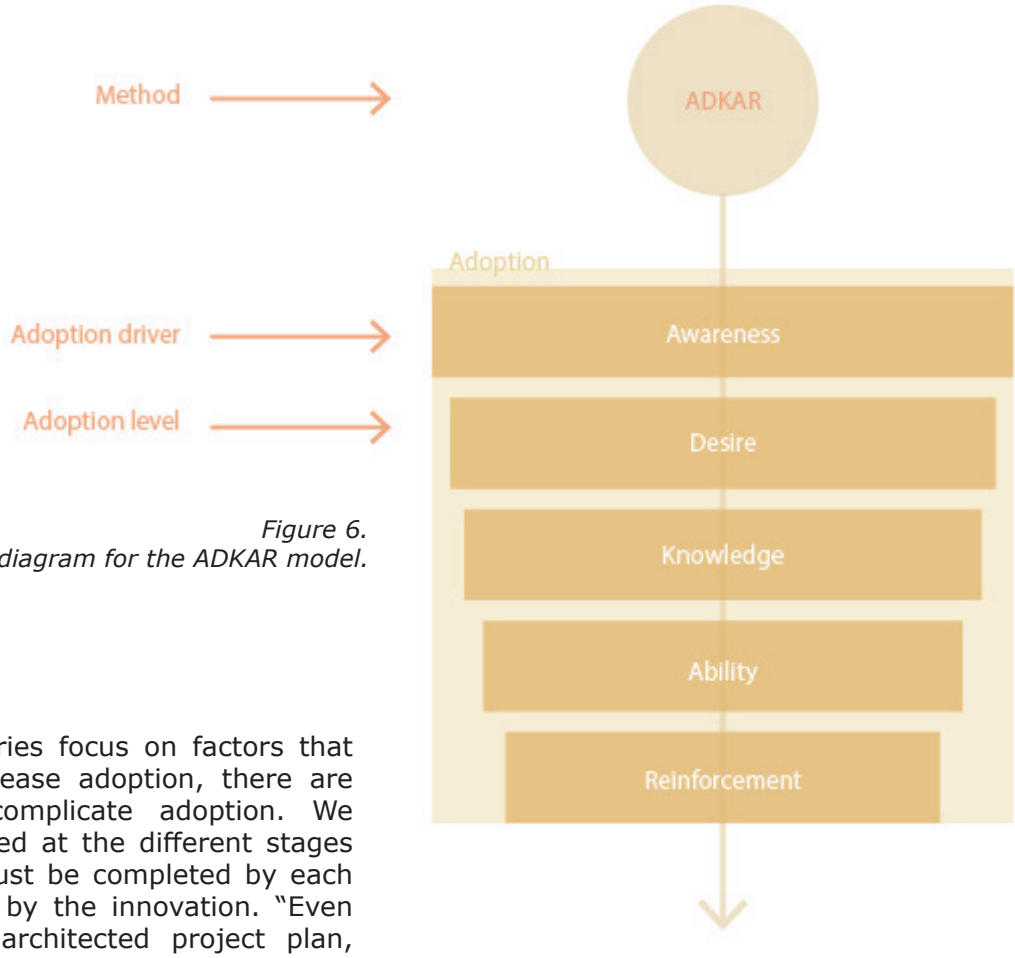


Figure 6.
The adoption diagram for the ADKAR model.

2.3.1 ADKAR

Although many theories focus on factors that can be used to increase adoption, there are also factors that complicate adoption. We have previously looked at the different stages of diffusion which must be completed by each individual influenced by the innovation. "Even with an effectively architected project plan, however, the most commonly cited reason for project failure is problems with the people side of change" (Prosci, n.d., p. 7). The ADKAR model addresses the issues that arise when individuals show resistance to change and do not adopt an innovation.

As mentioned in the diffusion description which has a similar model with the stages of diffusion as formulated by Rogers, the individual completion of both the diffusion stages and these ADKAR stages is crucial to successful adoption (see figure 6). Since the decision to adopt was made by a small group of people that represented the company, some users may not have felt involved in the decision. This means that the problems those stakeholders have with any stages must be addressed retroactively, to remedy the resistance (Prosci, n.d.).

This model consists of 5 different, sequential stages:

Awareness: creating an understanding of why the change is necessary is the first step in overcoming resistance.
Desire: personal motivation to adopt the change. People may have their own individual reasons, which should be engaged with and linked to the change.
Knowledge: before employees learn to work with the new software, they should gain the necessary knowledge.
Ability: once they are prepared to learn, this stage is where they are trained for the new way of working. An important aspect of this is the room to ask questions and make mistakes without there being real consequences.
Reinforcement: lastly, reinforcement helps establish a habit. This involves monitoring the implementation of the change, both to celebrate success and to address any barriers or issues that come up.

2.3.2 User-centeredness

Achieving the relevance that we have identified as crucial to increasing adoption of the innovation, can be done through employing design practices, specifically user-centered and co-creative design practices.

According to Sanders & Stappers (2012), user-centered design can be described as "making new products and services better meet the needs of 'users'. They [designers] use research-led approaches (...) to collect, analyze and interpret data in order to develop specifications or principles to guide or inform the design development of products and services" (p.18-19). In these methods the designer is the expert and he or she formulates user needs based on research.

The adoption diagram for user-centeredness and the two adoption drivers it produces are visible in figure 7.

Co-creative practices or 'participatory design' refers to methods in which the users are actively involved in the development of products or services to ensure that the product meets their needs (Sanders & Stappers, 2012).

According to Sanders and Stappers, participatory design can offer "relevant ideas" that can then be explored and further detailed through user-centered design (2012). A combination of these two methods is a natural match, since both aim to create relevance for user groups. From now on when referring to these different practices we will collectively call them 'user-centeredness'.

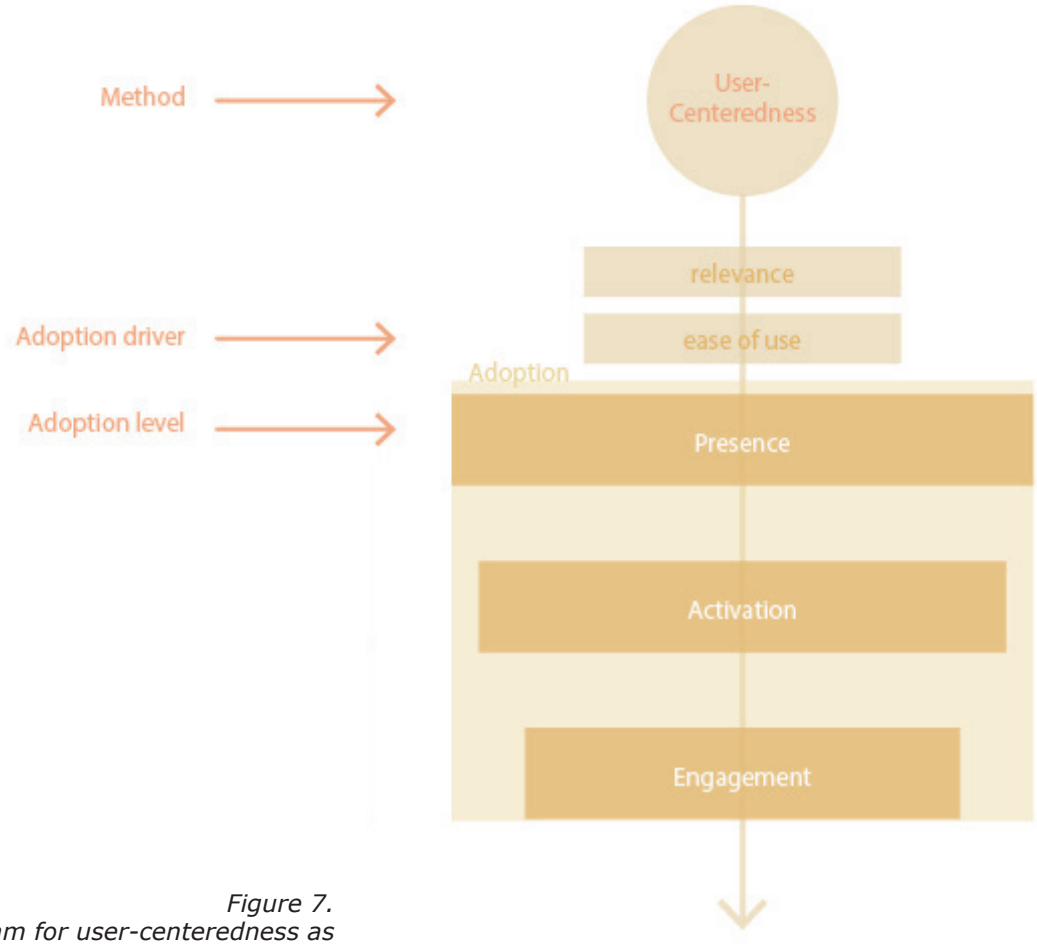


Figure 7.
The adoption diagram for user-centeredness as introduced above.

2.3.3 Growth hacking

The term growth hacking was coined by Sean Ellis and refers to using strategies with a sole focus on gaining and retaining customers. These strategies can be applied in different ways, from marketing to product engineering, and are most used in start-ups, where customer numbers are an important indicator of success. (Optinmonster; Quicksprout, 2019).

An adapted and shortened version of the original framework is the one formulated by Quicksprout which has 3 levels instead of the original 5. It moves down from getting visitors, to activating them into becoming members, to eventually engaging them so they become regular users (see figure 8). Different drivers are used for the different levels, the goal being to move customers down the funnel. Where first use can be elicited by pulling or pushing users into the application and stimulating engagement or membership, continued use has to be based on the application having value for the user. "You have to always stay ahead of the value curve if you want to retain users" (Lofgren, 2019, sect. 7).

In the case of A2H the model looks a little different, (see figure 8). Since the users are employees and they do not have to actively choose to purchase or use the application but essentially have to, the two top levels of the funnel become one. It's not about getting visitors or members, they all have the application on their tablet. The goal of that combined first level is to make sure they cross the threshold of everyday usage and to elicit an action from them.

The last level of the funnel remains the same: engaging users to ensure their continued use of the application and their encouragement of colleagues.

Growth hacking strategies focus on pulling users in, after which other characteristics more focused on actual functioning and process will determine whether users will stay and become regular users.

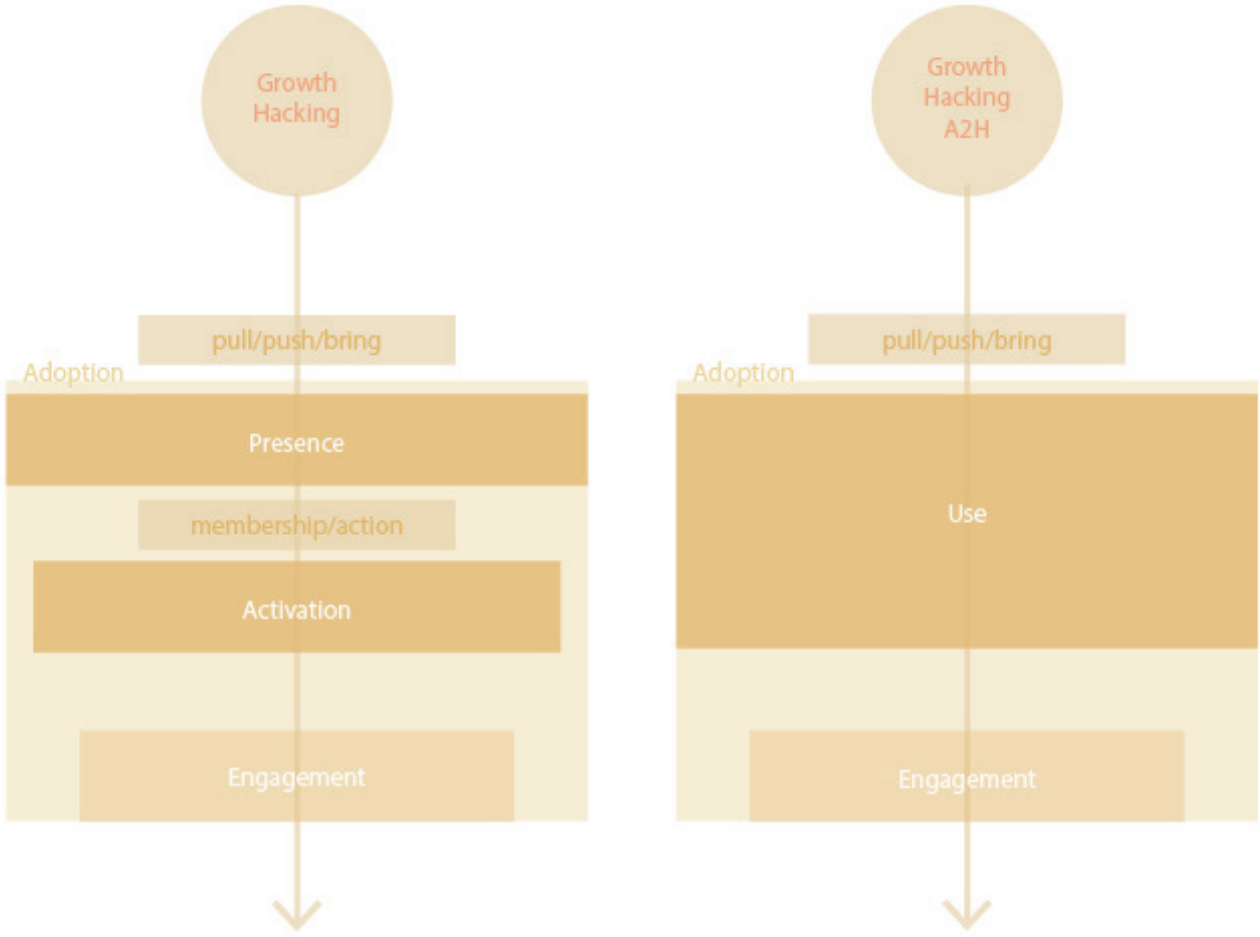


Figure 8.
left: The adoption diagram for growth hacking on the left, adapted from Quicksprout (2019).
right: the aoption diagram for growth hacking adapted for A2H.

2.4 Synthesis for A2H

The theories we have examined showcase the different ways that adoption rates are influenced and determined. Some techniques or strategies can be employed by the organization, top-down, to help cultivate adoption and engagement. However, an important part of affecting change lies with those who will bring the change into action: the individual employees within the organization.

Although not all individuals are always involved in decision-making, they can be supported in sharing responsibility for the new way of working. As explained, this can be done through use of the ADKAR model, which essentially functions as an adoption funnel as well.

From the UTAUT model and the studies on radical and disruptive innovation we can conclude that relevance for the user is one of the main drivers for adoption. User-centeredness brings relevance and ease of use and thus contributes to all levels of adoption and adoption as a whole, see figure 9.

Growth hacking, as can be seen from the model from section 2.3.3, pulls user into first use, but does not supply relevance, but that relevance is needed to reach the final stage of the adoption funnel.

The ADKAR model supports the 'people side of change', by engaging with the individuals and leading them through the stages of adoption consecutively.

Combining the two approaches stimulates complete adoption by creating relevance, and enriches it with growth hacking techniques to stimulate initial use. The ADKAR model contributes by outlining the more emotional and personal side of the adoption journey per individual, next to the practical levels that only show actual behavior.

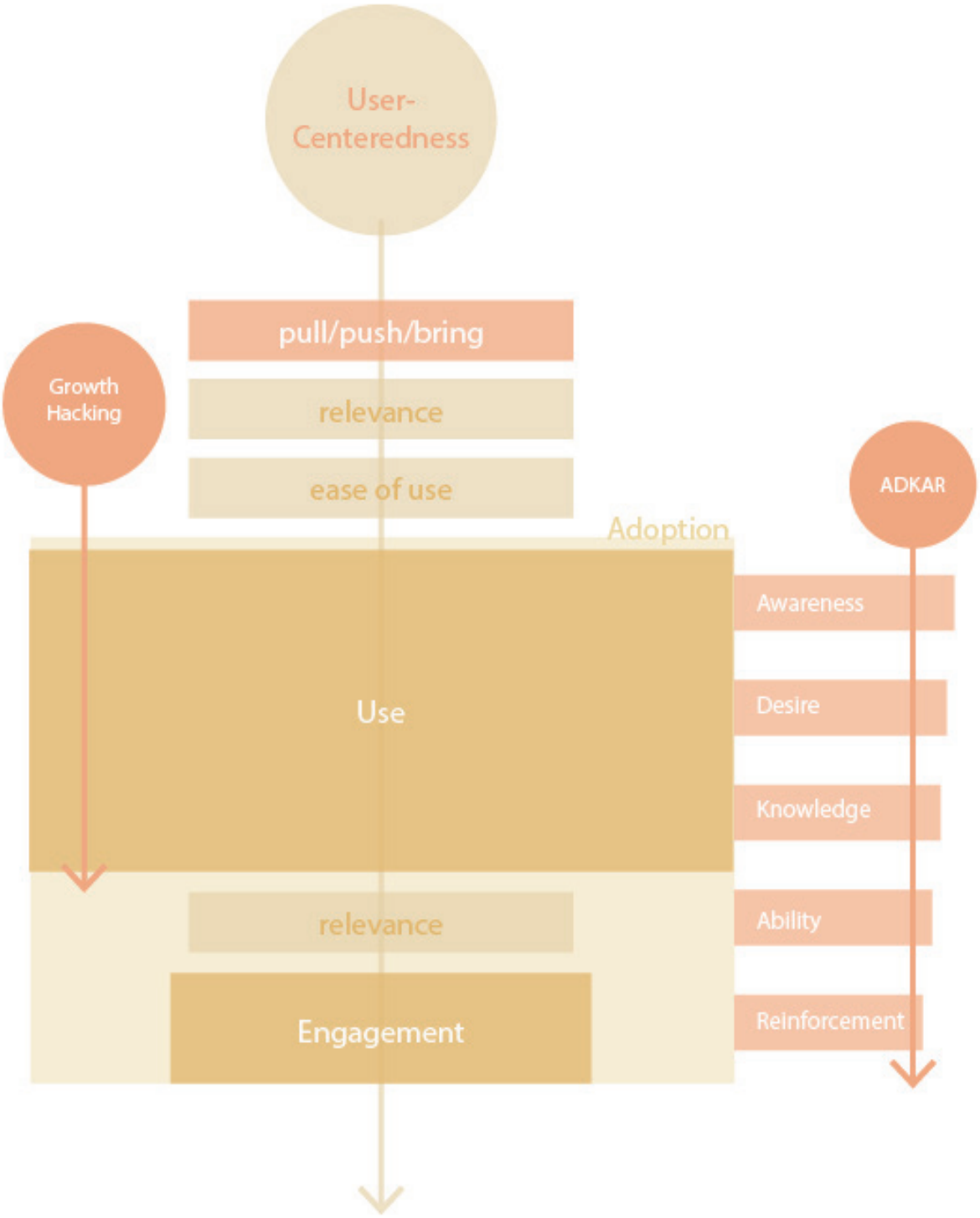


Figure 9.
An original combined adoption model showing the combination of growth hacking techniques and user-centeredness, the adoption drivers they create and the levels of adoption reached with these drivers. Also includes the ADKAR model for change management on the right, showing the adoption levels it is made up of.
Growth hacking pulls or pushes users into first use (of the day), and relevance and ease of use drive all levels of adoption, from first use up until engagement and long-term use. The ADKAR model supports the emotional and personal side of the adoption process.

3 Practice

In order to be able to compare theory to practice, the current way of working within the company surrounding A2H must be understood. We will therefore define implementation for this study and examine what that process currently looks like.

Through interviews with 7 different members of the A2H and digital team, the current development and implementation process is examined and described in this section, see Appendix for details of the study.

3.1 Implementation

Implementation as a concept has many different definitions depending on the industry you look at or even the different organizations and experts that define it. Looking purely at the dictionary definition it means the execution of a plan. According to Fixsen et al, implementation can be defined as "a specified set of activities designed to put into practice an activity or program of known dimensions" (Fixsen et al, 2005, p.5).

In order to analyse the current state of user-centeredness and adoption, we will apply Fixsen et al's definition of implementation to the A2H process (figure 10). This means the agile way of working, through which new rollouts take place, including the development of features and the decisions on which features to develop, the deployment of the features and the subsequent measurements and feedback from users. This process can be seen in the figure below.

