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Gamification Kit: A practical toolkit for designing user-centered gamification

Master's Thesis

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Thesis advisor: Eeva Raita, Ph.D.

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Abstract of master's thesis

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The use of game elements in non-game contexts can increase user engagement, which makes applying gamification principles to all kinds of services attractive. However, designing user-centered gamification is easier said than done. It is not enough to apply points and leaderboards to a service for it to become successfully gamified. Gamification design needs to be user-centered to create meaningful gamified experiences for the users.

This thesis conducts a design science research that studies what kind of a tool can aid user-centered gamification design process. The outcome of this study is Gamification Kit – a practical toolkit that brings user-centeredness to gamification design. The toolkit is evaluated in a case study, where it is used to gamify an existing service. Based on this study, the Gamification Kit simplifies the complex process of gamification design and ensures that user-centeredness is considered in gamification. The toolkit is especially focusing on increasing the intrinsic motivation of the users towards the service.

The Gamification Kit divides the design process of gamification into three phases – gamification applicability, ideation and validation. The applicability phase discusses if gamification should be applied to a specific service. It evaluates if the service contains aspects that are required for user-centered gamification, and identifies the main user emotions related to the use of the service. In the ideation phase, gamification activity loops, which consist of challenge, feedback and reward, are created. These activity loops can be used to create initial gamification concepts. In the validation phase, the intrinsic motivation of the gamification concept is validated by evaluating the presence of the intrinsic motivation drivers in the concept – meaning, mastery, autonomy and relatedness.

The Gamification Kit is still in its early stage of development. The results of this study however indicate that the Gamification Kit can be used to aid the design of user-centered gamification in the study context. However, future research is needed for more generalizable results.

Keywords	gamification, toolkit, user-centered design, user-centered gamification, meaningful gamification

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Pelielementtien käyttö palveluissa voi sitouttaa asiakkaita, mikä tekee pelillisten ominaisuuksien käytön niissä houkuttelevaksi. Käyttäjälähtöisen pelillistämisen suunnittelu ei kuitenkaan ole yksinkertaista. Pisteiden ja tulostaulujen lisääminen palveluun ei tee siitä onnistuneesti pelillistettyä. Pelillistämisen suunnittelun täytyy olla käyttäjälähtöistä, jotta pelilliset kokemukset voidaan tehdä merkityksellisiksi käyttäjille.

Tämä diplomityö käyttää design science research –menetelmää ja tutkii, minkälainen työkalu voi auttaa käyttäjälähtöistä pelillistämisprosessia. Tutkimuksen tulos on Gamification Kit – käytännöllinen työkalu, joka tuo käyttäjälähtöisyyden pelillistämisen suunnitteluun. Tämä tutkimus arvioi työkalua case study – menetelmällä, käyttäen sitä projektissa, jossa pelillistetään olemassa oleva palvelu. Tutkimuksen perusteella Gamification Kit yksinkertaistaa kompleksista pelillistämisen suunnitteluprosessia ja varmistaa, että käyttäjälähtöisyys otetaan huomioon pelillistämisessä. Työkalu keskittyy erityisesti kasvattamaan käyttäjän sisäistä motivaatiota palvelun käyttöä kohtaan.

Gamification Kit jakaa pelillistämisen suunnitteluprosessin kolmeen vaiheeseen – pelillistämisen soveltuvuus, ideointi ja validointi. Soveltuvuusvaihe tarkastelee tulisiko pelillistämistä liittää tutkittavaan palveluun arvioimalla sisältääkö palvelu ominaisuuksia, joita käyttäjälähtöiseen pelillistämiseen tarvitaan. Lisäksi se tunnistaa tärkeimmät tunnetilat, jotka liittyvät palvelun käyttöön. Ideointivaiheessa luodaan pelillistämisen aktiivisuusluuppeja, jotka koostuvat haasteesta, palautteesta ja palkinnosta. Näiden avulla voidaan luoda alustavia pelillistämiskonsepteja. Validointivaiheessa pelillistämiskonseptin sisäisen motivaation lähteitä validoidaan. Tämä tehdään arvioimalla, kuinka hyvin sisäisen motivaation tekijät - merkitys, taituruus, autonomia ja suhde – ovat läsnä pelillistämiskonseptissa.

Gamification Kit on vielä kehitystyönsä alussa. Tämän tutkimuksen tulokset kuitenkin osoittavat, että sitä voidaan käyttää apuna käyttäjälähtöisen pelillistämisen suunnittelussa tutkimuksen kontekstissa. Jatkotutkimusta kuitenkin tarvitaan, jotta tulokset olisivat yleistettävissä muihin käyttötilanteisiin.

Avainsanat	pelillistäminen, työkalu, käyttäjälähtöinen suunnittelu, käyttäjälähtöinen pelillistäminen, merkityksellinen pelillistäminen

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Writing these last words of the Master's Thesis is comforting. The extremely interesting, but long and challenging process is finally coming to an end, and it is time to thank all the people that were helping and supporting me during this process.

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Helsinki, September 18, 2017

Toomas Kallioja

Table of Contents

List of Figures

List of Tables

1 Introduction

The term gamification is relatively new, but the concept behind it has been around already for a long time (Nicholson, 2012). Similar underlying ideas for using game design and game elements in contexts outside of games have been previously explored within the human-computer interaction literature already in 1980s (Deterding et al., 2011c), but by using terms such as a playful interaction design (Deterding et al., 2011b). Different loyalty systems, such as frequent flyer miles or loyalty cards for shops, are also designed around the same principles than gamification – they try to increase the use of the service and change the customers' behavior by giving the customers rewards based on their actions.

During the previous years, gamification has gained a lot of attention both in the industry and in the academic field. The term gamification originated in the digital media industry already in 2008, but the widespread usage of the term started to emerge at the end of 2010 (Deterding et al., 2011b). More than five years ago, Gartner (2011) suggested that 70% of the world's largest public companies would have some gamified application already by the end of 2014. Today, there are many successful companies whose main differentiation is adding gamification to a core service. This is popular especially in the learning domain, where companies such as Codeacademy and Duolingo are heavily relying on gamification. Codeacademy is teaching coding with a gamified platform and Duolingo has gamified the learning of languages.

The future of gamification is still unknown – some believe that by 2020 the usage of gamification will be widespread, whereas others believe that gamification will not evolve to be a larger trend (Burke, 2012). The controversy opinions are likely because gamification has gained a lot of attention as being the potential next generation method for marketing and customer engagement (Hamari, Koivisto and Sarsa, 2014), but at the same time it is difficult to design a successful gamification process. Gartner (2012) estimated that 80% of the current gamified solutions will fail to meet their business expectations mainly due to the poor design of gamification.

There certainly is a great interest towards gamification, but the main difficulties are related to the poor design of the gamification services. Robson et al. (2015) believes that poorly designed gamification results from the lack of understanding of what gamification is and how it can be used to foster behavior change. Gamification should not be glued on top of a service, but designed to be an integral part of it. Nicholson (2012) points out that a popular approach of gamifying a service by only adding points and external rewards to it can even reduce the internal motivation of the users, resulting in harmful gamification.

A generally acknowledged design philosophy that could be used in gamification design is user-centered design (Norman, 1990). It puts the end-user to the center of the design process and ensures that the needs and goals of the users are the primary consideration throughout the whole design process (ibid.). Nicholson (2012) introduces the term meaningful gamification, where he applies user-centered design to gamification. The approach by Nicholson (2012) however is only theoretical, not discussing how user-centered gamification could be designed in practice.

To enhance the understanding and application of user-centered gamification, I conduct a design science research, in which I create a toolkit to aid user-centered gamification design in practice. Hence, the main research question of this thesis is:

What kind of a toolkit can aid user-centered gamification design process?

Answering the main research question requires understanding of the main theoretical considerations that need to be considered if a concept is gamified. Moreover, it must be researched how these theoretical considerations can be applied to a design process to design user-centered gamification. For this, I created a user-centered gamification design toolkit called Gamification Kit that I evaluate in this thesis.

To discuss these matters in more detail, I have formulated two sub-questions for the main research question. These sub-questions are:

1. *What are the main theoretical considerations for gamifying a concept?*
2. *How can Gamification Kit help to bring user-centeredness to gamification design?*

2

This thesis answers the first sub-question question by studying the existing academic research about gamification. The research will focus on understanding the core concepts of gamification, game design and gamification design processes. The main theoretical frameworks discussed in this thesis are self-determination theory (Ryan and Deci, 2000b) and gamification design framework MDE (Robson et al., 2015).

Based on the studied academic literature, this thesis introduces a Gamification Kit toolkit to aid user-centered gamification design. The goal of the Gamification Kit is to provide a practical design toolkit that helps gamification designers to evaluate the applicableness of gamification to a service, ideate gamification concepts and validate them.

To answer the second sub-question, this study justifies the reasoning behind the created toolkit and links it to the discussed theory. Moreover, the created toolkit is evaluated by conducting a single-case study, where a gamification concept is designed to an existing service using the Gamification Kit. By first answering these two sub-questions, the main research question can then be answered.

The research context of this study is the created Gamification Kit toolkit. Due to the innovative nature of the toolkit and the focus of the research, the toolkit is not compared to other methods to design gamification. This study introduces the Gamification Kit and evaluates how the toolkit can bring user-centeredness to the gamification design by conducting a qualitative single-case study. The context of the case study is gamifying an energy monitoring application. Qualitative data from the case study is collected in a form of physical artifacts and participant observations.

This thesis is structured to six sections: Introduction, Theoretical background, Methodology, Empirical study, Discussion and Conclusion. The structure of the thesis is visualized in Table 1.

Table 1: The structure of the thesis

Section I	Section II	Section III	Section IV	Section V	Section VI
Introduction	Theoretical background	Methodology	Empirical study	Discussion	Conclusion

The first section describes the background and motivation of this study, and defines the research questions. Moreover, it introduces the scope and the structure of the study. The second section defines the theoretical background of the study, and introduces the main theoretical frameworks that are used in this study. The third section introduces the research process of the study and the used research methodology. The fourth section presents the empirical study of the thesis. It introduces the created Gamification Kit toolkit and describes the process of the case study and the evaluation of the toolkit. The fifth section discusses the findings from the academic and empirical research, and answers to the research questions. Moreover, it describes the research contribution of the study, presents suggestions for future research and evaluates the study. Finally, the sixth section concludes the study and its main findings.

2 Theoretical background

This section introduces the theoretical background of the thesis, focusing on the main theoretical considerations for gamifying a concept. The following sections discusses about the different definitions of gamification, the main elements of games, the main characteristics of user-centered gamification and gamification design processes.

2.1 Games and gamification

The practice of gamification started to arise when the motivational aspects of games were started to be applied to services outside of game contexts. As gamification is originating from games, it is essential to understand the basic concept of games. Salen and Zimmerman (2004) define a game as "a system in which players engage in artificial conflict, defined by rules that result in a quantifiable outcome". Juul (2010) on the other hand summarizes that "a game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable."

Common for both the definitions are that games are rule-based systems, where the players of the games engage to influence to an outcome, and the outcome is quantifiable. Although the primary purpose of games is entertainment, the game design strategies intend to also engage the players in the gameplay (Dickey, 2005).

Games provide clear goals, sense of rewards and fulfillment to players, hence acting as good motivators by nature (Barata et al., 2013a). As psychologist Byron Reeves states, there are however no psychological mechanisms that would work only for games but not in real life – the reward centers that are activated by the well-designed games will also activate when interacting with any other well-designed interactive system (Pavlus, 2010). Gamification takes advantage of these motivational powers of games and applies them to non-game systems.

2.1.1 Defining gamification

The academic literature offers two viewpoints to gamification, one focusing more on the system level approach, and another focusing more on the goals and processes of the gamification. I will go through both the viewpoints and reason my own definition of gamification: adding design elements characteristic to games to non-game context as an attempt to motivate users to engage with the system and foster behavior change.

The most cited definition of gamification is by Deterding et al. (2011a), defining gamification as "the use of game design elements in non-game contexts". In other words, it is defining gamification as something that is taking traditional game design elements, such as feedback, teams, levels and ranks (Reeves and Read, 2009), and using them in a context that is not a game itself – hence the term gamification.

The definition by Deterding et al. (2011a) is taking a system level approach to gamification, defining that the usage of game design elements makes a system gamified. Huotari and Hamari (2012) criticizes this system oriented definition, because gamification is restricted to use only game design elements. They argue that gamification should be defined more broadly as the use of any kind of affordances that results to gameful experiences. The argumentation for this is that there seems not to exist any clearly defined set of game elements that would be unique to games, and that gamification is not carried out by any concrete elements alone. (Huotari and Hamari, 2012)

Deterding et al. (2011a) agrees that it is difficult to define what makes an element a game element. They give a heuristic definition for the game elements, describing these as elements that are somehow characteristic to games – meaning elements that are found in most games, are associated with games and play a significant role in the gameplay. However, it could be argued that an "affordance that results to gameful experience", as described by Huotari and Hamari (2012), can also be seen as a game design element. In essence, this specific affordance is the element that results to the gameful experience. Hence, it can be associated to a game and it plays a significant role in the gameplay.

In academic literature, other system level approaches in defining gamification can also be found. Gamification have been defined as using design that is characteristic to games by for example taking game design elements (Groh, 2012; Nicholson, 2012), lessons from the gaming domain (Robson et al., 2015) and motivational power of games (Sailer et al., 2013; Barata et al., 2013b) and applying them to non-gaming context (Barata et al., 2013a; Robson et al., 2015; Seaborn and Fels, 2015; Thom, Millen and DiMicco, 2012). The focus of the above-mentioned definitions of gamification are on the different elements that makes a system gamified, and they do not describe the goals or outcomes of the gamification.

In the gamification definition by Huotari and Hamari (2012), instead of the system-level approach, the emphasis is put on the experiential nature of gamification. They refer to gamification as "a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation". Thus, Huotari and Hamari highlight the process and the goal of gamification instead of the methods used, and emphasize the role of the user as the ultimate value creator.

Recently, also other researchers of gamification have taken a similar more process-oriented approach to gamification by defining what kind of processes and goals are typical to gamification. Seaborn and Fels (2015) states that in gamification, the usage of game elements is intentional and the goal is to offer a gameful experience. Gamification also aims to change behaviors (Robson et al., 2015; Barata et al., 2013a), such as make the users learn something new or exercise more. This is done by motivating and engaging the end-users (Seaborn and Fels, 2015; Groh, 2012), by promoting the intrinsic motivation of the users towards various activities (Hamari and Koivisto, 2015), and trying to encourage a productive behavior (Glover, 2013). Gamification also aims to create a sense of playfulness so that participation is more enjoyable and desirable (Thom, Millen and DiMicco, 2012).

As discussed above, gamification can be seen from two perspectives, one focusing more on the system level approach of gamification, and other on the process and the outcomes of gamification. On the system level, the most cited definition is by Deterding et al. (2011a), defining gamification as "the use of game design elements in non-game contexts". From the process point of view, gamification tries to provide a

gameful experience that changes behaviors by motivating and engaging the users (Seaborn and Fels, 2015; Robson et al., 2015; Barata et al., 2013a; Groh, 2012).

Based on these two viewpoints, I propose the following definition of gamification: **adding design elements characteristic to games to non-gaming context as an attempt to motivate users to engage with the system and foster behavior change**. This definition focuses on addressing both viewpoints of gamification, taking especially into account the desired outcome of gamification, which is not present in the most cited gamification definition by Deterding et al. (2011a).

My definition uses the term *design elements characteristic to games* as opposed to *game design elements* to give a definition to the term game design elements. These design elements characteristic to games are not only restricted to game elements, but can be any affordances that results to gameful experiences.

2.1.2 Main elements of games

The definitions of gamification generally discuss about the usage of game design elements in contexts outside of games. There are many game-specific elements, but some common core elements of games can be identified from the existing academic literature.

Flatla et al. (2011) defines core elements of games to be challenge, clear goals, rewards, feedback, progress and theme. Glover (2013) summarizes the main game elements to goal-focused activity, reward mechanisms and progress tracking. The study by Dickey (2005) of the common aspects of game design reveals clear goals and tasks, reinforcing feedback and increasing challenge as the main game elements. Also the study by Von Ahn and Dabbish (2008) reveal challenge as the key element of any successful game.

Based on the existing academic literature, this study focuses on goal-focused challenge, feedback and reward as the main game elements for gamification design. Next, I will go through these elements in more detail.

