Designing for user experience

A case study of Peil as an innovative user-centric news service from VG

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Abstract

In today’s innovative media market, media companies are increasingly investing in finding new ways to create attractive products and services for their consumers. User-Centered Design (UCD) is one approach for developing such products and services by involving users into the development process.

This thesis examines user-centered design in the media context. Through a case study of news app Peil, the thesis specifically looks at user-centric news application development with a special focus on user experience. Empirical findings are discussed in the context of theories and guidelines from human-computer interaction (HCI), user-centered design (UCD) and user experience (UX).

The main findings reveal that the development process of Peil mostly follows general practices and guidelines suggested by theoretical proposition. However, some discrepancies specific to the media industry have also been revealed. The content aspect has shown to be the most challenging aspect of user experience when developing user-centric news applications, while usability aspect has shown to have the highest correlation with users overall satisfaction.

By mapping the development process of Peil, together with its success and shortcomings, this thesis serves as a guideline for designing innovative user-centric news applications.
Preface

This MA project is an outcome of my profound interest in human-computer interaction (HCI) and media studies. The thesis gave me the opportunity to combine these two disciplines and conduct a research into the area of my genuine interest.

The journey of writing this work has been very exciting, engaging, and time-consuming. However, no excitement and curiosity would make this thesis completed without the help and support of great people from various areas of my life. Therefore, I would like to thank each one of them for their support, encouragement, and contribution.

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1 INTRODUCTION

User-friendliness and user experience are trendy words in today’s technology-driven, innovative media market. Media companies are increasingly placing their resources into creating user-friendly media interfaces to reach the target audience and meet their basic or unique, yet unfulfilled news consumption needs. This in return results in gaining a competitive advantage on a saturated media market (Gustafson & Johnson, 2003).

Peil, a news app from VG, is attempting to gain such competitive advantage on a Norwegian news market by providing quality user experience through the user-centered design approach. Although very trendy, user-centered design has not yet thoroughly been explored within the media context. Therefore, through the exploration of Peil, this thesis looks at the process of developing such user-centric innovative media products and explores what steps are necessary to take for meeting target user\(^1\) needs and creating a quality user experience.

1.1 Background and importance of the topic

The emergence of smartphones and mobile applications significantly changed the way media consumers interact with and experience the media content. We can now read the news on our way to work while rushing out of the house or standing in a crowded bus. We have access to the media content anywhere, anytime and in any context we desire. Smartphones have become primary source of news consumption for almost half (48%) of Norwegian news consumers, while 70% of them use mobile phones to access the news daily (Moe & Sakariassen, 2018). Accordingly, mobile technology and news website and application interfaces have become our very first touchpoints\(^2\) through the journey of accessing or interacting with the media content.

However, new technology can be confusing. It is often hard to figure out how to use them. “Design is not always intuitive and at times it leaves the users frustrated and unable to complete a simple task” (Abras, Maloney-Krichmar & Preece, 2004, p. 1). Huizingh (2000)

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\(^1\) In this thesis, term user refers to everyone who uses the product or a service, including media products. Term is also utilized when referring to digital audience and news consumers.

\(^2\) Touchpoint – a point of contact or interaction, especially between a business and its consumers (Oxford Dictionaries, 2015 a)
distinguishes between content and design and explains that “content refers to the information, features or services that are offered of web sites, design-to the way the content is made available” (Huizingh, 2000, p. 123). Consequently, digital news consumers go through two main experiences while consuming media products: 1) interaction experience with the app that serves as a container for the media content; 2) experience of the editorial content itself.

Technologies have always been necessary for media product creation and delivery, however, they were for many years broadly stable, not affecting the consumption of media content (Küng, 2013). After digital transformation and the emergence of new digital platforms, such as web pages, web applications, apps for iPad, iPhone and Android, the focus shifted from what is being provided, to how it is being provided (Storsul & Krumsvik, 2013). Furthermore, the spreading of mobile technologies has created a basis for more “personal media”, which stands in contrast with traditional mass-media and offers more flexible, personal and user-controlled communication (Hannemyar, Liestøl, Lüders, & Rasmussen, 2015). Hand-held devices have awarded media audiences with high portability, which results in “ever-growing levels of control over when, how, and where they consume media” (Napoli, 2011, p.1). As a result, media companies had to go through drastic innovations. These innovations include “changes in several aspects of the media landscape – from the development of new media platforms, to new business models, to new ways of producing media texts” (Storsul & Krumsvik, 2013, p.16).

However, not all innovative products manage to successfully connect with their consumers. Many companies are bringing what they think is a great product, service or feature to the market, only to discover that “the consumers simply do not get it” (Kraft, 2012, p. xv). Other companies achieve huge success without having any clue why (Kraft, 2012, p. xv). The question then arising is what is the secret for successful innovation? Why some companies manage to profitably connect with the consumers and utilize the technological disruption for their favor while others fail drastically? There are probably many aspects to explore in order to determine the ultimate innovation success recipe, however, if we rely on Kraft’s (2012) claim, “very often, the success of products, services, webpages, and even companies and brands comes back to one single thing: successful user experience innovation” (Kraft, 2012, p. xv). Kraft (2012) further challenges the importance of being first for gaining a competitive advantage, outlined by Gustafson and Johnson (2003) and claims that it is not important who is first, rather who is best at providing a quality user experience. To back up
his claim, Kraft uses the example of Apple’s success story and states: ”Was apple first company to apply touch screens to a smartphone? No. Touch screens existed in the mobile phone industry at least ten years before… But Apple managed to create an excellent user experience for this old technology”(Kraft, 2012. p. xv).

Hartson and Pyla (2012) also advocate for user experience and claim that “all other things being equal, a product that affords a better user experience often outsells ones with even more functionality” (Hartson & Pyla, 2012, p. 11). As an example, they highlight the competition between Blackberry and iPhone and argue that even though Blackberry provided excellent functionality, iPhone still gained tremendous success through providing quality user experience as a gateway to the functional features (Hartson & Pyla, 2012).

Based on the examples above, focusing on user experience and fulfilling your users’ needs through user-centered development approach is an important factor for successful innovation. Media industry is no exception.

Schibsted Media Group is one interesting example of a timely and successful reaction towards the disruptive digital environment. Schibsted is the largest media group in Scandinavia, and it puts great resources into the innovation of its media outlets. One such outlet is a popular Norwegian tabloid newspaper VG, which has been an innovation pioneer since the shift from print to digital newspapers. In 1995, VG launched its online edition and has gone through a number of gradual digital innovations since then. In 2010, VG introduced its third publishing platform for iPad, VG +, alongside with paper and web. Relying on media innovation theory, in regards with degree of novelty, Barland (2015) argues that VG+ was a result of incremental innovation, which refers to “gradual improvement, in which one innovation builds on another” (p. 127). Earlier in 2007, the emergence of smartphones resulted in the necessity to adjust VG nett to the smartphone platform. This change can also be considered as a gradual improvement, as it was a technology-induced change within an existing product. VGTV, launched in 2011 was another step ahead into the gradual innovation process within VG nett. However, the recent rise in mobile news consumption has provided bigger possibilities for exploitation of existing trends and mobile technology in the media field. Although less risky, gradual innovations seemed to be insufficient to solve challenging market problems and penetrate the niche markets, such as the young audience. Pioneering in innovation, Schibsted reacted on this change by developing Next Generation publishing products (NextGen), which focuses on the future of media products. Acknowledging the need for drastic changes, Espen Sundve, VP product manager at Schibsted states: “If you think the step from print to digital
was challenging, prepare yourself, the next leap for publishing and journalism is far bigger, more complex and way more exciting. It’s about going from one size fits all journalism to 1:1 journalism” (Schibsted media group, 2017). News app Peil, which is a subject of this study, is one part of these complex changes developed under the NextGen products.

![VG Portfolio](image)

Figure 1. VG portfolio. Adapted from “From one channel to great opportunities” by G. Steiro, 2018. Schibsted Media Group.

1.1.1 Case of Peil

Peil is a mobile news application from VG, created within Schibsted NextGen with the aim of reaching young audience. The app is primarily targeting young people between 18 and 25, who do not have formed news consumption habits from before.

The idea of developing an alternative news platform for the next generations led to gathering an interdisciplinary team in 2016. The team consisted of journalists, user experience professionals, developers, and a product manager. After a few months of user research and development, they came up with a news application - Peil.

The main focus of Peil is on the packaging and delivering the news in new ways that make it easily accessible and enjoyable for young users. In order to achieve this objective, Peil places a central focus on diminishing users cognitive load by providing them with very visual, short and focused news updates gathered from Schibsted media houses.
Peil was launched on App Store in Autumn 2017 and currently has over 40,000 users with 34% retention rate. However, as a product manager, Geir Larsen informs, it is still not a finished product and is undergoing continuous changes to improve its service and become more attractive to its target users (Larsen, personal communication, November 2018).

Unlike gradual changes that have been taking place within VG before, Peil is characterized by more radical innovation nature. In Schumpeterian tradition, radical innovation differs from incremental innovation by its “far reaching consequences” and the ability to “change the economy through creative destruction” (Krumsvik & Storsul, 2013, p.17). Christensen (1997) explains that radical innovation is a process where smaller companies with fewer resources are able to successfully challenge established businesses. However, there are also many examples of large and successful corporations that “have developed, implemented and profited from in-house radical innovations (e.g. Nokia and the cell phone; Kodak and the digital camera; Apple computers and the iPhone)” (Audretsch & Aldridge, 2008, pp. 7-8).

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3 Figure is adapted from internal documents of Peil, obtained through document analysis for this thesis. Document is not publically available.
4 34% of those who downloaded the app using it in the fifth week thereafter.
Developed under the NextGen publishing products, Peil represents such “in-house” radical innovation for several reasons. Firstly, it suggests the creative, radical solution for a challenging problem of engaging young audience. Secondly, it creates a niche market, and thirdly, it has the potential to challenge established businesses.

In addition, Peil has a transformative social impact by having the ambition to reach young audience and bring them back to the news. In this regard, Peil meets the media innovation criteria identified by Dorguel (2014), who argues that what distinguishes innovation from simply product development or reorganization is that it should have additional impact socially or economically (Dorguel, 2014).

According to the Norwegian Media Authority, 60% of Norwegian teenagers access the news via social media on a daily basis (Medietilsynet, 2018). Several Norwegian newspapers brought up the problem of youth absence among their readers (Aftenposten⁵, VG, DN⁶). In the interview with Dagens Næringsliv (DN) Mari Velstad, director of Media Authority states that the media industry should take young people’s media consumption habits very seriously. She suggests that if the media fails to capture the interest of the youth and adjusting their products to their needs, there is a danger that growing generations will not receive important media content (Campo, 2018).

Almost all popular Norwegian newspapers today have their news application versions developed. However, these news apps mostly represent the resized versions of their web-newspapers. In this sense, Peil is unique in a Norwegian news market because unlike its parent VG app, it is not merely a compressed version of the digital newspaper. It attempts to transform both, news and its packaging, and tailor them specifically for young readers according to their needs and news consumption habits.

However, the main question that arises is how to uncover your users’ needs and how to determine what your audience really wants? When it comes to the success of media products, there is no doubt that editorial content is the main player, as it’s the media industry after all. However, as mentioned earlier, in the smartphone era, media consumers need to interact with new technology in order to access editorial content.

Providing quality interaction experiences is the topic addressed in human-computer interaction (HCI)⁷ field. User-centered design approach is one popular method for developing

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⁷ Human-Computer Interaction (HCI) – is a study about how people interact with computer technologies. It specifically focuses on interface that facilitates this interaction.
user-friendly products by involving users in the development process. Therefore, to successfully innovate into media industry with the users in mind, it is worth to look at how user-centered design approach can be borrowed from HCI field and incorporated within media context.