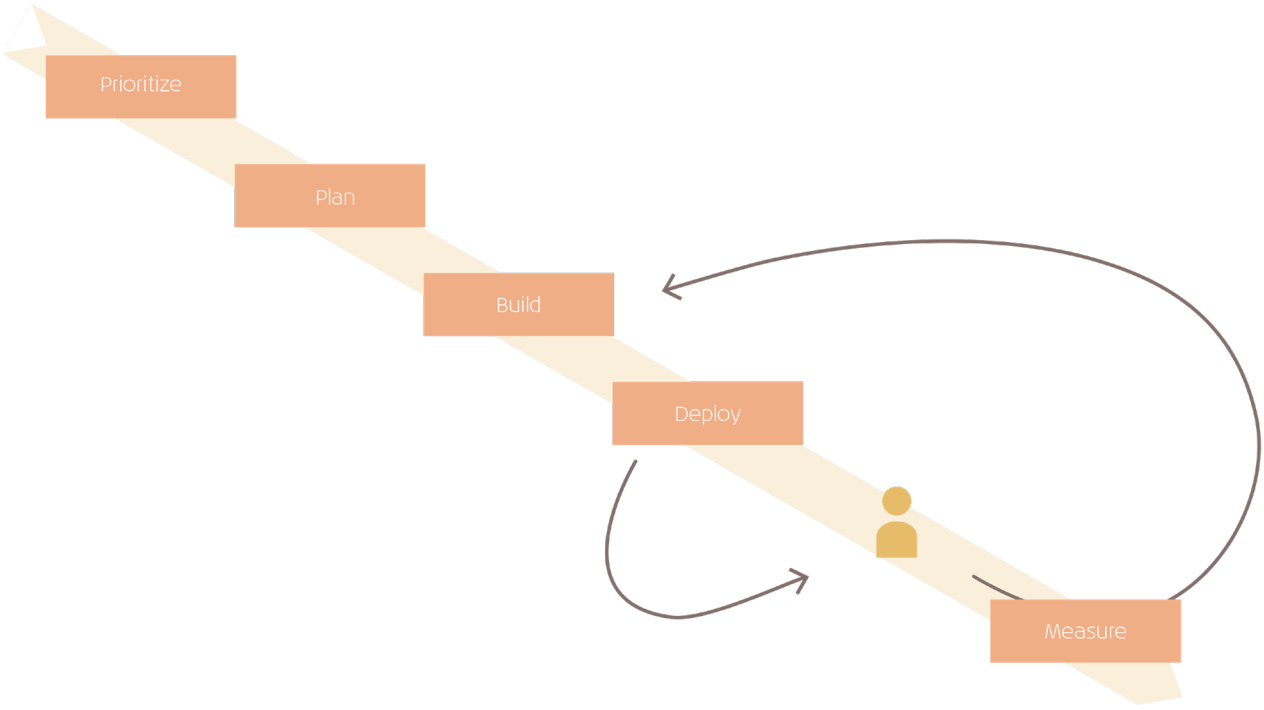


Figure 10.
The A2H development process, including the feedback loop on the sprint level.

3.2 Current situation

Prioritize:
The prioritization stage of A2H is preceded by other departments' sessions and decisions, see figure 11.

The yearly prioritization session for PS is held, in which A2H is one of the many aspects. This planning indicates what the priorities for that year are on an abstract level. Strategic value is determined by the VP of PS, since A2H is developed with the Ground budget. A strategic roadmap (sometimes including deadlines) is formulated by PS for the next year, that indicate any must-do's for A2H.

This roadmap is then used as input for the yearly planning for A2H, made by the business representatives of A2H, as well as from Ground, IS and CX. This is when the big themes and projects for that year (so-called epics) are prioritized. Additional prioritization meetings are held each quarter of the year, for more detailed planning.

Plan:
Business analysts then plan the sprints within quarters together with developers, information analysts and UX designers, according to necessary capacity, resources and time.
Every sprint has a certain amount of points available, and features are planned in according to their required effort. This is usually done according to the principle that every sprint should contain 50% new features, 30% bugfixes and 20% basics right.
The 'basics right' part of the sprint based on a backlog of 'jobs to be done' focused on optimizing current functionality and improving the overall experience of the application.

Build:
in two-week sprints the planned new features are built and realized. These sprints include new features as well as bugs and optimizing basic functionalities.

Deploy:
On the day of two-weekly releases, the newly developed features are pushed to the beta users so they can be tested, and the features that were previously deployed to betas are then pushed to all users. This also includes information about the release which is supplied to users through several different channels.

Measure:
Clicks and usage metrics of the different functions are monitored and discussed by the A2H team, mostly to find any serious issues with functionalities. The metrics do not currently reflect individual users but only the total usage per department.

Figure 11.
The substages of the prioritize step in the implementation process (as seen in figure 10).

3.3 Agile

The premise of working agile is that continuous delivery of software enables stakeholders to give immediate feedback and changes and features can be tested quickly. It is an iterative way of working that is done in short sprints, with an emphasis on collaboration and incremental innovation (Goodman, 2018). A visual representation of the agile way of working can be seen in figure 12. This includes the phases design, build, test and review.

Within the A2H team the 2-week sprints include these same phases. They are preceded by the prioritization and decision-making phases, which take place once every year or quarter.

The design and build phases coincide somewhat, since the design of the functionality itself usually already exists, so design and validation in the sprint is mainly focused on interface and interaction. The review phase is mostly based on usage metrics, but mainly focused on diagnosing serious issues with functions that impair use. The routine check of all functionalities and use of other metrics besides usage (such as satisfaction and more qualitative metrics) is not yet a part of the standard procedure.

A short feedback loop is one of the main reasons for using an agile workflow. This feedback can come from users but also from other stakeholders. One of the challenges of working agile is integrating feedback in an efficient and useable way while not going overboard in trying to please everyone and ending up convoluting the actual application (Meistertask, 2019).

The feedback balance is difficult to keep. Taking in helpful feedback and enough of it is the desired result of the feedback loop, but becoming too scattered or not having clear priorities are potential negative results.

Another potential issue is the difference between short-term and longer-term projects, where the latter may not necessarily benefit from incremental delivery in between. Some projects that are done for A2H are large because they consist of an entirely new feature or section of the application. These take up multiple sprints and this creates difficulty in planning in projects. Having to push many smaller projects (that are easy or quick to do) in favor of a very large project that takes up 3 sprints can feel illogical even though it may have high strategic value for the application or company as a whole. This can cause projects to be pushed for a long time, or for other smaller projects to be pushed. Having clear priorities within a project or an order of development can help split them up into chunks that make sense, or help create understanding of why it does or does not qualify as important enough to occupy an entire sprint.

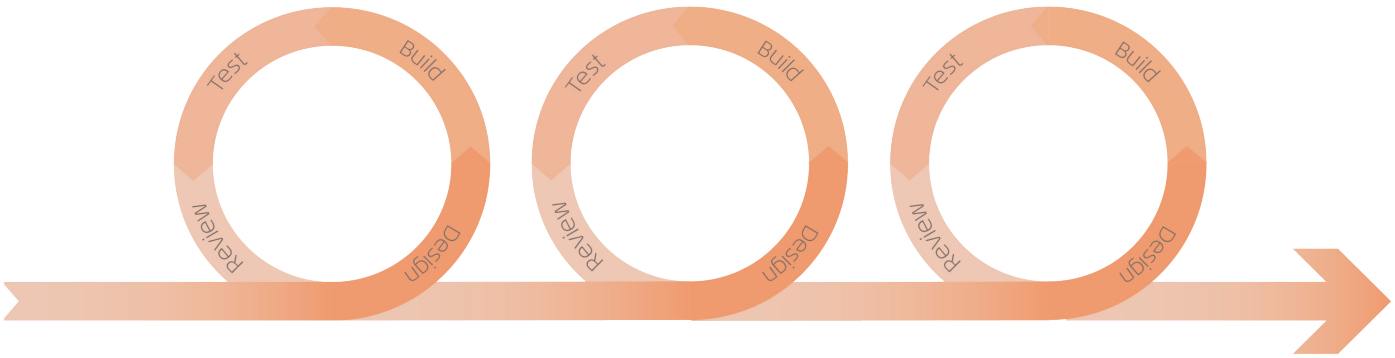


Figure 12.
Visual representation of the agile way of working.

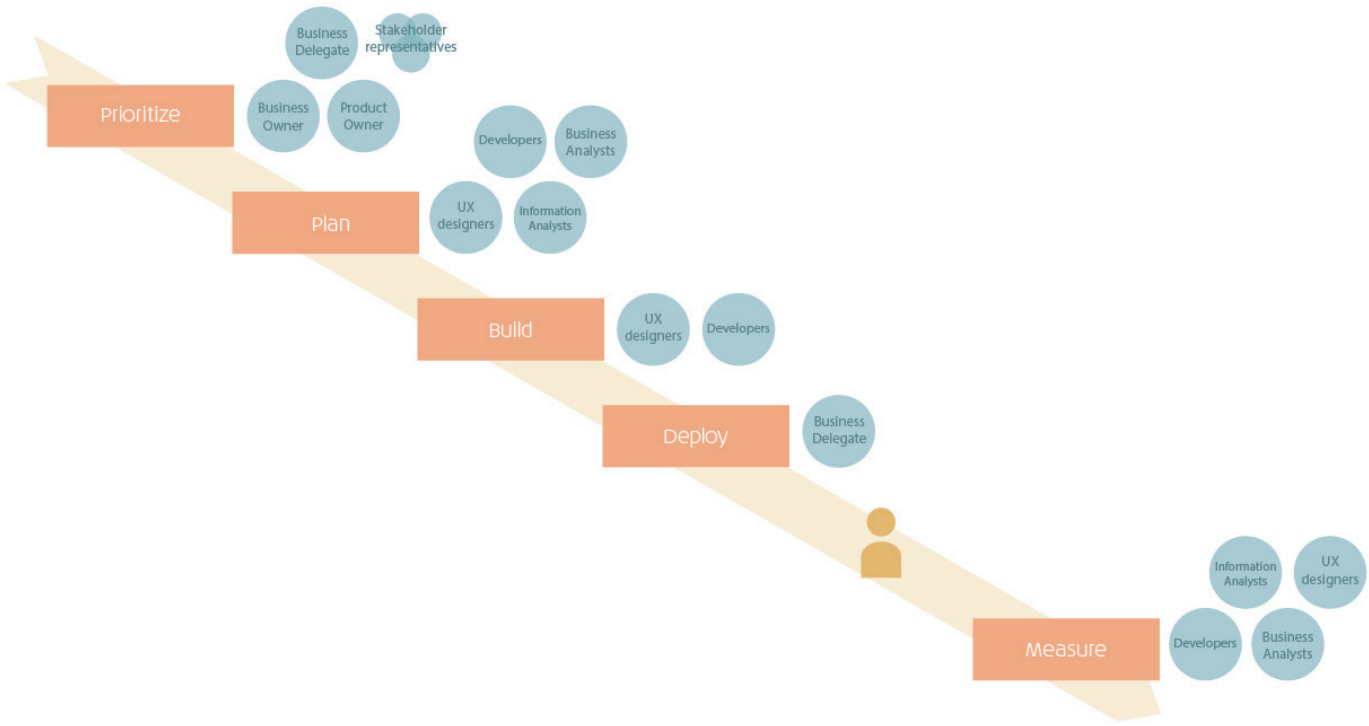


Figure 13.
The current implementation process of A2H, including the A2H team members involved in each.

Theory vs practice

Comparing the A2H development process to the previously introduced theory, we can see that user-centeredness methods are currently limited to the sprint level: build; deploy; measure. Some research is conducted with the users when functions are being developed, but only on usability.

In this way, qualitative feedback from users is used to validate designs, and received as feedback through different channels once the functions are live.

The business delegate also collects qualitative feedback through meetings with the beta users and observations on airside, and bears this in mind when selecting themes and features to be prioritized, but there is no formal structure for this. Moreover, the other stakeholders in the prioritization do not have these insights, making it difficult for those that do to 'prove' the user value.

This qualitative insight that the business delegate gains is occassionally used as direct input. For instance, letting users give suggestions and requests for basics right jobs. She then adds these to the list and prioritizes those that are most important to the agents.

In conclusion, user-centeredness is not yet practiced above the build phase.

Increasing relevance for the users can be achieved through investing in user-centeredness across the whole process, before as well as after the build phase. This means introducing user-centeredness at the prioritize and plan level. Since the planning is based on the input from the prioritization, increasing the user-centeredness at the top-level will likely ensure a trickle-down effect that makes the whole process more relevant.

3.3 Sprint level

To understand the user involvement as it currently exists we will first look at the sprint level (see figure 14). This includes the feedback and input loops, and the barriers that the involved parties perceive in the different phases of this process. These barriers keep the sprint loop from closing and operating at its optimum.

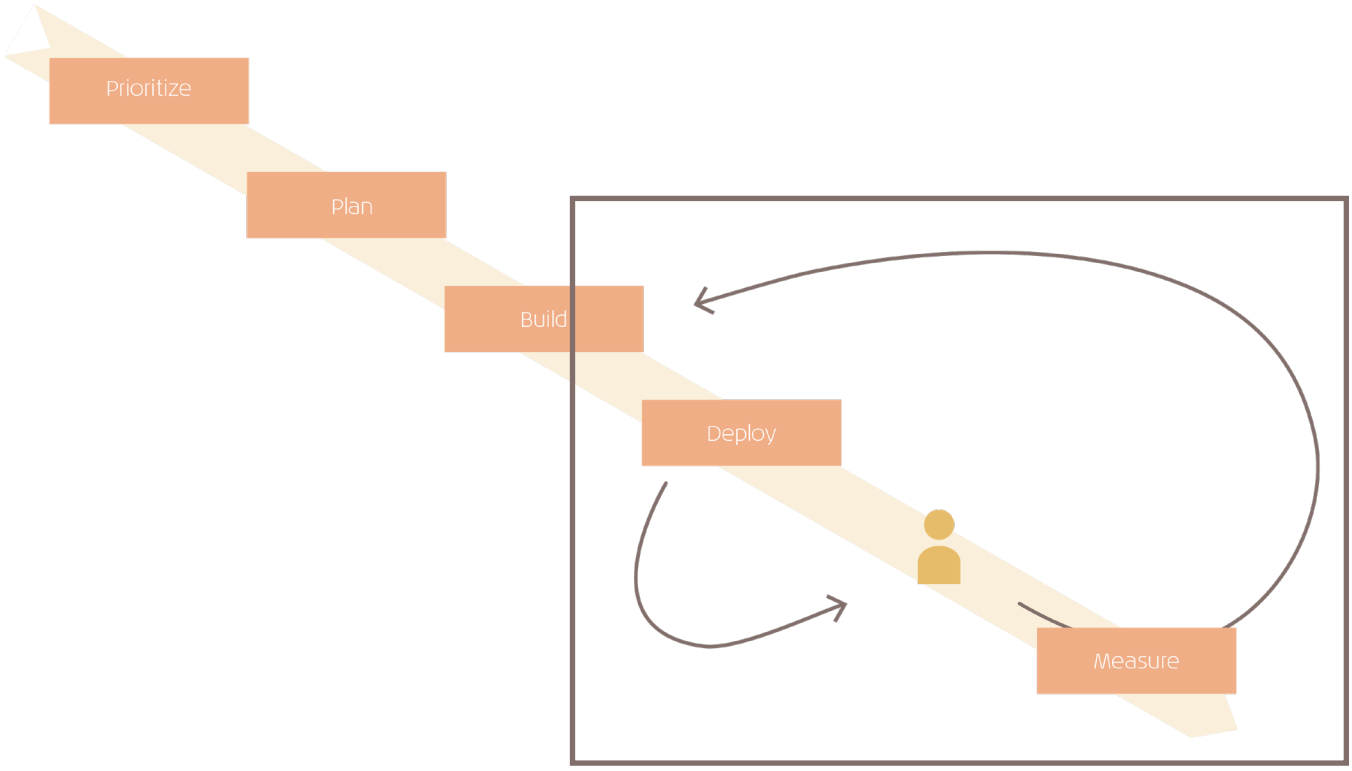


Figure 14
The A2H development and implementation process, with the sprint level highlighted.

Interviews

Semi-structured interviews were conducted with 5 users, see appendix for interview guide. Naturalistic observations were done in 3 different locations where users were working with the application, an hour each, followed by unstructured interviews with the subjects (n=3). An additional semi-structured interview was conducted with a shiftleader, who sueprvises agents (interview guide in appendix).
Information collection done by the researcher through note-taking during observation and validated with the participants in the interviews after observation.

Different barriers were found in different contexts, which can be clustered into 3 main categories:

1. Conditional barriers: facilities that must be in place for employees to be able to use A2H.
2. Functional barriers: barriers within the functioning of the app itself that are impeding use.
3. Emotional barriers: reasons for lack of use with an emotional or behavioral basis.

These represent different types of resistance amongst the A2H users that keep them from using the application often (or at all).
The next page shows some of the barriers mentioned around the different user processes to illustrate the different categories.

General barriers for use and acceptance have been identified, which are over-arching barriers that keep users from adopting in the first place. Only after use are the other barriers relevant. These include barriers for different actions: the giving and receiving of feedback, and barriers for learning about the application and its new releases (see figure 15 on page 36).

The presumed barriers as named by the business side of A2H are compared to the results from the interviews, to compare business interpretations of challenges to those formulated by users.

> *a lack of understanding of both the tool itself and its potential benefits to the user.*

There seems to be a lack of insight into the bigger picture, the purpose of A2H and the progress with which it expands. Users are not (always) aware of what's coming and A2H's role in the changing way of working.

> *the speed of change in the application is thought to create a sense of pressure that might be counter-productive.*

There definitely seem to be some issues regarding the users' awareness of new releases and their understanding of the new functionalities. This is mostly said to be due to getting a lot of information at an unsuitable time and not knowing where to look for it when they do want that information.

> *the difficulty in letting go of an old process and adopting a new and unfamiliar one.*

Some users do seem to be attached or used to the old way of working, and the fact that the shift to working with A2H is an incremental one makes it easy to stick with the old software, since it is still being used. Processes that are only available in A2H will ensure that people use the app.

Essentially:

1. Is it plugged in?

2. Can I find the 'on' switch?

3. Can I work with it?

3.3.1 Barriers for use/adoption

- Wifi isn't stable or does not always work
- Ipad batteries drain quickly
- Ipad is working too slowly, takes a long time for screens to load
- *"It loads screens that aren't necessary and this means I have to wait to use it."*
- *"Pop-ups are very small and I can't read them without glasses."*
- *"Not sure we can rely on the information, because it displays different numbers in different places within the app."*
- Users find it intimidating to stand in the middle of the crowd with just an ipad.
- *"Some functionalities don't work in the app, so we use the desktop for those and then just keep using it."*

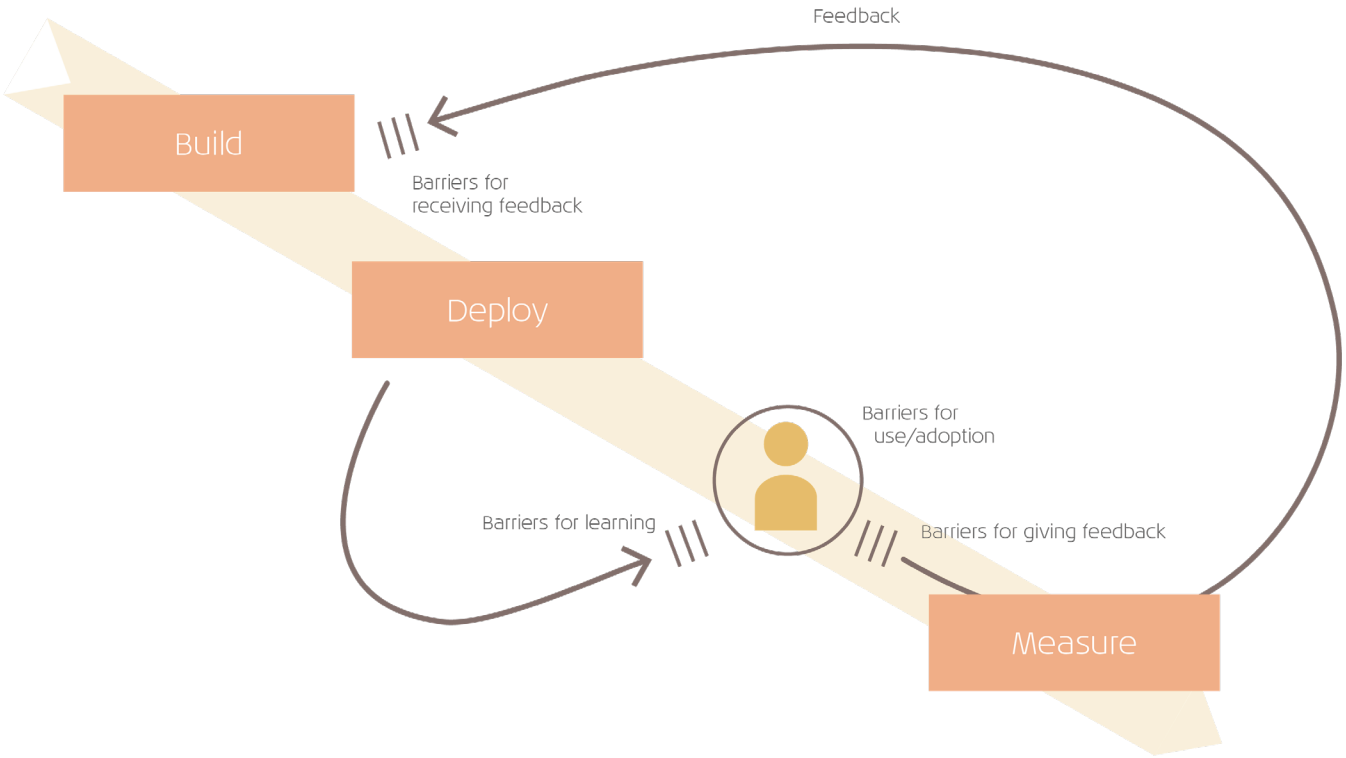


Figure 15.
The barriers of the current A2H implementation process surroundng user adoption and the feedback loop.

3.3.2 Barriers for learning

- The Appy at work sessions are available for all employees, but they have to be scheduled out to attend them, which isn't possible for some users' shifts. This means some have never attended a session like it, or only once.
- *"We aren't sure where to find the right information"*
- Release notes include a lot of information at once, meaning that there is no time during operations to read it all, so they skip it (and then don't know where to find it again).

3.3.3 Barriers for giving feedback

- Takes too much time during operation.
- *"I'm not sure where to do it."*
- There is no confirmation of reception or update on progress; *"I don't know what happens to my feedback"*

3.3.4 Barriers for receiving feedback

- Not a designated task for anyone on the A2H team.
- Fragmented 'arrival', multiple channels and varied forms of feedback.

3.4 Prioritize level

In order to expand user-centeredness to higher levels, we examine the current prioritization processes. Observation of the yearly prioritization session and interviews with participants have given insight into how the current way of working is experienced by the different participants.

Because of confidentiality considerations no recording or transcription was made of this meeting, the researcher kept notes of the activities and discussions.