Goal-focused challenge

Goal-focused challenges provide challenging goal elements tied to rewards (Flatla et al., 2011). This means providing clear goal-oriented tasks, such as collecting items, with clearly defined win conditions that triggers a challenging activity engaging the player (Flatla et al., 2011; Smith-Robbins, 2011). The challenges give the users direction of what to do in the game, so it should be made sure that there are always challenges for the users to complete (Zichermann and Cunningham, 2011).

The challenges should include a number of obstacles that the users' need to overcome to complete the activities (Smith-Robbins, 2011). The difficulty of challenges may increase as the game progresses (within the game boundaries) to keep the users interested (Flatla et al., 2011). This can be achieved by increasing the required actions per level (Zichermann and Cunningham, 2011), but also with other game features, such as timed response or randomness (Von Ahn and Dabbish, 2008).

Feedback

Feedback means providing different progress units and achievement markers to let the users understand how they have progressed in the game and how well they are doing (Flatla et al., 2011), and to understand what needs to be done to reach the next milestone (Glover, 2013). Without the progress tracking it would be impossible to identify what is still needed to reach the winning conditions of the provided goal (ibid.). The game features that provide feedback are for example points, levels and progress bars (Flatla et al., 2011; Zichermann and Cunningham, 2011).

Zichermann and Cunningham (2011) states that points are a requirement for all gamified systems. The points should be used to track every movement that the users make, so they can provide constant feedback on how the users are progressing. However, while the points can be used as a feedback mechanism to show the users their progress in the game, designers can also use the point system without sharing it with the users. The points can also be only visible internally as a feedback of how the different users are acting in the gamified environment. (Zichermann and Cunningham, 2011)

Levels in the games indicate the progress and show the users where they stand in the game (Zichermann and Cunningham, 2011). As the challenges in the game increase, also the leveling gets more difficult. In gamification, levels are not usually present in a similar way than in traditional games (ibid.). Still, levels are often used also in the gamified systems to indicate progress, for example by introducing different membership levels based on the user activity. Progress bars are also closely related to levels, since they are often used as a progress guide for the users (ibid.), showing how close they are in reaching a level or other activity.

Feedback can also be used as a reinforcement in the game, with an intention to change players' behavior. For example, a progress unit displaying a time restriction can speed up the players actions and social leaderboards can foster competition and increase replay value of the game (Flatla et al., 2011)

Reward

Goal-focused challenges set challenging goals with a defined set of winning conditions, and feedback shows how the user is progressing towards them. After these winning conditions are met, the third key aspect of games is reward. Challenges alone do not usually provide sufficient motivation to stay engaged in the game activities if the users are not rewarded (Flatla et al., 2011). Thus, the rewards work as behavior reinforcements (ibid.) and maintain the motivation of the users to engage in the game activities. Games can use many types of reward mechanisms, but Glover (2013) states three main reward categories: leaderboards, prizes and achievements.

Leaderboards are lists where users are ranked based on their success in a game (Glover, 2013). Thus, they provide a ranking system for games. They are typical especially in competitive activities and their purpose is to make simple comparisons between different users (Glover, 2013; Zichermann and Cunningham, 2011). Leaderboards can be of many different types: they can show for example all the users of the service, only the ones nearby the user or only the friends of the user (Zichermann and Cunningham, 2011). Leaderboards can act as powerful motivators (Glover, 2013), so it is important to pay attention to the type of the leaderboard that is being used.

In games, prizes are usually internal rewards, and users can be rewarded for example with special in-game items or additional game content when completing certain tasks (Glover, 2013). These rewards give the users access to game content that cannot be otherwise obtained. In the gamified services, it is common to reward the users also with external prizes, such as service discounts or free goods.

Glover (2013) defines achievements as icons that the users acquire as a sign of completing certain tasks. They are often publicly visible and act as a way for the users to gain social recognition (ibid.). Along with signaling status, the users also desire achievements for many other reasons: collecting is a powerful drive for many people, and many enjoy the surprising effect of obtaining an achievement (Zichermann and Cunningham, 2011). Especially badges are a popular way to indicate achievements in today's games and gamified services.

2.2 Characteristics of user-centered gamification

Next, I will go through the characteristics of user-centered gamification. This chapter discusses the importance of user engagement and how it can be increased through motivation. The roles of extrinsic and intrinsic motivation in gamification are also discussed, and the self-determination theory (Ryan and Deci, 2000b) is used to discuss the intrinsic motivation drivers.

2.2.1 User engagement and motivation

The main goals of gamification are to increase the user engagement towards a system or a service (Seaborn and Fels, 2015; Groh, 2012) and encourage the users to change their behavior (Robson et al., 2015; Barata et al., 2013a). There are multiple ways to achieve these, but the underlying concept in gamification context is motivation (Nicholson, 2012). Understanding the underlying needs and motivational sources of the users is important for user-centered gamification design (Nicholson, 2012).

Gamification is a motivational system that is built on the assumption that human behavior and attitudes can be influenced through technology (Hamari, Koivisto and Pakkanen, 2014). A key term for these kind of technologies is persuasive technology, which is an interactive computing system that is designed to change people's attitudes

or behaviors (Fogg, 2002, cited in Hamari, Koivisto and Pakkanen, 2014). Gamification can be seen as a one type of persuasive technology (Inbar et al., 2011), focusing especially on increasing users' motivation through gameful experiences (Inbar et al., 2011; Hamari, Koivisto and Pakkanen, 2014).

The persuasive technologies are often used in contexts where the users would be willing to undertake the target activities, but they have difficulties in starting or continuing them (Hamari, Koivisto and Pakkanen, 2014). These can be activities, such as learning a new language, exercising or recycling. As an example, people generally want to be healthier and get into better shape. Despite that this desire is present, many people have difficulties in taking any actions to reach this goal. It can be argued that by offering the users a well-designed incentive system that encourages them in reaching this goal, the difficult actions are easier to overcome (Zichermann and Cunningham, 2011).

As a persuasive technology, gamification is especially useful in systems where the users see the core activity valuable as it is. One of the core ideas of gamification is to use it for encouraging the users to accomplishing a desired activity (Glover, 2013). This also means that gamification is not a miracle solution that can be applied to any system. It can do little to make low quality or uninteresting activities and experiences more engaging or meaningful (ibid.). Only if the target activities are interesting for the users, gamification can be used to provide the additional motivation to complete the activities and to encourage the wished behavior (ibid.).

2.2.2 The role of extrinsic and intrinsic motivation in gamification

As discussed before, motivation plays an important part in the gamification design (Seaborn and Fels, 2015; Groh, 2012). There is however a diverse academic discussion about how motivational encouragement in gamification should be done. To gain a more comprehensive understanding of this topic, the roles of extrinsic and intrinsic motivation in gamification is discussed.

Motivation can be distinguished to different types, and the most basic distinction is between intrinsic and extrinsic motivation. Intrinsic motivation is when the user's actions are mostly driven by the task itself, because it is seen as inherently interesting

or enjoyable. The actions of intrinsically motivated user are not dependent on external pressure or rewards. Conversely, the actions of extrinsically motivated user are driven mostly by external outcomes, such as winning a prize or making money. (Ryan and Deci, 2000a)

It is debatable, what kind of positive or negative effects external rewards have on users' motivation (Bielik, 2012). In their meta-analysis, Deci, Koestner and Ryan (2001) found out that almost all forms of rewards, except non-controlling verbal rewards, reduced the internal motivation in educational context. Based on these findings, it could be argued that any kind of external rewarding decreases the internal motivation. Both Zichermann and Cunningham (2011) and Seaborn and Fels (2015) however criticize this view, emphasizing the importance of the design of the gamification system. Also Antin and Churchill (2011) suggest, based on their study about badge systems, that the negative effects related to the internal motivation are mostly about poor design.

It is however important to note that an external rewarding system should not be taken into use without committing to it, since researchers widely agree on the negative effects of removing a rewarding system. Deci, Koestner and Ryan (2001) and Pink (2010) states that when a system is based on external rewards and then the rewarding is stopped, the users motivation to use the system will be worse than in case the system would have been started without any reward mechanism in place. Also Zichermann and Cunningham (2011) do agree that once the user has been started rewarding, the user has to be kept in that reward loop forever. This is also supported by empirical gamification study from Thom, Millen and DiMicco (2012) that found out that removing a gamification system, in this case an external point system, from an application did have a significant negative impact on the user activity of the application.

It should be noted that several motivational sources can influence the user behavior at the same time. Lindenberg (2001) states that the strongest motivation becomes predominant in shaping the user behavior, but also weaker motivational sources have influence on the user behavior. In the domain of gamification, it should be then

considered that both extrinsic and intrinsic motivational sources can exist simultaneously and affect the user behavior.

According to Hamari and Koivisto (2015), gamification indeed is strongly driven by both extrinsic and intrinsic motivation. They discuss about utilitarian and hedonic aspects and how they relate to motivation. The utilitarian systems are considered to be extrinsically motivated, meaning that the system has an external goal and the system is designed to increase the value of this goal. Conversely, the hedonic systems provide self-fulfilling value by being entertaining and enjoyable as is, thus invoking the intrinsic motivation of users. (Hamari and Koivisto, 2015)

Games and game-like systems are hedonic, trying to provide enjoyment and entertainment to the users, invoking their intrinsic motivation. However, gamification is also using gameful experiences for reaching external goals. Hence, gamification can be seen to motivate the users toward utilitarian goals through hedonic behaviors, acting as a hedonic tool for productivity. Thus, both the utilitarian and hedonic aspects and motivations determine how gamification is being accepted by the users. (Hamari and Koivisto, 2015)

Also Zichermann and Cunningham (2011) and Seaborn and Fels (2015) states that gamification works best when the intrinsic motivation and the extrinsic rewards can be aligned and the extrinsic motivators are informed by the users' intrinsic motivators. Some users might not understand that something is actually intrinsically motivating for them until it has been discovered through extrinsic motivation (Zichermann and Cunningham, 2011). Nicholson (2012) however emphasizes that the more game design can be made meaningful to the users through information, the more internal motivation can be improved and the less there would be need for external rewarding.

Based on the literature, both motivational sources can be present in the gamified services, so it is important to find the right balance between intrinsic and extrinsic motivation and rewards in gamification. As Pink (2010) states, the external rewards can deliver a short-time boost of motivation, but the effect wears off. Hence, a long-term user engagement can be achieved with intrinsically motivational systems. The external incentives can still be used to activate the intrinsic motivation of the users (Zichermann and Cunningham, 2011; Seaborn and Fels, 2015) – as Zichermann and

Cunningham (2011) frames it, "a good extrinsic motivation is a good map to intrinsic motivation".

2.2.3 Self-determination theory and the intrinsic motivation drivers

From the academic research, it is evident that both extrinsic and intrinsic motivations can be present in gamification (Hamari and Koivisto, 2015; Seaborn and Fels, 2015; Zichermann and Cunningham, 2011), but the key for long-term user engagement is to invoke the intrinsic motivation of the users through gamification. Thus, it is important to understand the drivers for maintaining and increasing the intrinsic motivation of the users.

Self-determination theory (SDT) is a macro theory that studies when people's actions are self-determined and self-motivated (Ryan and Deci, 2000b). In other words, SDT focuses on what drives an individual's intrinsic motivation to make actions without external influence. Deci and Ryan (2000b) identifies three different intrinsic needs that are involved in self-determination – competence, autonomy and relatedness.

Intrinsic motivation can be enhanced by the feeling of competence during an action. This is achieved by carrying out optimal challenges, getting positive performance related feedback, and experiencing the senses of mastery and effectiveness. However, it must be noted that the feeling of competence does not increase the intrinsic motivation if it is not accompanied with a sense of autonomy. Autonomy means that the user actions must be self-determined – the user must have an ownership of own behavior and not be controlled by external factors. (Ryan and Deci, 2000b)

In addition to the feelings of competence and autonomy, also the feeling of relatedness can increase the intrinsic motivation of the users. Social environments can facilitate the intrinsic motivation by supporting the psychological needs of people. People are more intrinsically motivated when they feel relatedness, being connected to others, and security. (Ryan and Deci, 2000b)

Deci and Ryan (2000b) emphasize that people will be intrinsically motivated only for the actions that are intrinsically interesting for them. Thus, the actions must be intrinsically motivated to begin with for the feeling of competence, autonomy and

relatedness to be able to increase the intrinsic motivation of these actions. If the actions are intrinsically motivated and these three aspects are present, intrinsic motivation towards the actions increases. Conversely, if these three aspects are not present in the actions, intrinsic motivation towards the actions decreases. (Ryan and Deci, 2000b)

Similar aspects regarding the intrinsic motivation has also been discussed by other researchers. Pink (2010) discusses the importance of intrinsic motivation and the key drivers that he identifies – autonomy, mastery and purpose. These are highly influenced by the intrinsic needs proposed in SDT: the two drivers from Pink (2010), autonomy and mastery, are very similar to the intrinsic needs of autonomy and competence introduced by Deci and Ryan (2000b).

Deterding (2011) discusses about the intrinsic motivation drivers in gamification context and introduces his three main drivers for successful gamification – meaning, mastery and autonomy. These are very closely related to the identified motivational drivers by Pink (2010) and Deci and Ryan (2000b), but in his research, Deterding (2011) is applying his drivers more specifically to gamification context.

Based on the researched literature, this thesis focuses on four drivers to increase the intrinsic motivation in gamification – meaning, mastery, autonomy and relatedness (see Table 2). Next, these identified four main intrinsic motivation drivers are discussed in more detail.

Table 2: The main intrinsic motivation drivers in gamification context (Ryan and Deci, 2000b; Pink, 2010; Deterding, 2011)

Driver	Description	Example from the Duolingo language learning platform
Meaning	There needs to be a meaningful goal for the user to pursue even if the gamification mechanics would be removed.	The underlying goal of the users is to learn languages – the Duolingo platform only gamifies the learning part to make learning more motivating.
Mastery	Gamification should provide challenges, where the users can feel competence, and have the potential to reach the flow state. The users should see their advancement towards the main goal and the feeling of mastery.	The levels in Duolingo gets more difficult incrementally, so the users can feel the competence and mastery while learning. In addition, the users constantly see how close they are from becoming fluent in a language.
Autonomy	The user needs to be in control of own actions and not feel as being controlled by external factors.	The users can choose, which categories they want to practice and how much they want to practice during the day.
Relatedness	The users are more intrinsically motivated, when they feel that they are connected to others in the gamified system.	The users can add friends to compete with. They can also share their achievements and join language clubs of other users.

Meaning

In gamification, the purpose or meaning translates to the fact that under the gamification mechanisms, such as points and badges, must also be a meaningful goal for the user as is (Deterding, 2011). Thus, even if the gamification mechanisms would be removed, the content or the outcomes of the usage should be valuable and meaningful for the user.

Gamification mechanisms should only be used as a means to achieve meaningful goals, and not be the only elements that are driving the usage of the system (Glover,

2013). Gamification is not a miracle solution that can be applied to any system and make users more engaged to it. As emphasized by Deci and Ryan (2000b), people will be intrinsically motivated only for the actions that are intrinsically interesting for them. Thus, the purpose of the gamified system must be intrinsically motivating to begin with for the other motivational drivers to be able to increase the intrinsic motivation of the users.

Bringing user-centeredness to gamification design ensures that there is a meaningful goal for the user to pursue under the gamification mechanics. User-centered design is putting the user to the center of the design process by ensuring that the user's needs and goals are the primary consideration throughout the whole design process (Norman, 1990).

Mastery

Pink (2010) describes mastery as a process and a mindset, and an important part of it is the feeling of being competent. The feeling of competence is achieved by carrying out optimal challenges and getting positive performance related feedback (Ryan and Deci, 2000b). This results to experiencing mastery and effectiveness (Richter, Raban and Rafaeli, 2015). Pink (2010) states that mastery is asymptote – the user can get really close to it, but never actually reach it. Thus, the underlying goal of the user should be something that cannot be reached – otherwise the intrinsic motivation of the user decreases when the goal is reached, as the user feels that the mastery is achieved.

In gamification, mastery is closely related to challenges, which are one of the key aspects of gamification. The challenges should be interesting and meaningful in the context of the gamified system. Moreover, they should get more difficult incrementally and provide real challenge for the user. There should also be smaller goals to complete and get feedback from as the user is making the way towards the main goal. (Deterding, 2011)

Achieving mastery is also closely related to the concept of flow and reaching a flow state (Deterding, 2011; Pink, 2010). Reaching the flow state can be seen as one of the most potential aspects of gamification (Barata et al., 2013a; Blohm and Leimeister, 2013). Flow is a state where the user's skills and the challenge of the tasks are

optimally balanced, resulting in a highly focused mental state (Csikszentmihalyi, 2002). In addition to a sufficient challenge with a potential to succeed, the main aspects of flow defined by Csikszentmihalyi (2002) are goal-directedness and clear and immediate feedback.