1.2 Research questions and contribution

Building on the background and reasoning above, the main research question for this thesis is formulated as follows:

*How are mobile news applications developed with the user-centered design approach and the focus on user experience?*

It should be noted that the study is limited to a single case study of Peil as an example of user-centric news applications. By mapping the user-centered development process of Peil, the goal is to suggest the basis for analytical generalization which implies expanding, modifying or advancing theoretical concepts that lead to a proposed case study (Yin, 2014). Thus, this study does not aim to examine whether all innovative news applications are developed in the same way, but whether the process of development in one specific case (Peil) is aligned with practices and guidelines suggested by UCD theories, and whether these theories can be incorporated into the media context.

After mapping the user-centred development process of Peil, I will look closely into the specific aspects of UX elaborated within media context and attempt to determine the relationship between user satisfaction with each aspect and their overall satisfaction with Peil. These aspects are 1) usability, 2) interaction design, 3) visual design, and 4) journalistic content. Chapter 2 presents these aspects and explains them in detail.

Thus, the second research question will be defined as follows:

*What is the relationship between user satisfaction with specific UX aspects (usability, interaction design, visual design, content) of news app Peil and overall user satisfaction with Peil as a media product?*

The main goal of this research is to provide knowledge about innovation through the user-
centered design approach within the media context. In addition, to gain a better understanding of how UX might serve the media industry in terms of developing new forms of packaging and providing the news to the target user groups. Hence, this thesis contributes to limited literature available in the field of user-centered media innovation. By mapping the development process of Peil, together with its success and shortcomings, the thesis also serves as a guideline for designing innovative user-centric news applications.

1.3 Structure overview

Structurally, the thesis consists of five main chapters. Chapter 1 presented the problem area, the background of the study and the research questions. Chapter 2 discusses relevant theories and identifies theoretical basis for further analysis. However, the theoretical overview does not aim to provide knowledge about all aspects of different concepts within UX and UCD, but focuses on thorough explanations of specific concepts particularly relevant to this thesis. Chapter 3 presents the methodological approach of the study, explains the research procedures and discusses the quality of the research. Chapter 4 presents study findings and analysis: First, case study findings are presented and analyzed in terms of relevant theories, thereafter, survey findings are presented and analysed by applying descriptive statistics together with correlational analysis. Lastly, in chapter 5, I will summarize the findings, as well as methodological and theoretical reflections and suggest possible topics for further research.
2 THEORETICAL FRAMEWORK

This chapter aims to give an overview of the relevant research literature and elaborate a theoretical framework for this thesis. Due to the lack of research on the topic of interest, the thesis largely relies on theories, practices, studies, and guidelines from multiple disciplines, such as human-computer interaction, UX design, and cognitive psychology.

Firstly, the concept of user-centered design will be explained. Thereafter, the concept of user experience will be introduced, and specific UX components relevant to this thesis will be identified. Each component will then be clarified and explained. These components will, later on, serve as variables for identifying the relationships between users satisfaction with each UX aspect of Peil and their overall satisfaction with the product. In addition, design principles will be presented, and relevant cognitive theories will be discussed. Finally, media innovation theory will be briefly presented that will serve as a basis for selection of case for this study.

2.1 User-Centered Design (UCD)

The main research question of this thesis aims to understand the user-centered design approach within news application development. Therefore, it is essential to provide an explanation of what user-centered design entails and how it is portrayed in diverse HCI literature.

Term user-centered design (UCD) was first introduced in 1980 with the publication of the book: User-Centered Systems Design: New Perspectives on Human-computer interaction (Norman & Draper, 1986). It is primarily a software design methodology, which according to Norman (1986), utilizes the philosophy of prioritizing users and usability over the aesthetic design. However, the term has been altered since then, and in today’s design practices it is explained as a methodology that assists developers and designers in understanding their target users and creating products that effectively respond to their user needs (Lowdermilk, 2013). Pierce, Rogers & Sharp (2015) define user-centered design as the development approach where “the real users and their goals, not just technology, are the driving force behind product development” (p. 327). They further present three main principles that are commonly accepted as the basis for user-centered design approach:
1. **Early focus on users and tasks** - is concerned with understanding the users and tasks and goals they are trying to achieve.

2. **Empirical measurements** – refers to measuring the reactions and performance of the users while they are interacting with the product prototypes early in the development process.

3. **Iterative design** – refers to fixing the problems revealed from user testing and going back to the users for testing the modified solution again. The iterative design pattern follows the cycle of design-test-measure-redesign (Preece, et al., 2015, p. 328).

These three principles are incorporated in the user-centered development model presented below.

![UCD process](image)

User-centered design guidelines suggest that creating a user-friendly product always should start with the user research. Understanding the users involves answering the questions: “Who are they? What are their goals? What problems do they need to solve? In what kind of environment are they living and working? What is their context of use?” (Heinila, Strømberg, Leikas & Ikonen, 2005, p.18). However, Garrett (2011) argues that collecting broad data about the users can sometimes result in “losing sight of the real people behind all the statistics” (p. 49). Therefore, a common way to make the users more real in user-centered design is to create **personas** based on the user research (Garrett, 2011; Lowdermilk, 2013; Preece et al., 2015). A persona is a “fictional character constructed to represent the needs of a whole range of real users. By putting a face and a name on the disconnected bits of data from
your user research and segmentation work, personas can help ensure that you keep the users in mind during the design process” (Garrett, 2011, p. 49).

Personas create a basis for requirement specification, which then guides and forms the entire design process. Requirements are defined as “a statement about an intended product that specifies what it should do or how it should perform” (Preece et al., 2015, p. 353). Collecting user requirements is not an action, but a process which implies having a continuous dialog with the users to collect their needs and refine the requirements until they are clear, specific and unambiguous. (Lowdermilk, 2013; Preece et al., 2015).

Once the requirements are stable, the next step is to visualize design ideas and develop the design concepts (Heinila et al., 2005). The conceptual design ensures that requirements gathered in a research phase will be translated into the product design. In other words, it is an “outline of what people can do with a product and what concepts are needed to understand how to interact with it” (Preece et al., 2015, p. 397). Conceptual design is often visualized via scenarios, which are “informal stories about user tasks and activities” (Preece et al., 2015, p. 409). Scenarios are usually created as scripts depicting positive or negative usage of a proposed design, which helps designers to gain more comprehensive view of the product from different perspectives (Preece et al., 2015). Scenarios often assist in designing the first low fidelity prototypes, such as storyboards and card based prototypes. These are later on translated into detailed interface designs and high fidelity prototypes (Preece et al., 2015).

User-centered design approach is not a linear process, and the actions throughout the development do not come in sequential order. It is an iterative process and typically involves going back to the users for evaluating new concepts, ideas, prototypes or validating a final product. Iteration can take place at any stage of a development process and often result in refining the requirements and accordingly modifying the product (Gulliksen, Göransson, Boivie, Blomkvist, Persson & Cajander, 2003).

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8 Low fidelity prototype – simple, cheap, quick to produce prototypes, (usually paper or cardboard). They serve as a tool to test the high level concept and its functionality, rather than the visual appearance.

9 High-fidelity prototype – advanced prototype with more functionality. Looks and acts like final product.
Iterative cycle of design-test-measure-redesign is shown in the figure below:

![Iterative Process of Design](image)

Figure 4. Iterative process of user-centered design based on ISO 9241-210. Reprinted from Researchgate.net

Lowdermilk (2013) argues against common misconceptions around user-centered design approach and states that UCD is not subjective assumptions about user behavior, but objective proof that design decisions are effective: “If user-centered design is done correctly, your application becomes an outcome of actively engaging users. Therefore, any design decisions that were made by observing and listening to them will not be based on whims and personal preferences” (Lowdermilk, 2013, p. 7). He further highlights that UCD is not just a design, but it ensures that the product effectively achieves its designed purpose: “By placing users at the center of your development process, you remove ambiguity and get to the heart of what they need” (Lowdermilk, 2013, p. 6).

Mulder (2006) also advocates for involving users into the design process. He claims that listening and observing people allows for collecting information about their goals, attitudes, and behaviors. However, he also emphasizes the mismatch between what users say and what they do: “A user will clearly struggle trying to complete a task, and then claim the task was easy. Sometimes users are trying not to look stupid..., and sometimes users are trying too hard to tell me what they think I want to hear ”(Mulder, 2006, p. 2).

Lowdermilk (2013) too, emphasizes the importance of knowing when to listen to users and when to not: “Just because I´m suggesting that we listen to users does not mean that we
should listen to everything they tell us” (p. 17). Both, Mulder (2006) and Lowdermilk (2013) agree that the users are often unaware of their own behavior, and they provide a simplified understanding of their workflow. Therefore, they should be educated and carefully guided into providing valuable feedback and explaining their needs (Mulder, 2006; Lowdermilk, 2013).

Nonetheless, user-centered design is not only about converting user needs into functional requirements, but also about creating and maintaining a great user experience (Lowdermilk, 2013). UX literature typically emphasizes that distinguishing user experience goals from user requirements and usability can be confusing (Hartson & Pyla, 2012; Garrett, 2011; Preece et al., 2015). Therefore, the concept of user experience will further be explained in the following section.

2.2 User Experience (UX)

This sub-chapter aims to provide an overview over various definitions of user experience and elaborate a framework of user experience aspects within the media context. These aspects will then be utilized as a construct of measurements used for answering the second research question, which aims to investigate relationships between users’ satisfaction with specific UX aspects of Peil and overall user satisfaction.

In order to elaborate what elements of UX are most relevant to explore when designing an innovative media product, the thesis will first review what UX aspects are considered to be essential across all disciplines. Afterwards, the aspects specific to the hmedia field will be added to form a theoretical framework for further analysis.

2.2.1 Aspects of UX

User experience is a complex term, consisting of various elements, and diverse definitions are suggested by different UX practitioners and researchers.

According to Hartson and Pyla (2012), UX is “the totality of the effect or effects felt by a user as a result of interaction with, and the usage context of a system, device or product, including the influence of usability, usefulness and emotional impact during interaction” (p. 5). They further explain that the term “interaction” is quite broad and “embraces seeing, touching, and thinking about the system or product, including admiring it, and its presentation before any
physical interaction” (Hartson & Pyla, 2012, p. 5). In this regard, it is necessary to distinguish the concept of UX from the term *usability*, as the distinction is often not a clear cut (Preece et al., 2015).

HCI has traditionally been focusing primarily on usability goals alone, known as usability engineering, but recently, it has become more aware of broader range of user experience aspects where the usability is still central, together with other user experience goals (Preece et al., 2015, p. 19). To draw more specific distinctive line, “usability refers to ensuring that interactive products are easy to learn, effective to use, and enjoyable from the users perspective” (Preece et al., 2015, p. 19), while user experience places its focus on what kind of emotions the interaction evokes and how a system feels to a user (Preece et al., 2015, pp. 22-23).

However, user experience goals cannot be met without usability, since the ineffective and inefficient system is not likely to evoke desirable, positive emotions for the user. Hartson and Pyla (2012) refer to usability as only one specific component within user experience together with utility, functional integrity, persuasiveness and graphic design (pp.16-18).

Kraft (2012) makes the definition somewhat simpler and describes user experience as “the feelings that the user gets when using a product” (p.1). He suggests that in order to trigger positive feelings, the design needs to be simple, inviting and focused. (Kraft, 2012).

Schedroff (2009) focuses on the impact profound digital experience can have on users and argues that quality user experience is essential for assisting users in transforming information into personal knowledge. This knowledge is then stored in long-term memory and the association of the positive impact of a digital product is created into users mind. Therefore, it is more likely that the user will recall and return to the same experience (Shedroff, 2009).