The way prioritization currently takes place:
The aim of the session is to establish relative value and in that way reach a ranking of the epics for the upcoming year or quarter, depending on which prio session it is. Participants of the session include all stakeholders of the application, such as: the hub (home airport of the airline), the international stations at which the app is used, the customer experience department, any other stakeholders from digital with related products and the product owners of A2H.

Preparation

Before the session takes place, the representatives from the different departments describe the topics and themes they want to address in the upcoming period in so-called epic sheets. These sheets aim to summarize the content of the topics and their value for business, strategy and user. This is done by giving background into the need for this topic, the current situation and potential results. This is summarized in a value given to the epic based on business value drivers that are rated on a scale 0-100. Drivers for that value are described in the matrix that is used by the entire department. The allocation of value is done by the epic owners themselves.

Hub representative speaks from user perspective *"as an agent, I want this solved now, so I can do it more easily"* but is the only participant to do so.

"customer satisfaction should only be ticked by members of the CX department. I would never presume to tick a box about a subject that is not my own, but I know others that do"

Pitch phase

During the session, the participants pitch their epics to the other stakeholders, in an attempt to convey the value of the epic. This is also where other participants sometimes ask questions or 'challenge' the epic and its value.

"Okay well I know nothing about that, it's your department, so I cannot vote on it, we'll have to trust you."

Ranking

After all epics have been discussed, the ranking starts. Ranking is based solely on business value, which also includes user value. See appendix for the epic sheet and matrix.

The key observations are:

- Because the epic owners themselves allocate business/user/strategic values this leads to different interpretations of value and urgency. Participants have the highest stake in their own epics. This makes comparing epics difficult, because they do not reflect relative value.
- Discussions often reveal a lack of understanding of epics presented by other stakeholders. This also creates a skewed understanding of the business value because that is then communicated by the main stakeholder as they pitch.
- If participants do not understand someone else's epic they sometimes object to it or they vote along with them because they assume it has value even though they do not understand it. This makes comparison difficult. If there is no evidence, there is nothing to base the value or ranking on.
- Even though "employee satisfaction" is one of the business value drivers pitches rarely mention it. This goes for other drivers as well, not all are mentioned in each pitch making comparison more difficult.
- On the epic sheets boxes can be ticked for the different value drivers, but representatives feel differently about their authority to do so. While some fill them all in based on their own insight, others feel that some of the drivers can only be filled in by the designated department. This creates more inequality between the epics and their given business value.
- Values are sometimes not used in the prioritization but representatives pitch their own epics and a discussion follows in which the pitch is challenged and that is used to prioritize.

From this we can conclude:

- The epic sheet format asks for a value but because this is based on drivers that are difficult to quantify the values are not used to prioritize. This means the process of filling in the epic sheets as it currently happens is inefficient.
- Pitch-based value determination introduces factors that are unrelated to the content of the epic: ways of discussing business value, pitching skills of the representative, different questions elicit different responses and potential bias, etc…
- A lack of knowledge and evidence as to why an epic is assumed to have a certain value is experienced as problematic and annoying by the participants because they feel unable to adequately compare epics.

Essentially the prioritization sessions are an attempt at quantifying business value and making decisions easier by evening out the playing field. Practice shows that the many factors that influence the process actually create the opposite effect.

Capturing the value of projects in drivers that determine numbers by which to prioritize only works if the drivers are interpreted in the same way by all the participants, and are 'driven' by the same type of information and input. That is currently not the case.

Additionally, evidence for drivers (including user engagement and satisfaction) is lacking and makes quantification more difficult, undermining the effect of the value drivers on the prioritization.

4 Concluding Discover

From the different theories several aspects emerge as some of the most important in improving and encouraging adoption. Most of the aspects mentioned in the models by Tornatzky & Klein (1982) and Davis (1989) are included in the UTAUT (Venkatesh et al. 2003).

Examining the categories in which these adoption drivers have been collected we can observe that each category lends itself to a different kind of approach, see figure 16. Comparing these approaches to the development and implementation process of A2H, each approach can be applied in a different way (visible in figure 17).

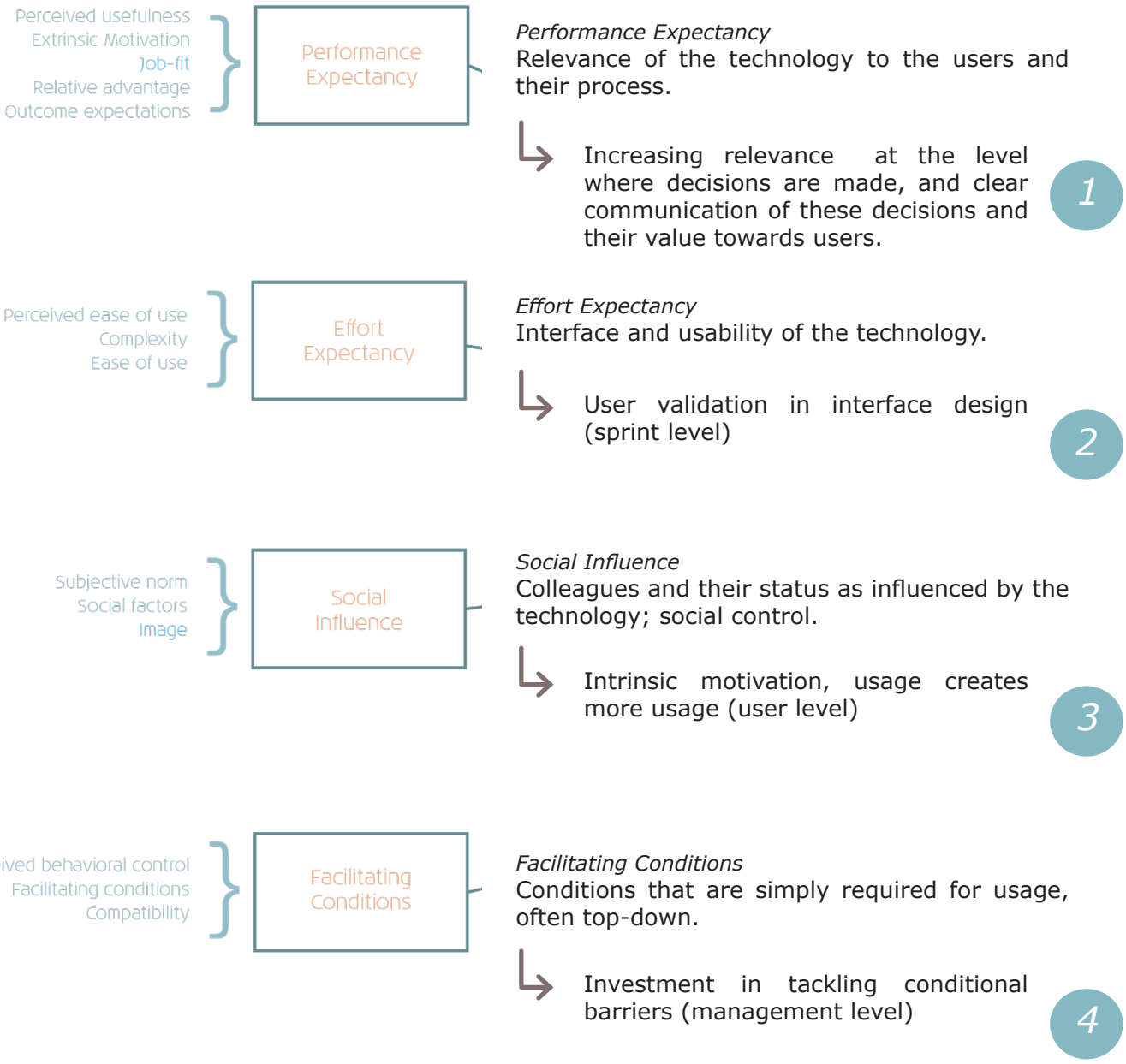


Figure 16.
The determinants of the UTAUT model and the characteristics that make them up.

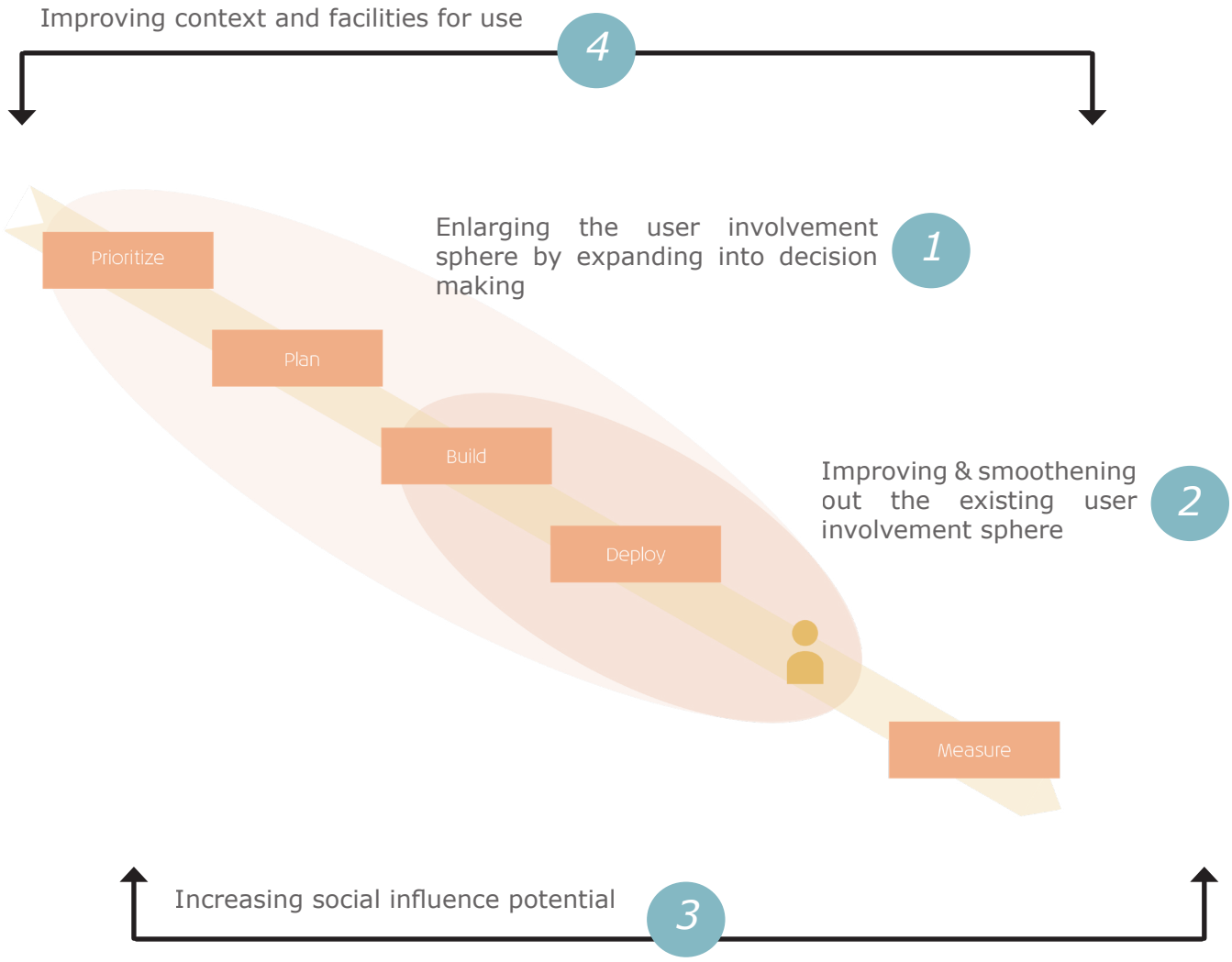


Figure 17.
The two spheres of user involvement, one already existent and one hypothetical.

We have examined two key methods for improving adoption: user-centeredness and growth hacking. Considering these while keeping in mind the current development process, they are most relevant higher up in that process where decisions are made about what to develop. It has also become clear that the current procedure around decision-making for A2H could benefit from some modification to make ranking easier and more efficient.

The contextual approaches (facilitation and social influence; 4 and 3 as indicated in figure 17) have less potential for this project, since they are not directly related to user involvement. Since usage creates usage, the social influence will increase automatically when relevance and user-centeredness help to stimulate adoption.

The main conditional barriers that must be tackled have been identified and are known within the company. Recommendations will be made for this approach.

Therefore, approach 1: expanding user involvement from the lower to the upper sphere, has the most potential for increasing adoption.

Optimally the process would include two loops of user input/feedback, one reactive and one proactive, see figure 18. This way proactive input from users would help prioritize based on relevance for the A2H users, creating more user-centeredness at a higher level while supporting business value. This prioritization is enriched with growth hacking strategies to boost initial adoption.
Later in the process, user feedback on new releases and existing features can be given easily and received clearly, and incorporated on the sprint level or added to the backlog.

Through this approach the expanded sphere allows proactive input which then trickles down to the user, and the current (smaller) user involvement sphere functions optimally. If the trickle-down effect creates more relevance for the users this may even have a preventive effect, meaning the sprint-level user involvement loop manifests fewer issues.

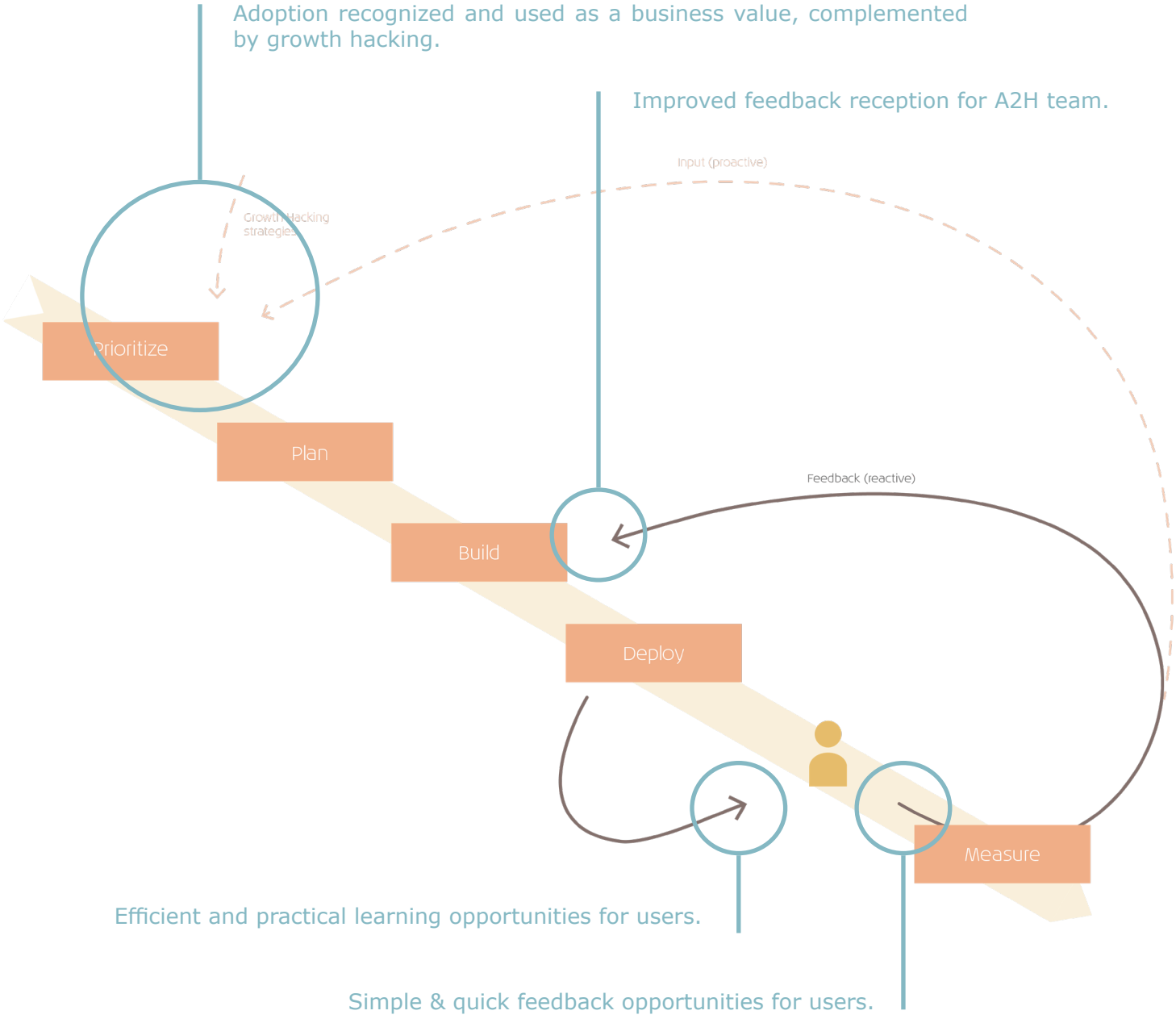


Figure 18.
The A2H implementation process with the points of improvement as covered in the two user involvement spheres.

Define

This chapter sharpens focus based on the conclusion of the discovery phase.

Taking into consideration the research done in the Discover phase, a focus is chosen for this project and criteria are formulated to guide the development of a solution.

5 Focus

Although a combination of the two spheres of user involvement would lead to best results, choosing one as a focus for this project allows a more in-depth look at the solution.

Considering the potential trickle-down effect and preventive effect, focusing on the prioritization level and proactive user input loop will have the most impact.
In addition to this, research has already been done to look at the reactive feedback loop (lower three targets), so I will stick to recommendations based on my findings for this loop.

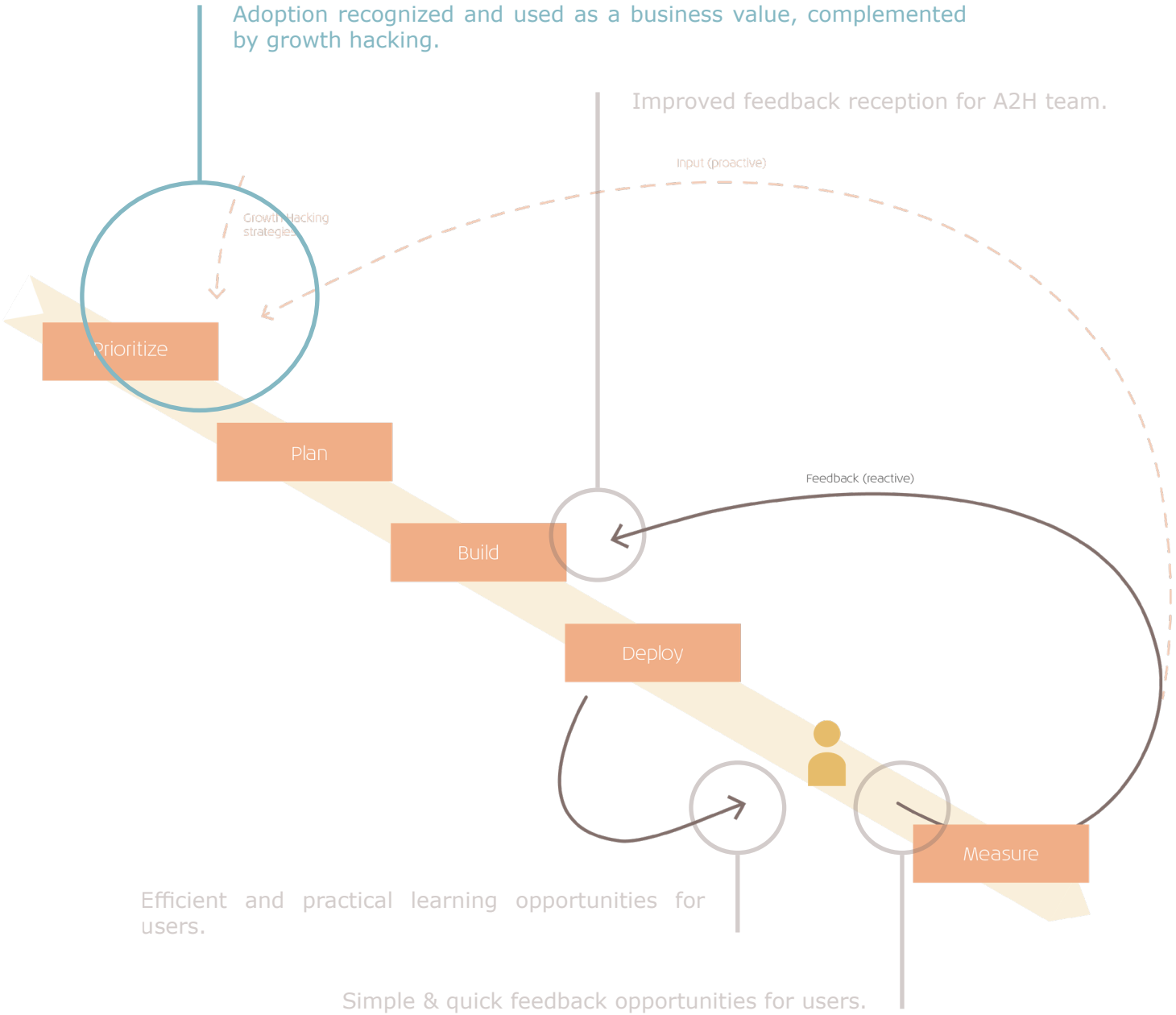


Figure 19.
The A2H implementation process with the two loops of user input, the identified points of improvement and a chosen focus on one of the points.

5.1 Assignment focus

Growing adoption can be achieved through a combination of user-centeredness and growth hacking. These elements must however be introduced at an early level, since sprints fill up quickly and decisions regarding functions to be developed are made in those early phases.

The A2H Business Delegate indicates that although validation takes place with users during sprints, in the prioritization sessions for the application user input is represented by her alone. This insight is based on her conversations with the users about their feelings on current application functionalities and 'gut feeling', but currently lacks a formal structure.