As discussed before, clear goal-focused challenge and feedback are also the key characteristics to games and gamification. Games can deliver information on demand and balance the difficulty levels of the challenges according to the users' abilities (Barata et al., 2013b), as a result providing comprehensive motivational support (Blohm and Leimeister, 2013). This prevents users from boredom and frustration (Barata et al., 2013b), and can lead to the above discussed flow state, where the users are pursuing for mastery.

Autonomy

Autonomy means that the user actions must be self-determined – the user must have an ownership of own behavior and not be controlled by external factors (Ryan and Deci, 2000b; Pink, 2010). It is important to give the user a feeling of being in control of the decisions on how and when the different actions are made and the ability to choose which actions to take (Deterding, 2011). The less the user feels like being controlled, the more autonomy the user has and the more the intrinsic motivation increases.

Autonomy should not however be confused with not giving clear goals and instructions, since they are important in guiding the user in the gamified system. The user should be given a clear goal to reach, but given the freedom to choose how to reach that goal (Deterding, 2011). Autonomy is also an important factor regarding the above discussed mastery and the feeling of competence: even though the user feels competence, the intrinsic motivation is not increased if it is not accompanied with a sense of autonomy (Ryan and Deci, 2000b).

Relatedness

People are more intrinsically motivated when they feel relatedness – that they are connected to others and feel secure (Ryan and Deci, 2000b). Relatedness also plays an

important role in the field of gamification. It translates to sociality and the feeling of being connected to others in the gamified system. It has been found that the social influence and recognition that the users receive through gamification is a strong predictor for the adoption and use of gamification applications (Hamari and Koivisto, 2013).

Social influence in gamified applications can be increased for example by providing social leaderboards that foster competition or by providing social achievements, such as badges, that can be browsed by or shared to others. These kinds of social environments can facilitate the intrinsic motivation by supporting people's psychological needs (Ryan and Deci, 2000b).

Especially competition is a preferred social aspect in gamification. On a basic level, competitive elements bring interactivity, which offers immediate feedback on users' actions. On a wider level, playing against an opponent evokes a social-competitive situation that fosters user engagement and involves the users. Thus, people often prefer games where competition aspects are present. (Vorderer, Hartmann and Klimmt, 2003)

An important aspect of sociality is also the principle of social proof (Cialdini, 2001). It indicates that individuals are more likely to engage in behaviors, which they perceive others are also engaged in, and they attempt to understand the correct behavior for a situation from the actions of others (ibid.). In a broader context, one clear example of social proof is fashion, but in the gamification context it can be seen for example in the habit of collecting badges: even though the users might not be externally rewarded for collecting badges, it is done as it is socially encouraged by the other users.

2.3 Design process of user-centered gamification

Having a meaning is one of the key aspects in the gamification experience, so it is necessary to understand what the users really desire to achieve related to the service. Thus, the key for intrinsically motivating gamification system is knowing and understanding the users. Nicholson (2012) introduces the term meaningful gamification, where he is adding user-centeredness to the context of gamification. By putting the user to the center of the design process, the intrinsic motivation drivers are

easier to be understood and implemented into the gamified system, creating meaningful gamification.

As an example, understanding the purpose for users to use the photo sharing platform Instagram shapes the possible gamification elements that can be designed to increase the intrinsic motivation of the users to engage with the Instagram service. The current gamification elements of Instagram, such as showing the number of followers, likes and video views translates strongly to a user goal of social recognition. However, if the goal of the users would be only to share great looking photos, Instagram could introduce gamification elements, such as photo quality ratings and dismiss some of the social gamification aspects.

Gamification design is a complex process, and the gamification experience needs to be carefully designed to support the intrinsic motivation of the users. In this thesis, MDE-framework defined by Robson et al. (2015), which is based on the MDA-framework (Hunicke, LeBlanc and Zubek, 2004) is used as a theoretical framework for gamification design.

2.3.1 MDA and MDE design frameworks

MDA (stands for mechanics, dynamics and aesthetics) framework by Hunicke, LeBlanc and Zubek (2004) is one of the most frequently leveraged frameworks in game design, built to understand games and game design processes. MDE framework (stands for mechanics, dynamics and emotions), introduced by Robson et al. (2015) is a framework designed for gamification design process and is based on the MDA framework.

Despite the term difference, the two frameworks are very similar in their content and their approach to the game and gamification design. For this study, the MDE framework is used as it is targeting specifically the gamification systems, but the academic literature from both the frameworks are studied. Next, the MDA game design framework is shortly discussed, followed by its differences to the MDE gamification design framework and a more detailed introduction of the MDE framework.

Game design is a complex process with many different aspects to consider. It abstracts from systems and code to content and play experiences. MDA framework breaks the consumption of games to three components: mechanics, dynamics and aesthetics. In short, mechanics describe the static components of the game, such as goals, rules and rewards. Dynamics describes the run-time behavior of the mechanics, and how the mechanics act on player inputs and each other's outputs. Aesthetics describes the desirable feelings and emotional responses of the player when the player interacts with the gamified experience. (Hunicke, LeBlanc and Zubek, 2004; Robson et al., 2015)

Robson et al. (2015) use the MDA framework as a basis for introducing the MDE framework specifically designed for gamification design process. The main difference in MDE framework is replacing the aesthetics with emotions. Based on Robson et al. (2015), aesthetic responses are largely computer game specific, but in the gamification context the engagement outcomes can be more widespread. This is due to the different natures of games and gamified systems – the purpose of games is to entertain its users, whereas in the gamified systems also non-game related aspects can influence the gamification outcome.

2.3.2 Mechanics, dynamics and emotions

The key components of the MDE framework – mechanics, dynamics and emotions are shown in Figure 1 and discussed next in more detail.
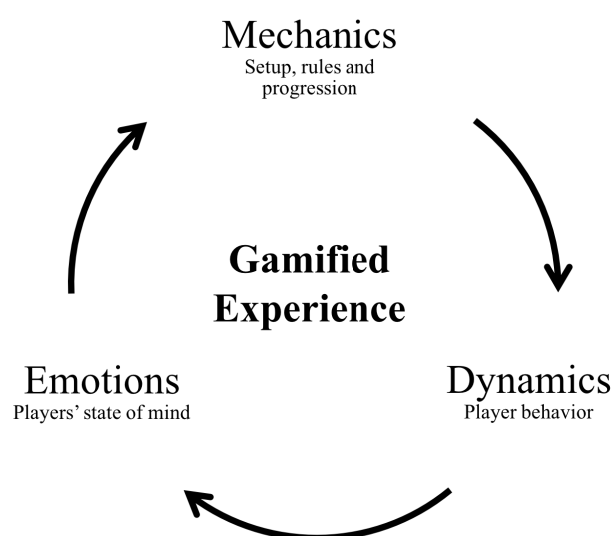
Figure 1: The main components of the MDE gamification design process. Adapted from Robson et al. (2015)

Mechanics

Gamification mechanics are the foundation aspects of gamification (Robson et al., 2015). They are decided by the designers of the gamified system (ibid.), giving them the ability to guide player actions in the system (Zichermann and Cunningham, 2011). The mechanics are various actions, behaviors and controls that are present within the gamification context (Hunicke, LeBlanc and Zubek, 2004), containing for example boundaries, elements and rules of the gamified system (Ibanez, Di-Serio and Delgado-Kloos, 2014; Robson et al., 2015). Elements are for example points, leaderboards and badges, whereas rules describe things such as goals, game rules and rewards of the system (Ibanez, Di-Serio and Delgado-Kloos, 2014; Robson et al., 2015).

Mechanics can be divided between setup, rule and progression mechanics. The setup mechanics define the environment of the experience that impact the overall context of the gamified experience. These include aspects such as the initial setting, who the player is playing against (e.g. solo, with friends, other people, computer-controlled players) and is the gamified experience real time. The rule mechanics define the permissible actions and constraints that shape the concept of the gamified experience. The progression mechanics describe the reinforcements that are present in the experience to affect the experience and behavior of the user. These include different progression elements, such as achievement rewards. (Robson et al., 2015)

It is notable that the gamification mechanics are known before the actual gamification experience starts and they remain constant throughout the experience, meaning that they stay the same each time a player engages with the system. The mechanics form the structure for the gamified experience, but on their own they are not enough to create a motivational experience. The mechanics need to be designed to support the gamification dynamics and emotions and only these three together can shape the behavior of the user. (Robson et al., 2015)

Dynamics

Dynamics describe how players interact with the gamification mechanics, and how these mechanics act on player inputs and each other's outputs over time (Hunicke, LeBlanc and Zubek, 2004; Robson et al., 2015; Zichermann and Cunningham, 2011).

Thus, unlike the mechanics, which are set by the designer and remain constant, the dynamics arise from how players follow these mechanics (Robson et al., 2015). As an example, shooter game mechanics, such as weapons and spawn points can lead to dynamics such as camping (Hunicke, LeBlanc and Zubek, 2004). As a result, the dynamics are difficult to predict and can lead to unintended behaviors – both negative and positive (Robson et al., 2015). For the designer, the challenge is to anticipate the possibly emerging gamification dynamics and develop the mechanics to support or avoid them (ibid.).

Werbach and Hunter (2012, cited in Ibanez, Di-Serio and Delgado-Kloos, 2014) states that dynamics should provide activity loops that include three components – action, feedback and emotion. Players perform tasks that are rewarded by the system, and the rewarding generates positive emotion (Ibanez, Di-Serio and Delgado-Kloos, 2014) increasing engagement and reinforcing the desired activity.

Based on the activity loop description, the three components of the activity loop could also be formulated as challenge, feedback and reward. This study previously defined these three components as the main game elements for gamification design. The performed tasks in gamification are often in a form of challenges, and performing these challenges provide feedback. The users are rewarded for completing the challenges, and it results to positive emotions. Forming this kind of an activity loop links the defined main game elements of gamification design to the design process of gamification dynamics.

Emotions

The mechanics and dynamics of gamification are designed to trigger desirable emotions in the user (Ibanez, Di-Serio and Delgado-Kloos, 2014; Hunicke, LeBlanc and Zubek, 2004; Zichermann and Cunningham, 2011). In gamification design, the emotions describes the desirable feelings and emotional responses when the user interacts with the gamified experience (Hunicke, LeBlanc and Zubek, 2004; Robson et al., 2015). The emotional responses of games should be fun-oriented (Hunicke, LeBlanc and Zubek, 2004), and as the goal of gamification is to provide gameful experiences, the same applies with gamification.

Gamification should be fun-oriented, but the driving factors for fun gamification experience needs to be identified. When discussing about emotions, it is necessary to move away from the term *fun* as an emotional goal and think about the underlying experiences of the gameful experience that makes it fun for the player (Hunicke, LeBlanc and Zubek, 2004). Hunicke, LeBlanc and Zubek (2004) introduce eight taxonomies that can be investigated when trying to understand how to make a gamified service fun: sensation, fantasy, narrative, challenge, fellowship, discovery, expression and submission. These taxonomies are described in more detail in Table 3.

*Table 3: The eight emotional taxonomies (Hunicke, LeBlanc and Zubek, 2004)*

Emotion	Description
Sensation	Sense-pleasure of playing a game. Fundamental aspect is to invoke different emotions and senses of players.
Fantasy	Getting power in games that cannot be achieved in real life.
Narrative	Gives a sense of purpose for player by introducing a story that the player is following throughout the game.
Challenge	Overcoming different obstacles, and being recognized for the efforts.
Fellowship	Games as social framework: provide an extra layer of interaction and gives a sense of belonging for the users.
Discovery	Learning more about the game context or yourself through gameplay.
Expression	Playing a game to express yourself.
Submission	Playing only to spend time, and not trying to complete challenges or obstacles.

Understanding the relation between mechanics, dynamics and emotions is the key for successfully gamifying an experience (Robson et al., 2015). By moving between these three abstractions, the dynamic behavior of the gamified system can be understood (Hunicke, LeBlanc and Zubek, 2004). With this understanding, it is easier to develop

techniques for gamification design process to encourage the desired behaviors of users and discourage the undesired ones (ibid.).

2.3.3 The two perspectives of gamification process

The MDE-framework is looking at the gamification design process from two perspectives. These two different perspectives – designer and end-user perspectives – are illustrated in Figure 2.
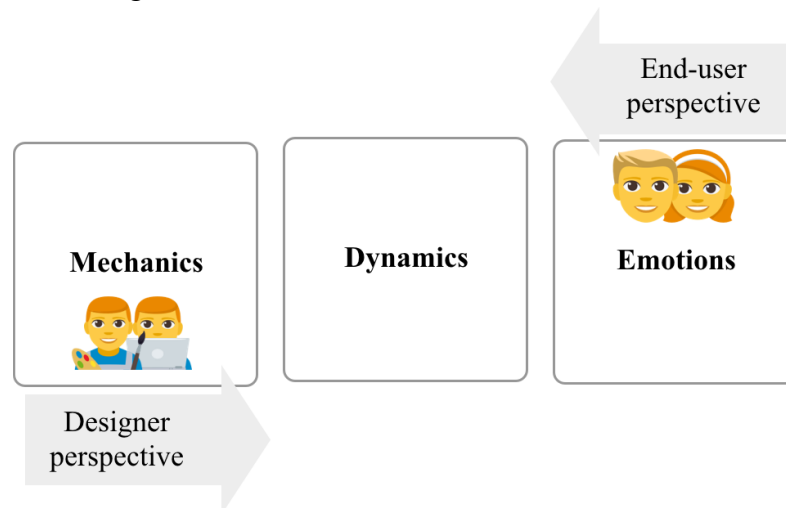
Figure 2: The two perspectives of gamification design process. Adapted from Hunicke, LeBlanc and Zubek (2004)

The designers of gamification can only affect the game mechanics that set the rules of the gamification experience and stay constant throughout the experience (Hunicke, LeBlanc and Zubek, 2004; Robson et al., 2015). The designers can only predict, which kind of dynamics emerge from the interaction with the mechanics and try to modify the mechanics to encourage the desired emotional responses of the users (ibid.). Conversely, emotions drive the end-users' use of the gamified systems (Robson et al., 2015). Players are more engaged by the emotional responses that occur when they interact with the game dynamics than by the rules that are set by the game mechanics (Lazzaro, 2004).

As emotions drive the users use of the system, the user-centered gamification design process should start from understanding what kind of emotions drives the users to use the service. It should then be discussed, which kind of gamification dynamics could lead to these desired emotions and design the gamification mechanics to support these dynamics.

3 Methodology

This chapter describes the methodology of this study. First, the research process of the study is described, and then the research methods are gone through in more detail. Finally, the empirical study process is described.

3.1 Research process

The research process of this study is visualized in Figure 3. The research process began with defining the business problem of how to design user-centered gamification. Based on the defined business problem, a study of the existing academic research around the research topic was conducted.
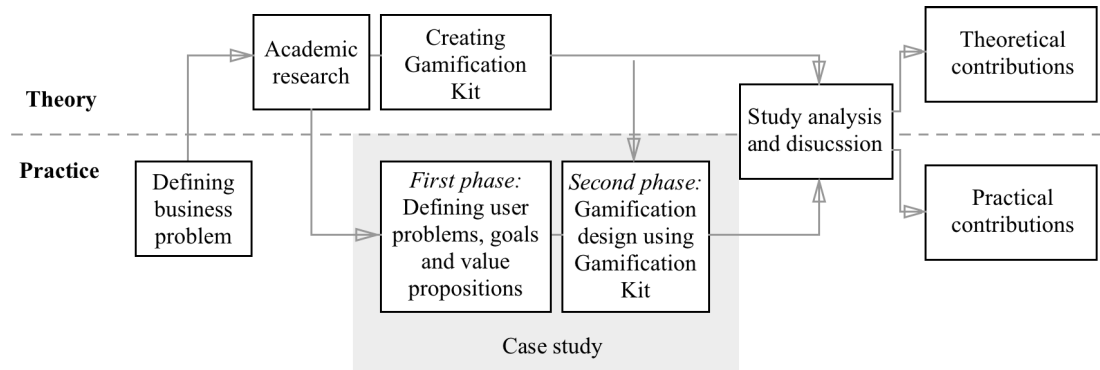
Figure 3: The research process of this study

After the theoretical research, the first version of the Gamification Kit was created based on the gathered theoretical knowledge. At the same time, the first design phase of the case study started by defining user problems, goals and value propositions from a series of user interviews and client workshops. After these aspects were identified, the second phase of the case study could be started. It consisted of using the designed Gamification Kit to guide the gamification design process of the case service.