Nielsen Norman Group provides a more complex definition: "'User experience’ encompasses all aspects of the end-user's interaction with the company, its services, and its products... True user experience goes far beyond giving customers what they say they want, or providing checklist features. In order to achieve high-quality user experience in a company's offerings there must be a seamless merging of the services of multiple disciplines, including engineering, marketing, graphical and industrial design, and interface design." (Nielsen & Norman. n.d.).

Garrett (2011) discusses the importance of decision making in the user experience design

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10 The Nielsen Norman Group (NN/g) is user experience consulting firm, founded by Jakob Nielsen, Donald Norman and Bruce Tognazzini in 1998.
process and claims that “no aspect of the user’s experience with your product happens without your conscious, explicit intent” (p.19). He argues that the best user experiences always result from a whole set of big and small decisions made on every step of the design and development process. “These decisions build upon each other, informing and influencing all aspects of the user experience.” (Garrett, 2011, p. 20).

In order to understand how these decisions are made, he suggests to “peel away the layers” of user experience and look closer into each of them (Garrett, 2011, p. 20).

He identifies five such layers that he calls planes. These five planes are as follows:

1. **The strategy plane** - focusing on product objectives and user needs. Answering the questions:
   - What do we want to get out of this product?
   - What do our users want to get out of it? (Garrett, 2011)

2. **The scope plane** - addresses functional and content requirements. Functional requirements involve what set of features the product will include, while content side is concerned with the information and editorial content (Garrett, 2011).

3. **The structure plane** - focuses on interaction design and information architecture and ensures developing a conceptual structure that enables predefined pieces of requirement fit together as a cohesive whole (Garrett, 2011).

4. **The skeleton plane** - is concerned with information design, interface design and navigation design (Garrett, 2011).

5. **The surface plane** - focuses on the sensory design and “presentation of the logical arrangements that make up the skeleton of the product”(Garrett, 2011, p. 134). On a skeleton level, out of five senses(vision, hearing, touch, smell, and taste), Garrett focuses mostly on the visual aspect and states that “this is the area where user experience designers have the most sophistication” (Garrett, 2011, p. 136).

Nonetheless, there is no clear definition of what “all aspects of the end-users interaction with the company” (Nielsen & Norman. n.d.) contain. Defining the aspects of user experience largely depends on the characteristics of both sides of interaction – users and the company itself. User characteristics, such as age, technological proficiency or cognitive capabilities largely affects their perceptions of a product (Spillane, Lawless & Wade, 2017). Similarly, depending on the specificity of a field, different aspects of user experience might be considered more important than others. For example, an art website would place a huge emphasis on aesthetic appeal, while healthcare system would focus on precision and usability.
Therefore, elaborating user experience elements is subject-specific and varies across different disciplines. The next section will specifically look at the user experience into the media field and present important UX aspects relevant to explore while examining UCD in news applications.

2.2.2 Elaborating UX aspects within media context

The literature overview presented in the section above showed that the user experience is a complex term consisting of various elements. However, the goal of this study is not to explore all the aspects of user experience but to focus on specific aspects that are essential for designing an interactive news application in order to ensure providing a quality user experience. Consequently, the scope of this thesis in terms of user experience elements will be confined to the following aspects: 1. Usability, 2. interaction design, 3. visual design, 4. journalistic content.

Usability, interaction design and visual design are elements of user experience that are considered of huge importance across most disciplines. However, news app Peil is a media product, developed for providing the young audience with journalistic content. Consequently, in addition, content element will be added as an essential aspect specifically for media field. These four aspects will be reviewed in the following sub-sections.

1. **Usability**

Zarour and Alharbi (2017) conducted a systematic literature review of the UX research published from 2005 till 2018. The study included literature from different research disciplines in relation to UX and aimed to identify UX aspects that generally need to be considered when designing for the quality user experience. Results show that the usability aspect was shown to have the most significant effect on overall user experience (Zarour & Alharbi, 2017).

As explained above, “usability refers to ensuring that interactive products are easy to learn, effective to use, and enjoyable from the users perspective” (Preece, et al., 2015, p. 19).

In HCI literature, usability is usually broken down into specific usability goals. According to Hartson and Pyla (2012) usability includes characteristics such as ease of use, productivity, efficiency, effectiveness, learnability, retainability, and user satisfaction (pp. 9-10). Preece, Rogers & Sharp (2015) describe that usability consists of the following metrics: effectiveness, efficiency, safety, learnability, and memorability. Others highlight the metrics
defined by the ISO/IEC 9126-4 that consists of only effectiveness, efficiency, and satisfaction (Mifsud, 2015). Yet others divide usability into five so-called attributes: learnability, efficiency, memorability, errors and satisfaction (Nielsen, 2012). Thus, usability is a broad concept and it is hard to define the exact elements that determine how well the system meets the usability goals. However, the definitions above give us a basis for seeing the pattern of most vital usability goals, which will be used within this thesis for measuring users perceived usability of Peil. These usability goals are 1. Effectiveness; 2. Efficiency; 3. Learnability.

**Effectiveness**

*Effectiveness* refers to “how good a product is at doing what it is supposed to do” (Preece et al., 2015, p. 19). It measures whether the product is capable of allowing people to achieve their goals, carry out their tasks and access the information in an effective way (Preece, et al., 2015).

Effectiveness of the interface implies making certain design choices that enable users using the features in a way that leads to the actions they would like to perform. Hartson and Pyla (2012) point out the limited threshold of users effort, beyond which “they give up and are not able to access the desired functionality” (p. 12). To highlight the point, they refer to Larry Marine (1994) and quote: “If the users can’t use a feature, it effectively does not exist” (Marine, 1994, as cited in Hartson & Pyla, 2012, p.12). They further cite how Marine (1994) describes usability testing of a new version of a system where users commented that “they wished they had a certain feature on the current system and how frequently they would use it. But the current product already had that feature and designers wondered why users would ask for something they already had. The answer was clear: the users did not have it because it was not accessible to them“ (Marine, 1994, as cited in Hartson & Pyla, 2012, p.12). In this regard, effectiveness is related to the principles of visibility and affordance which will further be discussed in section 2.3.2.

**Learnability**

Another important usability goal is *learnability*, which refers to “how easy a system is to learn to use” (Preece et al., 2015, p. 21). There is no doubt that every digital experience requires some learning from the users (Leung, 2008). However, it is also well known that most people do not like spending too much time and effort learning how to use the product, they want to get started right away (Preece et al., 2015, p. 21). Thus, learning product features should be possible by exploring its interface, otherwise, it will be a waste “if a product provides a range
of functionality that the majority of users are unable or not prepared to spend time learning how to use’ (Preece et al., 2015, p. 21). Therefore, interfaces should be designed in a way that facilitates “learning in the process of doing” (Leung, 2008, p. 19).

**Efficiency**

One more crucial usability attribute is *efficiency*, which refers to how quickly and efficiently the users can perform their tasks after they have learned the design (Nielsen, 2012). Digital designers are often reminded that users seek for convenience and do not tolerate inefficiency. “Saving time is regarded as the ultimate objective for both designers and users.” (Leung & Tam, 2008, p. 49).

These three usability goals (effectiveness, learnability, and efficiency) will be used for measuring user satisfaction with usability aspect of Peil.

2. **Interaction design**

At a structural level of development, the abstract issues of the strategy and scope are shifting towards the concrete factors that determine the user experience of the final product (Garrett, 2011). Here, the interaction design concept comes into play. Traditionally, interaction design used to be lumped under the term “interface design”. However, after the changing concept of interaction, it was recognized as its own discipline (Garrett, 2011).

Garrett (2011) distinguishes between interaction design and information architecture and argues that they are separate, equal concepts. He describes interaction design as a concept that is concerned with the “options involved in performing and completing tasks” (Garrett, 2011, p. 81), while information architecture “deals with the options involved in conveying information to a user” (Garrett, 2011, p. 81). However, he further adds that both concepts are all about “understanding people – the way they behave and think” (Garrett, p. 81).

Leung and Waters (2008) also argue the importance of interaction design and write that designing a digital product is no longer “creation for the sake of creation, rather, understanding the relationship between user and application is fundamental to developing something that works at a functional as well as experiential level” (p. 93).

Preece, Rogers and Sharp (2015) define interaction design as “designing interactive products to support the way people communicate and interact in their everyday lives” (p. 8).

Garrett (2011) argues that interaction design and information architecture are intangible structure of a product, which are then made tangible by specific aspects of interface design,
navigation design, and information design. Hence, since interaction design is an intangible structural plane and therefore not assessable as a single construct, in this thesis, it will be used as an umbrella term consisting of its tangible, concrete elements: interface design, navigation design, and information design. These constructs will later on be used for evaluating users satisfaction with the interaction design aspect of Peil.

**Interface Design**

As Garrett (2011) explains it, “Interface design is all about the right interface elements for the task the user is trying to accomplish and arranging them on the screen in a way that will be readily understood and easily used ” (p. 114). He also points out that successful interfaces should highlight the important features and users should immediately be able to notice them, while the visibility of unimportant aspects should be reduced. “A well-designed interface recognizes the courses of action users are most likely to take and makes those interface elements easiest to access to use” (Garrett, 2011, p.115). This is related to the visibility principle that is introduced and explained in section 2.3.2.

**Navigation Design**

According to Garrett (2011), the navigation design of a product must accomplish three simultaneous goals: 1. “It must provide users with a means for getting from one point to another” (p.118), 2. It “must communicate the relationship between the elements it contains” (p.119), And 3. It “must communicative the relationship between its contents and the page the user is currently viewing” (p. 119). All of the above ensures helping users finding their way around, and it is vital that every page “communicates clearly to users where they are on the site and where they can go ” (Garrett, 2011, p. 119).

Kalbach (2007) suggests that navigation design experience significantly outweigh visual experiences. Therefore, in order to provide satisfactory user experience, effective navigation design should be implemented. This will make users come back to your product, which in turn brings a competitive advantage to the company (p.17).

**Information Design**

Information design is all about presenting information in a way that facilitates effective communication. It is as a “glue that holds other components of the design together” (Garret, 2011, p. 124). Information design involves arranging pieces of information in a way that “reflects how your users think and supports their tasks and goals” (Garrett, 2011, p. 126).
Together with navigation design, information design has a “wayfinding” function. Navigation systems employed in a digital solution, are responsible not only for providing the navigation choices, but also “they have to communicate those choices clearly” (Garrett, 2011, p.127). Information design is the way of this communication.

3. Visual design

The importance of aesthetics and visual appeal of digital products has been highlighted in several HCI and UX literature. Preece, Rogers & Sharp (2015) referring to different empirical studies, (e.g. Tractinsky 1997; Jordan, 2000) state that the aesthetic appeal of an interface can have a positive effect on users perception of the usability of a product. “When the look and feel of an interface is pleasing and pleasurable – e.g. beautiful graphics, nice feel to the way the elements have been put together, well-designed fonts, elegant use of images and colour, a good sense of balance – users are likely to be more tolerant. … furthermore, good-looking interfaces are often more satisfying and pleasurable to use” (Preece, et al., p. 138-139).

But what exactly is meant by aesthetic appeal?

Hartson and Pyla (2012) referring to Wasserman, Rafaeli & Kluger (2000) describe the term aesthetics as “a sense of pleasure or beauty, including sensual perceptions” (p. 29). They further address the confusion about determining the aesthetic beauty and argue that the key issue regarding determining what should be considered as aesthetically appealing lies in the conflict between subjectivity and objectivity (Hartson & Pyla, 2012). They claim that “the objective view is that aesthetic quality is innate in the object or the design and is known by certain features or characteristics regardless of how they are perceived”(Hartson & Pyla, 2012, p. 29), while subjective view of aesthetics “depends on how they are perceived (Hartson & Pyla, 2012, p. 29).