From adoption literature we know that relevance is one of the most important influences on adoption. Enabling user influence in the prioritization ensures relevance of features for users. In order to have a significant impact on the adoption of digitalization tools, they should be suited to their users' process. Not just in interface, but also in functionality. Prioritizing according to user needs increases the relevance for users of the app as a whole and thus the adoption. Additionally, including adoption on a business level makes sense because adoption drives efficiency and customer-centricity.

5.2 Reformulated Design Goal

Increasing adoption by representing user input (aided by growth hacking strategies) in the prioritization process for A2H, to help the airline achieve their goal of making operations more efficient and customer-centric through digitalization.

Looking at the model composed based on the literature study, we are expanding the user-centeredness in the implementation process, see figure 20. The combination of user-centeredness and growth hacking in the prioritization phase will complement the current adoption efforts. Ease of use is achieved through the user validation already being done on the sprint level.

Increased involvement of users in the decision-making process also engages the ADKAR model, because it makes individuals more directly involved in the choices made, and gives them a sense of ownership by creating more transparency and awareness regarding upcoming changes. More about this in the next section, as well as additional recommendations for use of the ADKAR model in the final deliverable.

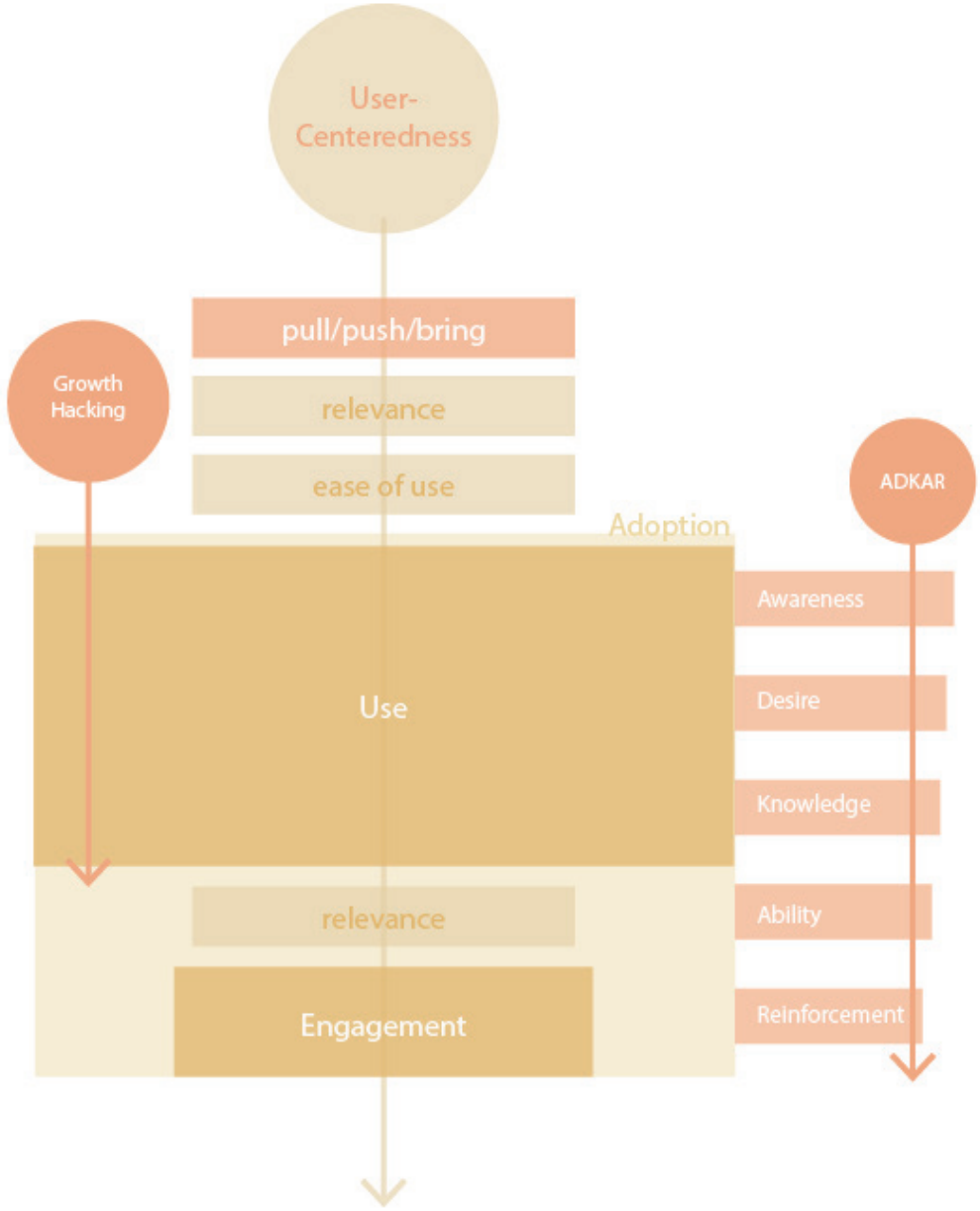


Figure 20.
An original combined adoption model showing the combination of growth hacking techniques and user-centeredness, the adoption drivers they create and the levels of adoption reached with these drivers. Also includes the ADKAR model for change management on the right, showing the adoption levels it is made up of.
Growth hacking pulls or pushes users into first use (of the day), and relevance and ease of use drive all levels of adoption, from first use up until engagement and long-term use. The ADKAR model supports the emotional and personal side of the adoption process.

5.3 Refocused strategic fit

Adoption has the clear benefit of increasing customer-centricity because it empowers employees to better help them with the adopted tools. Aside from this, involving them in the development has another benefit: giving employees the chance to give feedback and input into their own workplace and process has been proven to increase satisfaction and productivity (see figure 21).

According to research conducted by Coch and French, employees that are given more input in their own processes and feel a shared responsibility show an increase in productivity (Likert, 1961).

Increased insight into the reason for innovation was also included in this employee involvement. These employees were first given the information to understand why a change was necessary, and then asked to give their insight into how to implement that change. This goes along with the ADKAR model described in the literature review and included in the synthesized model (see previous page).

According to Bhatti & Qureshi (2007, p. 56), "the best way to improve productivity is by striving for the shared goals of employees and managers. By allowing worker input into developing the mission statement, establishing policies and procedures, (...) etc., you can improve communication and increase morale and satisfaction." Involving employees that will be affected by the decisions in making those decisions it will increase their productivity as well as their satisfaction.

Figure 21.
Overview of the role of user involvement and adoption and their relation in this project.

Strategic barriers

These benefits depend on an investment by the higher management of the company.
User-centeredness benefits are often only visible in the long run and sometimes difficult to quantify, or it is hard to define when they are considered successful.
This is one of the reasons many companies struggle with expanding user-centered efforts or incorporating them in their way of working.

One way of assessing where a company currently stands regarding the implementation and embrace of user-centricity are so-called UX Maturity models.

5.4 UX Maturity

UX can refer to different activities within different companies and contexts, but for this study we will define it as user research techniques and processes (Anderson, 2019).

Incorporating user research in a productive way can be a challenge for many companies. To ensure optimal use of these UX capabilities the entire process should be well-defined and understood, and aimed at achieving user-centeredness. The different stages in this process of implementing UX are described in UX maturity frameworks. As defined by Anderson, these frameworks "enable organizations to categorize the quality and effectiveness of their user research processes and practice" (Anderson, 2019).

Several different frameworks exist that describe these stages, some split into more levels than others. Looking at three of the best known frameworks we will establish the current position of the company through the lens of the A2H department. The frameworks we will use to benchmark position include the 'Nielsen Norman Corporate UX Maturity Model' (Nielsen, 2006), the Keikendo model (Carraro, 2017) and the adapted Keikendo model (Anderson, 2019).

The models have a differing number of tiers, see figure 22. The current position of the companies UX efforts can be seen in figure 22 as well, which is around the halfway point.

The tools to advance maturation for each model show similarities as well. Most relate to proving return on investment for UX research, and expanding it to other parts of the development process and company beyond interface design and validation testing. This suits the general direction or evolution of UX maturity which in all of the models involves a move from employing user research to validate assumptions or 'check a box' to a more deliberate use of the research, to use of research earlier in the development process (exploratory research) and eventually into a company mindset where UX is part of all decisions.

In the Keikendo model, for instance, the current position of the company appears to be somewhere in level 3 'Expert', which means that UX efforts have a place in the development process but lack some formalization. In order to progress, an effort to quantify should be made to further formalize UX activities.

In the other models this position in the middle is similar, although split up into more tier: UX has its own budget and own place in the process, but this is mainly to validate changes and done relatively late in the development. A move toward maturity is tied to quantification and expansion of UX efforts to other phases of the development.

Focusing on the A2H process of development, proving the value of user-centeredness and quantifying results are the next steps to aid UX maturation. An important part of this is proving value to people beyond the digital department and the stakeholders on the business side who want to see ROI and measurable impact.

Getting these stakeholders on board and proving value to them is also one of the most common problems identified by those working on growing UX within their organization (Anderson, 2019).

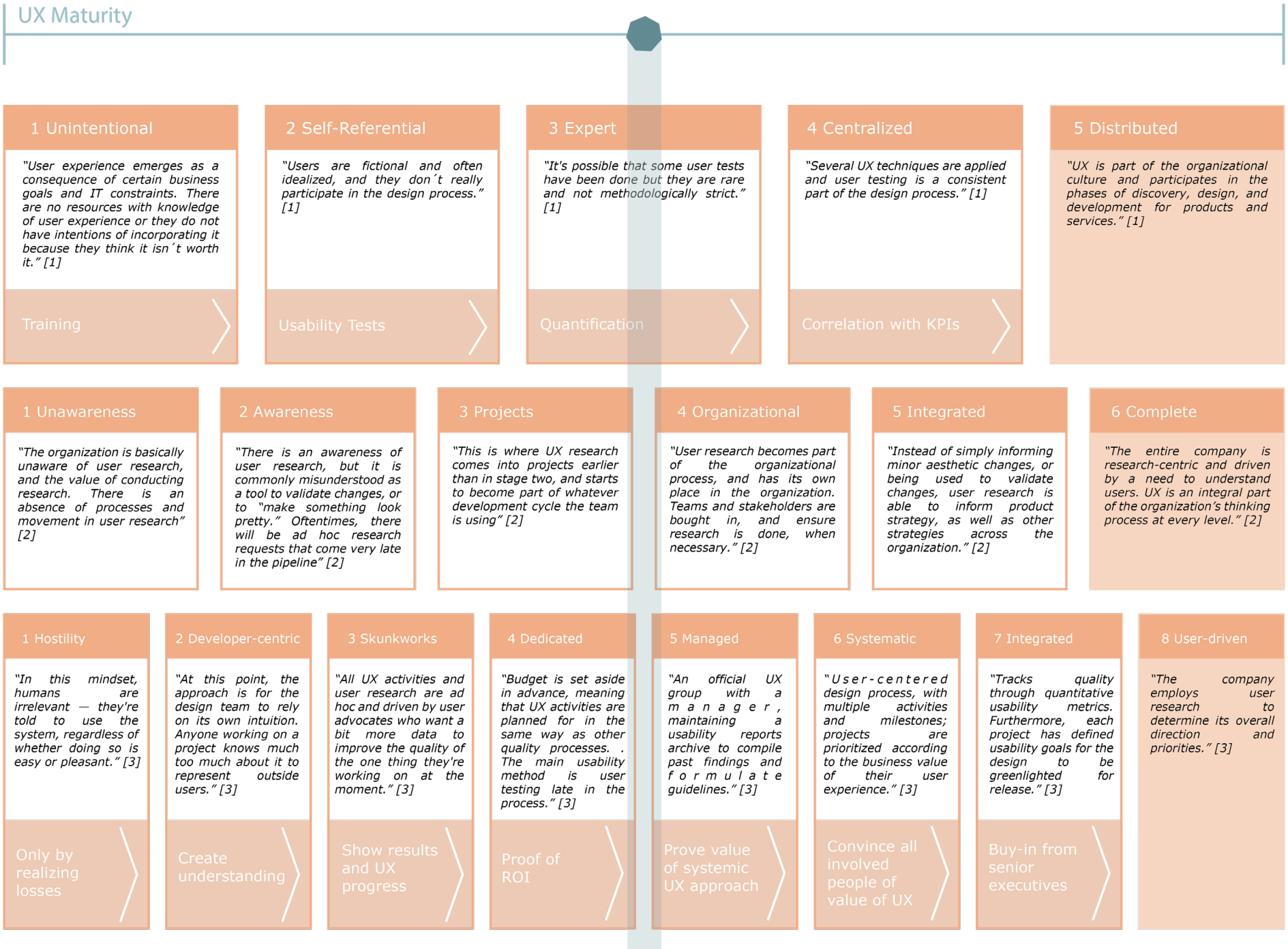


Figure 22.
The different UX maturity models and their levels. Adapted from [1] Carraro, 2017; [2] Anderson, 2019 ; [3] Nielsen, 2006

6 Concluding Define

6.1 Solution Space

Knowing the solution will connect the users to the prioritization session, we can start exploring that solution space. Finding a way to incorporate user input in the prioritization process means that our solution should address two main touchpoints (see figure 23):

1 The incorporation of user input in the prioritization session for A2H. This is complemented with the usage of growth hacking strategies to promote features that pull or push users into A2H.

2 The collecting of user input that relates to the epics or themes that are to be discussed at the prioritization meeting.

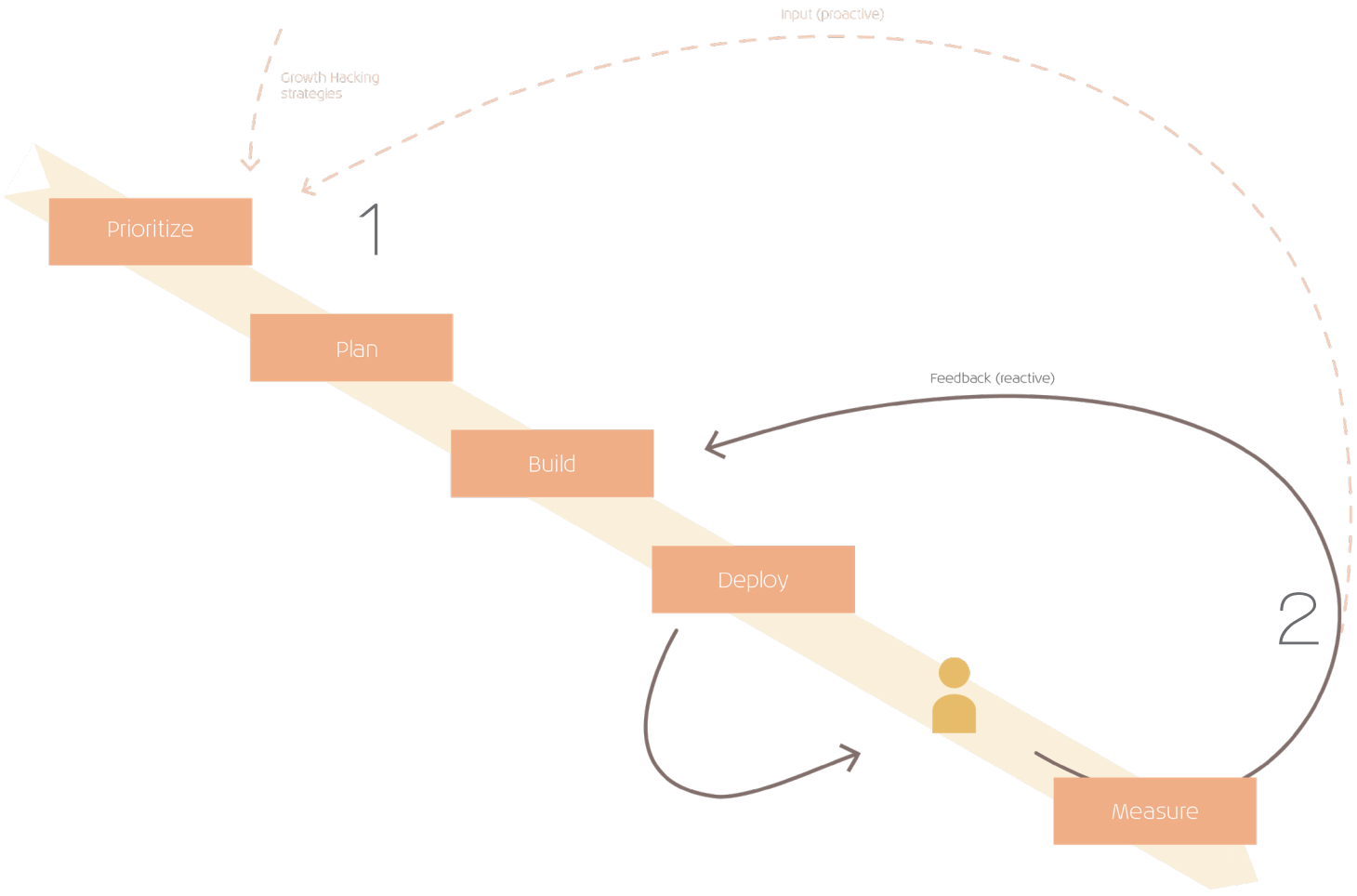


Figure 23.
Overview of the optimized implementation process including the intervention (visualized as a dashed arrow) that allows user input to be fed into the prioritization phase.

6.2 Criteria

From the literature and an examination of the current practice we can formulate the main criteria for the final intervention:

The solution should translate user input on epics into a format that is understandable and usable for the business side of the A2H team, to clarify the user value and aid in prioritization.

The solution should fit into the current prioritization process.

This current way of working is still being figured out, and large scale change like this takes a relatively long time in an organization as large as this. Therefore the intervention should fit into the context of the current prioritization session using the current materials.

The solution should enable the participants in the prioritization session to utilize user input in a way that does not make the entire prioritization process take much more time than it currently does.

Looking into the future it would be ideal if the prioritization process could be more automated. However, if the solution is to be implemented in the current process it should fit into the way it is now done.

The solution should gain user input in a way that is easily repeatable.

This so that the intervention can be used continuously even though the user input may change, in order to make the intervention as usable as possible for the company.

The solution should include a strategy to prove value of investing in User Research in order to aid in securing stakeholder buy-in.

To help the company move forward and increase their user-centeredness the current solution needs to suit the current process. It should however include preparation for expanding the user-centered way of working further in the future.

Develop

In this chapter the two touchpoints of the solution space are further researched and examined, in order to work towards concepts for both.

This research consists of the gathering of insights into the needs and desires of both the users and the prioritization participants.

Finally, conclusions from the research are drawn and the first concept draft is presented.

7 Touchpoints

Since the ambition for this project is to connect the lower level of the development sprint to the highest, the solution interacts with two main touchpoints: the user side and the business side.
To develop a solution that connects the two, we will look at solutions for the two separate sides and how to combine those into one concept.

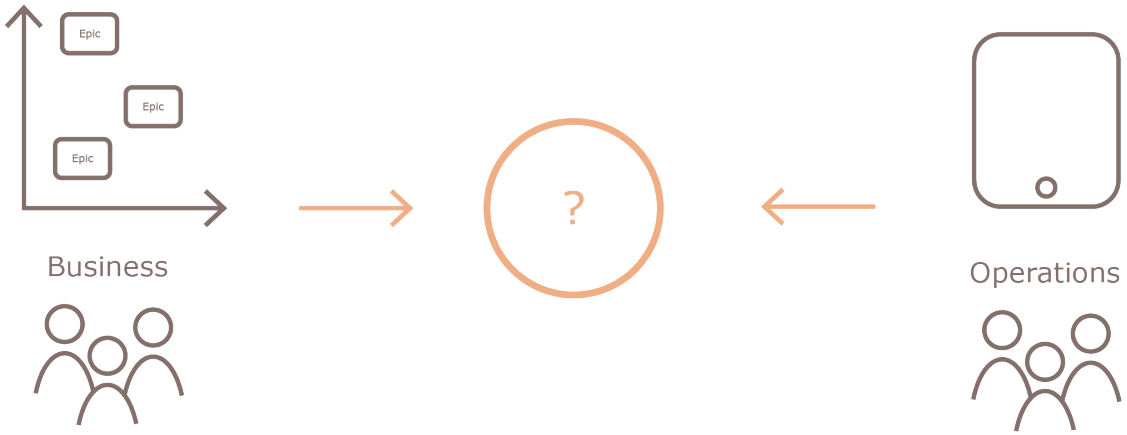


Figure 24.
Visualization of the place of the intervention between business and users.

The bridge between the two should enable prioritization participants to use employee input efficiently and thoroughly while retaining authenticity and preventing cherry picking or biased user insight collection. The strength of user research (especially qualitative) often lies in its richness (Sanders & Stappers, 2012), but this poses some difficulty when it comes to using it in the prioritization process.
The translation between the two therefore will need a predetermined format or guideline to ensure relevance and keep user input from being too time-consuming. This format or template should enable the different involved parties to conduct their process efficiently and effectively.

7.1 Business side

The business side should supply the quantitative information regarding the epic such as number of impacted departments and the number of agents in those departments.
To ensure comparability between epics the same type of information should be available for each of them. A template created with insights from the context and participants can ensure this process goes smoothly (see figure 25). This template will capture the information necessary or beneficial to the participants in their decision-making, as discovered through research.