After the case study was completed, the results of the research were analyzed, and the results of the study were discussed. Lastly, the research contribution of the thesis was described.

3.2 Design science research methodology

This study is following a design science paradigm that solves identified business problems by creating new and innovative artifacts (Hevner et al., 2004). Artifacts may include constructs, models, methods and instantiations (ibid.), but more broadly they can be "any designed object with an embedded solution to an understood research problem" (Peffers et al., 2007).

It is important to differentiate the design science and routine design from each other. The routine design applies existing knowledge to organizational problems using existing best practice artifacts. Conversely, the design science research solves important unsolved problems in new innovative ways or solves existing problems in more effective ways (Hevner et al., 2004). Moreover, the design science is not only about solving the identified problem, but also evaluating the design, making research contribution and communicating the results (ibid.).

Hevner et al. (2004) propose seven guidelines to help understand the requirements for effective design science research. The guiding principle in design science research is that the knowledge and understanding of the design problem and its solution are acquired while the artifact is built and applied. Hence, the first guideline is that an innovative and purposeful artifact must be created in a design science research. (Hevner et al., 2004)

The other guidelines state that the artifact must be created for a specified problem domain, and the artifact must be thoroughly evaluated. The created artifact must be innovative, but also formally represented and consistent – the terms novelty and rigor are thus crucial in design science research. Moreover, the development of the artifact should be a search process that uses existing theories and knowledge, and the results of the design science research must be effectively communicated to other researchers and practitioners. (Hevner et al., 2004)

This study is following a design science research methodology (DSRM) process, introduced by Peffers et al. (2007). They studied influential prior research about design science from Hevner et al. (2004) and a number of other researchers, and gathered the existing guiding principles and practice rules of design science research. Using these

principles and practice rules as a basis, they introduced the DSRM process for carrying out design science research.

The DSRM process consists of six activities, which can be seen in Figure 4. The figure also shortly describes how these activities are present in this research. Next, the six activities are gone through with a more detailed description of how they have been considered in this study.
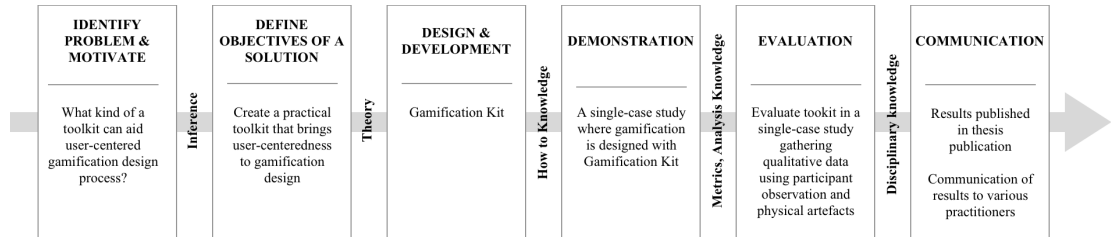

Figure 4: Design science research method process. Adapted from Peffers et al. (2007)

The first activity is problem identification and motivation, where specific research problem is defined and the value of a solution is justified (Peffers et al., 2007). This study introduces its research problem as: *What kind of a toolkit can aid user-centered gamification design process?* The motivation for the problem and the value of a solution is discussed in the introduction chapter in more detail.

The second activity is defining the objectives for a solution, indicating quantitatively or qualitatively the goals of the new solution (Peffers et al., 2007). This study introduces the goal of creating a practical toolkit that brings user-centeredness to gamification design process.

The third activity is design and development, which means determining the functionality of the artifact and creating the artifact (Peffers et al., 2007). This requires knowledge of the theory that can be brought to the solution (ibid.). The chapter 2 of this study defined the required theoretical background for designing and developing the artifact, and the chapter 4.1 introduces the created artifact, Gamification Kit.

The fourth activity is demonstration, where the artifact is used to solve one or more instances of the identified problem (Peffers et al., 2007). Activities such as

experimentation, simulation or case study can be examples of demonstration (ibid.). This study is demonstrating the use of the artifact in a single-case study.

The fifth activity is evaluation. It consists of observing how well the artifact supports a solution to the identified problem. The objectives of the solution should be compared to the actual observed results from the usage of the artifact in the demonstration. The evaluation can be done in many ways depending on the nature of the problem and artifact. The evaluation can be done for example with quantifiable measurements, satisfaction surveys, client feedback or simulation. (Peffers et al., 2007)

Hevner et al. (2004) categorizes evaluation to five categories: observational, analytical, experimental, testing and descriptive. This study is using the observational evaluation method, and the Gamification Kit is evaluated by using it in a single-case study to evaluate it in depth in a business environment.

The case study method was chosen as the evaluation method, since it can be applied also to show the validity of an innovative solution in practice (Kasanen, Lukka and Siitonen, 1993). A case study is independent from prior experiments, so it is suiting particularly well to new research areas, where a new innovative solution is generated and validated (Eisenhardt, 1989). The strength of a case study is its ability to show that a novel theory is empirically valid (ibid.), because the case study describes the data in a real-life environment.

The conducted case study evaluates if the created Gamification Kit can provide a solution to the identified problem. The goal of the design research is to create a toolkit that can aid user-centered gamification design. Thus, the main question that the case study tries to evaluate is: *How the Gamification Kit helps the participants to design user-centered gamification?* Qualitative data is collected from the case study in form of physical artifacts, which are the filled canvases of the Gamification Kit, and observations gathered as a participant.

At the end of the evaluation activity, the researchers can decide to iterate back to the activity three and try to improve the effectiveness of the artifact, or to continue to the last activity and leave further improvements for future research (Peffers et al., 2007).

This study describes the findings of the evaluation, but leaves the iteration of the toolkit for future research.

The sixth activity is communication, where "the problem and its importance, the artifact, its utility and novelty, the rigor of its design, and its effectiveness" (Peffers et al., 2007) is communicated to researchers and other relevant audience. This study achieves this by describing the design science research process in this thesis and communicating the results of the design science research and the created artifact to relevant practitioners in business environment.

3.3 Empirical study description

This chapter shortly describes the empirical study process. The empirical part of the research process consists of introduction to the created Gamification Kit, description of the case study process and evaluation of the Gamification Kit. The next section briefly introduces the background of the Gamification Kit and then the case study of the research is shortly introduced.

3.3.1 Gamification Kit

The created artifact Gamification Kit is a toolkit that aids designers and other stakeholders to design user-centered gamification. The Gamification Kit was created based on the gathered theoretical knowledge about gamification from the academic literature. The toolkit is a set of three canvases: The first canvas focuses on the applicability of gamification, discussing if gamification is relevant to be applied to a service or not. The second canvas guides gamification ideation process and the third canvas is used to validate the created gamification concept. The contents of the Gamification Kit canvases are discussed in chapter 4.1 in more detail.

The Gamification Kit created in this study is an extension to Lean Service Creation (LSC) toolkit (Futurice, 2017), which is a service design process and toolkit introduced and open-sourced by Futurice. The LSC toolkit is made of the best practices from hundreds of projects blending service design, user-centric approach, lean business thinking, agile development, and startup mentality. The LSC toolkit consists of a set

of canvases and a handbook that can be used to guide service design process. (Futurice, 2017)

The decision to use Lean Service Creation design toolkit as the basis for Gamification Kit is based on two aspects. Firstly, the LSC is a design toolkit created and used by Futurice, which is the company that I am working on. The LSC toolkit was used to guide the first design phase of the case project, and thus it was a natural choice to use and extend the existing design tools of the company.

Secondly, the Lean Service Creation is a validated toolkit and a general framework that guides service design process, already considering many of the essential user-centered design aspects, such as identifying user problems and goals and generating value propositions. Hence, by extending the existing LSC toolkit, it was not needed to discuss these aspects in the Gamification Kit itself, but it could focus only on the essential parts of the user-centered gamification design process. However, the Gamification Kit is not restricted to be used only with LSC, but it can also be used together with other design tools.

The canvases of the toolkit are intended to be used by printing them, preferably in A1 size. The canvases can be hanged to a wall or put them to a table or to a floor. The discussed topics in the canvases should be answered by writing to them. For this, post-it notes are encouraged to be used so that the canvases can be re-used and the answers can be modified if needed. The Gamification Kit is an open source design toolkit similarly to Lean Service Creation, and the users can use and modify the Gamification Kit based on their needs. Following the principles of the LSC, the users of the Gamification Kit are encouraged to "take it, use it, break it, make it yours and make it better" (Futurice, 2017).

3.3.2 Case study description

The Gamification Kit was used and evaluated in a case study, where a gamification concept was created to an existing service. The case study was a design project that was carried out during the spring 2017 for a client of a Finnish digital service agency Futurice. The goal of the project was to increase the user activity and user engagement

of the client's mobile application and research if this could be done through the means of gamification. The context of the mobile application was energy monitoring.

The project was a two-month long service design project, which focused on building a prototype of a gamification concept for the mobile application. The project consisted of two design phases: the first phase used the Lean Service Creation toolkit and the second phase used the created Gamification Kit toolkit. Next, the design phases are described in more detail.

The first design phase of the case study was implemented by using the Lean Service Creation toolkit. During the first phase, the user problems and goals were identified and value propositions were generated and validated. The design methods were qualitative interviews, ideation workshops and concept validations.

The results of the first design phase – the identified user problem, user goal and value proposition – were used as the base for the second design phase, which was conducted by using the Gamification Kit. The toolkit was used to guide the gamification design process of the case project by first ensuring the applicability of gamification to the service, and then ideating and validating gamification concepts.

4 Empirical study

This chapter describes the empirical study part of this thesis. The first section introduces the Gamification Kit and links its content to researched theory. Then, the usage of the toolkit is demonstrated by describing the design process of the case study. Finally, the Gamification Kit is evaluated based on the findings from its usage in the case study.

4.1 Introduction of Gamification Kit

Based on the theoretical research, I created a new practical toolkit to aid the design process of user-centered gamification. This toolkit, the Gamification Kit, is bringing user-centeredness to gamification design by starting the design process from understanding the user needs and goals and building gamification mechanisms to support the identified goals of the user.

The goal of the Gamification Kit is to take a practical approach to gamification design, and help the designers and other stakeholders to design gamification that takes into account the user needs and fosters intrinsic motivation of the users. The toolkit consists of three canvases.

The first canvas, gamification applicability, is evaluating if using gamification is suitable in the context of the service that is studied. Moreover, it identifies which user emotions should drive the usage of the created gamified experience. The second canvas, gamification ideation, concentrates on ideating key gamification mechanics and building meaningful gamification dynamics. The third canvas, gamification validation, is used to validate the ideated gamification concept and understand if it supports the intrinsic motivation of the user.

The Gamification Kit is used as a part of a user-centered process, but using it requires some preliminary information about the service and its potential users. Next, the preliminary requirements for using the Gamification Kit are gone through, and then each of the Gamification Kit canvases and their role in the user-centered gamification design process are discussed in more detail.

4.1.1 Preliminary requirements

Previously discussed theoretical gamification design framework MDE (Robson et al., 2015) brings out an important aspect related to gamification design. The only factor that gamification designers can affect by the means of design are the mechanics of the gamified system. However, the players of the gamified systems experience the system through emotions. Hence, when designing user-centered gamification, it is important to understand what are the feelings and problems of the users related to a system or a certain problem. This way the designer can understand what kind of emotions the gamification should be encouraging and design gamification mechanics to support those emotions.

As described in the theory part, the system in which gamification is applied to and its content should be meaningful for the users even without gamification mechanisms (Deterding, 2011; Glover, 2013). Gamification is used only to encourage the users to change their behaviors so that they could reach the goals that they have. These goals should be something that the users are trying to pursue for, but have difficulties in reaching them, such as exercising more or saving more money. Gamification should then be used to strengthen the intrinsic motivation of the users in reaching these goals. To understand how the intrinsic motivation could be strengthened, the underlying needs and goals of the users in the context of the developed service need to be well defined.

As can be seen, the starting point of the whole gamification process should be a good understanding of the problems, needs and goals of the service users. Still, gamification is not a miracle solution that can or should be applied to every solution. The value proposition for the users should also be defined to understand if the ideated service concept is something where gamification would be relevant to be applied in the first place.

As a result, before applying gamification to any system, it is necessary to first understand the user needs and goals and the proposed value propositions. After these are defined, it can be evaluated if gamification could be applicable in this specific context. As there are multiple different design toolkits already existing that can be used

to identify these, the Gamification Kit is not focusing on these aspects. Hence, before using the toolkit, these three central aspects should already be defined.

In this study, the problems and goals are identified and a validated value proposition is generated by using the Lean Service Creation design process, but these aspects can also be identified with any other design methods. The Lean Service Creation toolkit is briefly introduced in the chapter 3.3.1, and the design process of the case study where the Lean Service Creation is used is described in the chapter 4.2.1.

4.1.2 Gamification applicability canvas

The first canvas of the Gamification Kit is called gamification applicability. This canvas is used to evaluate if gamification is relevant to be applied to the service context or if other kind of system design should be used. This canvas can be seen in Figure 5.

The canvas is structured so that in the top part the preliminary user related findings – the user problem, user goal and value proposition – are defined. Next, the applicability of gamification in the service context is discussed with a series of questions. They guide the participants in deciding whether applying gamification mechanisms to the service concept would be beneficial or not. Finally, if gamification is seen as a potential solution, the emotional experiences related to the potential gamification concept are identified. These different parts are next discussed in more detail.

4.1.2.1 Identifying user problem, goal and value proposition

The starting point for user-centered gamification process is identifying the user problem, goal and value proposition. As discussed before, these should be already defined before starting to use the Gamification Kit. Thus, the filling of gamification applicability canvas starts with writing down each of these, so they are clearly defined and visible for everyone throughout the discussions related to the other topics in this canvas.

GAMIFICATION APPLICABILITY

USER PROBLEM

USER GOAL

VALUE PROPOSITION

OTHER SYSTEM DESIGN

Are user problem and goal related to motivation?

No — Partly — Yes

Is it difficult for user to find motivation to complete goal?

No — Partly — Yes

Can user goal be divided to meaningful checkpoints?

No — Partly — Yes

Is value proposition encouraging behaviour change?

No — Partly — Yes

GAMIFICATION

EMOTIONAL EXPERIENCES
Which emotions should the users experience while interacting with the gamified system?

| **SENSATION** Feeling sense-pleasure, horror games | **FANTASY** Power that not in real life | **NARRATIVE** Introducing a story, giving purpose | **CHALLENGE** Overcome obstacles, puzzle games | *OTHER?* |
| **FELLOWSHIP** Give a sense of belonging | **DISCOVERY** Learn more about the game or yourself | **EXPRESSION** Self-expression, minecraft games | **SUBMISSION** Spend time, no constant challenges | *OTHER?* |

Gamification Kit is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Gamification Kit

Figure 5: The gamification applicability canvas

User problem

User problems are the needs or wants of the user related to an existing service, or to a more general topic around the service. For example, in a context of energy monitoring service, user problem might be that an application does not provide accurate enough results, or that the user does not feel motivated enough to reduce energy consumption.

Identifying the user problems are relevant as this is the starting point for the user-centered design process. There must be a clear user problem that is worth solving, and

it is important to write it down when discussing about the applicability of gamification, since not all user problems are relevant to be solved through the means of gamification.

User goal

It is important to understand the meaning of user goal in this context. The user goal is not tied to the system or gamification context, but means the ultimate goal of the user that the user is pursuing for related to the service context. The goal is the underlying reason why the user wants to use the system. For example, in sports tracking applications, the goal is not to see how much a user has ran, but it might be to lose weight or get more motivation to running. In social media applications, the user goal is not to get a lot of likes, but the underlying goal might be to get social recognition or to feel as being important.

The user goal is strongly related to the user problem, but the user problem and goal give different insights about the user, so it is important to define them both. For example, the goal of a user might be to lose weight, but the user problem might be that it is difficult to find time to work out, or that in an existing service it is difficult to follow own progress and thus be motivated.

Value proposition

Value proposition describes the value that the service proposes to deliver to the user. In other words, it describes the current user needs or problems and how it is proposed to be solved in the new service. The value proposition gives boundaries to the solution, and is thus important to define before thinking about the gamification aspects. This is because as discussed before, gamification should not be the core of the service, but only used to encourage certain behavior that the user is interested to accomplish. Hence, as the value proposition defines the initial service idea, it should be discussed if the value proposition includes aspects in which gamification mechanisms could be beneficial.