Because there is no agreement on how to measure aesthetics and it all comes down to personal preferences, it is challenging to design the interface which will be perceived as pleasurable by all users. Therefore, Garrett (2011) suggests that instead of evaluating the visual design in terms of its aesthetic appeal, we should focus more on how well the design works. “How effectively does the design support the objectives defined by each of the lower plane? Does the look of the product make distinctions between sections of the architecture unclear or ambiguous undermining the structure? Or does the visual design clarify the options available to users, reinforcing the structure? ”(Garrett, 2011, p.137).

In this thesis, the goal is not to objectively evaluate the visual design of Peil, but to evaluate it from users perspective, how users perceive the visual design of Peil.
4. **Content**

Another requirement within the scope plane defined by Garrett is a *content requirement*. (Garrett, 2011). Garrett (2011) distinguishes between *content format* and *content purpose*. He mentions that when focusing on format too much, the purpose of the content is often forgotten and suggests to pay more attention to it. This is particularly important in the media context. Traditionally, newspapers were considered to have the following functions: 1) News function; 2) Editorial function; 3) Backgrounding function; 4) Entertainment function; 5) Advertising function; 6) Encyclopaedic function (Willey, 1942). Although newspapers have turned into multimedia production, the functionality of journalistic content stayed unaltered (Sánchez-García, Campos-Domínguez, Berrocal Gonzalo, 2015).

However, exploring the strategic role of online newspapers, Krumsvik (2006) writes that in a strategic context, digital editions of newspapers are primarily used for three main purposes: 1) To defend the” market position among readers and advertisers”; 2) To market the print paper; 3) To provide “the paper/company with a contemporary image” (p. 292).

Consequently, tailoring content in a way that ensures achieving strategic purposes as well as its journalistic mission would be an ideal solution for digital news product. When it comes to content format, it follows the same user-centered philosophy as any other UX aspects and requires knowing your users first. Format includes specific content features, such as font size, depth, amount of text, type of text, etc (Garrett, 2011).

According to Garret (2011), it is also very important to identify who will be responsible for each content element and its maintenance, also, how frequently it will be updated. The frequency goals usually derive from product objectives. “How often do you want users to come back? Based on the needs of your users, how often do they expect update information?” (Garrett, 2011, p. 73).

Also, based on product objectives and user needs, it is vital to prioritize which content requirements are most relevant and useful to the users and should be fulfilled (Garrett, 2011). From the media perspective, deciding which news is relevant for your users and worth publishing can be a challenge and requires substantial journalistic knowledge. Therefore, while evaluating the content aspect of Peil, news relevance perceived by users will be given particular attention. In addition, from UX point of view, the feeling users get from receiving news stories will be observed. This will measure the extent to which users feel up to date about current news with the help of Peil. All these measurements will then be combined for evaluating user satisfaction with the content aspect of Peil.
2.3 Design theories and design principles

2.3.1 Mental models and Metaphors

In cognitive psychology, a mental model is explained as “internal constructions of some aspect of the external world that are manipulated, enabling predictions and inferences to be made” (Craik, 1943 as cited in Preece, et al., 2015). In other words, it is a mental process where preliminary knowledge guides the mind to develop assumptions about how things work in a real world. In the field of HCI, this concept is used to adjust the technology to users mental models and design user interface in a way that corresponds with user’s pre-assumptions. Different people have different backgrounds and experiences, and consequently, their mental models significantly diverge. However, knowing your specific target group and evaluating their mental models will remarkably contribute in designing an intuitive user interface, which behaves the way users anticipated it would (Spolsky, 2001).

When designing an interactive product, an interplay between designers mental models and users mental models takes place. Designers mental model is “designer´s conceptualization of the envisioned system – what the system is, how it is organized, what it does and how it works” (Hartson & Pyla, 2012, p. 302), while user´s mental model is “a conceptualization or internal explanation each user has built about how a particular system works” (Hartson & Pyla, 2012, p. 303). Mismatch between designers and users mental models might cause severe interaction design flows. Therefore, testing of how designers concepts match with users understanding usually takes place in conceptual design phase, which is a “part of an interaction design, containing theme, notion, or idea with the purpose of communicating a design vision about a system or product” (Hartson & Pyla, 2012, p. 305).

One central component of conceptual design is metaphors (Preece, et al., 2015, p. 45). Metaphors are “analogies for communication and explanations of the unfamiliar using familiar conventional knowledge. This familiarity becomes the foundation underlying and pervading the rest of the interaction design” (Hartson & Pyla, p. 306).

Garrett (2011) explicitly emphasizes the importance of metaphors while explaining the concept of interaction design. He notes that our habits are usually the foundation of our interaction with the world, and thus, to make the interface easily graspable, one should consistently follow the patterns that are already familiar to the users. However, Garrett (2011) also points out that we should be very cautious while making the metaphor choices and choose them wisely based on our users mental model. “Using metaphors effectively is really
just reducing the mental effort required for users to get around and use the functionality of your product” (Garrett, 2011, p. 113).

2.3.2 Design Principles

Design principles assist UX designers in their design thinking when designing for user experience. These principles are “generalizable abstractions intended to orient designers towards thinking about different aspects of their design” (Preece et al., 2015, p. 25). Design principles within UX field are derived from a mixture of theory-based knowledge, design practices and experiences, and a common sense (Preece et al., 2015). The most commonly used design principles are concerned with “how to determine what users should see and do when carrying out their tasks using an interactive product” (Preece et al., 2015, p. 26).

There are various design principles presented in diverse UX literature. Preece, Rogers and Sharp (2015) highlight principles of visibility, feedback, constraints, affordance and consistency to be the most important ones. Lowdermilk (2013) adds proximity and hierarchy principles. Yet others add balance, unity and alignment (Tomita, 2015). Therefore, there is not a clear list of design principles to apply when designing an interactive product. However, the goal of this section is not to get a full overview over the general design principles, but to specify and explain those, that should be followed to make users interaction with the product easy and effective, which are the primary objectives of Peil. Therefore, UX principles explored in this thesis are based on Preece, Rogers and Sharp’s book Interaction Design (2015) which is used as the main textbook for an introductory course in Interaction Design for bachelor students at the Institute for Informatics, University of Oslo. These principles are:


Although, it should be emphasized that the thesis does not aim to assess the app heuristically and evaluate whether these principles are incorporated in the app correctly, but the goal is to evaluate whether Peil team took these principles into consideration in the development process while making design choices.

Visibility

The visibility principle refers to highlighting certain visual elements and making them visible for bringing the users attention to a specific interface feature (Lowdermilk, 2013). If functions are not visible, users might have difficulties finding them or knowing how to use
them (Preece et al., 2015). “The more visible functions are, the more likely it is that users will be able to know what to do next” (Preece et al., 2015, p. 26). This traces back to effectiveness, as a usability goal (see p.17). Drawing users attention to the important features they need to accomplish their tasks will make the product effective to use. In addition, visibility facilitates navigation design by making guiding features easily locatable for the users.

**Feedback**
Feedback refers to letting your users know that application has received their input and it is being processed accordingly (Lowdermilk, 2013, p. 66). “Without this confirmation, the user is left confused about whether or not their action was received by the application” (Lowdermilk, 2013, p. 66). Preece, Rogers and Sharp (2015) highlight various feedback techniques available for interaction design, which include audio, verbal, visual and combination of these (p. 27).

**Constraints**
The principle of constraints refers to restricting users from conducting certain actions. These restrictions are usually done through graphical interface features, which “prevents users from selecting incorrect options and thereby reduces the chance of making a mistake” (Preeece, et al., 2015, p. 27).

**Consistency**
The consistency principle “refers to designing interfaces to have similar operations and uses similar elements for achieving similar tasks” (Preeece, et al., 2015, p. 29). Following the consistency principle makes interfaces easier to learn and use (Preeece, et al., 2015). There is a distinction between internal and external consistency. Internal consistency refers to designing features to behave the same within an application, across different screen states. External consistency refers to designing interfaces and their features to be the same across applications and devices (Preece, et al., 2015). Garrett (2011) also points out the importance of internal consistency: “making your interface consistent with others that your users are already familiar with is important, but even more important is making your interface consistent with itself”(Garrett, 2011, p. 111).
Affordance

Affordance principle refers to informing users how to use an object/interface/feature. In other words, making your design affordable means “to give a clue” to your users (Norman, 1988). Norman (1999) differentiates between perceived and real affordance. Real affordance is attributed to physical objects, which are “perceptually obvious and do not have to be leaned” (Preece, et al., 2015, p. 29), while perceived affordance in contrast, requires having a set of learned conventions. For example, users have experiential knowledge of how to use graphical elements like icons, toolbars, links or buttons. However, they still should be designed in a way that invites users to perform certain actions: “icons should be designed to afford clicking, scrollbars to afford moving up and down, buttons to afford pushing” (Preece, et al., 2015, p. 29).

Affordance principle works together with the principle of visibility. Affordance ensures incorporating the “clues” in the interface, while visibility makes sure these “clues” are highlighted and easily noticeable.

2.4 Media Innovation Theory

As mentioned earlier, this thesis aims to understand a phenomenon of innovation through the user-centered design approach within media industry. Therefore, it is vital to understand what media innovation entails and what criteria should a product fulfill to be considered an innovation. This theoretical framework will then be applied to identify what innovation criteria Peil meets.

To characterize media innovation, Storsul and Krumsvik (2013) suggest focusing on two dimensions of change: 1. What is new, what aspects of media is changing? 2. The degree of novelty - How limited or far-reaching is the innovation and what effects does it have? (Storsul & Krumsvik, 2013, p.16).

Based on the dimension of change, Storsul and Krumsvik (2013) distinguish between 4 P’s of innovation: (1)product, (2) process, (3) position, and (4) paradigmatic innovation (pp. 16-17). They explain that in the media context, product innovation comprises both, new media technologies and platforms, as well as new services offered on existing platforms, like media applications (Storsul & Krumsvik, 2013). Process innovation refers to changes in the ways of producing, packaging and delivering media products. It also includes “innovation in media organisations and how they organize their activities” (Storsul & Krumsvik, 2013, p. 16).
Position innovation entails changes in brand identity, “a media organisation’s strategic positioning on a media market, or addressing of new target groups” (Dorguel, 2014, p. 54). Lastly, paradigmatic innovation refers to changes in organizational mindset, “such as resetting of a media organizations value creation and business models” (Dorguel, 2014, p. 54).

In media innovation theory, one additional dimension of change is highlighted – the aspect of social innovation (Storsul & Krumsvik p. 17). This refers to the social impact of the innovation, using existing services or products in a way that meets social needs and improves peoples’ lives (Storsul & Krumsvik p. 17).

Regarding the degree of novelty, Dorguel (2013) argues that what differentiates the innovation from merely a product development or reorganization is its additional economic or social impact (p. 29). Storsul and Krumsvik (2013), referring to Schumpeterian tradition, distinguish between incremental and radical innovations (Storsul & Krumsvik, 2013). As mentioned in the introduction chapter, incremental innovations are gradual changes that lead to gradual improvements, while radical innovation refers to radical changes through creative destruction, where creativity and innovation lead to disruption of the established order (Krumsvik & Storsul, 2013). This dichotomy corresponds with Christensens’s (1997) description of sustaining and disruptive innovation models. Disruptive innovation can be seen as a specific kind of radical innovation, which disrupts both, existing markets and traditional business models. This kind of innovations generally underperform the established businesses in the beginning, however, by bringing innovative value proposition and better solution to the market, they often lead to becoming attractive to the consumers and eventually challenge established incumbent businesses (Christensen, 1997).