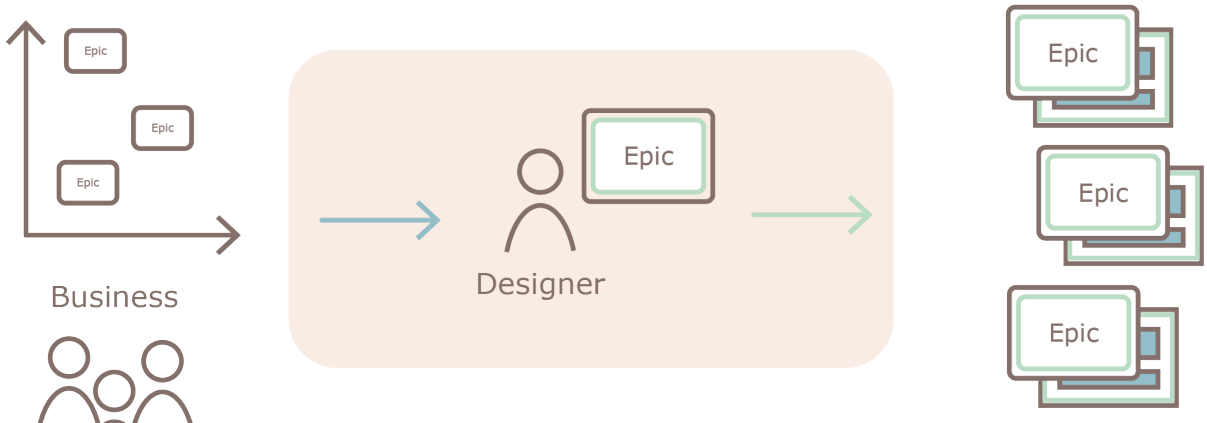


Figure 25.
Visualization of the process from business to UX owner and then to epic sheets.

7.2 User side

For the user side we would need user input per epic to show the relevance for the target group of the subject or feature. Getting this information straight from the users ensures that it is as authentic as possible.

The formulated requirements include that the intervention should enable repeated user input collection and usage, without taking too much time. The intervention should be usable within the current context, meaning that it should be able to function on its own after completion of my project. Therefore, the designer cannot play a permanent role in the intervention but can contribute to its final functioning.

A template to collect user input can be created once by the designer (see figure 26). If this is also made using user input it will consist of user needs and wishes on a more abstract level. This will capture the emotional needs of the target group while allowing for a fill-in of user input that is more relevant to the specific epics/ features.

If the template is filled in by the same person for all epics, this automatically introduces relative value and makes the epics more suited for comparison. In some departments within the company experimentation has been done where individuals were made responsible for allocating value for all epics (strategic or business, for instance). This allows for discussion during the prioritization to focus on ranking the epics, because the value-allocation does not need to be checked for equality and fairness.

Additionally, the sessions to collect user input for the epics will inevitably include more insights than the template has room for, and may not be relevant to the projects on the table at that moment. Nevertheless these insights can be valuable and should be collected and reported.
I therefore propose creating a new role within the A2H team to conduct this user research using the template, and take charge of the UX efforts as a whole and act as a 'UX owner' within the A2H team (see figure 26).

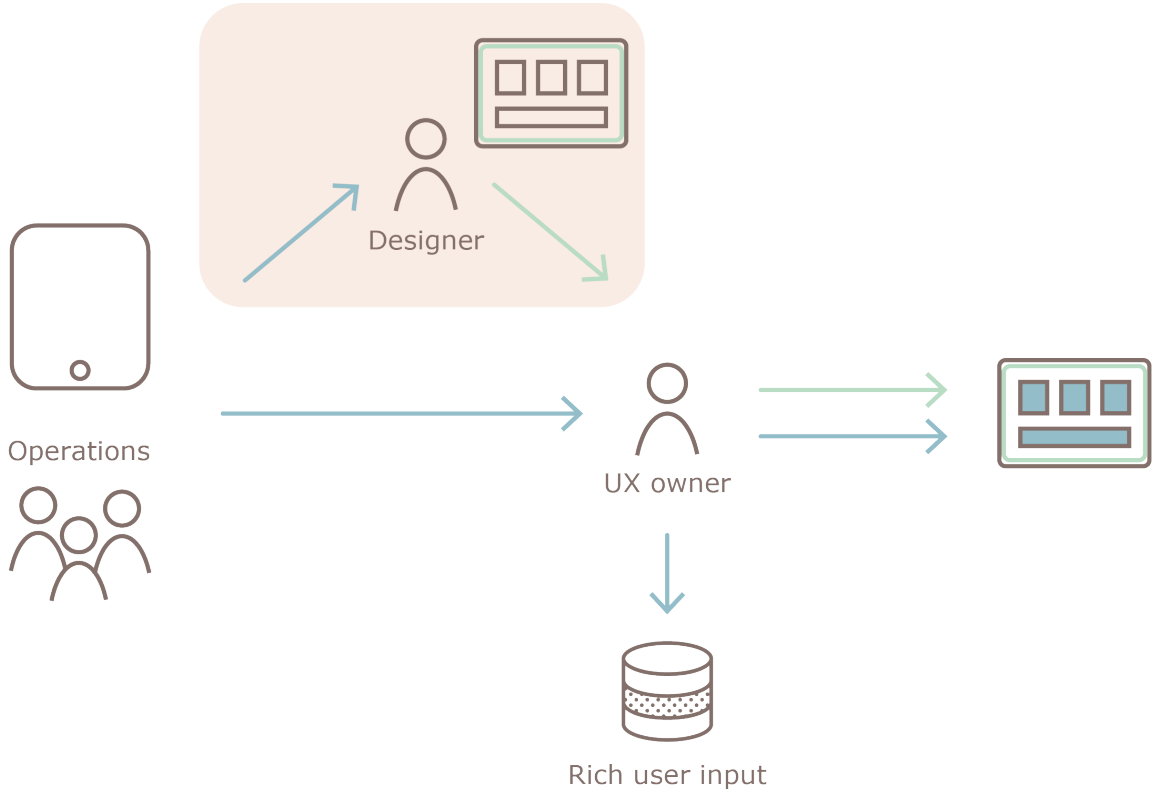


Figure 26.
Visualization of the process from users to UX owner and epic research results.

8 Gaining Insights

8.1 Prioritization

In order to establish the needs of the two target groups insights are collected. For both the users and the prioritization participants interviews and observations will give the information necessary to develop the concept.

For the prioritization side, insights are collected by conducting an MVP-test, interviewing an in-company expert about the matrix, discussing current prioritization issues with one of the participants as well as a discussion with that same participant and one of the Scrum masters.

8.1.1 Explorative MVP

An MVP test is conducted to see what kind of effect a rough version of an intervention has on the prioritization process. This will help identify the needs and limitations of the context and participants. Using an adaptation of the Strategyzer Test Card (Strategyzer, 2015) hypotheses can be tested regarding the intervention. These hypotheses are formulated as beliefs and a method is established to test those beliefs.

We believe that:

1. User input in the prioritization session will lead to different results.
2. Qualitative user input is more effective than quantitative input.
3. Adoption is understood by the stakeholders to be an important part of implementation.

To test this we will do the following:
Conduct A-B testing with two different methods to assess differences between quantitative and qualitative user input. This will also help bring any potential department bias to light so that can be excluded from the conclusions. The participants will be asked to prioritize the same epics they previously prioritized so that their content is already understood. They will do so in pairs (within pairs different departments will be represented). After this prioritization a discussion will be had with all participants together to evaluate the differences between their results and their experience of the user input.

A
- 2 participants (IS & CX)
- Qualitative input on epic sheets

B
- 2 participants (PS & CX)
- Quantitative input in the form of an adoption value boost

- All (4) participants
- Compare results & discuss

Key insights:

- Following user input is believed to align with strategic goals, participants trust in the importance of adoption. *"If it is an enabler for adoption then all the other values depend on that adoption."*
- Qualitative input needs quantitative information to be trusted (how many people does this epic apply to, what kind of user said this, etc…) *"I want to know who this applies to, how many agents and which departments?"*
- Discussion revealed that background information and evidence is important for all value drivers, not just user engagement. *"a healthy balance between agent's input and the other values: I want more information on all of them."*
- Qualitative input can be interpreted in different ways and also lead to the prioritization of epics that users are not interested in because that makes the participants believe it needs to be invested in to create interest.
- Quantitative input led to a prioritization order following the user boost numbers almost exactly from highest to lowest.

From this we can conclude:

- User input influences the prioritization of epics.
- There is a need for more information about the allocation of business value based on the drivers: when to tick the driver boxes and why.
- A combination of quantitative and qualitative user information is most effective in supporting the participants of the prioritization in their decision-making.
- Interpretation of input may require additional information to not only provide user input but also give instructions or a format about how to use it.

8.1.2 Matrix background

Interview and discussion with one of the people who shaped and introduced the matrix currently used to prioritize and evaluate epics and features within PS and Digital.

The content and conclusions of this interview are discussed with the company supervisor (business delegate) for verification and practical point of view.

The matrix is meant to be used as a guideline for evidence, to make epic owners consider the different aspects and (potential) effects of their epic and stimulate consideration of relative value. This includes both concrete and measurable input and more abstract or personal information like quotes or experiences.
The epic sheet is only meant to include the matrix. OGSM is often put onto the epic sheets separately but should be included under the strategic value drivers. Additionally, the use of 'tickable' boxes for OGSM does not currently inspire or lead to collection and use of evidence but instead makes it easier to assume OGSM value.

Ambiguity between the value drivers is inevitable and drawing a line between the exact domains of drivers is impossible because most drivers can be led back to strategic value. Logical, since all drivers should give value for the company. Additionally, since epic sheets always describe features and possibilities for the future, concrete measurements such as KPI's are difficult to use to back up decisions. Values are usually speculative and therefore the line between qualitative and quantitative is blurry.

Aim of the matrix is to make prioritization objective, quick and pleasurable. These characteristics are important because they make the process less daunting for participants and thus help ensure everyone prepares adequately. This is also one of the reasons that they have avoided creating long forms for people to fill out, because although it makes the epics more objective, it is in conflict with the quick and pleasurable part of the process. So would an addition to the forms sabotage the quick and pleasurable aspects of the process?

"I think that by making more of an effort up front, the participants will actually save time during the discussion."

My observations have led me to believe that the quick and pleasurable aspects of the prioritization get lost because the lack of evidence or clear-cut value of the epics lead to longer and more difficult discussion. This discussion is started when participants pitch their epic to the others, conveying its value. This is how relative value of the epics is established, but that gives a lot of weight to the participants' pitch quality and skill, not to mention a lot of subjectivity.

Something worth considering is whether the addition of more to-dos increases resistance in proportion to the amount of required preparation by the participants. However, the preparation required only formalizes aspects that the epic pitcher should be aware of currently, since they influence the business value of the epic. This means that the only extra time investment is the noting down of knowledge that the participants should possess without any addition to the epic sheet. It actually unburdens the participants partly because the background information is accessible for all participants and does not need to be communicated through the pitch.

8.1.3 Business Delegate

Weekly discussion with my internal supervisor, who is also the business delegate from PS to A2H, to discuss the gained insights and progress of the intervention.

As described, the business delegate is currently the unofficial user representative. She speaks to users regularly and incorporates their feedback in her epic pitches and prioritization efforts for the app. Considering that she is only one of multiple participants, the impact is there but relatively small.

The main frustration with the current way of prioritizing is that the epics are nearly impossible to compare to each other. Although it is acceptable and inevitable that epic score on different value drivers, the comparison should be possible if only to show that difference. Currently the overview is hard to find, creating a possibly myopic understanding of epics where people only focus on the drivers that are relevant to the epic rather than a holistic appraisal of the epics.

There has been some push from different participants and parties within both the digital department and passenger services regarding evidence-based decisions. The current way of working encourages the use of evidence, but does not require it. This also means that sometimes the epics on the table are not all at the same level. Some may still need a Proof-of-Concept, MVP version or a study to collect more information to complete the epic sheet. If this has to be established during the discussion, it takes up time that should be spent on ranking. Creating a format that all epic owners need to adhere to ensures that expectations are the same for everyone involved and lack of evidence can be established and remedied beforehand.

These different frustrations are mostly based on the current phenomenon where the discussion in the prioritization session concerns matters that should be clear beforehand. This way the achieving goal of prioritization: assessing and defining relative value, becomes almost impossible.

8.1.4 SCRUM master

Interview and discussion with one of two SCRUM masters within the PS department who support use of the matrix and the agile way of working.

The content and conclusions of this interview are discussed with the company supervisor (business delegate) for verification and practical point of view.

We looked at the possibility of splitting user value into employee and customer rather than just 'user'. This in the hope that the way it is filled in will equalize between epics. This is a logical change for digital because employee-facing tools always mean that the user is an employee, and the customer is not always directly involved. In order to examine this approach and determine scalability/applicability for PS, an interview with one of their SCRUM masters is conducted.

The main insights are:

- Main goal of prioritization should be ranking by user/business value together.
- This ranking does not need to be exact (and often can't be) but should indicate globally which epics have more value than others. In this way a global ranking shows which epics are at the top, the middle and the bottom. This does not imply that the ranking between the highest three is completely accurate, as long as it's clear they should be at the top.
- Changing the matrix adds complexity and has the potential danger of making it a longer process, especially if the roles are different per epic (user/employee/customer).
- Splitting up values forces participants to determine for themselves what has more value or how to divide the value amongst employee vs customer, but this is not their responsibility.
- People should be well-prepared for the prioritization so that the discussion can focus on relative value rather than figuring out details about the epic.
- Scrum master does acknowledge that in practice preparation is not always equal between all business owners.
- The business owners pitching the epics at the prioritization should not be stakeholders in the epics to ensure that the ranking achieved in the session is as objective as possible, which is why they are different from the epic owners. However, in practice the business owners do have a stake in the projects and sometimes overlap with the epic owners.

8.1.5 Concluding expert interviews

- Although the change may not be scalable, a modification to the matrix can make user input more present in the A2H prioritization.
- An addition to the matrix may make it easier to understand but more complex to use.

A change to the matrix should not create too many more categories, and its use should be clarified.

- A good preparation by the epic and business owners should be the goal of the epic sheet, so that the pitches and discussion can be 'trusted'.
- Forcing people to prepare evidence helps them pitch and convey their business cases optimally so that the ranking can be achieved in a timely manner.

Preparation by the epic owners and business owners ahead of time may only cost more time if that time is then won back in the discussion itself.

- A holistic view of epics is currently nearly impossible because only the drivers that are positively influenced are presented. An overview of all drivers both relevant and not is missing, which means comparing their total value is difficult. *"Some people indicate drivers of which they have no knowledge, but others don't. That means those that are less thorough get the advantage because the epic seems more influential."*
- The fact that the prioritization gives an idea of relative value but does not always distinguish between epics that are close together, provides an opportunity for employee value to be the 'decider'. If three epics have about the same value, the one that has the most added value for employees can be moved to the top of those three. *"It's not about an exact value, but an idea of a ranking: which epics should be above the cut-off line and which can be below it?"*

An overview of the different user drivers should be visible even if not all of them are relevant to the epic. Although not all drivers are evidence-based, the user value can be and can be a first step to achieving this for all values and their drivers.

- A need for more evidence behind the epics has been expressed by several participants, and frustration exists because claims are made that do not always have the proof to back it up. *"a healthy balance between agent's input and the other values: I want more information on all of them."*

There is an opportunity to increase the trust between participants and make them more sure of their decisions, by presenting the user input as 'evidence' for the user value of epics.

8.2 User

In order to establish the needs of the two target groups insights are collected. For both the users and the prioritization participants interviews and observations will give the information necessary to develop the concept.

For the user side, insights are collected by doing a contextmapping session, two rounds of interviews with users and a discussion with one of the design researchers and several UX designers.

8.2.1 Contextmapping

As explained by Kistemaker (2010): "contextmapping is a method to gain insight in the environment, emotions and needs of the real person behind the customer, enabling industries to develop products and services that complement this". To achieve the user-centeredness that drives adoption, uncovering the needs and wants of the user group is crucial.

A contextmapping session is conducted to get to know the target group better and find out their motivations and drivers. Since the user input is meant to be used for prioritization, this often involves non-existent features. These features are therefore hard to gain accurate direct input on from the users. Therefore, more general insight into motivations regarding their work can help evaluate which epics are supportive of these motivations, complemented by insight into their current experience of supporting tools.

Goals:
1. Uncovering the motivations of A2H users regarding their worklife.
2. Assessing what kind of input users give when asking about work and tools.

Method:
Individual work by users is committed to paper and documented by themselves to preserve their exact phrasing and intention. Templates will be used to make documentation more accessible to the users and ensure they stay on-topic.

From a wide selection of photographs, participants are asked to select one that symbolizes something they value in their work. After selecting one they will place it on the circles of the template to indicate its importance. They are then asked to add more pictures and words to the circles, and indicate what helps them achieve these ambitions and goals.
They are then separated into groups of three or four and asked to discuss amongst themselves what they included in their circle and the means to get there. They make a new paper as a team summarizing this and then present their insights to the rest of the group. The session is concluded by summarizing the most common and important elements the different groups mentioned.

- 13 participants (A2H users, all groups)

Key insights:

From the presentations, the discussion afterward and the documentation handed in by the participants (see appendix), the most interesting insights were the following:

- Even if their ambitions or motivators at work are quite easy to elicit, most find it difficult to identify the tools that help them achieve their work ambitions.
- The clear focus of the employees was on creating a good passenger experience and also benefiting from this experience because it creates a good atmosphere.
- Another important factor was working together not just with colleagues but also with other teams.
- Digital tools and A2H specifically were mentioned as supportive and motivating, but only when they could contribute to servicing passengers.
- Information and communication were two of the most commonly named factors on the documentation and in the presentations. Sometimes agents have less information than passengers or receive it at a later moment, making their service more difficult and creating an unpleasant experience for the agents.
- The three most important motivators for the agents were communication, teamwork and tool support.

From this we can conclude:

- Improving information exchange and internal communication contributes greatly to employee experience and satisfaction. They currently experience frustrations, mostly due to a lack of information. *"Not sure we can rely on the information, because it displays different numbers in different places within the app."*
- Employees echo the idea that their work experience is symbiotic with that of the customer. *"If we're in a good mood, so are the passengers that we talk to."*
- Improving and simplifying collaboration between colleagues and teams improves satisfaction.
- The most common themes the participants' representations of what motivated their work are: Helping passengers, Efficiency, Flexibility, Certainty & Confidence, Workflow & Process, Appreciation, Innovation , Working together

8.2.2 Interviews round 1

Semi-structured interviews with agents about their current use of A2H relating to specific, existent functions and their use or lack of use and reasons for it. *See appendix for guide.*

The content and conclusions of the interviews were discussed with the company supervisor (business delegate) as well as one of the design researchers for verification and comparison to their previously gained user insights.

Interviews were conducted with users in several different target groups about the app. The aim is to understand which functions they use/like or don't use/dislike, and why. We also spoke about which features they would like to have and why.

These interviews revealed a clear focus on task-related features. It may sound logical, but the process users go through at their different work areas is very specific and always follows a certain workflow. This flow is currently only partly supported in A2H, or not at all. An interruption like that in workflow leads to a dislike of using the app, or a resistance to the tablet in general.

Another point often raised related to the workflow is that the screens in the app do not always follow each other up in a logical way that supports their common actions while working. Going back and forth between screens is an often-heard complaint, as is the loading of unnecessary information without being able to stop it.

"I feel embarrassed when I'm standing in front of passengers and I can't help them on the ipad or it takes too long so I'd rather send them to a desk."

"If I open it to check something it loads screens that aren't necessary and this means I have to wait to use it even though I don't even want that information"

"I don't care so much about innovation, I just want to have a backup system"

"When the Ipad is not functioning well now, it is going to be a disaster when there is only an Ipad in the future, without a backup computer."

"Some functionalities don't work in the app, so we use the desktop for those and then just keep using it."

"Passport swipe with the ipad would be helpful, since pax wouldn't have to disrupt the process by going through all the rows of passengers. It will save time and chaos."

"I really like the last call option, I basically only open my Ipad for that at the gate."

"I would have more attention for innovations and changes when I would get more appreciation for my work. I will then open up and be motivated to put effort in changing my way of working."

8.2.3 Design Researcher

Discussion with a design researcher who conducts user research into different employee-facing applications and has previously worked on A2H research. Based on insights gained from earlier research and contextmapping results.

Expert interview

Currently there are two design researchers active at the digital studio. They conduct research for all of the employee-facing tools, usually as requested by the product owners. They use methods such as journey mapping, interviews, observation, co-creation and other creative sessions.

Usually insights are gathered in response to a specific request about an epic, from the epic owner or product owner. These insights are then communicated to the person who requested it, usually as backup for the epic or as validation. The director of the digital department and the head of the design team are also aware of and involved in any design research.

Much of the development being done so far does not necessarily seem relevant to the users. They don't always understand why certain things are being worked on and others are not. That is not to say it is not looked at, but the research often comes in to verify epics that are already 'in the works' or decided on.

This also means that research is not being done to the same degree for all epics. Some are looked at specifically if requested, but it is not a standard part of the process. This is also due to the capacity issue, as two designers cannot conduct research for all of the different apps and API teams in the digital department.

"Optimally we would our research to feed the epics, so to speak. To create epics based on user needs. For now though that is just not possible with the workload."

The designer also indicates that there is still so much work in the backlog to get the functionality of the app to where they would like it that listening to users may seem like a luxury to some people, especially on the business side

Additionally, the target group is viewed as one big group. Because development started for all of the users at the same time when the iPad and the app were first introduced, development takes place for A2H as a whole, incrementally. The different groups within the total users are not considered when it comes to epics, or at least no real distinction is made in their importance and size. The design researchers do of course conduct research with the group to whom the epic is relevant.

"I think the value of user-centeredness should be clear to participants before making them do extra work. Forcing them does not work."

Additional feedback from several of the UX designers within the department on a conceptual draft of the user input collection template.

"User may always be an employee, but although customers don't interact with the apps directly, they should be represented in the business value. Finding a way to represent them as indirect users is necessary. We often find that both the user and the customer is somewhat neglected in the decisions that are made, because most are focused around business value."

8.2.4 Interviews round 2

Semi-structured interviews with agents to discover and define values and needs around their work. See appendix for guide + value cards.

Content and conclusions discussed with internal supervisor (business delegate) as well as one of the design researchers for verification and comparison to their previously gained user insights.