4.1.2.2 Questions to validate gamification applicability

After the user problem, user goal and value proposition are defined and written down, it is time to discuss if the service concept is something in which gamification could be

applied to. This is done by answering to a set of questions about motivational and behavioral aspects related to these defined aspects.

In the canvas, the questions are inside a box with a line under each of the question to indicate the level of how strongly the participants think that the question is true or false. The participants should mark their answer to the line under each of the questions. Reasoning for the selected questions are discussed next.

Are user problem and goal related to motivation?

The purpose of the first question is to discuss if motivational aspects are present in the user problem and goal. As discussed in the theoretical part, gamification is used to encourage behavior change and increase the user engagement by increasing the motivation of the users to use the service (Robson et al., 2015; Barata et al., 2013a; Nicholson, 2012). Gamification is not however a miracle solution that could be used to make an uninteresting or poorly designed solution more engaging (Glover, 2013). Thus, it is necessary to discuss if motivational aspects are related to the user problem or goal, or if the problem is more related to the poor design of the service. If motivation plays a role, gamification could be used to encourage user activities, but otherwise it would be more feasible to solve the user problems with other type of system design.

Is it difficult for user to find motivation to complete goal?

As the first question discussed, an essential part in gamification is to find motivational aspects in user goals. In addition to the motivational aspects, these aspects must also be something where user needs encouragement. Gamification is ideally used to encourage activities that the users are interested to complete, but have difficulties in getting themselves motivated (Hamari, Koivisto and Pakkanen, 2014). Hence, it is important to discuss whether the user has difficulties to find motivation for completing the desired goals. This way it can be better understood if gamification could be used to encourage and motivate the users to complete these goals.

Can goal be divided to meaningful checkpoints?

As discussed, the identified user goal should not be tied to the gamification context, but be more broadly related to the service context. However, the user should also have

clear goal-focused activities to pursue for in the gamified systems context (Flatla et al., 2011). These goal-focused activities should help the user to advance towards the main goal. Hence, it needs to be possible to divide this main goal of the user into smaller tasks or activities that can act as checkpoints.

Checkpoints can be goals in the gamified system, and act as progress indicators, showing the progress towards the main goal. This way, the ultimate goal is divided to more easily approachable activities. The checkpoints are important in gamification so that the user can be given slowly increasing challenges and show progress, keeping user engaged. If checkpoints can be identified from the main goal, it could be meaningful to apply gamification to the concept. If these kinds of checkpoints however cannot be identified, the gamification mechanics would be difficult to be applied, as there would be no clear progress indicators to show the user how he or she is progressing towards the main goal.

Is value proposition encouraging behavior change?

Gamification is intended to change people's attitudes and behaviors (Hamari, Koivisto and Pakkanen, 2014). Hence, it cannot be meaningfully applied to any kind of solution without discussing the motivational aspects related to the solution. It is necessary to discuss if the proposed solution, in this case the proposed value proposition for the user, is something that encourages users to change their behavior. If this kind of aspect can be identified from the value proposition, the motivational aspects play a key role in the value proposition and gamification could thus be used to encourage the behavior change of the users.

When the questions related to the validity of gamification have been answered, it is time to decide whether gamification would be a feasible approach in the service context. There are no exact rules when gamification should and should not be used, but the answers to the questions should guide the decision process and help the decision makers to make more informed decisions whether gamification could be applied to the concept or not.

To help the participants to choose how to proceed, the questions area of the canvas is split to two sides, the left one indicating other system design, and the right one

gamification. All the answers in the canvas should lean towards gamification side for the gamification to be a feasible option. If some answers lean towards the other system design, it is a strong indication that the service idea may not gain full benefits of gamification.

If gamification is not seen as a feasible option for the concept, it can still be discussed if the user problems and goals could be divided to smaller activities that could be gamified. As an example, LinkedIn service is not completely built around gamification. However, it is using multiple different gamification features in the service. When the users are asked to fill their profile information, they are encouraged to fill all their information by showing progress indicators and indicating the strength of their profile. In this case, there are parts of the service, where gamification mechanics are meaningful to be applied to encourage the motivational aspects.

4.1.2.3 Identifying emotional experiences

If gamification is decided to be used, the next part is understanding the emotional aspects of the user problem and goal. This is a fundamental aspect in user-centered gamification design. Based on the MDE-framework (Robson et al., 2015) introduced before, users experience the gamified system through emotions that arise when interacting with the game dynamics. Thus, emotions are the motivational factors that drive the usage of the gamified system. As Gamification Kit sets the user to the center of the design process, it is important to begin the gamification design by identifying what kind of emotions users should experience while interacting with the gamified system.

This canvas has defined eight emotional experiences that are characteristic for gamification. These emotions are based on the previously discussed listing of games aesthetics by Hunicke, LeBlanc and Zubek (2004): sensation, fantasy, narrative, challenge, fellowship, discovery, expression and submission. A more detailed description of each of the emotions can be found in Table 3.

It is important to note that emotional experiences are not limited only to the listing in the canvas, so the designers are encouraged to identify other emotional experiences as well. Thus, if there are user thoughts and feelings not related to any of the described

emotions, the canvas has also two fields labelled as "other" to fill other emotional experiences. When thinking about these other emotional experiences, it is advised to try to stay away from too general emotional words, such as "fun" (Hunicke, LeBlanc and Zubek, 2004), and to try to think the underlying concepts of what really makes a gamified system fun, such as competing with friends (fellowship) or learning new things (discovery).

Each of the emotional experiences should be discussed one by one, and it should be discussed if any kind of user thoughts or feelings are related to these emotions. For example, if user have stated that he or she would like to see how much energy neighbour is using, this relates to fellowship. On the other hand, if user says that he or she likes to find new recipes, it is related to discovery.

Before filling the emotional experiences section, it should first be defined which kind of feelings and thoughts the service users have related to their goals and problems. These should have been defined already during the preliminary design process when trying to understand the user problems. Each of the emotional experiences should then be discussed one by one, and these user feelings and thoughts should then be linked to the related emotional experiences. For example, if a user has stated that he or she would like to see how much energy the neighbor is using, this relates to the emotion of fellowship. On the other hand, if the user says that he or she likes to find new recipes, it is related to the emotion of discovery.

When all the emotions and relevant user thoughts have been gone through, it should be clear which kind of emotions are relevant for the user in the service context and which can be omitted. This can be identified by looking at which emotions relate to the most important user feelings and thoughts or which emotions have the most user feelings related to them. Based on these findings, it should then be decided, which of the emotional experiences are the most important related to this concept and should be selected to be taken forward.

To summarize, the gamification applicability canvas ensures that applying gamification would be meaningful in the service context and that the gamification design process keeps the user at the center. Filling of the canvas is started by marking down the defined user goals, problems and proposed value propositions. These are

then used to identify if gamification is applicable in the service context by answering to questions related to important gamification aspects. If gamification is seen applicable in the context, the canvas helps to identify the most important user emotions that are related to the service concept.

4.1.3 Gamification ideation canvas

The next part of the Gamification Kit is to change to gamification ideation canvas, and start ideating the possible gamification mechanics and concepts. The gamification ideation canvas supports this by guiding the participants how to proceed with the gamification ideation. The gamification ideation canvas can be seen in Figure 6.
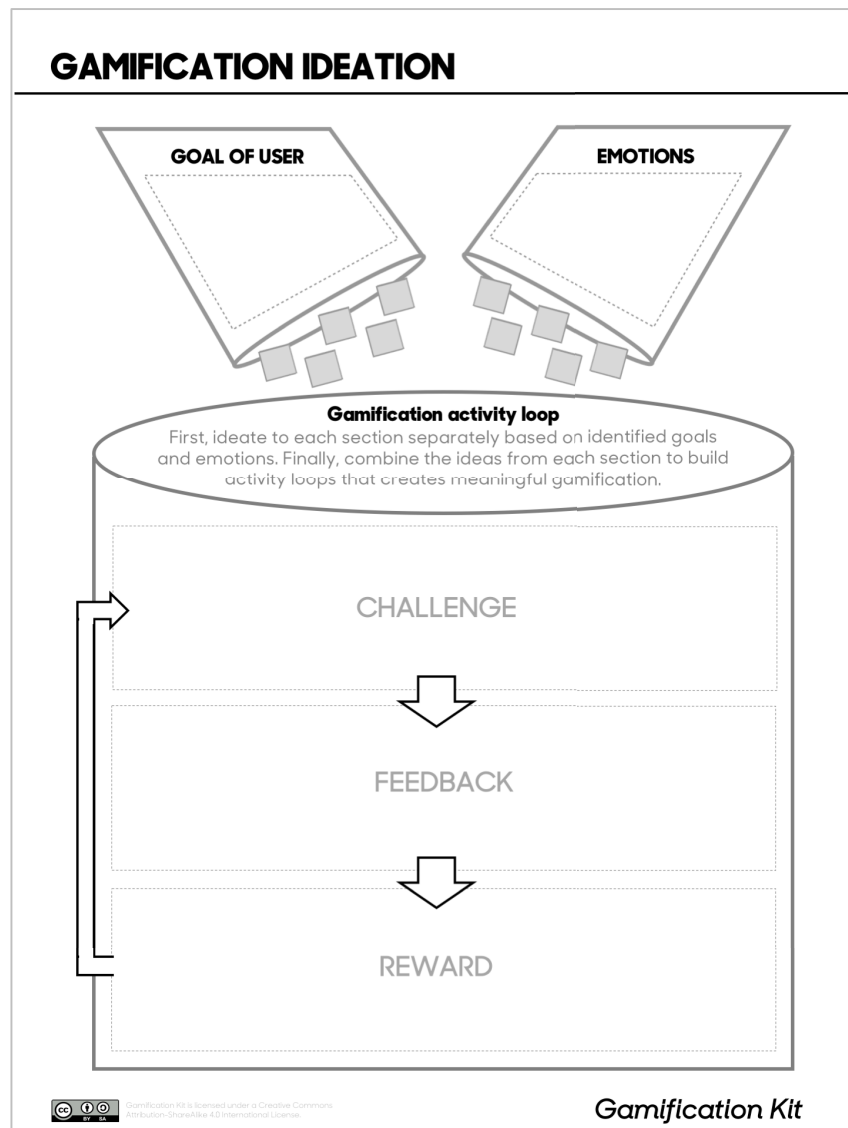

Figure 6: The gamification ideation canvas

First, the identified goal of the user is written down as one ideation ingredient, and the desired user emotions are written down as the second ingredient for ideation. These are used as the basis for ideating the gamification mechanics and dynamics, since the user-centered gamification is based on these aspects.

Under the gamification mechanism, the user needs to have a meaning to pursue. This is the user goal, which should be interesting and meaningful for the user as is. Gamification is only used to encourage the users to reach that goal. Moreover, the users experience gamified systems through emotions, so to engage the users, the gamification mechanics should be designed to support the desired emotional responses. Keeping the user goal and desired emotions in mind through the whole ideation process is thus important.

The actual ideation process of gamification is done around the previously identified key game elements of gamification design – goal-focused challenge, feedback and reward. When these individual elements are connected to each other, they form gamification activity loops. When the connection is done in a meaningful way, successful game dynamics emerge.

Gamification mechanics need to provide goal-focused challenges for the users, and the users should receive informative feedback to understand how they are progressing. When a challenge is completed, the user should be awarded to encourage the desired behavior. During the gamification process, the user should experience desired emotions. These meaningful gamification activity loops lead to user engagement and to users taking new challenges to proceed towards their ultimate goal.

The ideation process of the canvas is divided to two phases. The ideation process starts by first separately ideating around each of the key elements during the same ideation session. This is done to gather potential gamification mechanics that are related to user goals and emotions. In the second phase, these mechanics are combined to create engaging activity loops for gamification dynamics.

In the first ideation session, the participants ideate different challenges, feedbacks and rewards that are related to the user goals and desired emotions. The ideas are filled to

the corresponding boxes in the canvas. The following questions can help to guide the ideation to keep the user goal and emotions in mind:

> *What kind of goal-focused challenges the users could have related to the goal and desired emotions?*

> *What kind of feedback the users could get and how they could be rewarded to support reaching the goal of the user and feeling the desired emotional responses?*

The ideation in the first phase should focus only on the individual ideas related to challenges, feedbacks and rewards. This way a lot of ideas can be generated and the ideation stays simple and effective. Moreover, at this point of ideation, there is no need to think how the ideas in the different sections are related to each other.

When the first ideation session is done, ideally there are tens of different ideas in each section. The building blocks for gamification are now identified. The ideas in the canvas can be gone through quickly with the participants and a short discussion can be held. Moreover, if the participants wish, another similar ideation session can be done to build on top of the ideas of others and gather even more building blocks for gamification concept ideation.

The second ideation phase is about creating activity loops from the ideated elements of challenge, feedback and reward to create engaging gamification dynamics. As can be seen from the canvas (Figure 9), the flow of the gamification activity loop should go from challenge to feedback and then to reward, which can introduce a new challenge. Hence, as user is completing meaningful challenges or sub-challenges, a supporting feedback should be shown to indicate the progress of the user. When the challenges are being completed, the user should be rewarded to encourage the desired behavior of the user.

In the second ideation phase, the participants should examine the ideas that are in the different sections of the activity loop, and try to make meaningful combinations to form complete activity loops. Again, in this phase the more activity loops can be ideated, the better. Still, also in this phase of the ideation, the user goals and emotions

should be considered to ensure that the activity loops are taking the user needs into account.

After the second ideation session is done, there should be multiple different combinations of challenge, feedback and reward. These combinations form the potential activity loops for gamification dynamics and the gamification structure for gamification concepts. As the user goals and emotions are the basis for ideation, these activity loops should also support the desired goal and encourage the desired emotions of the user, keeping the user engaged in the system and increasing the intrinsic motivation.

The most promising activity loops should be discussed and refined, building complete gamification concepts out of these. To help in this, the participants can do another ideation session around the chosen activity loops to ideate new game elements or discuss and combine potential activity loops together. As a result, there should be one or more gamification concepts that can be taken to the next canvas for validation.
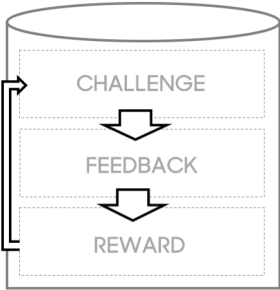
This study or the ideation canvas do not take a stance in the more detailed rules of the ideation, as there are many ways to do the actual ideation activity. This canvas gives only the guidelines on how the gamification ideation process should be structured when the canvas is being used. The actual ideation activity and its time frame is not relevant in the context of this study or when using the canvas. The ideation activities can be done in five-minute brainstorm sessions or in twenty-minute discussions, and it is up to the facilitator of the session to decide the more specific rules for the ideation. The most important thing is to ensure that the two-phased ideation process described before is followed, and the ideation is based on the user goals and emotions.

4.1.4 Gamification validation canvas

Gamification validation canvas is used to investigate the motivational parts of the proposed gamification concept. The canvas is structured as first having a description of the discussed gamification concept and then having different sections where the intrinsic motivation drivers of the concept are discussed. The gamification validation canvas can be seen in Figure 7.

The usage of the gamification validation canvas starts by defining the main gamification activity loop of the gamification concept and giving a brief written description of the concept. This is done to make sure that every participant has a common understanding of the concept. Moreover, by writing the concept down it can be seen how clearly defined the concept is. Usually, the easier the concept is to write down, the more clearly it is defined.

Figure 7: The gamification validation canvas

The next parts of the gamification validation canvas investigate how well the gamification concept is supporting the intrinsic motivation of the user. As was

identified in the theory chapter, both extrinsic and intrinsic motivation can be present in gamified system (Hamari and Koivisto, 2015; Seaborn and Fels, 2015; Zichermann and Cunningham, 2011). However, the intrinsic motivation is driving the long-term usage and engagement of the system.

The extrinsic motivation can only be used to bring a short-time boost of user engagement and to invoke the intrinsic motivation of the user (Pink, 2010; Zichermann and Cunningham, 2011). Thus, for the user-centered gamification, the presence of intrinsic motivation is essential. For that reason, also the gamification validation canvas focuses to discuss the presence of intrinsic motivation drivers in the gamification concept.

As discussed in the theory chapter, the intrinsic motivation drivers were identified to be the aspects of meaning, mastery, autonomy and relatedness. The canvas helps to evaluate if the gamification concept includes these intrinsic motivation drivers or if the concept should foster the intrinsic motivation of the users more. Next, the usage of the canvas to evaluate the presence of these four intrinsic motivation drivers is discussed.