Theoretical framework of media innovation has been utilized for selecting a case for this study. What innovation criteria Peil meets and why it is a suitable case for this study, will be discussed in chapter 3.2.1.
3 METHODOLOGY

This chapter presents and explains the methodological choices taken throughout the study. Study objectives are usually guiding all stages of the research project, including the choice of methods (Gentikow, 2005). Methodological choices in this thesis are hence a result of careful consideration of the research topic, research questions and goals, and limitations related to resources and research scope.

3.1 Mixed methodological approach

Traditionally, research is divided into two major types: Quantitative and qualitative. However, researchers increasingly employ a mixed method research approach that combines both quantitative and qualitative data to understand a complex phenomenon being investigated (Yin, 2014). One major advantage of mixed method approach is that it allows addressing more complicated research questions and “collect a richer and stronger array of evidence than can be accomplished by a single method alone” (Yin, 2014, p. 66).

This study investigates a complex phenomenon consisting of both, descriptive, exploratory and relational analysis. Consequently, mixed methodological approach is a necessary path to take.

Yin (2014) suggests that the case study approach is most suitable for answering exploratory or descriptive “how” and “why” questions, while survey is most appropriate for quantitative research and answering “what” questions. The nature of the research questions in this thesis diverge and consists of both “how” and “what” questions. Accordingly, the combination of case study and survey methods has been chosen as components of mixed method approach. Qualitative data obtained through a case study will be the main data source for answering “how” question and describe the process behind the development of Peil as an innovative news application. Quantitative and qualitative data, obtained through the survey, will be utilized to answer “what” question and uncover the associations between user satisfaction with specific UX aspects of Peil and overall user satisfaction of Peil users.

Nonetheless, it should be noted that both, survey addresses the same case as the case study and could have been embedded within a case study research (Yin, 2014). However, for more clarification and transparency of the steps taken for data gathering and analysis, I chose to distinguish survey and case study and explain and follow each research designs separately due to the noticeable difference between them.
3.2 Case study

A case study is an in-depth, detailed examination of one or more specific situations or cases (Lazar, Feng & Hochheiser, 2017, p.153). Depending on research objectives, a case study can be exploratory, explanatory or descriptive (Yin, 2014). Descriptive case study is usually interested in documenting a system, a context of technology use and the process that led to a proposed design, while explorative design aims to understand a novel phenomenon and its context (Lazar, et al., 2017). Case study of Peil aims to understand both, the process leading to a design solution of Peil, as well as the novel phenomenon of user-centered design approach in the media innovation. Thus, the study is combination of descriptive and exploratory research. Study is confined by a single case of Peil. Single case studies are increasingly used with the cases involving new design methodologies, for describing the steps that were taken throughout the process, the details of the eventual design and “the lessons learned that might be of more general interest” (Lazar, et al., 2017, p.162). Yin (2014) further outlines that a case study is appropriate for studies that investigate a contemporary phenomenon on which researchers have little or no control. Peil is a contemporary case of mobile news applications and is still in the development phase, therefore a suitable examination phenomenon for a case study research approach. Case studies often rely on multiple data collection techniques (Lazar, et al., 2017). Yin (2014) argues that the combination of different data sources is the strength of a case study research. Most common data sources generally includes interviews, observations, artifacts and documentation (Yin, 2014). Case study of Peil presented in this thesis will utilize the data gathered through interviews, observations and document analysis. In addition, quantitative and qualitative data acquired through survey will be used to strengthen the findings via method triangulation and provide a solid basis for discussion. The case study was conducted from November 2018 till March 2019. However, the study explores the development process of Peil from the beginning (2016) up until March 2019.

3.2.1 Selecting a case

A number of criteria has been applied for selecting a case:

1. The case should be a news application that represents a media innovation.
For defining whether Peil is a media innovation or not, media innovation theory, discussed in chapter 2 has been applied. In the case of Peil, all 4 p’s and social innovation criteria are being met. Firstly, Peil offers new service, simplified, effective news delivery on already existing media platform, which corresponds to product innovation criteria discussed by Storsul and Krumsvik (2013, p. 16). Secondly, the ways in which Peil is developed and its user-centered design approach significantly differ from traditional media product development approaches and incorporates users into the innovation process, thus, it meets the criteria of process innovation. Thirdly, by targeting a new user group, young audience, and consequently modifying the brand of VG in this regard, it is also an obvious example of position innovation. In addition, the need of new sustainable business models and value creation has become obvious, hence the paradigmatic change is also taking place. Finally, Peil has a social impact, as it is targeting young audience and strives to engage them in reading the news. Its value proposition involves maintaining informed, democratic society by educating and informing the young audience.

When it comes to degree of Novelty, as discussed in the introduction chapter, Peil represents “in house” radical innovation, and by bringing different value proposition then its parent company, it has a potential to challenge established businesses and disrupt the existing business models.

2. The case should be using an user-centered design approach

Personal pre-case-selection research revealed that Peil applies UCD approach and has a particular focus on understanding users tasks and goals through user research. In addition, personal communication with Geir Larsen, product manager at Peil, revealed that the app was planned to be user-centric from the beginning and the main emphasis has been placed on providing users with effective and enjoyable reading experiences.

3. The case should be already launched and should have sufficient number of users.

The objective of the project at hand is not only understanding the development process of news applications, but also determining the relationships between users perceived level of satisfaction with specific UX aspects and perceived overall satisfaction with the product. In order to measure the perceived satisfaction levels, it is necessary that the product is in usage by a sufficient number of users. It is hard to define what sufficient number might mean in this case. However, informal interviews with Peil development team in the pre-case-selection
phase revealed that Peil already had over 15,000 active users, which can definitely be considered as a sufficient number of users for measuring the perceived satisfaction levels.

4. **Team should be willing to contribute to the research and allocate their time that is required for gathering the data through different sources.**

Geir Larsen, product manager of Peil was the first person I contacted through Jens Barland, supervisor for this thesis. Larsen immediately accepted my request and was willing to contribute to the study. He and the whole Peil development team has been very helpful and collaborative throughout the research process.

Thus, Peil meets all case-selection criteria and was chosen as a suitable example for exploration of user-centered development within media context.

### 3.2.2 Interviews

Interviews are a common source of evidence in case study research approach. One important advantage of interviews is the ability to “go deep” and explore the phenomena in-depth by “giving interviewees the freedom to provide detailed responses” (Lazar, et al., 2017, p. 188). Primary goal of this case study is understanding a process of news app development. This is a complex phenomenon which requires in-depth conversations with people included in the process being studied. Hence, interviews were conducted with the Peil development team leaders, which according to Kvale and Brinkmann can be defined as elite interviews (2009, p. 147). Such interviews often raise concerns regarding confidentiality and anonymity. The status of the interviewees makes their identities openly recognizable. One solution to such matters are obtaining the consent from interviewees. For this reason, informed consents were obtained from respondents, where they agreed on using their names and job titles in this research for referencing to their responses. In addition, authorization was acquired from the Norwegian Centre for Research Data (NSD). Both, the informed consent forms and the letter of authorization can be found in Appendix 2 and 3.

Regarding the interview type, semi-structured interview was chosen because “it offers sufficient flexibility to approach different respondents differently while still covering the same areas of data collection” (Noor, 2008, p. 1604).

The main goal of the interviews was to gain in-depth knowledge about following topics: 1) What steps were taken in the process of Peil app development; 2) How each step was
performed and what was the rationale behind it; 3) Personal opinions and assessments about UCD process and the product itself.

Interviews were conducted in November 2018 and March 2019 and lasted approximately 1 hour each.

3.2.3 Observations

Observation is often an advantageous technique for gathering additional information about the topic being studied (Yin, 2014). Observations can be structured and unstructured (Kothari, 2004). In this thesis, due to its exploratory nature, I will employ an unstructured observation technique to utilize its flexibility (Kothari, 2004).

Observation evidence, obtained for this thesis, combine both participant and non-participant observation notes. Referring to direct, non-participant observation, Yin (2014) highlights that such observation “might be made throughout your fieldwork, including those occasions during which other evidence, such as that from interviews, is being collected” (Yin, 2014, p. 113). He further adds that this is especially useful in an organizational context. Thus, unstructured, direct observations have been conducted during my visits to the field while collecting other types of evidence (interviews and documents).

In addition, the participant-observation technique has also been used for obtaining an insight into the actual discussion process of the Peil team. Participant observation is a type of observation where the researcher is not merely a passive observer, but has a particular role and “may actually participate in the actions being studied” (Yin, 2014, p. 115).

After the survey data of this thesis was analyzed, Peil team invited me to walk them through the findings. During this meeting, I actively participated and observed the discussion of the team, their collaboration and their thoughts for the future. This observation took place 13.03.2019 and lasted over an hour.

3.2.4 Document analysis

Document analysis, as a research method, is especially applicable to qualitative case studies and is often combined with interviews and observations to establish credibility through data triangulation (Bowen, 2009). It is a “systematic procedure for reviewing or evaluating documents - both printed and electronic (computer-based and internet-transmitted) material” (Bowen, 2009).
Researchers often distinguish between scientific literature and other documentation sources (Skogerbø, 1996; Krebber, 2002; Syvertsen, 2004). This results in a dichotomy between “primary documents as the actual objects of the study and secondary documents as records or accounts of primary documents” (Karppinen & Moe, 2012). In social science research, primary documents refer to the “accounts produced by people who experienced the particular event or the behavior we want to study” (Mogalakwe, 2006). Such primary sources, created throughout the development process of Peil will be employed for document analysis in this thesis. These sources include reports from the team meetings, user research documents and compilation of the development process of Peil produced by Peil UX team members.

3.3 Survey

Survey is a well-defined set of questions distributed to individuals for obtaining responses (Lazar, et al., 2017, p. 105). In HCI research, survey is a popular method, especially appropriate for measuring attitudes, awareness and feedback about user experiences (Lazar, et al., 2017). Furthermore, it is often widely used for assessing the relationship between two variables, such as indicating “which product dimensions are most strongly associated with users overall satisfaction” (Müller, Sedley & Ferrall-Nunge, 2014, p. 256).

The second part (RQ 2) of this thesis is particularly concerned with measuring users feedback and attitudes towards Peil with the aim to compare how their satisfaction rate of Peil differs according to their satisfaction levels with different UX aspects. Hence, the survey is a suitable approach for gathering the necessary evidence for enabling answering the research question posed.

3.3.1 Data collection procedures

Determining your target population and the number of people selected for a survey is key to effective survey research (Müller et al., 2014). In this study, the survey is addressing the same case as the case study conducted in the scope of this very thesis. Thus, the target population has been selected accordingly - users of Peil. However, conducting a census and reaching everyone in the population is often neither possible nor necessary (Müller et al., 2014). Therefore, it is a common approach to select a
sample out of the target population and distribute the survey to the sampled units (Fricker, 2008, p. 196). As a sampling method, a self-selected survey distribution was applied. After consulting with the development team of Peil, we decided that the best way to expose the survey to Peil users would be to use its news-oriented nature and include the survey as a news story. This was because the pop-up surveys might have evoked irritation, which would interfere with positive user experience that Peil strives to achieve. Thus, the survey was presented as a news story and exposed to the sampled users.

To establish further credibility with the survey respondents, a short introduction text was also provided within the survey. Here, the study purpose was clarified and respondents were notified about their rights to withdraw from the study at any time. As for data privacy, the survey was exposed within the app which utilizes the Schibsted privacy policy about data protection (GDPR) to which Peil users have already been agreed to when registered as users. However, the confidentiality of responses has been once more emphasized in the survey introduction text for establishing trust within respondents.
3.3.2 Overall Survey structure

It is important to distinguish between two different structures of the survey: “the structure of single questions and the structure of the entire survey” (Lazar, et al., 2017, p. 119).