The contextmapping exercise revealed what the agents find most important in their work, and the comparison of different individual results as well as the group presentations showed which were most common. These results were turned into value cards so that they could be used as a tool in the next round of interviews, to verify and test applicability of the results to all the user groups.

The cards were used to interview agents at the hub, by asking them to rank them by importance as well as indicate whether any were unnecessary or missing.

After this a link was made with A2H and how the app currently does or does not help them achieve these values.

Interviews with the users led to the condensation of the value cards into the 6 most important values to include on the user input template, and the formulation of design principles within those themes.
Additionally, the formulation of the adoption boosters was determined through results from these interviews.

"Things are never finished, it feels like unfinished function after unfinished function stacked on top of each other"

"There are so many different ways of doing things or workarounds, I think it would be better if there was one clear way of working that we all followed. I think that would also look better for the passengers."

"KLM is a service driven company, not commercial. Now we seem to lose that and we become more commercial. Passengers miss that, I can see that."

"I feel like KLM expects a lot of flexibility from me but not the other way around"

"Innovation is not most important, but it can make sure that all processers will be smooth and comfortable."

"Most important goal: passengers have to be satisfied, and leave with a happy and comfortable feeling."

"Upgrading a passenger in Appy is fun, since you can show you work for a modern company."

9 Concluding Develop

In this section the conclusions of the project so far will be outlined, and the first draft of the intervention is presented in accordance with these conclusions. Reflecting on the findings of the research so far, we can draw some conclusions about what the solution should accomplish within the company, as well as the findings from our literature study and research that it does not engage with.

From the interviews with users we have learned that agents can identify what motivates them but find it hard to identify how to achieve this. They share a clear company identity and indicate that this is important to them, but expect the company to take care of them and show them the same flexibility and support that they provide for the company. Users feel unsupported when it comes to working with the tablet, they indicate wanting more understanding of why things are changing and how to work with the new tools, or that they feel uncomfortable working with it.

Both the practical and the more behavioural and emotional side of a changing workplace can be better supported by management. From the literature we know different ways of achieving this. The practical measures that can help adoption have been discussed as the main goal for the intervention: ensuring relevance and ease of use by facilitating more user involvement and smoothening out the existing user involvement. This is an opportunity for design to help give form to this support, by creating an understanding of the users' goals and developing ways to facilitate them. Increasing user-centeredness at the decision-making level can help formalize it and create awareness of its importance amongst the participants.

Emotional and personal support of such a change as A2H is also necessary. Agents feel responsible and representative of the customer-centric and service-focused airline identity. When it comes to implementing A2H and the new opportunities it brings for passenger experience this can be an opportunity to aid employees in understanding the change and getting them on board. A clear link can be made with the value of A2H in passenger interactions and making operations more efficient. This depends on constant, transparent communication from A2H to its users. As far as emotional support and the utilization of the ADKAR model goes, recommendations will be made alongside the intervention to support the employees as much as possible.

A focus on the context of the solution means a trade-off between applicability and 'pureness' of user-centeredness. The solutions, frameworks and techniques presented in the literature review show generic models for adoption, but in reality the context and existing structures and knowledge in companies influence the applicability of these models.

Although the focus of the company is efficiency and user-centeredness, getting there should be done step by step. Rushing to implement 'perfect' ux or design research practices and skipping the in-between stages does not work (Nielsen, 2006). Ensuring applicability means sticking to a relatively small scale for now as far as user-centeredness goes, but should expand as more budget and knowledge becomes available. Achieving long-term impact does not necessarily require a huge initial investment, but should be built towards with smaller investments and constant validation of those investments.

Research into the current way the business operates (beyond adoption efforts) has also revealed some opportunities for improvement. The process of prioritization needs more evidence to help comparison and make prioritization easier and faster. Increasing user-centeredness goes along with this, because user input can function as the evidence for user value, which decision-making should be partly based on.

That same balancing act around applicability influences which changes can be made on the short term. Some differences in the way of working go along with the implementation of the intervention, but some may require more time or effort, and are therefore relegated to the recommendations. To keep the changes manageable, some must simply be pushed to the future, after the first results are visible.

On pages 70 and 71, the first draft of the intervention is presented. Its functioning and purpose is described, linking it to the research insights and design goal.

Business

This template is filled out by the epic owner. It has the function of supporting the epic owner in communicating the epic to the researcher and the prioritization participants. However, giving them ownership over part of the user input process also has the aim of creating more empathy for the user group, and potentially for confronting them with the business' assumptions regarding users. Documenting their expectations of the epic creates a basis to compare the actual user input with. This can help illustrate the importance of validating assumptions or expectations and giving users their own voice in the process.

Matrix change
First of all, a change to the matrix is proposed for the A2H prioritization process. The original matrix can be found in the appendix.
To stimulate the use of evidence while including user input, the user input template will be used instead of the drivers currently listed under 'user value'. This part of the matrix will be renamed to 'employee value', since the users of A2H by its very definition of 'employee-facing tool' are always employees. This makes the matrix more concrete, because originally 'user' could mean employee or customer, but the difference was not clearly defined and changed with every epic. This change makes the epics more comparable. The passenger experience is hereafter represented by the employees through the core need 'pax experience'.

Impacted users
The epic owner is asked to indicate which of the subgroups will be impacted by this proposal. This helps provide some background about the number of impacted users to help prioritization. Additionally, the development of the app is done with budget from its main stakeholder: GS. If ranking requires a decision based on which departments get priority, such information is easily available and known ahead of time.

Adoption Boosters
These are the growth hacking techniques discussed in the literature study. Some features pull or push users into use of the app, for instance by being the only channel through which a certain action is possible. The epic owner is asked to predict whether the epic possesses any of these growth hacking characteristics. Once this is validated with user input it can help reveal any misunderstandings between business and users, as well as help business better understand what triggers adoption.

Process & Use
Asking the epic owner to fill out how they believe the agent process changes should the epic be realized helps the researcher understand what they should focus on when conducting their research with the users. It also forces the epic owner to visualize the change for users and detail it.

User

This template is filled out by the user researcher to help evaluate the epics based on user needs and user input. It is not presented directly to the users but used as a basis for conducting research. It provides a framework within which to discover and document user experience.

Adoption boosters
As mentioned, the adoption boosters are communicated from both the business and the user side to identify any misconceptions or undiscovered barriers. Since growth hacking within A2H means getting users to take the first step of opening the application, the users can give an indication of whether the epic has one (or more) of the three growth hacking characteristics.

Core needs & Design principles
These make up the said framework. Needs that relate to the entire work experience have been formulated, with design principles to further elaborate on them. These give the same basis to each epic on which to evaluate employee value. Not all needs will apply to all epics, but providing the same format makes them more comparable.

Explorative Prompts
This part of the template is not directly related to the epic, but stimulates the collection of more general insights, which can then be used to work towards more explorative research and the use of user insights as input for the formulation of epics rather than their validation. It can also help bring the surrounding workflow into the discussion, which can reveal gaps that had not been previously identified and help shape the current epic or provide ideas for further development.

Figure 27.
The first draft of the user-side template

USER

ADOPTION BOOSTERS

○ **SOLVER**
Solves a known irritant or deterrent, completes a currently partial or incomplete workflow (MVP completion).

HOW
.....
.....

○ **FILLER**
Makes functionality of A2H equal to legacy system.

HOW
.....
.....

○ **EXCLUSIVE**
Only available/possible in A2H, not in legacy systems.

HOW
.....
.....

EXPLORATIVE PROMPTS

Do users indicate other gaps in this workflow?

Are there related or new irritants?

Are there other barriers/deterrants for use not solved by this epic or feature?

CORE NEEDS & DESIGN PRINCIPLES

TEAMWORK	CERTAINTY	EFFICIENCY
Encourages positive collaboration.	Ensures the agent has the right information at the right moment.	Enables the avoidance of unnecessary actions in daily operation.
Gives the agent the power to support colleagues.	Ensures the agent knows which actions to take.	Empowers the agent to complete their tasks more efficiently.
Supports quick information exchange.	Makes the agent feel comfortable and secure approaching passengers.	Simplifies or shortens agent workflow.
WORKFLOW	**FLEXIBILITY**	**PAX EXPERIENCE**
Allows the agent to complete their task in a single, smooth workflow.	Gives the agent freedom to help passengers optimally.	Maintains or creates easy/ easier service for passengers.
		Maintains or creates quick(er) service for passengers.
Improves the agent's experience of completing their tasks.	Makes the agent feel empowered and supported in their job and tasks.	
		Maintains or creates better service for passengers.

Figure 28.
The first draft of the business-side template

BUSINESS

IMPACTED USERS

WORK AREAS AFFECTED	AGENTS WORKING IN THIS AREA
☐ Gate	.....
☐ Lounge	.....
☐ Transfer	.....
☐ Travel & Services	.....
☐ Departure	.....
☐ Arrivals	.....
☐ Customer Handling	.....
☐ Document Check	.....
☐ International Stations	.....

ADOPTION BOOSTERS

◯ **SOLVER**
Solves a known irritant or deterrent, completes a currently partial or incomplete workflow (MVP completion).

HOW
.....
.....
.....

◯ **FILLER**
Makes functionality of A2H equal to legacy system.

HOW
.....
.....
.....

◯ **EXCLUSIVE**
Only available/possible in A2H, not in legacy systems.

HOW
.....
.....
.....

PROCESS & USE

WORKFLOW

Which user workflow does this epic or feature fit into?

How does it change it?

How does it relate to the rest of the workflow or task?

For instance:
Do all take place on the same medium or device?
Are there development plans for related tasks?
Is the rest of the workflow in Appy?

Deliver

The following chapter concludes this project by presenting the final solution.

First, the MVP tests that aid in developing the concept further, and the validation process for the final concept are presented.

Then the final solution is presented, consisting of a roadmap towards the future, with an immediate intervention to start the process of moving towards that future. a plan for validation of the solution moving forwards is also presented, as well as recommendations for the processes not addressed directly with the intervention.

10 Concept Validation

The drafts created with the gained insights are still separate parts of a process. To optimize them and create a coherent workflow for the different involved parties MVP tests have been conducted with the people that would be charged with using the templates (see figure 29).
After the MVP testing has provided enough information to complete the concept and workflow, validation interviews help validate the final concept and inform the last iterations.
In the next chapter the final concept is presented.

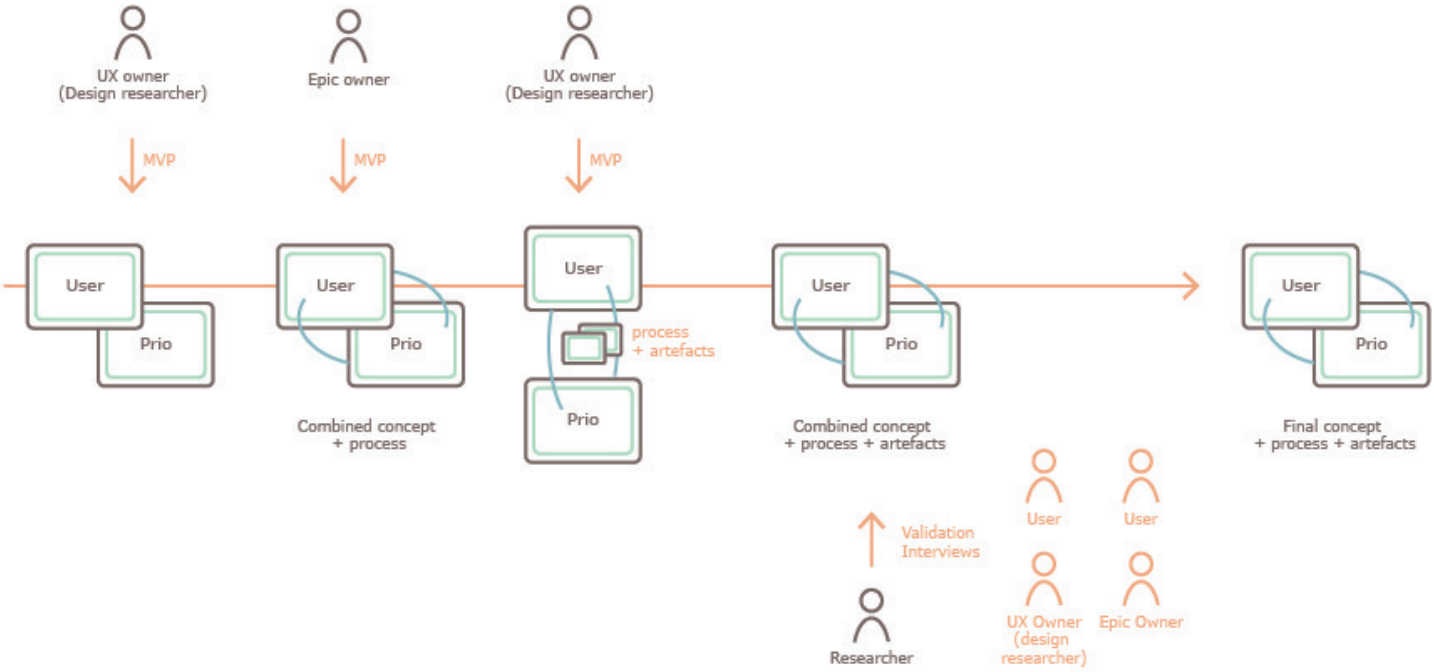


Figure 29.
An overview of the MVP and validation process.

10.1 MVP testing

As the templates are now developed for the two touchpoints separately, the process that takes place around them and combines the two will be developed by exploring the needs that the participants express in the MVP tests.
The MVP format was chosen to help understand the needs of the different parties involved in the process and their requirements and desires. Explanation of MVP procedure are given for each:

UX Owner (Design Researcher 1)

Goals:
1. Evaluating usability and desirability of first concept draft.
2. Defining the steps that both sides require to use and implement the intervention.

User template MVP conducted with one of the design researchers working at the digital studios who currently research epics for (amongst others) A2H. MVP done with one of the 2020 epics to simulate the real situation as much as possible.

Key insights:

- A clear picture of the context is needed to conduct the research. This includes the current process and proposed future one, as well as wat goes on around the process (the workflows it fits into).
- The assumed benefit for the user and process should be clear to the researcher so that it can be validated with the user group.
- Not all of the epic sheets are filled out in the same way, because the epic owners do it themselves and have differing levels of knowledge about the target group and their work.
- The template can help give a clearer understanding of epics and projects, but the requirements are not the same for every epic. For some epics not all parts of the template may be used, or it may require modification.
- The design principles give a clear basis for interviews and further research.

Epic Owner & Prioritization participant

Goals:
1. Evaluating usability and desirability of improved first draft.
2. Evaluating usability and desirability of the process around the artefacts.

Prio side template MVP conducted with an epic owner who is also one of the participants in the prio session around A2H. MVP done with the same epic (their own) to simulate the real situation as much as possible.

Key insights:

- Current descriptions of some fields leave some room for interpretation, more instruction may help ensure comparability between epics.
- Hard to show how the process changes on the process line because "the whole way of working changes, not just actions in it."
- Within gate work area there are different departments that have different ways of working and should be split up.
- This template may not accommodate bigger epics as they sometimes come to the table during discussions, but this is a good thing because it forces them to be split into more practical epics. This also aids in the prioritization process because the bigger ones are often impossible to prioritize. These splits should take into consideration any dependencies.
- Safety of the users is crucial to company operation and identity so should be included in the principles.

UX Owner (Design Researcher 2)

Goals:

1. Evaluating usability and desirability of current intervention artefacts.
2. Evaluating usability and desirability of the process around the artefacts.

User template MVP conducted with one of the other design researchers working at the digital studios who currently research epics for (amongst others) A2H. MVP done with one of the 2020 epics to simulate the real situation as much as possible.

Key insights:

- It is important to focus on the root of an epic. This means looking at where the desire for change is coming from rather than assuming its relevance and diving further into details.
- Narrative is crucial to communicating user insights to business representatives.
- It's difficult to fit insights into categories, so space for interpretation should be left.
- Concrete research like this (for specific epics) needs examples to make it tangible for the people being interviewed.
- Mapping out what you want to find out as a researcher and shaping your research to achieve this is crucial, a template can definitely aid in this because it provides a certain format to be filled.
- Templates work because experience has shown that use insights need to be framed in a 'business conclusion' to be usable or understandable for the business representatives.

10.2 Validation interviews

After development of the intervention, including process and all the necessary artefacts, interviews are conducted with representatives from the different involved parties. The goal of this validation process is both to finalize the design, and to evaluate the desirability, feasibility and viability of the solution.

Below in figure 30 is an overview of the developed process around the intervention, including its artefacts. This will be further elaborated in the next chapter with the presentation of the final concept. It is now used to indicate for which roles interviewees were chosen. For each interview, a description of the different prospective roles of the interviewee is given, as well as the hypotheses and method used, and the analysis conducted, followed by the most important insights from the interview with the relevant quotes.

Hypotheses are based on the design goal and formulated criteria, as well as the desirability, feasibility and viability of the solution.

The previously formulated criteria are:

- The solution should translate user input on epics into a format that is understandable and usable for the business side of the A2H team, to clarify the user value and aid in prioritization.
- The solution should fit into the current prioritization process.
- The solution should enable the participants in the prioritization session to utilize user input in a way that does not make the entire prioritization process take much more time than it currently does.
- The solution should gain user input in a way that is easily repeatable.
- The solution should include a strategy to prove value of investing in User Research in order to aid in securing stakeholder buy-in.

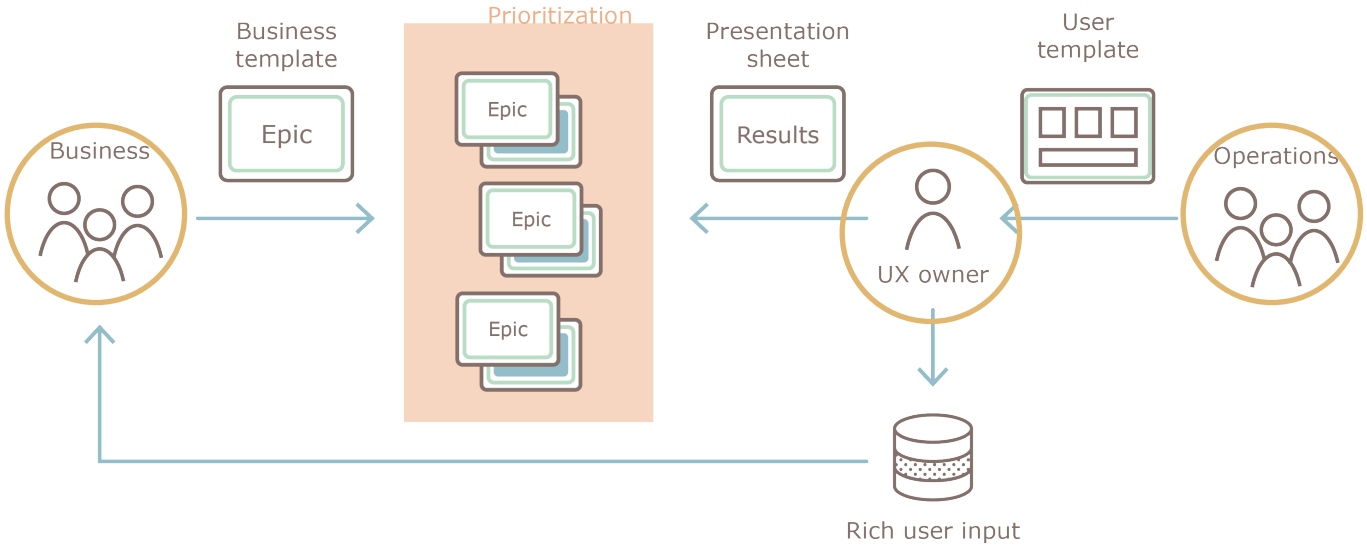


Figure 30.
Visual representation of the functioning of the intervention developed for this project, with indication of the validation interviewees.

UX Owner (Design Researcher 1)

Their role in the intervention:
to gain insights from the epic owner on the business side and use these insights, together with the user input template, to collect user input regarding the specific epic and present it to the business in the presentation sheet.

Hypotheses to test:
1. The epic understanding and user input templates aid the UX owner in constructing their research.
2. The core needs provide a framework that makes collecting relevant insights easier.
3. The intervention process fits into the researchers' way of working.

Method:
a semi-structured interview with the one design researcher in the digital studio, who has previous experience with user research of this target group and best represents the UX owner role within the current team. Interview guide can be found in the appendix.

Analysis:
Based on audio recording, the interview is analyzed and interpreted with the goal of identifying iterations on the final concept, and the formulated hypotheses are validated.
Full overview of quotes in the appendix.

Validating hypotheses:

1. The epic understanding and user input templates aid the UX owner in constructing their research.

- *"Sometimes things happen purely from a tech-push, in a manner of speaking they may not even know the current process, they just work from the future process. This [epic understanding template] helps clarify right away what is unknown and needs research."*
- *"[User input template] gives direction for structuring your interviews, but also for the building up of presentations."*
- *"[Explorative prompts] are useful. Are there other things I should ask about? What should I look out for? Sometimes it turns out something creates a new irritator, for instance."*

We can say that this hypothesis has been proven true. The templates save time in preparing research as well as give direction.

2. The core needs provide a framework that makes collecting relevant insights easier.

- *"knowing these principles and needs beforehand ensures that the basis is there. After a while you get to know the users, and their core needs, and it helps the conversation. They may of course change, but then you could alter them."*
- *"It would definitely influence how I [analyze and process data and results]. I would do it more according to need or principle, I would try to cluster my insights around such a topic. Otherwise you're picking through all your insights trying to create structure."*
- *"Often you can say from a gut feeling 'oh this epic will touch these and these core needs,' that way you have focus for setting up your interviews. I'm not searching for the effect so much anymore, but I can look for those values specifically, I know what matters to them."*

This hypothesis also appears true. The collecting itself, through the interviewing and interview structure is supported by the framework, as well as the structuring of results and research data.