Meaning

The driver of meaning implies that under the gamification concept and mechanisms, there should be a meaningful goal for the user to achieve (Deterding, 2011). In other words, the content and perceived value of the system should be valuable for the user even without gamification. This should be ensured already in the user insight phase by understanding the relevant problems and needs of the user and in the ideation phase by ideating concepts that are related to the user goals. However, it is important to verify that the service concept still has a meaningful goal for the user to pursue behind all the gamification mechanisms.

As said earlier, the gamification mechanisms should only be used as means to achieve the meaningful goals, and not be the only elements that are driving the usage of the system. Thus, the canvas has the questions of *Is service meaningful without gamification? What is the value for the user without rewards?* to make the participants discuss about the intrinsic driver of meaning in the gamification concept.

Mastery

The driver of mastery is highly related to challenges, which are one of the key aspects of gamification. The challenges should be interesting and challenging enough in the context of gamification so that the potential rewards feel rewarding. The users should feel as being competent, and sense a feeling of mastery as they complete smaller challenges and make their way towards the main goal (Ryan and Deci, 2000b; Deterding, 2011). Feedback and rewards are also important to show the user its progress towards the mastery.

To discuss about the presence of the intrinsic driver mastery in the gamification concept, the questions *Is there a clear end goal and smaller tasks? Can user see its progress? Are rewards too easy to obtain?* are introduced in the canvas to guide the discussion.

Autonomy

The driver of autonomy means the sense of freedom that the user has while using the gamified system. The user should feel as being in control of the gamified system and should not feel like being manipulated to do certain tasks (Ryan and Deci, 2000b; Deterding, 2011). Thus, the user should have the possibility to choose when and where to play, and to decide how to complete the gamification activities. It should however be noted that the users should not be left without guidance. It is important to guide the player in the gamification process, but let the user control the gamification experience (Deterding, 2011).

To discuss the presence of autonomy, the questions *Does the user have freedom to choose when to play? Is user forced to do certain tasks? Is user guided, but not directed?* are introduced in the canvas.

Relatedness

The driver of relatedness means the feeling of being connected to others in the gamification system. The users should see that the others are also doing same activities to feel a sense of belonging. It is not necessary to have aspects of relatedness in the

gamification concept, but social aspects can increase the intrinsic motivation of the users significantly (Ryan and Deci, 2000b).

To discuss the presence of relatedness, the questions *Does the user see what other users do or how they perform? Can user share own results or communicate to others?* are introduced in the canvas.

After these intrinsic motivation drivers have been discussed, it should be decided whether the gamification concept has enough aspects to boost the intrinsic motivation of the user. There are no exact measures to state if the gamification concept is intrinsically motivating enough, but the first three intrinsic drivers meaning, mastery and autonomy should be found in the gamification concept. The aspect of relatedness is not necessary to be present in every gamification system, but it can be a powerful driver to increase the intrinsic motivation of the users.

When considering if the gamification concept is intrinsically motivating enough, the gamification validation canvas gives three different options: no, partly or yes. If the gamification concept is seen as not intrinsically motivating, the concept should be discarded or iterations should be made to include more intrinsic motivation aspects. This is because user-centered gamification should always invoke the intrinsic motivation of the users. If the concept is seen as partly intrinsically motivating, it should also be iterated based on the shortcomings found from the discussions to include more intrinsic motivation aspects.

If the concept is seen as intrinsically motivating after discussing all the different aspects, it should be safe to proceed forward with the gamification concept. This means that the gamification concept includes intrinsic motivational drivers to engage the user for long-term.

4.1.5 Outcome of Gamification Kit

When all the canvases have been discussed and filled, the Gamification Kit has guided the participants through the gamification design process and ensured the presence of user-centeredness in the process. By using the Gamification Kit, the participants should now have a gamification concept that includes gamification mechanisms that

motivates and supports the users to reach their goals. Moreover, the concept includes game mechanics and activity loops that are characteristic to well-designed games, and contains intrinsic motivation drivers, which ensure that the users sense the gamification concept as meaningful and engaging also in long-term.

It should be however noted that the Gamification Kit only gives a basic structure for the potential gamification concept. As in any well-designed user-centered design process, the designed gamification concept should be tested with the potential end-users to get early feedback about the concept and understand if the proposed solution is really solving the user problems and supports their goals in a meaningful way. Based on the gathered feedback from the testing, the concept should be iterated and refined. The Gamification Kit can be used to support this continuous iteration process as well – the toolkit can be used to guide the design of larger gamification concepts or even individual gamification features that need to be further refined.

4.2 Design process of the case study

To validate the created Gamification Kit, a single-case study was conducted. The goal of the case study was to create a gamification concept to an existing mobile application, and the Gamification Kit was used to guide this design process. The case study consisted of understanding the client problem, identifying customer problems and goals, generating and validating value propositions, evaluating gamification applicability, ideating gamification concepts and validating them.

The next section first briefly describes the first phase of the case study design process, which focuses on understanding the preliminary requirements for conducting the actual gamification design. Then the focus is on showcasing the usage and applicability of the Gamification Kit. This is done by describing the process of evaluating gamification applicability, ideating gamification concepts and validating them by using the previously introduced canvases of the Gamification Kit.

4.2.1 Preliminary design phase

The design process of the case project began by forming a common understanding of the business problem of the client and their business goals related to this problem. In

addition, the existing application data was analyzed, the previous customer interviews were examined and other similar application solutions were benchmarked. In terms of this study, these aspects of the preliminary design phase are not relevant, but the emphasis is put on identifying the user problems and goals, and generating a value proposition. The first design phase was conducted by using the Lean Service Creation toolkit as a support.

Identifying user problems

Identification of the user problems started by defining the most relevant user groups to focus on. Based on the business goals of the client and the existing data that was analyzed, two user groups were decided to be targeted. The first user group consisted of users, who are actively using the mobile application of the case company. The other user group consisted of users, who have tried the mobile application, but are rarely using it. The filled LSC segmentation canvas with the defined user groups can be seen in Figure 8.


Figure 8: The filled segmentation canvas

To understand the existing problems of the current users, seven interviews were held with the existing users of the application. The interviewees were selected from the two user groups: out of the seven interviewees, four were active users and three were semi active users. The interviewee selection was done based on the application usage data. By interviewing users from both the user groups, the interview data could be gathered both from the active users to understand what are the key drivers for the application usage and what is lacking in the application, and from the more inactive users to understand why they currently do not see the value in the application.

The interview was structured as a semi-structured interview, focusing on understanding how the users feel about energy, what kind of habits and emotions are

linked to their energy consumption and how they use or have used the existing mobile application.

The interviews started with an informal discussion and introduction to the topic. Then basic user information was gathered, such as in which kind of apartment the user lives, what kind of energy contract the user has and how aware of the current consumption the user is. After that, the interview dived deeper into what kind of relationship the users have on energy consumption and what kind of emotions they have related to energy. Lastly, the emphasis was put on the usage of the energy monitoring application, investigating how, why and in which situations the user uses the application.
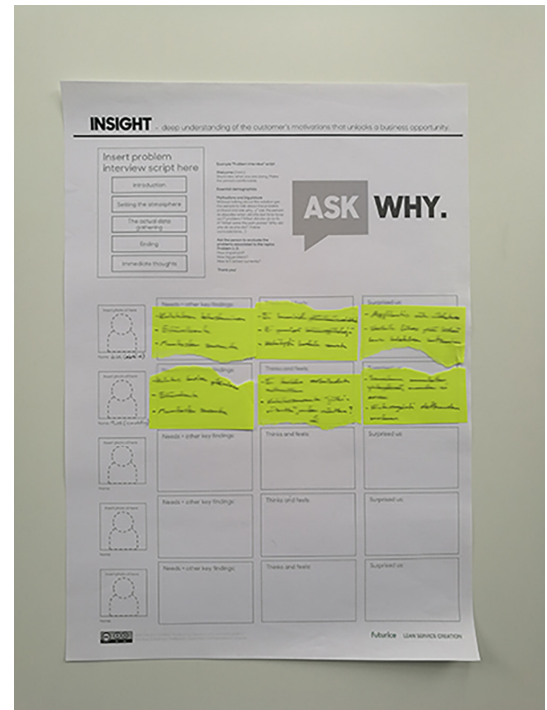
Figure 9: The filled insight canvas

After the interviews, the interview data was analyzed and the LSC insight canvas was filled. The canvas can be seen in Figure 9. The interview data revealed a series of user goals and problems that were gathered and evaluated based on how often they were presented and how essential they were for the users. Eventually, the three most relevant problems and the associated goals were selected to be taken into the ideation phase.

Ideating and validating value propositions

After the relevant user problems were identified, the next phase was to ideate how these could be solved. Based on the ideas, value propositions were formed. The ideation phase was done in workshops, using the LSC ideation canvas as a support. I acted as a facilitator in the workshops, and the workshop participants consisted of people that were involved in the design projects of the client organization.

I held three workshops to ideate around the identified three user problems. Each workshop had a different problem that was used as the basis for the ideation. The

workshops lasted for 45 minutes and they were structured to have a short introduction to topic, two brainstorming sessions, voting for the best ideas and having a short end discussion.

After all the workshops, the filled ideation canvases from the workshops were collected and the best ideas were gathered together. The filled ideation canvases can be seen from the Figure 10. From these workshops, three different ideas were decided to be taken forward.
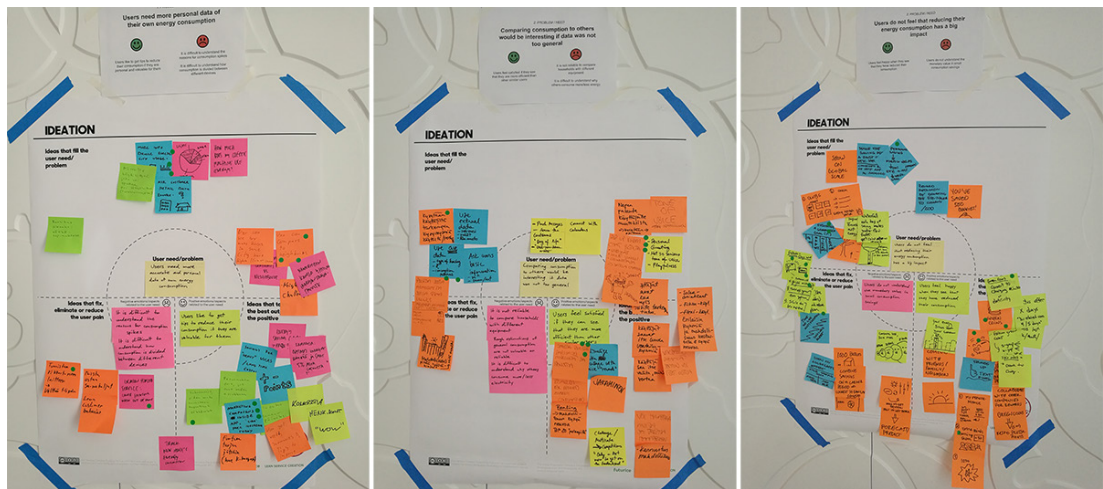
Figure 10: The filled ideation canvases from the workshops

Next, more structured value propositions were defined based on the ideas from the workshops. These were done with the help of the concept and value proposition canvas. Eventually, three different value propositions were formulated to validate them with the end-users.

The validation of the value propositions was done with fake advertisement, meaning that a made-up advertisement of a concept around the value proposition was created to test if the proposed value proposition was attracting for the potential users or not. The created fake advertisements to test the value propositions were done following the guidelines described in the fake advertisement canvas of LSC (Futurice, 2017). The users were introduced briefly to the concept by showing the advertisements and asked for their feelings, first thoughts and potential interests. Based on the feedback gathered, one value proposition was decided to be taken to the second phase of the design process: the gamification design.

4.2.2 Gamification design process with Gamification Kit

As stated before, the preliminary requirements for using the Gamification Kit are identified user problem, user goal and value proposition. The first design phase of the case study identified these aspects, and the second design phase used the Gamification Kit to guide the gamification design process.

Next, I describe the design process of gamification in the case study and the usage of the Gamification Kit canvases in this process. As the ideated gamification concept is still under development in the case company, the identified value proposition and the more detailed concept ideas are not discussed in the design process description.

4.2.2.1 Evaluating gamification applicability

The first canvas of the Gamification Kit was used to decide if gamification would be feasible to apply to the proposed service concept or not. The filled Gamification Applicability canvas for the case project can be seen in Figure 11.

Filling the canvas started from writing down the identified user problem, user goal and value proposition. These were then used as the basis for discussing the applicability of gamification by answering a series of questions in the canvas. The exact user goal, problem and value proposition of the ideated service are not introduced in this study, since the gamification concept is still under development in the case company, but more generalized versions of these are:

Figure 11: The filled gamification applicability canvas

User goal: Increase the understanding about energy consumption and lower energy bill

User problem: Users do not feel that their actions have a big impact on energy consumption

Value proposition: Encourage people to do activities related to energy consumption that they would not otherwise do

The first question to answer in the canvas was *Are user problem and goal related to motivation?* This was identified as true. The defined user goal includes motivational aspects, since the user goal is about learning and saving more. Many users are motivated to understand more about their energy usage, so they can make more informed decision related to their energy consumption and thus reduce it. Moreover, reducing the energy consumption is related to motivation, since it is directly affecting the energy bill of the user.

The user problem was also seen to relate to motivation. The users are not motivated to pursue for their goals, since the users do not see the impact of their energy saving actions. This was identified also partly as a problem of system design as the existing system is not showing the impact of the users' energy savings. However, this problem also includes motivational aspects, and it could be solved by finding ways how gamification could make the impact of the user actions more visible and thus motivate the users to do more saving actions.

The second question, *Is it difficult for user to find motivation to complete goal?* was also identified as true. It was discussed that the users are generally interested to reduce their energy usage and understand more about their consumption, but as the user problem states, they do not see that it has a big impact. The goal for the users is to reduce their consumption to lower the energy bill. However, they feel that reducing their energy consumption lowers the energy bill very little, so it is not very motivating. Hence, the users do have difficulties to find motivation to reduce their energy consumption.

The third question is formulated as *Can goal be divided to meaningful checkpoints?* This was identified as true as well. Understanding more about the energy consumption could be divided to for example different levels depending how much the user has

learned about energy consumption. Moreover, the process of reducing energy consumption and lowering the energy bill could be shown to the users with progress indicators and certain checkpoints. Progress indicators can show how the users has progressed towards their goals and motivate the users to reach more checkpoints that takes them closer to their goals.

Fourth question to discuss was *Is value proposition encouraging behaviour change?* This was also stated to be true. The identified value proposition of the idea encourages people to do activities related to energy consumption that they would not otherwise do. Thus, it encourages people to change their normal behavior.

After the questions were answered, it was time to discuss if gamification could be applied to the concept, or if other means to proceed with the service concept should be decided. All the discussed questions in the canvas were identified to be true, indicating that gamification could be used in the concept to encourage and engage users. Thus, it was decided to proceed with applying gamification to the concept idea.

Next part of the applicability canvas was to discuss about the thoughts and feelings of the users and link them to the corresponding emotions that are identified in the canvas. This was done by individually going through the emotions in the canvas and discussing, which user thoughts and feelings that were identified in the user interviews could be related to which emotion. From the discussions, four main emotional drivers were identified – narrative, challenge, fellowship and discovery.

Narrative
From the interviews, it was understood that the users do not feel like the energy saving has a big impact. These thoughts could be discouraged by bringing some narrative to the service. With a narrative, energy savings could be attached to a story, which could give the users a purpose to save energy.

Challenge
The interviews also revealed that energy saving is often goal-oriented. Interviewees for example compares their current consumption to their consumption one year ago, and try to keep the current consumption lower. For these kind of thoughts, the emotion

of challenge could be used to engage the users. The users could try to achieve certain goals related to energy consumption and be rewarded for the efforts.

Fellowship

Also energy comparison to neighbors and similar kind of houses was something that interested the interviewees. This indicates that the emotions related to fellowship could be engaging in the gamified service. This way the users could feel a sense of belonging and a friendly competition in the service.

Discovery

Most of the interviewees were interested to understand more about their own energy consumption. They were interested to get more personalized energy saving tips to understand how to improve their current habits. The interest of comparison against neighbors was also partly because that way the interviewees could learn more about their own consumption. This translates to the emotion of discovery. The users would be willing to learn more about energy consumption related things, because they feel like that way they could make more informed decisions related to their own consumption.

The other emotions listed in the canvas were not seen to be important related to this service concept. There were no strong user feelings and thoughts that could be related to sensation, fantasy or expressions. Also, the emotion of submission (using service as a pastime) was found to be relevant only for the heavy users of the system. For other users, there were no interest to browse the service with no other intention in mind than to spend time.