Defining appropriate overall structure of the survey is important, since “the questions do not exist in a vacuum, rather, they are part of an overall survey structure” (Lazar et al., 2017, p. 122). For this reason, careful attention was given to the overall survey structure, including survey layout, instructions and logical order of the questions.

To set up the survey, online tool “easyQuest” was utilized. Introduction text was presented together with the contact information in case of additional questions respondents might have. Questions related to similar topic were grouped together with the aim of lowering the cognitive load and allowing the respondents to “think more deeply about the topic, rather than “switching gear” after every question” (Lazar, et al., 2017, p. 122). Length of survey and easy, understandable language are also important aspects to consider (Lazar, et al., 2017). This was especially important for survey respondents of Peil users, because of the specificity of value Peil is creating for its users. The value lies in providing news in short, understandable and effective ways, that does not require much effort and time. For this reason, the survey that was exposed as a news story of Peil, had to be adjusted to the needs of Peil users and be precise, short and easy to understand. Therefore, survey structure has been consulted with Peil UX team and number of changes have been made through several iterations in order to adjust to the target respondents. In addition, we chose respondents native language (Norwegian) as a survey language for eliminating cognitive load and unambiguity of questions resulted by language barrier.

3.3.3 Questionnaire design

In surveys, there is only one chance of deployment of the questionnaire and unlike qualitative research, the possibility for clarification or probing questions is limited to zero. Therefore, it is essential that the questions are accurately designed to measure the topic of interest (Müller et al., 2014). Types of questions asked is one of the most important things to consider while designing a questionnaire (Müller et al., 2014).

The goal of the questionnaire was to obtain understanding of both, qualitative aspects of user experience, as well as rating single users on a dimension of satisfaction scale. For this reason, a combination of open-ended and closed-ended questions were included.
For closed-ended questions, depending on the goal of the question, diversity of question types were utilized, such as single-choice questions, multiple-choice questions and rating questions. For rating-type questions, 5 point Likert scale was used. Survey also utilized the practice of asking “contingent questions” (Babbie, 1990). In other words, some questions were filtered and asked only based on the answers on previous questions. Questions were carefully examined to avoid the common survey problems, such as asking “double-barreled” questions, biased wording in questions, or the use of the words of sensitive nature (Lazar, et al., 2017, p. 121). It is essential to conduct a pilot testing of survey questions to ensure its validity and reliability and to make sure that the questions are clear, unambiguous and unbiased (Lazar, et al., 2017). Dillman (2000) suggests three common approaches to pilot testing: 1) Expert review of survey; 2) Interviews with potential respondents to assess cognitive and motivational sides of survey; 3) Pilot study of survey tool and implementation procedures. Survey conducted for this study employed all three pilot testing methods. The questions, introduction text, and survey tool were evaluated by UX experts at Peil development team, as well as “outsider” UX expert at the University of Oslo for avoiding possible bias from the experts that actually work on the product. Multiple changes were made in the questionnaire after the expert testing and their feedback, which resulted in iteration and retesting the survey until its final version was designed. Thereafter, an informal interview was conducted with one Peil user, that helped to evaluate cognitive and motivational qualities in the survey tool. Finally, two pilot studies and informal follow-up interviews were conducted to ensure clarity and unambiguity of the questions.

3.3.4 Operationalization of construct

Burnette (2007) defines operationalization as “the process by which a researcher defines how a concept is measured, observed, or manipulated within a particular study. This process translates the theoretical, conceptual variable of interest into a set of specific operations or procedures that define the variable’s meaning in a specific study” (Burnette, 2007, p. 635). The goal of this survey was firstly, to uncover user satisfaction with each UX aspects of Peil and their overall satisfaction level with the product. This would allow further analyzing the relationships between them. Secondly, it aimed to look at the overall picture of Peil users, such as demographics, their news habits, the sources of their satisfaction or complaints they might have with the product.
Accordingly, the questions were developed by translating the interest variables into measurable questions which then were grouped in different sections.

Questions 1 and 2 identifies the demographics of the respondents, such as age and gender. Questions 3, 4 and 5 measure respondents news consumption frequency as well as the length of their usage of Peil and how they were introduced to the product.

Questions 4 and 5 measure to what extent respondents primary goal and expectations were met after downloading the app. First, open-ended question is asked to uncover what their primary goal were. Next, Likert scale closed-ended question is used to assess the degree to which they think the product helps them achieve this goal.

Questions 6, 7, 8 and 10 serve as measurements for usability aspects, such as effectiveness, efficiency and learnability.

Questions 11, 13, 14, 15 and 20 address the interaction design aspects, including how users perceive interface design, how intuitive the navigation is and how well they think the news is structured in the app. (Question 15 is an open, contingent question, which is only asked to those who think that some interface features are confusing).

Questions 16 and 17 address aesthetic appeal of Peil from respondents perspective, as well as the importance respondents say the visual appeal has to them.

Questions 18, 19 and 21 address the content aspect and measures: 1) How relevant users find the news provided through Peil. 2) To what extent they feel that Peil helps them being updated about the most important news. 3) Whether they get news from other sources or whether Peil is sufficient.

Questions 22 uncovers the aspects that users think are most important for them about Peil. Question 23 reveals what particular aspects respondents think Peil fails to provide successfully.

Question 24 evaluates the overall satisfaction with the product.

Question 25 is an open-ended question and invites respondents to think about what changes they would make about Peil.

To summarize, the survey aimed to measure users perceived satisfaction of each aspects of user experience as well as users overall satisfaction of Peil. Survey also identified what users think are the most important aspects for their positive user experience and what aspects they think should be modified. In addition, it uncovered to what extent Peil users fall into pre-defined target age group and to what degree the app fulfills users primary expectations.
3.4 Methodological challenges

Quality of the research is “commonly discussed in relation to the concepts of reliability, validity and generalizability” (Kvale & Brinkmann, 2009, p. 241). Validity is concerned with the extent to which the research is investigating what it is supposed to investigate, while reliability refers to the consistency and reproducibility of the results (Lazar, et al., 2017). Generalizability refers to study's transferability and the ability to apply the research results to other examples of the phenomenon (Denscombe, 1998).

These concepts are assessed differently in qualitative and quantitative study designs. Therefore, considering a mixed method approach of this thesis, I will separately discuss the quality of each research approach used in this study.

3.4.1 Case study research quality

Validity
To ensure the validity of the case study research, I relied on construct validity criteria, which refers to the identification of “correct operational measures for the concepts being studied” (Yin, 2014, p. 46). There are two steps that should be taken to ensure construct validity: 1. Researcher should define what specific concepts of a phenomenon the research is measuring. 2. Researcher should identify operational measures that suites the concepts (Yin, 2014, p. 46).

In this thesis, a case study is utilized for describing and exploring a process of Peil app development. Specific focus has been placed on user-centeredness and user experience. Operational measurements that match those concepts have been identified as follows: 1. User-centered development process reported through interviews with Peil development team. 2. Documentation analysis of the process. 3. Observation. These resulted in multiple sources of evidence and data triangulation which is an essential step for increasing the construct validity (Yin, 2014, p. 47).

It is also important to determine the validity of each data collection methods included in the case study design. When it comes to semi-structured interviews, validity is mainly depended on the skills of the interviewer/researcher (Kvale & Brinkmann, 2009, p. 248). I believe my journalistic background and experience with researches previously done in HCI field provide a good basis for determining the interview quality. In addition, elite interviews are characterized by an imbalance between knowledge of researcher and respondents that are usually highly knowledgeable about the topic of investigation (Kvale & Brinkmann, 2009). In
this regard, my knowledge about the topic derived from my bachelor in Interaction design has been very helpful, together with pre-interview preparation specifically about the case of Peil. Interview guides were created for ensuring that interviews would revolve around the investigation topic. In addition, raw interview data was documented into a case study database, as suggested by Yin (2014), that gives the possibility to go back and verify the details while transcription.

One major challenge that I had no control over was respondent error and respondent bias. Some interview questions required respondents to think back in time and reflect on the processes and steps that were taken months ago. This might have resulted in the inaccuracy of the answers or omitting some important information. However, the triangulation of data through document analysis and observations served to diminish these inaccuracies and strengthen the validity of the research.

**Reliability**

Reliability ensures that if other researchers follow the same procedures, they will arrive to same conclusions (Yin, 2014).

Yin (2014) suggests two tactics for ensuring reliability: 1. Use of case study protocol. 2. Creating a case study database. Both suggestions were followed. Case study procedures have been conducted following pre-developed protocol and the data generated through interviews, documents and observations have been documented in a study database.

In addition, qualitative research is often characterized by researchers subjectivity and fully reliable results are almost unachievable (Gentikow, 2005, p. 57). However, Getnikow (2005) claims that reliability can be strengthened by transparent data collection and analysis procedures, as well as researchers reflections over the process.

When it comes to interviews, they are often prone to subject error and subject bias (Kvale & Brinkmann, 2009). This means that respondents might answer differently on different days (subject error) or their answers might differ with different interviewers (subject bias). This kind of bias is hard to eliminate. However, in case of elite interviews, we can assume that the skills and high knowledge of the respondents, as well as their own interest to depict the reality as precisely as possible, would result in more reliable answers then in case of non-elite interviews.

Observations are also highly prone to researcher bias. While observing a phenomenon, “we filter what we see and hear, and interpret our observations through the lenses of our own history, experience, expertise, and bias” (Lazar et al., 2017, p. 244). Therefore, in order to
make the observation as transparent as possible, I followed Angrosino’s (2007) suggestion to make a clear distinction between observation and interpretation. Observation facts have been documented into the case study database, together with my subjective interpretations, which might or might not be aligned with the interpretations of other researchers. Document analysis, on the other hand, is very stable and does not suffer from subject errors or bias. However, Yin (2014) suggests that its low retrievability and biased selection of documents might result in low reliability. To eliminate the case of biased selection I gathered and analyzed all available documents that were related to the process of Peil development. When it comes to retrievability, even though the documents are not publicly available, I believe Peil team would be willing to contribute with these documents to other researchers that would try to reproduce the study.

**Generalizability**

Unlike quantitative research, the goal of case study is often not to generalize, but to go deeper into the data and describe or explore the phenomenon. According to Yin (2014) this gives bases for analytical generalization which implies expanding and generalizing theories. In this context, analytical generalization may corroborate, modify or otherwise advance theoretical concepts that has been used while designing the case study (Yin, 2014, p. 41). In this study, I used theoretical concepts of user-centered design and user experience and highlighted how the innovative development process is commonly conducted in regards with those concepts. Based on this theoretical proposition, I then conducted a research of one specific media product and looked deeper into it through the media lens. Thus, this study aims to generalize not whether all innovative news applications are developed in the same way, but whether the process of development in one specific case (Peil) is aligned with and can be generalized into the general user-centered design theories.

3.4.1 Survey research quality

To evaluate the quality of the survey research, it is crucial to consider the degree to which the results accurately represent the target population. Internet surveys often suffer with coverage error, a potential mismatch between the target population and the sampling frame (Müller et al., 2014). In addition, non-response bias is very common disadvantage of online surveys. Self-selected survey approach was used in this study, which is highly prone to under-coverage due to researchers limited control over the selection process (Bethlehem, 2008). In other
words, this means that those users who did not respond to the survey might have provided very different answers that would result in different conclusions. Also, the users who are early adopters and very passionate about technologies, are usually very eager to provide their feedback, thus the survey responses might be overrepresented by early adopters and not the occasional users (Müller et al., 2014).

**Validity**

For the survey research, I used two common approaches to validity identified by different researchers - face validity and construct validity (Cronbach & Meehl, 1955; Heale & Twycross, 2015).