3. The intervention process fits into the researchers' way of working.

    - *"First off, it saves me a lot of research. But it also helps me communicate what I'm talking about to the business side."*
    - *"There is no standard of information that I receive from the business when conducting research [for epics]. I never got a standard amount. That is if I got any at all."*
    - *"I think that it mostly helps because from that moment on [filling out the epic understanding template] you are on the same page, so that you can refer back to it. Now what you often see is that everyone ends up talking about [an epic] as different things."*

    This hypothesis is not proven completely, because the way of working would change with this intervention. The subject did indicate that she would experience it as a positive change, due to the improved information exchange and saved time.

Most important insights for concept iteration:

- Creating a living system that helps evaluate as well as shape epics, to motivate iteration of epics. This process would require more time and resources, because it would require an iteration of research as well to ensure valid input for the prioritization. Therefore, this will be framed as a recommendation to expand the intervention in the future.

    - *"It can function as an insight. We may have created this understanding of the epic before research, and then when you compare it to research results it turns out to be different. That makes me think you would want a 'what we thought' and 'how it actually should be changed, yes or no".*
    - *"I would want everything to constantly be seen as a living thing. You write down your insights in this template, and then when you phrase it as 'these were our assumptions but it should be so and so' that can lead to changes to the epic. The constant calibration of the epic, so to speak."*

- Reflecting the changes within the A2H flow, not just in general workflow, in the epic understanding template. Both the UX Owner and Business representative mention the visualization of app screens or app workflow to be validated with the user, so creating a prompt on the epic understanding template regarding this can stimulate this preparation.

    - *"Some epics aren't necessarily in a certain workflow but in a flow within the app. Depends on the research but if it is a functionality that exists in a certain place in the app it might be relevant to look at how that flow works."*
    - *"Sometimes when you observe users as they work you notice they have many steps to complete [for a certain task or action]."*
    - *"I would, for instance, use room on the epic understanding for screenshots or descriptions to show how users would get there. [To then validate those with the users.]"*

Users

Their role in the intervention:
to give input on specific epics through interviews with the UX owner.

Hypotheses to test:
1. Supported by the epic sheet and the user input template, the researcher is able to collect relevant insights from the user.
2. Gathered insights fit into the core needs framework as previously defined.

Method:
2 semi-structured interviews based on the user input template, with agents from different departments regarding epics specific to their work. Interview guide can be found in the appendix.

Analysis:
Based on audio recording, the interview is analyzed and interpreted, and filled in on the presentation sheet, including evidence. By attempting to use the developed intervention the researcher identifies iterations on the final concept to better aid in user research, and validates the formulated hypotheses. Full overview of quotes in the appendix, as well as the filled out presentation sheets for each interview using results from the interview.

Validating hypotheses:

1. Supported by the epic sheet and the user input template, the researcher is able to collect relevant insights from the user.

    We can say that this hypothesis is true. The user input template was used to construct an interview guide, and the researcher was successful in gathering input from the user regarding the core needs and design principles. The interview guide and selected transcripts can be found in the appendix.

2. Gathered insights fit into the core needs framework as previously defined.

    This hypothesis also appears true. By filling out the presentation sheet for each interview the researcher has established that insights can be categorized into the pre-defined framework. These presentation sheets can be found in the appendix.

Epic Owner/Prioritization Participant

Their role in the intervention:
to provide information on the epics that help the UX owner in preparing their research, and to then use the presented insights from the UX owner to prioritize epics for A2H.

Hypotheses to test:
1. The presentation sheet aids in comparison of epics, and thus aids prioritization.
2. The user input gives desired information to the participants.
3. The intervention fits into the current A2H process.
4. The intervention, along with the formalization and validation strategies, enables immediate and long-term impact.

Method:
a semi-structured interview with one of the prioritization participants who is also an epic owner.
Interview guide can be found in the appendix.

Analysis:
Based on audio recording, the interview is analyzed and interpreted with the goal of identifying iterations on the final concept, and the formulated hypotheses are validated.
Full overview of quotes in the appendix.

Validating hypotheses:

1. The presentation sheet aids in comparison of epics, and thus aids prioritization.

    - *"Of course there are always strategic goals that may weigh heavier than something else, that's the reality. But I think it absolutely will help in making sure that we can concentrate on the things that hold more value for users."*
    - *"Especailly when talking about things that are very close to one another, when the time/effort formula gives about the same result, you can say let's look at the user's opinion and that makes decision-making easier."*

    This hypothesis can be seen as true. The business representative makes clear that the influence the templates have over the session are constructive, and that they aid decision-making.

2. The user input template gives desired information to the participants.

    - *"I think that when you have a format like this it can absolutely help the conversations. Such as are we building this for the passenger or for the user? Or both? And what does the user think about it? You could see [in the MVP test] that people were influenced by that, it's a very concrete way of sharing this information."*

    Aside from the difference in the weight of needs (discussed above) the interviewee indicates that the information provided is helpful and no other information is required. They also cite the MVP test that was conducted as proof that they find the type of information valuable.

3. The intervention fits into the current A2H process.

- *"Depending on what the feature contributes to you can give more evidence-based user input."*
- *"The fact that people have to fill something out is always seen as an obstacle. But the forms themselves are quite easy and don't cost a lot of time."*

For this hypothesis goes the same as the process-related one for the UX owner. The process is altered, so it does not fit into it exactly. However, the changes are plausible and manageable according to the business representative, also from the epic owner's perspective.

4. The intervention, along with the formalization and validation strategies, enables immediate and long-term impact.

- *"They will think more about what would I want to show on the screen, and what value does that bring, and what do I expect it to bring us?"*
- *"It could be input for the app's refinement moments for some features. That it's very clear what the question is, is there information from the interviews that we should take into consideration…"*

We can say that this hypothesis has been proven true. The immediate impact on the prioritization process has been evaluated as possible and helpful, and the interviewee indicates a potential influence on other parts of the process as well, helping to give direction for changes to the app. Further long-term impact is difficult to accurately evaluate, but the willingness to engage with it gives an indication.

Most important insights for concept iteration:

- An addition to the how-to regarding indicating the relative importance of values. A small change that allows for flexibility but does not indicate a ranking of core needs or principles. This would lead to too much complexity, and additionally if certain values are very influential they will be reflected in the business and/or strategic value as well as the user value. After all, the user value is only one of the contributing values for prioritization.

  - *"I think [relative importance of needs] is different for each epic but that it can cause discussions: which one is better or more important: solver, filler, exclusive… Hmm but I suppose that may lead to higher business value. Yeah and passenger experience you would expect to be reflected in the strategic value."*

- Some practical changes in the formulation of target groups to increase readability.

11 Solution

On the next pages the final solution is presented. This includes the intervention that can be implemented right away: The User Value Framework, as well as the validation and formalization strategies that surround it and support UX maturity within the company.

11.1 Transition

Moving towards UX maturity for the A2H team and the company as a whole means increasing user-centeredness and formalizing it throughout all the related processes. To achieve this, a large shift is needed in all different aspects of the A2H development. The plan to transition towards user-centeredness is presented in the form of a roadmap (figure 31 on pages 84/85), including a first intervention that can be implemented in the process as is and start this transition.

This roadmap describes the move towards the desired way of working within the A2H team: evidence-based, user-driven and objective. The map is made up of several different parts: the intervention, how it helps move towards formalization of user-centricity, and how its validation expands and supports more user-centricity with time.
The user aspect of the matrix will always need direct user input, and is inherently qualitative. Other input on the other hand, can be more and more data-driven in the future, making the prioritization sessions more efficient, and decisions more evidence-based. This solution focuses on the user side of the matrix.

User-centeredness at the prioritization level means letting users represent themselves in the discussion. Since prioritization is based on the matrix and its value drivers, the user side manifests through the matrix drivers of 'user value'. For A2H I propose substituting user value with employee value, since the application is employee-facing, and the user is always an agent.

Research has revealed that agents value the passenger experience as one of the most important motivators for their work. Any A2H changes that affect passenger experience always do so through the employees, since customers do not interact with the application directly. Including passenger/customer experience from their perspective is therefore a logical approach, because that experience takes place through them. This way both the user and the customer interests are represented by the employee value.

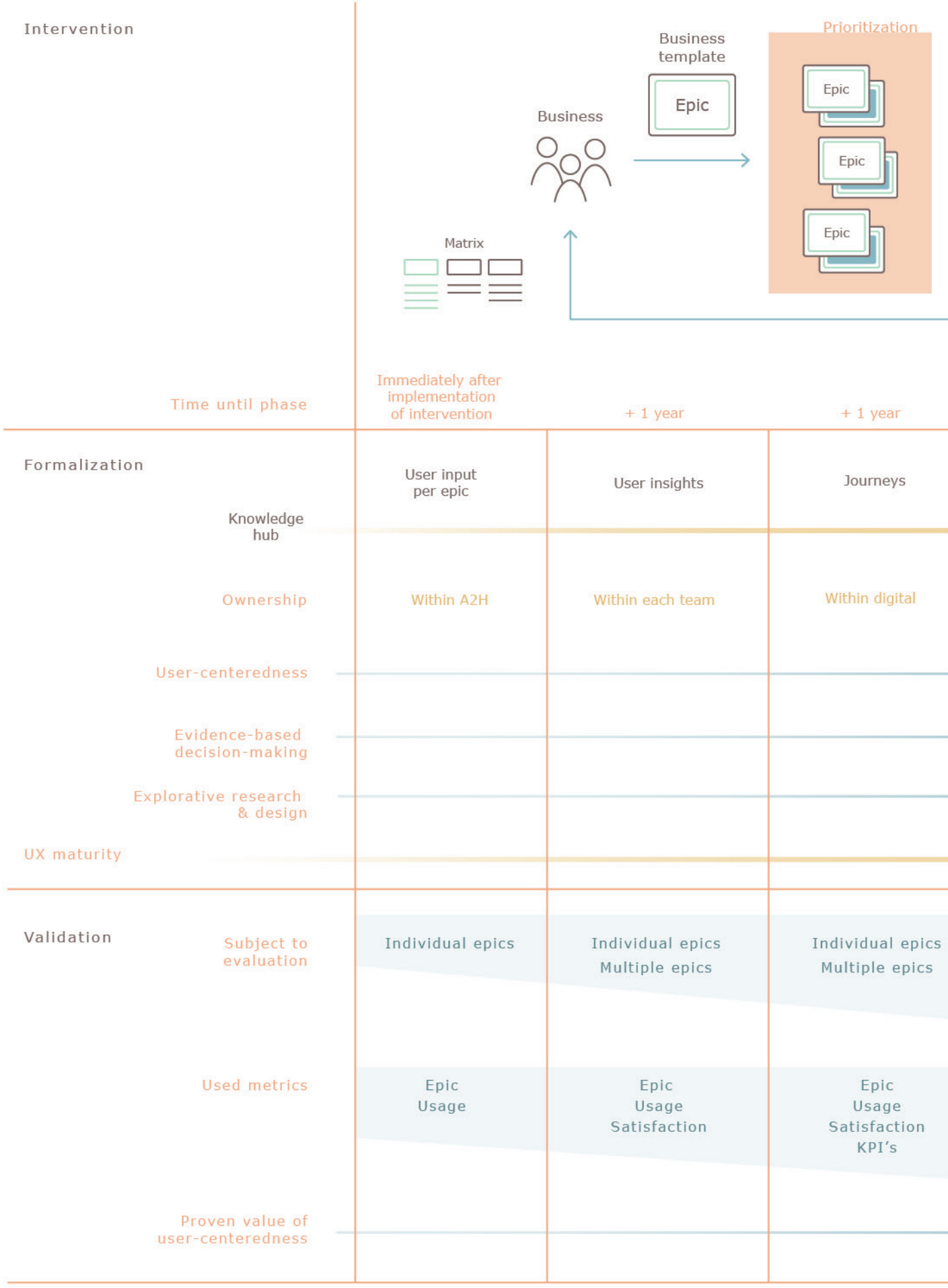
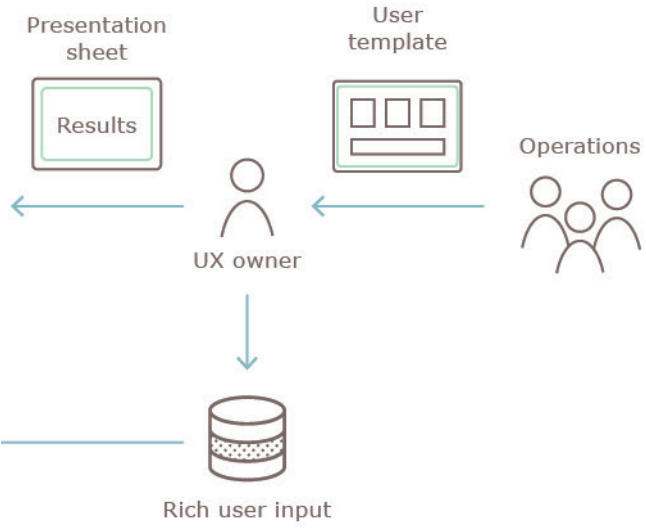


Figure 31.
The solution roadmap including the intervention, the formalization and validation segments and the desired state towards which they are working.



Desired

Data-Driven

Quantitative input for decision-making and evaluation of decisions and development.

+

Qualitative input in all phases: creating epics, development, and evaluation of decisions and development.

UX Owner

	+ 2 years	+ 3 years
	Understanding of user context, needs and behavior	Building on existing knowledge by maintaining and continuing collection of insights and journeys.
	Central UX owner	Senior management
	Individual epics Multiple epics Decision-making	Individual epics Multiple epics Decision-making Revenue
	Epic Usage Satisfaction KPI's Revenue	Epic Usage Satisfaction KPI's Revenue ROI

User-centricity recognized as valuable and important in all parts of the development, with its own budget and team.

Constant validation of features, decisions, return on investment and claims/promises made for certain functionalities and epics.

11.2 Intervention

The proposed first step is the User Value Framework, a new way of incorporating user input in the A2H development process, as a step towards increasing adoption and UX maturity of A2H development. This includes artefacts that can be implemented in the current process. This process is visible in figure 27.
User input is collected per epic to make them more comparable and facilitate the assessment of relative user value in the prioritization process. The full Intervention packet can be found in the appendix.

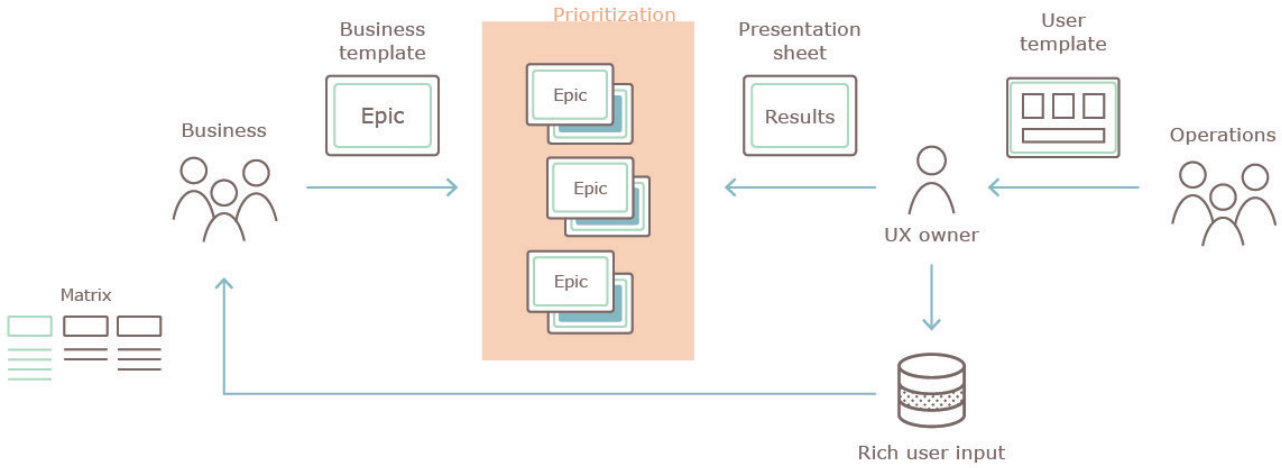


Figure 32.
Visual representation of the functioning of the intervention developed for this project.

11.2.1 Role

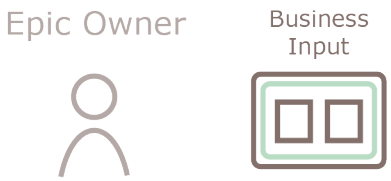
Epic research is currently carried out by the design researchers within the Digital department. Although the designers have the capabilities to carry out the research, they do not currently have the capacity. Two designers are doing research for all of the applications and API's in the department, but doing detailed research using the intervention for all epics requires more time than currently available.

Therefore, a new role within the A2H team is proposed: that of UX owner. This person is responsible for user-centeredness and the maintenance of collected user insights and knowledge.
Considering the design research responsibilities, the person fulfilling this role should preferably have a background in design or user research. Given the ambition to move towards a more explorative type of user research, design capabilities will contribute to developing new directions for development.

11.2.2 Process

The process taking place around the intervention has been developed as well, although this may differ a little between epics. A more detailed explanation as well as each person's responsibilities can be found in the how-to document (see full intervention packet).

1



Epic owner fills out the epic sheet to explain the epic as per usual, with the addition of the business template. This is filled in together with the epic sheet, and provides some extra information.

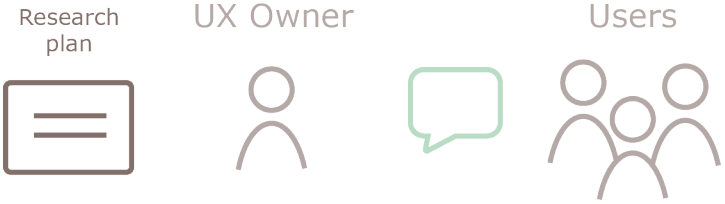
2

The epic is then discussed between the epic owner and the UX owner. The UX owner uses the epic understanding template as a support tool to map the context of the epic and understand its role in the agent's process. It is also used to discuss potential or expected benefits for all parties with the epic owner, so that these can be validated in the context of the user needs.

3

The UX owner then proceeds to prepare their research, using both the epic understanding sheet and the user input cheat sheet, which describes the user needs. This is used to prepare the interview guide, or any other research methodology, and should give the UX owner a starting point for their queries.

4



Research is conducted by the UX owner with the impacted users, using the templates as a guiding principle. Multiple users are interviewed to gain a complete picture, and all the insights are gathered by the UX owner.

5

Insight gained in the research will be relevant to the specific epic, but also occasionally more general or informative of the agents' workflow or journey. A distinction should be made between these different kinds of information by the UX owner, and allocated as such.

6

The insights that are most relevant to the epic are summarized in the epic presentation sheet, indicating whether the epic supports the core user needs. On the back of the presentation sheet evidence can be added to support the user need 'verdict', such as quotes or research insights.

7

The more general insights or explorative results from the research should be saved in the user insights database for future reference. I recommend organizing it in a way that builds towards mapping complete user journeys for the different subgroups, and to tag insights by topic, feature or workflow/task.
These general insights are presented to the business representatives of the different departments at regular intervals, for instance quarterly, to go ahead of quarterly prioritization. This will aid in moving towards a more user-driven mindset for development at the creation level where epics are formulated.

Figure 33.
The process around the intervention.

11.2.3 Artefacts

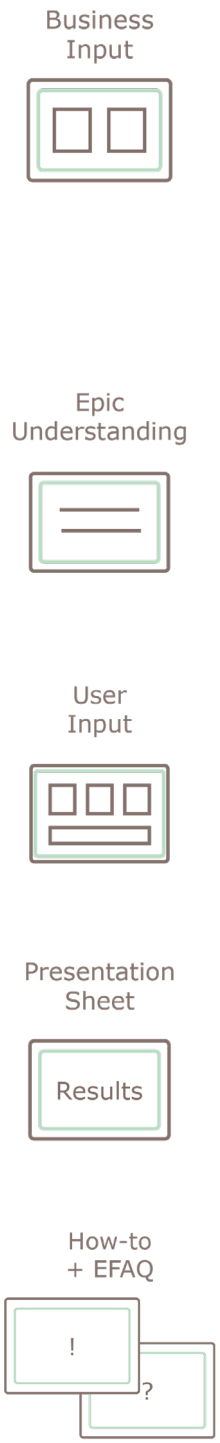


Figure 34. Artefacts of the intervention

Business template

This template is meant to aid the epic owner in explaining the epic to the UX owner and conveying the change in way of working for the agents. It also cultivates a sense of ownership on the business side of the user input process.
It also includes a part focused on adoption and whether epics have specific adoption boosting elements. This is derived from the growth hacking theory on pulling users in. A comparison between the business perspective of the user and the actual user perspective on this can also show how easily assumptions are made.

Epic Understanding template

This is the template used by the UX owner to map out the context of the epic and the agent workflow that it affects. Together with the user input template, it functions as the translation between the business interpretation of an epic and the user interpretation. Distance from the business is created by introducing the UX owner, and assumptions are recorded so they can be evaluated and tested.

User Input cheat sheet

This is used by the UX owner to take the step from epic information to user information. It is used, together with the epic understanding template, to shape the research done with the users. They give the UX owner an idea of what to test, and the UX owner then has specific design principles to validate, with the background information in mind.

Presentation sheet

The relevant insights should be collected and used to form a verdict regarding the adherence to the design principles. This verdict is then recorded and presented in the presentation sheet, which is attached to the epic sheet. Evidence for the verdict can be recorded on the other side of the sheet, to give background, such as quotes or insights. This gives a clear and concise view of the epic from user perspective, within the bounds of the user need framework. This framework makes the sheets comparable.