After these emotions were discussed through, it was discussed if some important user thoughts or feelings had not been categorized to any of the emotions, and would belong to the *other* field. However, all the relevant user problems and needs were identified already in the emotions, so there was no need to define additional emotional experiences. The four identified emotional drivers – narrative, challenge, fellowship and discovery – were taken forward for the ideation phase of the gamification design process.

4.2.2.2 Ideating gamification concepts

After the validity of gamification usage in the concept idea was confirmed and the desired emotional experiences were identified, it was time to ideate the actual gamification concepts around the service idea using the gamification ideation canvas. The filled ideation canvas of the case study can be seen in Figure 12.

First, based on the preliminary design process and the emotions identified in the gamification applicability canvas, the ingredients for the ideation process – the user goal and emotions – were written down.
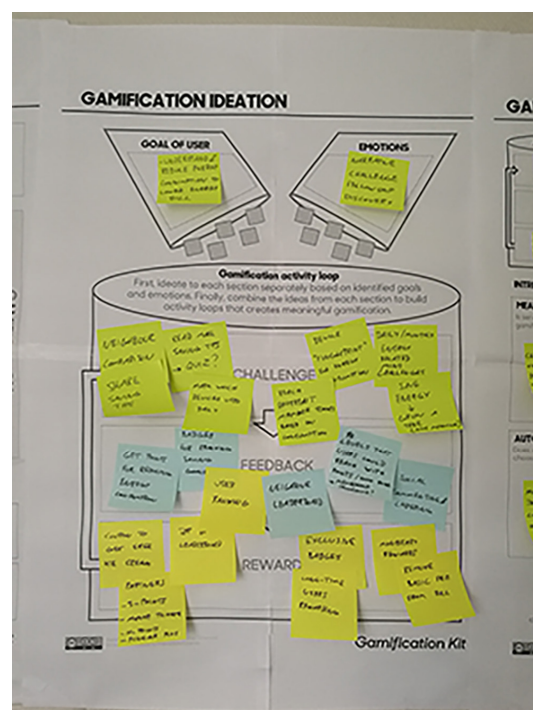
Figure 12: The filled gamification ideation canvas

Next, the first ideation phase was conducted following the canvas guidelines. During the first phase of ideation, the task was to ideate potential activities to each section of the main game elements of gamification design (challenge, feedback and reward) separately by keeping the above-mentioned user goal and desired emotional responses in mind.

The result of the first ideation phase introduced a set of ideas of challenges, feedbacks and rewards that could support the goal of the user and lead to the desired emotions. The ideas generated to each section were first categorized based on which emotion they were related to, so it would be easier to go them through and discuss them.

The challenge section introduced ideas, such as competing with neighbors (fellowship), learning more about energy consumption (discovery) or completing different energy consumption related activities (challenge). The challenge ideas were all related to some of the identified emotions. The feedback section introduced possible feedback elements, such as leaderboards, point systems, badges and levels that were all designed to support the goal of the user. The reward section introduced elements,

such as exclusive badges, monetary rewards and partnering rewards with other companies, such as movie tickets, as possible forms of rewards.

After the first ideation phase, the second ideation phase was done. The idea of the second phase was to gather together the best ideas from each of the different sections and combine them to create activity loops. The results of this ideation phase are multiple activity loops and initial gamification concepts, where there would be a meaningful challenge that could be encouraged by proper feedback and be rewarded with a relevant reward, possibly leading to a new challenge.

During the second ideation session, the aspects from each of the sections were linked together to create meaningful gamification activity loops. As a result of this ideation session, multiple gamification activity loops were defined, with each having different elements or focus areas. Still, many activity loops were using similar kind of elements. The activity loops were discussed and initial gamification concept formed. Two concept ideas were selected as the most promising and they contained gamification elements that were considered to be the most suitable in this service context. Eventually, as these two ideas were developed further, it was decided to merge these two concepts into one gamification concept.

The gamification activity loop in the selected gamification concept consists of challenges of doing different energy consumption related activities that are tied to the identified emotions. By linking the activities to the identified emotions, more people can find interesting content in the gamified system, and thus get them more engaged to the system. Feedback elements in this concept are progress indicators, point system and levels. Rewards include both in-system rewards in a form of social leaderboards and levels, and external rewards that are energy-related with possible monetary benefits.

4.2.2.3 Validating gamification concept

After the gamification concept was ideated, it was time to move to the validation phase of the gamification concept. The filled gamification validation canvas can be seen in Figure 13.

The purpose of the validation canvas is to validate the gamification concept and examine if it invokes the intrinsic motivation of the users. First, the designed activity loop for the gamification concept and a short description the concept is written down. Then, in the validation phase of the canvas, the presence of four intrinsic motivational drivers are evaluated – meaning, mastery, autonomy and relatedness.

Meaning

Meaning discusses if the underlying service is meaningful for the user even without gamification mechanisms in place. For the ideated concept, the initial goal for the users is to understand and reduce their energy consumption. The designed gamification concept is only used to encourage the users to reach this goal by introducing certain activities that are awarded with points and levels. Even if the point system would be removed, the information received from completing these activities would benefit the users and lead them towards their goals of understanding more about their energy consumption. Thus, it can be said that this concept has a meaning to pursue even if the gamification would not be present.

Mastery

Mastery means that the user feels that there is enough challenge to stay engaged in the service and that they can see their progress towards mastery or expertise. The gamification concept includes different activities that the users can complete, and it was discussed that some of them should be easy to do, but to emphasize the element of mastery, there should also be more difficult activities, so that the active users would need to put additional effort to complete them. Also, the leveling aspect of the gamification concept brings a sense of mastery as the users can see their progress and
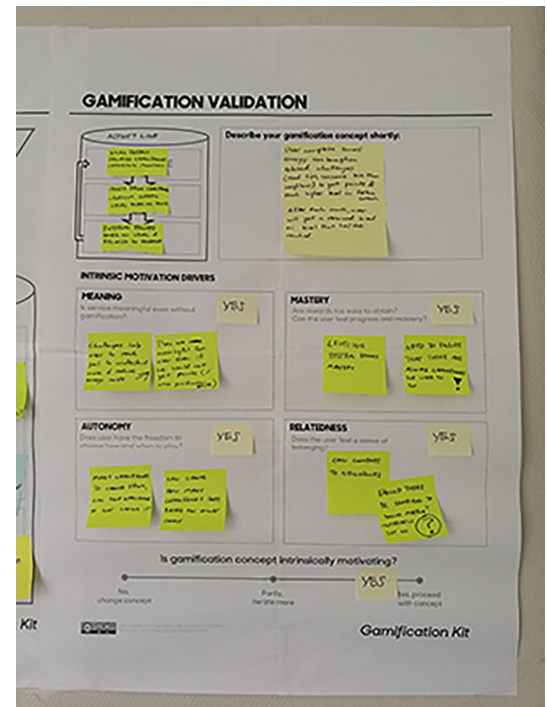

Figure 13: The filled gamification validation canvas

can climb up the levels depending on how much effort they want to put in completing the different activities.

Autonomy

Autonomy relates to the users' freedom to choose when and how to interact with the gamified service. For this gamification concept, it was discussed that there should be enough challenges, so that the users can choose, which challenges to complete. Based on the amount of challenges they complete, they can estimate which level they are able to reach. Hence, the users have freedom to choose what are their goals in the gamified service and then decide how much effort they put into completing the different challenges.

Relatedness

Relatedness means feeling a sense of belonging, and is about social interaction in the service. From the user interviews, it was identified that the users did not feel the need to share their energy consumption results to others. However, they were interested to understand how much the other users consume energy. Thus, the described gamification concept includes activities, where the users can compare themselves to other users, encouraging friendly competition and allows the users to gain social recognition.

After these intrinsic motivation aspects were discussed, the final discussion point in the canvas was to decide whether the gamification concept is intrinsically motivating enough. Regarding this concept, it was identified that it is intrinsically motivating, as all the intrinsic motivation drivers could be identified in the concept. However, as these intrinsic motivation drivers were discussed, some modifications were done to the gamification concept to increase the intrinsic motivation of the system even more. An example was the discussion of mastery, where it was decided that activities need to be of different difficulty levels to keep the users more engaged.

At this point, the gamification concept had been created and validated with the Gamification Kit. The toolkit validates that the gamification concept contains aspects that can drive the intrinsic motivation of the users and encourage the long-term usage of the service. However, as it was mentioned in the introduction of the gamification

validation canvas, the gamification concept should still be taken on to end-user validation to ensure that the gamification concept really matches to the needs and wants of the end-users. At the end, user-centered design is difficult to be made without asking validation the results with the actual end-users.

For the developed gamification concept, the end-user testing is done with interactive prototypes of the ideated gamification concept. However, the end-user testing is not part of the Gamification Kit, so this part is not discussed in this thesis.

4.3 Evaluation of Gamification Kit

Gamification Kit was used in the case study to guide the design process of gamification. Previous section described how the Gamification Kit was used in the case study, and following is more detailed evaluation of the Gamification Kit based on the findings from its use in the case study. First, the toolkit is evaluated in overall, followed by more detailed evaluation of each of the canvases of the toolkit.

The main question that the case study tried to evaluate is: *How the Gamification Kit helps the participants to design user-centered gamification?* The evaluation is based on qualitative data that was collected in form of physical artifacts (the filled canvases of the Gamification Kit, see Figures 11, 12 and 13) and informal participant observations that were carried out during the gamification design process of the case study.

In general, the strength of the Gamification Kit was seen that it guided the participants through the design process of gamification by introducing a structured design process that was easy to follow. Thus, it was not needed to think about which aspects should be considered in gamification design, but the canvases introduced the topics that should be discussed in each part of the process. Moreover, it was trusted that by following the design process introduced in the Gamification Kit, the user-centeredness was taken into account in the gamification design.

The process of Gamification Kit was seen to be simple, as it was structured to clear sections that could easily followed. Gamification is however a complex process and there are many aspects that can be considered in gamification design. Concerns arose

if the Gamification Kit simplifies the gamification design process too much, and if not all relevant aspects are considered. The concern is understandable, as there are many aspects related to gamification that are not discussed in the canvases, and on the other hand, the toolkit is heavily influenced by certain theories, such as the role of intrinsic motivation.

Moreover, as Gamification Kit is intended to only guide and support the design process and is not giving exact rules how on to make decisions or how to do actual ideation exercises, participants have a lot of freedom while the toolkit is used. This is a benefit in a sense that the participants can use the toolkit to fit their own needs, but it also has risks. If the participants do not have much knowledge about the Gamification Kit or gamification design prior using the toolkit, there is a risk that the participants use the toolkit incorrectly and the results are not truthful. Thus, it would be advisable that there would always be someone with sufficient knowledge of how to use the Gamification Kit as part of the team or acting as a facilitator.

4.3.1 Gamification applicability canvas

The gamification applicability canvas was seen to give good guidance especially in understanding the underlying factors of the user motivation and the role of gamification. Even though the user problem, user goal and value proposition were already defined, the canvas deepened the understanding of the service users. By going through the questions about gamification applicability by reflecting to these defined aspects, the motivational drivers of the users could be better understood.

Moreover, the canvas clarified the role of gamification, as it was understood that it is not suitable to all services, but especially in services, where motivational aspects play a significant role. By answering the questions, it was easier to recognize what kind of role gamification could have as means to encourage the usage of the service. Thus, based on the case study, the defined set of questions in the canvas gives a good guideline to help decide if gamification is relevant in the service idea.

In the case study, all the questions related to the gamification applicability were identified as true, and thus it was relatively easy to decide that gamification could be applied to the service idea. However, the canvas gives no exact rules that can be

followed to decide when gamification should and should not be applied to the service, so it is difficult to make explicit decisions not to use gamification solely based on answering the questions in the canvas. The canvas is only meant to be used as a guidance to help make decisions and raise discussion, but it is not designed to give explicit answers.

Defining user emotions were seen as beneficial to give guidance on what the gamification concept should focus on. By going through the emotions, the understanding of the end-users got better, as their emotional drivers were understood. However, the user feelings were not always easy to be linked to certain emotions, so there are concerns on how well these different emotions are understood by the other users of the canvas who are not familiar with them. If the meaning of the emotion is understood differently, distinct results may occur.

4.3.2 Gamification ideation canvas

The ideation process introduced in the gamification ideation canvas was mostly seen as easy to follow and the two-phased ideation process clear. The activity loop of gamification was easy to understand, and made it easy to define initial gamification concepts based on the activity loops. Moreover, keeping the user goal and emotions as a focus point during the whole process ensured that all the ideas were reflected on how it benefits the user.

The most challenging part of the ideation process was when the ideation process of the canvas was done, but the initial gamification concept needed to be refined and more content needed to be added to make proper gamification concepts out of them. The ideation canvas simplifies the ideation process and focuses on building meaningful gamification dynamics using the activity loops, but do not guide the refinement process of the concepts. This can be seen as a drawback, as there are still many important aspects that gamification concept needs to include other than meaningful activity loops.

4.3.3 Gamification validation canvas

The gamification validation canvas was seen to give important insights about the underlying factors of the gamification concept and its intrinsic motivation drivers. The identified four drivers guided the validation phase and gave a structure for validating the intrinsic motivation of the concept. The questions attached to each of the driver helped to understand what kind of aspects should be discussed. By discussing about these four drivers, it was easier to understand what are the strengths of the concept, and what could still be improved.

The canvas does not have any exact rules that indicate, when there is enough intrinsic motivation present in the gamification concept. The canvas only helps to guide the users to make this decision, but it is up to the participants to decide if there is enough intrinsic motivation to proceed forward or if more iterations should be done. Thus, there is a risk that participants see the ideated concept intrinsically motivating enough to proceed forward, even though the answers in the canvas would indicate other. The role of the canvas is however to guide and raise discussions and not to give explicit answers.

5 Discussion

This chapter discusses the results of this study. The next sections answer the research questions of the study and discusses the research contributions. Moreover, the suggestions for future research are given. Lastly, the trustworthiness of the study and its limitations are evaluated and the ethical considerations are discussed.

5.1 Answers to research questions

Gamification has gained a lot of attention during the previous years, but it is still often poorly designed. This is resulting from the lack of understanding what gamification really is and how it should be implemented (Robson et al., 2015). Adding points and leaderboards to a service is not enough to make it successfully gamified, but gamification design should be user-centered, putting end-user to the center of the design process (Nicholson, 2012).

Nicholson (2012) introduced the term meaningful gamification, where the needs of the end-users are put to the center of the gamification design process. However, this takes only a theoretical approach to user-centered gamification, not discussing how the user-centeredness could be applied to gamification in practice.

The purpose of this thesis was to take a practical viewpoint to gamification design and consider how user-centered gamification could be designed in practice. The research questions for the thesis was formulated as: *What kind of a toolkit can aid user-centered gamification design process?*

To answer the research question, it was necessary to first understand the theoretical considerations that needed to be considered for gamifying a concept. This formed the first sub-question: *What are the main theoretical considerations for gamifying a concept?* Then I created a user-centered gamification design toolkit Gamification Kit and evaluated how it can bring user-centeredness to gamification design. This formed the second sub-question: *How can Gamification Kit help to bring user-centeredness to gamification design?* The answers to the sub-questions are discussed next, and then the main research question is answered.

5.1.1 The main theoretical considerations for gamifying a concept

This section answers to the first sub-question: *What are the main theoretical considerations for gamifying a concept?* It summarizes the main considerations that were identified from the existing academic literature.

Based on the literature study, gamification can be seen from system and process viewpoints. The system viewpoint defines gamification as using game design elements in non-game context (Deterding et al., 2011a), and the process viewpoint emphasizes that gamification tries to offer gameful experience that changes the users' behavior by motivating and engaging them (Seaborn and Fels, 2015; Robson et al., 2015; Barata et al., 2013a; Groh, 2012).

These two different viewpoints resulted to the gamification definition that was proposed in this thesis. This thesis defines gamification as: adding design elements characteristic to games to non-game context as an attempt to motivate users to engage with the system and foster behavior change.

The academic research indicates that the main goals of gamification are to increase the motivation of the users to engage with a system (Seaborn and Fels, 2015; Groh, 2012) and to change the users behavior (Robson et al., 2015; Barata et al., 2013a). Based on the literature, both intrinsic and extrinsic motivation can be present in the gamified service (Hamari and Koivisto, 2015; Zichermann and Cunningham, 2011; Seaborn and Fels, 2015). However, the extrinsic motivation is only giving a short time increase to motivation (Pink, 2010), and it could be mainly used to invoke the intrinsic motivation of the user (ibid.). The intrinsic motivation is driving the long-term usage of the service.