Face validity refers to researchers examination of a content and determination of whether it is related to what the study is aiming to measure. To ensure face validity, survey questionnaire was sent to UX experts at Schibsted NextGen as well as UX expert from the University of Oslo. Neuendorf (2002) argues that face validity strengthens the survey tool, however, others consider face validity as a very subjective criteria, prone to bias and therefore, weaker criterion for determining the validity of the research (Lazar et al., 2017). Therefore, criterion validity and construct validity should also be considered. “Construct validity refers to whether you can draw inferences about test scores related to the concept being studied” (Heale & Twycross, 2015, p. 66). In other words, it evaluates whether the respondents survey score truly measures the concept that we are interested in. For example, if Peil user scored high on content satisfaction scale, does that mean that the user is actually very satisfied with the content? In order to determine homogeneity of this criteria, operationalization of the construct was created and documented above (see ch. 3.3.4). Operationalization presents what questions measure what concepts and whether there is a homogeneity within, “meaning that the instrument measures one construct” (Heale & Twycross, 20015, p. 66).

**Reliability**

Reliability of survey research is concerned with the consistency of variables and is often assessed by external and internal reliability (Bryman & Cramer, 2004, p. 22).

To ensure the external reliability of survey research, it is important to examine the survey questions and observe possible measurement errors caused by poor survey design (Lazar et al., 2017). To eliminate this type of error, survey questions were carefully examined in terms of wording and technical flows. However, measurement errors can also cause mismatch between respondents answers and their true values. Evaluating such deviation is quite
challenging and require using test-retesting technique to eliminate possible errors (Bryman & Cramer, 2004, p. 22). Respondents might answer differently in different time points and thus affect the survey results. Due to limited access on the user sample, test-retesting techniques was impossible to use in this research.

Another common practice to ensure reliability of the survey results is measuring the internal consistency of the questions/answers that measure the same construct (Taherdoost, 2016; Huck, 2007; Robinson, 2009). The most common internal consistency measure for Likert scale survey data is Chronbach’s Alpha coefficient (Tahersdoost, 2016; Cronbach & Meehl, 1995; Müller et al., 2014).

In the survey at hand, I am most interested in measuring constructs of perceived usability, interaction design, visual design and content aspects, as well as users overall satisfaction with Peil. Each constructs are measured through several questions. Chronbach’s alpha coefficient of these questions revealed internal consistency from 0.656 to 0.685. Cronbach’s alpha from 0.50 to 0.7 is generally considered as moderately reliable, while 0.7 and higher is highly reliable (Tahersdoost, 2016, Bryman & Cramer, 2004; Robinson, 2009). It is also highly dependent on how many items measured variable consists of. If the variable is measured by less than 10 items (questions), then Chronbach’s alpha is generally smaller (Nunnally, 1978). Consequently, we can say that the consistency of the questions in this survey research is moderately to highly reliable.

**Generalizability**

In order to generalize survey results, sample size and sampling procedures need to be carefully considered (Foster, Diamond, & Jefferies, 2015). There are various formulas for calculating the target sample size. I utilized Krejcie and Morgan’s formula\(^\text{11}\), which suggests that out of population size 40 000 (Peil users) for achieving 95% confidence level and 10% margin error, minimum 96 respondents would be sufficient. In order to acquire 96 responses, we need to consider the estimated response rate and expose the survey to the number of participants that will likely result in minimum 96 responses. Müller (2014) suggests considering the incidence rate of 50% in addition to estimated response rate. Following these guidelines, I estimated a response rate of 35 % and an incidence rate of 50%, which determined the number of target sample size: 1075

\(^{11}\) Krejce & Morgan (1970)
respondents. The number of responses obtained was 132 total, which is a sufficient number for claiming generalization.

However, the research does not follow random sampling procedure and relies on self-selected survey instead. For this reason, statistical generalizability of the survey findings is not possible. (Creswell & Plano Clark, 2011, p. 174).

Moreover, survey is conducted with the main goal to answer RQ 2 and reveal associations between variables measured, as well as describe users attitudes towards each aspect of Peil. Therefore, together with descriptive statistics, correlational analysis will be used, which in this thesis will be applied as “descriptive statistics on two variables as opposed to one (Foster et al., 2015, p.181). Consequently, no inferences will be made about the population, but the pattern will be shown which might then serve as a basis for further inferential research.
4 ANALYSIS AND FINDINGS

This chapter presents the findings from the qualitative case study of Peil and quantitative survey of Peil respondents. Findings and analysis are separated in two main sections:

1. Case study findings and analysis, comprising semi-structured interviews, document analysis and observations. This analysis mainly provides a description and exploration of the process of Peil development from the beginning (2016) until March 2019 and aims to answer the first research question.

2. Survey findings and analysis comprising quantitative and qualitative survey data. This segment aims to look at the success of Peil from the users perspective, as well as to answer the second research question by determining the relationship between users perceived satisfaction of specific UX aspects and the overall user satisfaction with Peil.

4.1 Case Study Analysis and Findings

Theoretical proposition strategy, suggested by Yin (2014), has been applied for case study analysis. Theoretical proposition strategy refers to an analytical approach where proposed theory serves as a basis for case study analysis and allows for theoretical reflections, and might lead to further hypothesis or propositions (Yin, 2014, p. 136). When it comes to analytical technique specifically, pattern matching logical analysis has been utilized, which allows for comparing how findings from the case study match with the predicted theoretical propositions (Yin, 2014, p. 143).

As mentioned earlier, the case study of Peil in the scope of this thesis is concerned with answering the following research question:

RQ 1. How are mobile news applications developed with the user-centered design approach and the focus on user experience?

The theoretical framework regarding user-centered design and user experience presented in chapter 2 has been utilized as theoretical proposition. Thus, analysis will follow user-centered design principles and map the development process of Peil from idea generation in 2016 up till March 2019.
Case study database for this study consists of three sources of evidence:

• Andreas Bøhler – UX lead at Peil. Interview date: March 2019. |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 2. Research documents            | • “Personas based on Insight Interviews”  
• Notification research documents  
• “Ads in Peil”  
• “How do we do user research in Peil” (Heltne, 2018).  
• Compilation of important highlights in Peil development process over the last two years (Bøhler, 2019). |
| 3. Observation notes             | • Non-participant observation notes taken during the interviews at the working space of Peil.  
• Participant observation notes taken during the presentation and discussion of survey findings conducted within this MA project (March, 2019). |

Interviews were analyzed by theoretical reading approach, which refers to “theoretically informed reading of interviews” (Kvale & Brinkmann, 2009, p. 235). More specifically, it implies a researcher reading through the interviews several times, making theoretical connections with the specific themes of interest and interpreting the results accordingly (Kvale & Brinkmann, 2009, p. 236). This was a preferred approach because of the interview nature and research objective. The goal is to look at the process of Peil development in the lens of user-centered design theories. This way of exploration enables determining how the process of innovative media product (Peil) development is in line with user-centered development process generally used in HCI.

Document analysis was conducted with the aim to verify the interview findings or find possible contradictions. Analysis follows interview technique suggested by O’leary (2014)
where the researcher treats the document as an informant that provides relevant information for the research. In other words, this technique implies a researcher “asking” questions and finding answers within the documents. Observation notes were used as a supplementary data to gain better insight into the topic under investigation. Observation analysis also follows theoretical proposition strategy and observational notes have been approached as informants for obtaining relevant research evidence (O’leary, 2014).

4.1.1 Idea generation

According to Larsen and Bøhler, Peil was a reaction to a drastic decline in the share of young people among VG readers. A decrease in young readers from 18 to 25 is also confirmed by document analysis. The figure below, retrieved from internal documents of Peil, depicts this decline both in VG and other media outlets.

![Graph presenting a significant decrease among VG readers in the age group of 18-25. Adapted from the document “How we do user research in Peil “, by V.Heltne, 2018.]

Andreas Bøhler, UX lead at Peil, explains that it all started with a vague, futuristic vision within VG, when there was an obvious need for drastic innovation in order to stay relevant in the future (Bøhler, personal communication, March 2019). Product manager at Peil, Geir
Larsen agreeably notes the importance of the future focus, regardless of the possible risks and challenges radical innovations might involve:

“Schibsted and VG specifically, acknowledged that innovation is very difficult when you have all this legacy and you are already huge. There is so much risk connected to exploring radical ideas, however, I think the risk was very necessary to take” (Larsen, personal communication, November 2018).

As mentioned earlier, to innovate for the future, Schibsted set up a separate unit Next Generation Publishing Products (NextGen), which entirely focuses on exploring the next generations of its products. Larsen further explains that within NextGen, there is an initiative called VG next, where the idea of developing more personal, futuristic media product was initially born. This idea, later on, was developed into what now is Peil – news service from VG.

4.1.2 Initial user research

Following the user-centered design approach, Peil placed an early focus on the users and started with researching the target audience. Bøhler says that the identification of the target user group was quite easy, because of the noticeable decline in news consumption among young people between 18 and 25. Consequently, this age group was defined as a target audience for the product to be developed.

According to Bøhler, initial user research was conducted by UX researchers at Peil and was limited to interviews with 16 users. Participants were recruited in collaboration with Norstat, and the sample was approximately evenly distributed within the age range of 18-25.

UX research literature suggests that interviews are invaluable technique for understanding user needs, goals and concerns. In addition, interviews conducted on early stage of the development tend to be broad and rather unfocused for gaining broader insight from users (Lazar et al., 2017; Preece et al., 2015). Aligning with the literature, Bøhler explains that the reason why the initial user research was confined only with interviews, was that they were in

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the exploration phase and it was very important to have the possibility for asking open questions. He further adds that this way, they could gain broader insight into the user needs and formulate more follow up questions if needed to dig deeper:

“The goal of this research was to map out what typical news day looks like for this user group, learn about their general news habits, frequency of reading the news, preferences about local versus international news, and their personal interests” – says Bøhler.

According to Bøhler, interview findings were then sorted within three different categories, based on users news habits, which resulted in creating three personas: 1. Persona that reads the news regularly; 2. Persona that has a habit of skim-reading the news; 3. Persona that does not, or very seldom reads the news.

![Personas created after initial user research at Peil. Adapted from How we do user research in Peil (Heltne, 2018).](image)

Creating personas that characterize typical users of the product is a common practice in user-centered design approach and helps to better identify your users goals, attitudes, motivations, concerns and pain points (Garrett, 2011; Preece et al., 2015). Personas are grounded into the data and are usually presented with a textual description accompanied by visual representations (Nielsen, 2018). However, the method of persona is often criticized for not
describing actual people and only portraying its characteristics, which prevents designers from getting to know actual users (Bak, 2008). In addition, there is an unresolved problem of determining how many users one persona can represent (Nielsen, 2018).

In the case of Peil, following common practices, personas were derived from the data and were portrayed textually – describing their goals, attitudes, motivations, concerns and pain points, as well as visually – using photographs. However, the data that served as the basis was limited to 16 users of predefined target age group. Therefore, the question to explore is the extent to which the chosen users represent the user population Peil tries to reach. The question of whether Peil reached its target population or not, will specifically be addressed in the survey research in chapter 4.2.1.

On the other hand, UCD is more concerned with depth rather than the width (Preece et al., 2015), therefore, utilizing smaller datasets is a common approach for initial research. (Lazar et al, 2017, p.5). Consequently, we can argue that Peil did utilize the initial research approach commonly used in UCD practices.

Bohler explains that after the team discussion, out of three personas, only one has been chosen as the main target user. According to the internal research documents, the chosen persona is hypothetically named Ida and represents young people between 18-25 who do not put any effort in reading the news. However, Ida feels pressure from the society to be up to date and have some conversational knowledge about the current happenings.

The document depicts the following needs of Ida:

- Knowledge to talk about news
- Easily explained news
- Be aware of what is happening
- Avoid spending too much time and effort on reading the news
- Learn more about/be updated on her field of interest.