Information and instructions on how to use the templates are included in the How-To & EFAQ.

11.3 Formalization

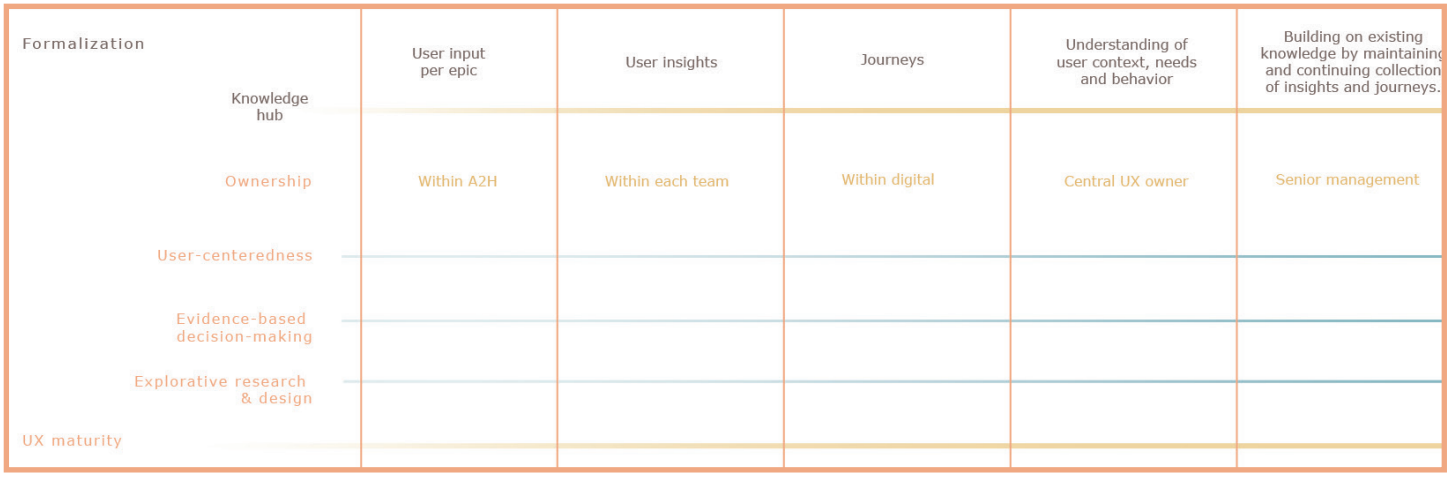


Figure 35.
Formalization segment of the solution roadmap.

This part of the roadmap shows the advancement that can be made using the intervention as a first measure in starting formalization of UX efforts and metrics. Looking at the UX maturity models we used to assess the company's current position, there are certain measures that cultivate a step-by-step maturation.

Since the company is currently at a point where there is a designated budget and people specifically hired for UX efforts, a start has been made with formalizing its place in the development process. It is, however, still limited to the last phases of the project and mostly used for validation purposes.

The models indicate that an important part of advancing and proving value is starting to compare the projects that included UX efforts with those that did not. Since the intervention also functions as a way of measuring UX compatibility of past epics, a comparison can be made with previous development as well. See the 'validation' section for an elaboration on this. Comparison between results can therefore give an indication of the importance of UX and help advocate its continued use. A linking to KPI's can help elevate this to a next level, because it explicitly shows business value impact (Carraro, 2017).

Eventually a link should be made to revenue that UX can stimulate and its ROI. These links should be made further in the future, because it can take a while for the impact to trickle down to the level of customers (since it is an employee-facing tool) and the revenue should be measured over time to give an accurate picture of the impact it has, and the difference between more user-driven or user-valued features and those that do not suit the user needs.

Another aspect of UX maturity is the ownership. It often starts with teams conducting UX research as an extra activity, or at their own discretion. Moving towards a more centralized way of working, people are appointed within teams to conduct this research, after that one person is appointed as the owner, and then an owner that transcends products and oversees all UX efforts, and eventually UX should be represented in senior management.

The UX owner that is proposed in the solution would initially conduct the research just for A2H. A manager of the design team exists already within the company, so the expansion of UX efforts is made significantly easier by this.

The current focus is mainly on validation research and interface design, but the existence of a responsible person and team is a necessary medium for expansion. The main form of expansion that still needs to take place is increasing capacity by hiring more designers so each team can invest in both validation and exploratory UX research, and establishing a centralized knowledge hub.

That brings us to the next (and possibly most important) part of the formalization. In order to shift towards a more exploratory mindset, a universal truth around user experience should be established (Valsplat, 2020). This means centralizing insights around the user groups for all teams to utilize. The intervention allows for a first step in this information gathering, starting the hub with insights around specific epics and building towards a complete picture of the target group (Nielsen, 2006).

11.4 Validation

An important part of increasing UX maturity and formalizing its activities depends on investments from higher up, which depends on buy-in from stakeholders. Proving value without needing a large initial investment is done through a step-by-step expansion of validation efforts and constant results.

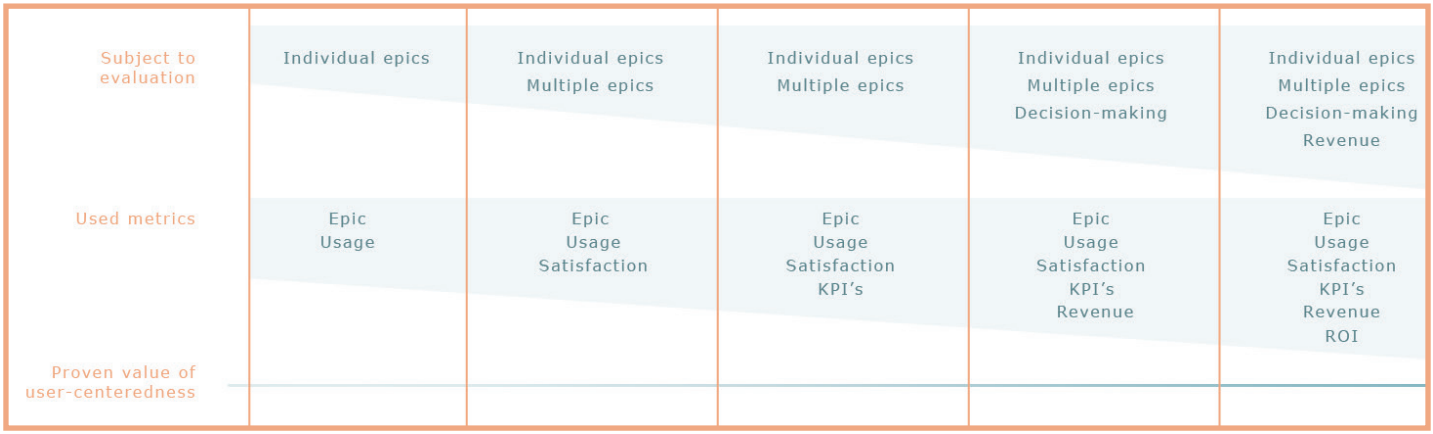


Figure 36.
Validation segment of the solution roadmap.

Continuing validation means expanding the ways in which impact of features and epics are measured. Currently the A2H team looks at the usage rates of features and this occasionally incites more research into why usage is lower than expected.
Using different types of metrics can help give a more complete view of the impact of user-centeredness. Measuring over time will give more and more insight, and help understand the effect of decisions in the long term.

Google researchers have formulated the HEART framework, which describes different ways of measuring user experience (Usabilla, 2017; Interaction Design Foundation, 2016). This includes the following metrics:

Happiness, which measures satisfaction. This is usually measured using surveys.

Engagement, which includes usage. This can be measured per user, per day/week, for instance.

Adoption, which measures new users. As previously discussed, new users are not as relevant to A2H because it is an application that is necessary to complete employee tasks. This can however include measurements of how many people update to the latest edition of the application, or how quickly how many users start engaging with a new functionality.

Retention, which is closely related to adoption. This shows how many people continue to use functionalities and how many drop out. Since alternatives still exist in the legacy systems for many of the functionalities, this can be an interesting metric to look at for A2H, to understand when churn occurs and what this is due to. Churn is essentially the opposite of retention, when people stop using an application.

Task success, which can be split into how much time a task takes and how often it is completed successfully. This is a metric already being looked at within A2H, to diagnose bugs or other issues that keep users from completing their tasks in the app.

Using those metrics to track features and epics as they are realized and comparing them to the results of the user input research can show the difference between usage of user relevant features and non-relevant features. Most of the HEART framework I call 'usage', as seen in

the validation strategy. The happiness metric I view separately because it is currently being worked on in the digital department in the form of surveys.

As more is developed and these metrics give an indication of the UC/A relationship, the evaluation can be expanded to include these satisfaction metrics, determined through surveys. These are currently being developed but will likely take some time to implement, hence the later addition of this technique. They are also expected to take some time on the user's part, whereas most other metrics can be analyzed entirely from the A2H team's side.

After comparing epics and features with one another and evaluating the UC/A relationship, it can expand to bigger scale. Looking at decision-making and which epics live up to expectations set at the prioritization session, and how decision-making reflects user-centeredness. Percentage of epics prioritized that have a high user relevance versus those that do not. How does the decision-making influence the usage, adoption and retention rates?

Lastly, evaluating revenue and ROI in relation to the decisions made in the prio session. Do epics live up to the expectations set in the prioritization and yield the promised business results? Is there a difference between epics that are user relevant or not and their revenue results?

In this way a small start with validation using existing systems and metrics allows for fast results that can then justify an investment in further research and validation, and expansion of validation scope.
When, in the future, epics are informed by user research and the entire development process is UX-driven, these metrics can be used to evaluate the added value of those epics as opposed to business-driven epics.

11.5 Recommendations

Other recommendations are made from the analysis and research conducted. Some considerations were purposefully left out of the main solution because they were not in the direct scope, but they do relate to the realization and implementation of the solution or the adoption of A2H. They are divided into different levels, depending on how simple or complex they will be to implement (figure 37). Some recommendations are specifically meant to support the ADKAR model, these will be in orange.

Additionally those relating to specific touchpoints in the process are categorized according to their place in the development journey, such as the recommendations for level 1, as visible in figure 38.

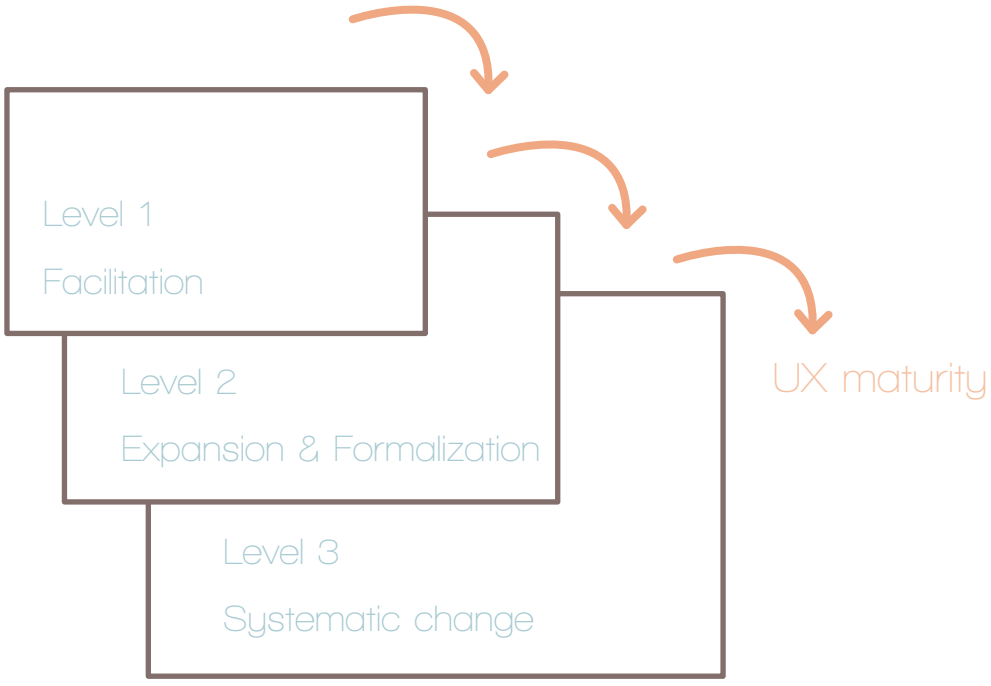


Figure 37.
The order of recommendations that aid in reaching UX maturity.

Level 1 – Facilitation

Facilitating use:
- Invest in hardware for proper wifi reception.
- Ensure charging is possible on the job.
- Work on refactoring the app to make it faster and more efficient (this is in the 2020 planning).
- Include working with A2H in the training for new agents, making sure to include explanation of why this change is necessary and desirable, as well as practice moments where there is opportunity to try and fail without consequences.

Receiving feedback (by A2H team):
- Appoint someone within the team to be in charge of processing feedback given through the different channels.
- Introduce shadowing of agents by the different stakeholders of A2H as a recurring event, to cultivate empathy as well as show importance of user-centered products. This will also show users they are being heard and taken seriously.

Giving feedback (by users):
- Rotate users at the user council meeting to include those who are not beta-users.
- Recurring events such as Appy Days, where agents can come to the developers and designers and talk to them about A2H.
- Creating sense of ownership by letting Shift leaders in on goal setting for A2H metrics (this has been started).

Informing users:
- Regular updates on planned development and upcoming releases, including reasons for development. Some may be related to strategic goals, but letting users know this also lets them know these developments have a reason instead of being a sign to them that they are not being listened to.
- Summarizing release notes in one-pager and linking to full information.
- Split up A2H training into basics and new features to make it more relevant for experienced users.

Prio session:
- Create a structure/format for pitching epics in the prio session so that they are more comparable. [touching on all drivers or OGSM aspects]
- Ensure that all participants are aware of the different epics and their content ahead of the meeting.
- Splitting bigger epics so that all epics up for discussion are of similar size.
- Let one person determine a certain value for all epics so they are more comparable. So all user values would be established by the UX owner, for instance, and the strategic value could be done by the product owner in collaboration with the PS department, which determines the strategic roadmap. This can be an in-between step on the way to automation of value allocation, or depending on evidence and letting go of value ahead of the decision (relying strictly on relative value).

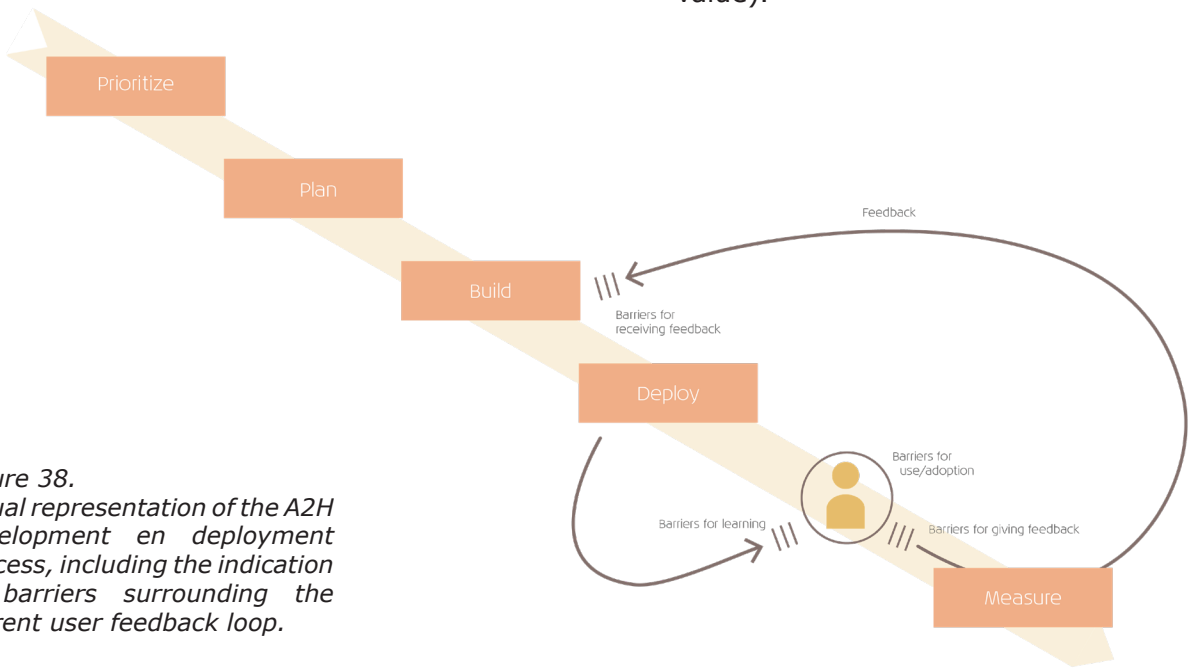


Figure 38.
Visual representation of the A2H development en deployment process, including the indication of barriers surrounding the current user feedback loop.

Level 2 – Expansion & Formalization

Gaining user insights:

- UX owner team expands, more invested in design reseachers.
- Using co-creative sessions to create a sense of ownership amongst A2H users, and gain insights on desired functionalities and embrace a more explorative mindset for epic directions.

Giving feedback (by users):

- Expand goal setting by letting users in on it, to increase engagement and productivity as described previously, and get insights regarding their use and non-use of functions.
- Make giving in-app feedback easier and quicker (for instance, enabling screencaps with captions to be sent directly).

Informing users:

- Include A2H in all education programs for agent training.
- Adapt training to new way of working with the tablet by including sales training and other service-focused skills. Incremental innovation still creates a big difference over time in how agents are asked to approach passengers.

Prio session:

- Create clear product vision, including all stakeholders in the process, relating to other (legacy) systems and channels. What is the purpose of A2H in the grand scheme of things? This can also help create a framework for the evidence that is relevant to strategic value and business value. Working to create standards for the values other than the user value will help make prioritization easier and more effective.

Level 3 – Systematic Change

- Change management training and awareness on all management levels.

- A formalized framework or process for the evidence collection and presentation for all matrix drivers.

- Part of this evidence is quantitative and data driven, so that predictions for revenue, nps, eps, etc can be as accurate as possible, and the prioritization sessions can be finished more efficiently.

- UX as the driver for decisions and direction for the digital department. User insights are the main source of new epics.

12 Discussion

Goal and results

The purpose of this project has been to examine ways in which to increase adoption of a digital employee-facing tool by involving its users in the implementation. This was achieved by examining adoption and the existing theories around it, as well as the current implementation process and user involvement. This research revealed that relevance of an innovation to its target group is one of the most important adoption determinants, as well as its ease of use. A combined model was introduced that shows the application of user-centeredness t increase adoption, supported by growth hacking and the ADKAR model.

Considering the existing agile feedback loop is focused on cultivating ease of use, a focus on creating relevance was chosen. the decision-making on the business side of the application's development, where choices are made regarding development of the application. The design goal was reformulated as "Increasing adoption by representing user input (aided by growth hacking strategies) in the prioritization process for A2H, to help the airline achieve their goal of making operations more efficient and customer-centric through digitalization."

Focusing on this prioritization process revealed some areas for improvement regarding the current way of working, as well as a need for more evidence to support decisions. Intersecting this opportunity with the user involvement goal of the project led to the development of a framework that allows for the collection of direct user input to provide evidence for decision-making.

The framework was established using insights from contextmapping, observations and interviews, and reflects the core needs of the user group. Additionally, studies and interviews were conducted to establish whether user input in the prioritization session would yield different results than the current way of working, and it was found to have influence on the decisions made.

The framework is presented as part of a strategy to increase UX maturity in the company, including a validation and expansion strategy over the long term to accommodate in-between proof of value of user-centeredness.

Contribution to new knowledge

This research has outlined how user input can be used to make employee-facing tools more relevant to their users and in turn increase their adoption.

The digitization of processes and tools is a common occurrence in many companies, as an attempt to leverage the possibilities of data collection and improve customer experience and service. To achieve this, the adoption of the tools is crucial, and therefore stimulating adoption is a challenge many are facing.

The insights gathered during this research contribute to the existing adoption literature by showing how the existing adoption models can be combined and applied to a corporate context. Additionally, much of the adoption literature is focused on customer-facing innovations. This study was conducted for an employee-facing tool, showing how many of the adoption models can be adapted for this context. In this case the adoption did not include a personal choice to adopt a new technology, but a top-down decision or technology push, which meant that parts of most models did not apply. The presented combined model shows how the different theories of user-centeredness, growth hacking and ADKAR work together to support a tech push innovation.

The developed framework can be adapted to other contexts as a tool to collect evidence for decision-making around development of tools or digital solutions. It can be adapted for different user groups by establishing new core needs and design principles. The same applies to the validation and expansion strategies, if adapted to different types of metrics that are relevant to other contexts.

Research limitations & Future research

One of the limitations of this research has been gaining access to authentic feedback regarding the application. Efforts were made to create a sense of trust, such as the decision not to record the exploratory interviews, and to conduct the interviews in spaces that were familiar to the interviewees. However, the fact remains that users are being asked why they do not use a tool they have been told to use. Authenticity of their answers is very hard to ensure. This is also partly why combining qualitative and quantitative data is important, to verify statements with the relevant metrics.

Another limitation is the small number of validation interviews. Due to the covid-19 consequences validation could not take place as planned, leading to fewer interviews which were conducted remotely. Testing was done with two different epics and their users to give some diversity for testing, but further validation is recommended, with more members of each of the involved parties: users, prioritization participants and possibly some more designers within the company (such as ux designers or service designers in different departments).

For further research I would also recommend attempting to establish a correlation between user-centeredness of past epics as assessed using the presented framework and the usage numbers of these functions by the target group. This could help create initial evidence for the longer-term validation strategy.

Future research could also include expansion of the framework by looking at how best to explain and demonstrate hypothetical functions to users. The Epic Understanding Template attempts to include some app flow screens and the previous and future way of working, but the study has revealed differences from person to person regarding their ability to visualize future functionalities.

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