Based on the research about intrinsic motivation (Ryan and Deci, 2000b; Pink, 2010; Deterding, 2011), this thesis focuses on meaning, mastery, autonomy and relatedness as the key drivers for intrinsically motivating gamification. To include these intrinsic motivation drivers to the gamification concept, the gamification designers need to understand the users that the gamification is designed for. Hence, understanding the users' problems and goals are the starting point for user-centered gamification design.

This thesis uses the MDE-framework (Robson et al., 2015) as a theoretical framework to approach the design of user-centered gamification. It divides the gamification to three components: mechanics, dynamics and emotions. The MDE-framework looks at the gamification design process from two perspectives: the designers can only design the gamification mechanics, but the users are experiencing the gamified system through emotions. Hence, this thesis suggests that user-centered gamification design should identify the emotional responses that the users want to feel, and use them as the basis when designing the gamification mechanics.

The gamification dynamics describe how the users of the gamification interact with the designed gamification mechanics (Hunicke, LeBlanc and Zubek, 2004; Robson et al., 2015). The gamification mechanics should provide activity loops that include an action, feedback and emotion (Werbach and Hunter, 2012, cited in Ibanez, Di-Serio and Delgado-Kloos, 2014). When these activity loops are designed to support the emotions and goals of the users, desired emotional responses occur and engaging and intrinsically motivating gamification can be created.

This study also researched the existing academic literature of the main elements of games (Flatla et al., 2011; Glover, 2013; Dickey, 2005; Von Ahn and Dabbish, 2008) and focused on goal-focused challenge, feedback and reward as the main game elements for gamification design. Based on these elements, this thesis created a variation of the gamification dynamics activity loop, replacing action, feedback and emotion with challenge, feedback and reward.

5.1.2 How Gamification Kit brings user-centeredness to gamification design

This section answers the second sub-questions: *How can Gamification Kit help to bring user-centeredness to gamification design?* The section focuses on identifying the aspects of the toolkit that bring user-centeredness to the gamification design process.

Based on the theoretical research, a practical user-centered gamification design toolkit Gamification Kit was introduced to help gamify a concept. It can be used to guide designers and other stakeholders to design gamification that considers the user needs

in the gamification design process. Next, it is discussed how the Gamification Kit can bring user-centeredness to gamification design.

The preliminary requirements for using the Gamification Kit are identified user problems, user goals and value proposition. Thus, the toolkit ensures that the participants who are designing gamification have a sufficient understanding of the current user needs and goals before designing gamification. If these aspects are not known, the Gamification Kit cannot be used to bring user-centeredness to gamification design.

The toolkit emphasizes the role of gamification as a tool to motivate and engage the users. Gamification is not suitable to be applied to every service, so it should be discussed if the service contains aspects that are required for user-centered gamification. These are for example the presence of motivational aspects in user problems and goals and difficulties for users to reach their goals in the service context. The toolkit ensures that these required aspects are found in the studied service so that it could be gamified.

Instead of focusing on the game mechanisms, the toolkit starts the gamification design process from the end-users point of view. Emotions are driving the end-users usage of the gamified systems (Lazzaro, 2004; Robson et al., 2015), so the gamification design process starts by identifying the emotions that could drive the usage of the designed gamification system. This way it is known, which kind of emotional responses are wished from the game mechanisms so that the gamification feels meaningful and engages the users.

The ideation process introduced in the toolkit keeps the user goals and identified user emotions in the center throughout the design process. This way the toolkit ensures that the ideated gamification mechanics are meaningful for the users, since they are all related to the user goals or desired emotions.

The toolkit helps to validate the created gamification concepts by examining the presence of intrinsic motivation drivers. The intrinsic motivation has been identified to drive the long-term usage of services, so the validation phase ensures that the gamification concept includes enough aspects to foster the intrinsic motivation of the

users. These are done by examining the presence of the four identified intrinsic motivation drivers – meaning, mastery, autonomy and relatedness.

5.1.3 How Gamification Kit can aid user-centered gamification design process

This section answers the main research questions: *What kind of a toolkit can aid user-centered gamification design process?* It describes the Gamification Kit and how it structures the design process to aid user-centered gamification design.

The Gamification Kit introduces a structure for a gamification design process that consists of three design phases: gamification applicability, gamification ideation and gamification validation. The toolkit consists of three canvases, each representing one of the design phases. The canvases give a structure for the gamification design process.

The gamification applicability canvas ensures that gamification is relevant to be applied to the concept idea, since not all services should be gamified. The canvas helps the participants to understand if the service context contains aspects that are required for user-centered gamification. This is done by answering to certain questions that guides the participants in designing if gamification is suitable or not.

The emotions are the starting point for user-centered gamification design. Thus, the applicability canvas also helps to get an understanding of the most important emotional drivers of the users. The canvas introduces a set of emotions, and the participants can discuss, which user emotions are the most relevant in the service context.

The gamification ideation canvas guides the ideation process of gamification concepts. It ensures that the user goals and emotions are considered when the ideation is done. Moreover, it defines the gamification activity loop that consists of challenge, feedback and reward: Performing meaningful challenges should provide feedback to the users to show them their progress. When the challenges are completed, meaningful rewards should be given (and potentially a new challenge) to engage the users.

The ideation process of the canvas helps to ideate these different challenges, feedbacks and rewards (that should be related to the user goals and emotions), and links them

together to form the activity loops. These activity loops build the basis for gamification concepts.

The gamification validation canvas ensures that the gamification concepts are intrinsically motivating. It guides participants to evaluate if their gamification concept includes all the four identified intrinsic motivation drivers: meaning, mastery, autonomy and relatedness. This canvas helps the participants to determine if the gamification concepts are intrinsically motivating enough, or if they should still be iterated more.

It must be noted that the outcome of the Gamification Kit is a validated gamification concept, but only on paper. Following the user-centered design approach, the ideated and validated gamification concept should still be validated with the end-users to ensure that it solves their problems and supports their goals.

5.2 Research contributions of the study

The aim of this thesis was to create a toolkit that aids user-centered gamification design process. This was done by researching the existing academic literature of the topic, and based on the learnings create Gamification Kit that can be used by practitioners to design user-centered gamification. The Gamification Kit has been evaluated in a single-case study in context of designing gamification to an energy monitoring application. Thus, it is the responsibility of the reader to evaluate how generalizable the research contributions of this study are to other contexts.

The results of this study suggest that the user-centered gamification design process can be divided to three design phases: gamification applicability, gamification ideation and gamification validation (see Figure 14). However, before user-centered gamification design can be started, a sufficient understanding of the end-users of the designed service should first be formatted in a preliminary design phase. Following a user-centered approach, the main user problems and goals should be identified. Moreover, a value proposition should be created and validated.

Figure 14: The Gamification Kit

1. Gamification applicability

The first phase of the user-centered gamification design is evaluating if gamification is applicable in the context of the service. This is achieved by evaluating if the user goals, problems and proposed value proposition are related to motivational aspects. Then, the emotional drivers of the users should be identified. The emotions are driving the usage of gamified services, so identifying the relevant emotions in the service context is the starting point for user-centered gamification design.

2. Gamification ideation

The second phase is gamification ideation, where the gamification concept is ideated. The identified user goals and user emotions should be the base for the ideation, and all the ideas should be related to these. The ideation of user-centered gamification focuses on three main game elements of gamification: challenge, feedback and reward.

The main game elements form a gamification activity loop: Meaningful challenges need to be supported with feedback to show the progress of the users. When the challenges are completed, meaningful rewards should be given that may lead to new challenges.

The gamification ideation is divided to two phases: First, ideas related to each of the main game elements are ideated and discussed. Then, the individual ideas of different

game elements are linked together to build the gamification activity loops. These activity loops form the initial gamification concepts that can be refined.

3. Gamification validation

The third step is gamification validation, which ensures the presence of intrinsic motivation drivers in the gamification concept. It discusses the presence of four intrinsic motivation driver of gamification: meaning, mastery, autonomy and relatedness.

This thesis suggests that by following the guidelines and design process introduced in the Gamification Kit, the user is kept in the center of the gamification design process, ensuring that the resulting gamification concept is user-centered and invokes the intrinsic motivation of the user.

5.3 Future research

The introduced Gamification Kit was evaluated in a single-case study, where it was used to design gamification to an existing mobile application. The results indicated that the Gamification Kit did aid the design process of user-centered gamification. However, the results also gave some suggestions to improve the existing toolkit. These changes to the toolkit were decided to be left for future research.

The results of the Gamification Kit evaluation can be seen valid in the case study context, but more research should be done in other domains to make more generalizable results of the applicability of Gamification Kit in designing user-centered gamification. Moreover, the Gamification Kit could be evaluated with other research methods and validate the Gamification Kit against other user-centered design processes.

The Gamification Kit is a toolkit with a set of guidelines that can be followed to design user-centered gamification. It is not designed as a formal process that needs to be strictly followed, and thus the end results are also difficult to measure. It could be researched how the results of the gamification design process guided by the Gamification Kit could be evaluated. Moreover, based on the current work done, more

formal process for user-centered gamification design could be created and evaluated in future research.

5.4 Evaluation of the study

This chapter evaluates the conducted study. This is done by discussing the trustworthiness of the study, the study limitations and the ethical considerations of the study in the next sections.

5.4.1 Trustworthiness of the study

This study follows a design science research methodology, and the evaluation of the created Gamification Kit was done by conducting a qualitative single-case study. As a qualitative research, a central issue is trustworthiness of the research. To evaluate this study, four criteria proposed by Guba (1981, cited in Shenton, 2004) for evaluating qualitative study were used: credibility, transferability, dependability and confirmability. These criteria have been accepted by many researchers for evaluating trustworthiness of qualitative research (Shenton, 2004).

Credibility translates to how believable are the results of the research. Lincoln and Guba (1985, cited in Shenton, 2004) argue that ensuring credibility is one of the most important factors in establishing trustworthiness. Shenton (2004) introduces a set of provisions that can be made by researchers to promote the credibility of their study.

Adopting well established research methods is one criteria to promote the credibility. This research follows the design science research methodology to follow a generally accepted research process for carrying out design science research. Moreover, peer scrutiny of the project is another criterion to promote the credibility. This thesis has been scrutinized by both academics and practitioners, and it had resulted to refinement of methods and greater argumentation of the design process.

Transferability describes how the findings of the study can be generalized, meaning to which extent the findings of the study can be applied to other contexts (Shenton, 2004). The findings of qualitative research are based on specific context or a limited number of participants, so it is impossible to demonstrate that the findings and conclusions are

applicable to other situations (ibid.). Lincoln and Guba (1985, cited in Shenton, 2004) argue that the responsibility of the researcher is to provide enough information about the context of the study, and it is then up to the reader to estimate the transferability of the study. In other words, the researcher must provide information about the boundaries and the context of the study and the description of the studied phenomenon, so that the reader can determine how confident they are in transferring the findings of the study to other contexts.

This study provides a thick description of the studied phenomenon, study context, applied theory, research process, methods and empirical findings. With this information, the readers can define whether the findings of this study could be applied to other contexts.

Dependability addresses the consistency of the research process. This can be achieved by reporting the process of the study in detail, so that future researchers are able to repeat the work. Moreover, thorough research process and method description allows the reader to assess how well proper research practices have been followed. (Shenton, 2004)

This research follows a design science research methodology, a generally acknowledged design science research process. The different activities of the research process were described and the used methods were reasoned. Moreover, the theoretical background for the created artifact was introduced and the setting of the empirical study was described so that the study could be replicated by other researchers.

Confirmability addresses how objective and free of bias the results of the research are. It is inevitable that in qualitative research the researcher affects the research results in some manner. However, it must be indicated that the findings of the research are not purely a subjective view of the researcher. This can be done for example by reasoning the decisions why some approaches have been favored over others and discussing the preliminary theories for the study. (Shenton, 2004)

This thesis creates a new practical design toolkit based on theoretical knowledge gathered from the work of other researchers. In this research, some theories have been favored over other, but the thesis justifies the made decisions and the preliminary

theories that are used as the basis of the Gamification Kit. As I was also the participant on the evaluation phase of the Gamification Kit, there are issues regarding the confirmability of the evaluation of the toolkit. However, the evaluation process of the case study is described in detail for the reader to determine the extent in which the results can be accepted.

5.4.2 Limitations of the study

The created artifact, Gamification Kit, is based on multiple different game and gamification theories, ensuring that the theory behind the created artifact is rigor. However, some theories (i.e. Self-determination theory and gamification framework MDE) have been favored over others. As an example, this study examines the user motivation as a driver for behavior change and self-determination theory is used as the main theoretical framework. Behavior change could have also been examined by using the theory of cognitive dissonance. However, the decisions to use certain theories were reasoned on the thesis.

Gamification is also a complex process, and the Gamification Kit could not consider all the aspects related to gamification. Decisions were made to simplify the gamification process, and some aspects were decided to be left out. As an example, the Gamification Kit does not use the classification of different player types by Bartle (1996), which is a popular approach in identifying what drives players to play a game. Instead, the Gamification Kit focuses on identifying the relevant emotional drivers of the users and using them to guide the gamification design.

Even though the theoretical background of the Gamification Kit is based on well acknowledged theories, the empirical evaluation of the Gamification Kit has its limitations. Evaluation results are based on a single-case study in a specific context, which limits the generalizability of the results. Thus, the reader is responsible for determining if the results are generalizable outside of the research context. To get more generalizable results, more studies of the subject should be made in other contexts.

I acted as a participant in the case study where the Gamification Kit was used. Thus, some of the results might be biased based on the existing knowledge of the participant

about gamification design. Different results might occur in case a participant with no prior knowledge about gamification design uses the Gamification Kit.

The designed Gamification Kit is a first prototype for guiding user-centered gamification design process. The learnings from the case study are used to iterate the Gamification Kit, but the iteration results are not part of this study, but are left for future research. Thus, the introduced Gamification Kit in this study will most likely be improved in the future.

5.4.3 Ethical considerations

As the research was based on a practical business problem and the case study was conducted in a business environment, there are risks that research could be biased by business interests. However, the research followed a design science research methodology to ensure the rigor of the research process and valid research contribution.

The preliminary phase of the case study consisted of user interviews and workshops. The participants in these events were participating voluntarily, and any data that was gathered was handled by ensuring the anonymity of the individuals. This thesis does not reveal any confidential data from the participated organizations.

All communication related to the research have been done with honesty and transparency, and purposeful representation of any type of misleading or biased data have been avoided. The research discussion and analysis have been done objectively.

6 Conclusion

This thesis researched what kind of a toolkit could aid user-centered gamification design process. The theoretical objective of the study was to understand the main theoretical considerations when gamifying a concept. After these were identified, a toolkit to aid user-centered gamification design process was created. The practical goal of the study was to evaluate how this created Gamification Kit brings user-centeredness to gamification design process. The evaluation of the toolkit was done in a case study.

Based on the theoretical research, gamification can be viewed from both system and process perspectives. Gamification is especially used to increase user engagement and foster behavior change by using intrinsic and extrinsic motivation. However, the intrinsic motivation is driving the long-term usage of a system. Gamification design process can be divided to mechanics, dynamics and emotions. The designers can only design the gamification mechanics, but the emotions drive the usage of the gamified system. Thus, user-centered gamification should start the design process by understanding the desired user emotions that the gamification should evoke.

The user-centered gamification design process can be divided to three phases: gamification applicability, gamification ideation and gamification validation. The gamification applicability studies if gamification is applicable in the context of the service. Moreover, it identifies the most important user emotions related to the service.

Gamification ideation should be based on the identified user goals and emotions, and ideate gamification activity loops that consist of challenges, feedbacks and rewards. These three are the main elements of games. Gamification concepts should be created based on these ideated activity loops. Gamification validation phase should then validate the created gamification concepts based on the intrinsic motivation drivers of gamification – meaning, mastery, autonomy and relatedness.

Based on the evaluation of the Gamification Kit, its strength is that it introduces a structured process for gamification design that is easy to follow. By following the design process, the designers will keep the user in the center of the design process. The Gamification Kit also simplifies the complex process of gamification design, and

moves away from the common approach of only adding points and badges to a system, and focuses on understanding the needs and goals of the users, and invoking their intrinsic motivation.

The Gamification Kit is an innovative toolkit that is still in its early stage of development. The results of this study however indicate that the Gamification Kit does aid the design of user-centered gamification. The research contribution of this design science research allows future research to continue the development of the Gamification Kit or build new research on top of the findings. Still, the Gamification Kit can be used by practitioners already today to ensure that user-centeredness is considered also in gamification design.

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