(Adapted from internal document Personas based on insight interviews, 2017)

In the interview, Larsen explains that this initial user research revealed main reasons why some young people have given up reading the news.

“For a lot of young people, it is too much content, too long articles, too many updates, complex language, which makes it difficult to stay on top of the news. This has proven
to be a problem for them, because in social circles they feel outside, not included, not knowing what their friends are talking about. They would like to be more up to date. So, our team decided that we should solve this for them.” - states Larsen.

He then adds that after persona-creation and specification of the target user group, both, news team and tech team of Peil defined product requirements together:

“After the discussion, both, from editorial point of view and from the product point of view we reached a common understanding of what our users need. That was a limited number of stories, visual, limited amount of text and also we put a lot of effort into the actual user experience” – says Larsen.

Bøhler also emphasizes that three very distinct problem areas derived from the research 1. Users felt like news was a burden 2. They lacked focus in how news was presented 3. They needed easy access to the news. Consequently, both, Bøhler and Larsen agree that they decided to fulfill Ida’s needs by designing an effective, efficient and visual product with understandable interaction features and quality user experience.

However, comparing the document with the interviews show that not all needs of Ida have been taken into account while specifying the product requirements. For example, the need for being up to date on her field of interest has been neglected. The document also describes that one of Ida’s goal is to be updated on the latest news related to her studies/work. In other words, Ida would like to be served personalized news that is relevant to her, alongside general news which gives her ground to take part in the discussions. Although, as Larsen and Bøhler note, personalization of content is contradicting their value proposition, even though it has been shown to be one basic need of the persona they are designing an user-centric product for. Larsen focuses on the educational value of Peil, and explains that their value lies in creating a product that provides users with the news they need to know in order to be informed about the current happenings. From the media point of view, such approach is essential for fulfilling the main functions of news journalism, to facilitate maintaining a well-informed, democratic society. However, from UCD perspective, creating and not using the personas, or not basing a design solution on their basic needs, might be a reason for failure. (Flaherty, 2018).

Consequently, we encounter a dilemma of whether the media product should rely on traditional generic approach and remain its social impact or to adjust user needs and serve
them news of their relevance. This is clearly a challenge specific to user-centered design in the media industry and a topic of potential further investigation.

4.1.3 Conceptualization and design

Bøhler notes that the clear guidelines on user needs made the concept development process quite easy. Both, Bøhler and Larsen mention that several different interaction concepts were developed along the way. According to Bøhler, the first concepts were more of a product of internal guess, digital trends and a touch of genius design\textsuperscript{13}, rather than user needs. Consequently, these concepts were based more on designers mental models than that of users\textsuperscript{14}. However, UX literature suggests the opposite, that design should first and foremost adjust users mental models (Spolsky, 2001; Preece et al., 2015). Expectedly, these design concepts proved to be ineffective and discarded soon after testing with the users.

“We were having ongoing conversations with our users. All new ideas and concepts were tested before going further in the process. For example, we had a chat functionality first, which proved to be inefficient. It was piling up too many stories on readers. Also, it was hard for the users to know which stories were going to be explained, because we did not explain everything. So, we did not develop this concept further.” – explains Bøhler.

Bøhler also states that new concepts and ideas have routinely been discussed in an interdisciplinary team consisting of developers, UX, and editorial teams. He adds that ideas are usually formulated into questions and discussed in the team to choose the best ones. Chosen ideas are then converted into mock-ups and idea cards before moving on to actual high fidelity prototype development and implementation.

\footnote{\textsuperscript{13} Genius Design – «Relies on the experience and creative flair of a designer» (Preece et al., 2015). In genius design, users role is limited to only validating a design solution.}
\footnote{\textsuperscript{14} Theory of Mental Models explained on p. 22.}
Generating such low fidelity prototypes is a common approach in user-centered design. (Preece et al., 2015; Lowdermilk, 2013; Yamazaki, 2009). However, as mentioned in the theoretical framework, todays leading UX guidelines suggest using scenarios\(^\text{15}\) as a tool for visualizing conceptual design, which then leads to developing low fidelity prototypes, such as storyboards and card based prototypes (Preece et al., 2015, p. 409). Document analysis does not show any trace of using scenarios while developing a conceptual design of Peil, neither did interview respondents mention the usage of this technique.

When it comes to specific UX aspects elaborated in a theoretical framework, Bøhler states that in the design decision-making process all four aspects (1. Journalistic content, 2. usability, 3. interaction design, 4. visual design.) were given special focus.

**Usability**

Both, Larsen and Bøhler emphasize that special attention was given to providing users with easy and effective access to the news. Such focus on usability corresponds with the needs of persona Ida for time-efficient and easy news updates.

\(^\text{15}\) Scenarios - stories depicting positive or negative usage of a proposed design, which helps designers “to gain a more comprehensive view of the proposal”. (Preece, et al., 2015, p. 409)
Bøhler explains that general news consumption experience makes young users feel overwhelmed by the amount of text in the news articles, as well as the large amount of stories. Therefore, Peil team decided to narrow down the amount of stories and make each story short and precise. As Bøhler says, this way they tried to meet their usability goals by ensuring effective and efficient news updates for their users.

As suggested by theory, efficiency refers to how quickly and efficiently the users can perform their tasks after they have learned the design (Nielsen, 2012). It has become especially important in modern news consumption where users seek for convenience and do not tolerate inefficiency. “Saving time is regarded as the ultimate objective for both designers and users.” (Leung & Tam, 2008, p. 49). Accordingly, focus on efficiency as a vital part of usability of Peil is in line with both, UX theory, as well as the needs of target persona Ida.

Content
The most relevant stories of the day are regularly selected by the editorial team at Peil. Bøhler admits that deciding what is relevant and worth exposing to Peil-users is very subjective. However, he believes the news team has sufficient competence in this field to select the content they think the readers should be informed about. Larsen also notes that they always try to calibrate towards users, however, when it comes to content, it is important to consider what value Peil wants to propose, and what the product objectives are.

“Most of our design choices about UX are based on what users are telling us. … When it comes to content, I do not believe that we should solely listen to users. Because some wants for instance Peil to be perfectly tailored for them. But it’s not our job to personalize. This is not the value that we want to offer.” – states Larsen in the interview.

As emphasized in the theory chapter, involving the users into the design process does not mean that designers should listen to everything users say (Lowdermilk, 2013). Evidently, Peil team chose to not listen to the users when it comes to their needs about journalistic content. Bøhler on the other hand, notes that they have discussed personalization ever since they started. However, he also sees it as a challenge to keep a balance between offering personalized content and “being a public servant” (Bøhler, personal communication, March 2019).
Document analysis highlights that content study was one of the research areas conducted in depth through the development phase of Peil, in June 2018. Internal research document *Content testing* shows that the content study aimed to get answers to the following questions:

- What kind of news is Ida interested in?
- What news she thinks is important?
- How does Ida measure whether she is updated about news or not?
- Why Ida does not click on a news to the front page?
- How long does she read and when does she drop out of the news? Why?
- Where is the line between what is considered to be entertainment and what you actually need to know because it is a hot topic?

(Adapted from internal document *Content testing*, 2017)

An interview guide outline was also documented with detailed description of the interview process. The study also employed think-aloud research technique, where participants were asked to go through the front page of VG and explain every action taken, why they chose to read a certain article, why they skipped another, etc. Think-aloud technique is a common approach in UCD while conducting user-based testing (Lazar et al., 2017).

Document also depicts that special focus was given to the use of words and sentences. Study findings revealed that content should be written in a non-complicated, easily understandable and informal language.

It is true that the content study was conducted to understand what Ida perceives to be most relevant news for her to meet her needs and be up to date. However, as discussed above, Ida is an umbrella character of a typical user, and users within are likely to have very subjective perceptions of what is relevant and what is not. Also, news relevant to her study/work field was one of the needs of Ida identified through the initial user research, which would be possible to fulfill through personalization. On the other hand, serving personalized content contradicts the value proposition of Peil. Consequently, relying on the evidence from these sources, we can once again argue that content is indeed a challenging aspect for user-centered news app development.


**Interaction design**

Regarding the interaction design aspect, Larsen notes that Peil team puts a lot of effort into making users interaction with the content as delightful as possible:

“Reading experience should be calm. It should allow users to focus on one thing, in addition, to be in short format and something users are familiar with” -states Larsen.

Larsen also explains that app format was chosen because it allows for creating delightful experiences with very a visual interface, utilizing the entire screen, using large images and providing consistent user experience within different screen states.

Concepts of familiarity, attention span, and consistency outlined by Larsen are well-known concepts in interaction design literature and practice. Familiarity principle is related to the concept of Interface metaphors, which is “intended to provide familiar entities that enable people to readily understand the underlying conceptual model and know what to do at an interface” (Preece et al., 2015, p. 45). Tidwell (2010) advocates for familiarity principle and argues that because users act habitually, familiar interface features should be included in the design for avoiding confusing experiences.

Regarding attention span, it is commonly known in HCI that the way information is presented can have a great influence on how difficult or easy it is to focus and obtain a piece of information (Preece et al., 2015, p. 67). In this regard, it relates to visibility principle discussed in the theory chapter. Visibility principle refers to visually highlighting certain elements for catching users attention (Lowdermilk, 2013, p. 65). One story per screen is one strategy Peil is using for achieving users focus and attention to the news.

Consistency principle is another key principle in interaction design and “refers to designing interfaces to have similar operations and use similar elements for achieving similar tasks” (Preece, et al., 2015, p. 29). Consistency makes interfaces easier to learn and use (Preece, et al., 2015). As Larsen mentions, Peil focuses on providing internal consistency by making similar design between different screen states.

When it comes to other design principles, such as feedback, affordance and constraints, they were neither mentioned in the interviews, nor shown by internal documents. This might be a result of the trade-offs that can arise when applying more than one design principle. For example, constraining users from conducting certain actions might lead to diminishing the
visibility of information (Preece et al., 2015). In addition, applying the affordance principle might cause the interface to become more cluttered and thus difficult to use (Preece et al., 2015). Therefore, design choices largely depend on prioritizing some principles over others. Thus, based on interviews and document analysis, we may say that Peil prioritized usability over affordance and visibility over constraints. However, if we look at the interface of Peil itself, there is a clear presentation of the affordance principle.

As explained in the theory chapter, affordance principle refers to informing users how to use an object/interface/feature. In other words, making your design affordable means “to give a clue” to your users (Norman, 1988). The example below shows how Peil gives user a clue what to do with the interface.

Figure 11. Screenshots of Peil. April 2019.

Screenshots above depict different screen states of one story exposed in Peil. Arrows are pointing towards so-called “clues” that give users hints where to go next. Small dots on the upper left corner show users current location and by placing them in a column, it guides users towards scrolling up or down if they want to read about different stories.
Horizontal line increments to the bottom of the interface are giving a hint that users should pursue the continuation of the story horizontally. This is afforded by a familiar “swipe” function.

Consequently, even though not mentioned in the interviews and internal documents, the affordance principle can be traced through the interface. However, it should be noted that this thesis does not evaluate the app heuristically, but explores whether these principles were discussed in the process of making design choices. The fact that some principles were not mentioned in the interviews, but clearly has been addressed through the design process, might be a result of methodological error. Interviews were conducted with only two leaders of Peil team, which might have been insufficient for providing a full picture over each design decision made. In addition, interviews required respondents to think back in time and recall information from the past events. This might have caused omitting some details about design decisions and implementation of specific interface features. Such errors will further be addressed in the methodological reflection in chapter 5.2.

**Visual design**

Chapter 2 discussed the importance of the visual appeal of a digital product and showed that aesthetic appeal of an interface is generally considered to have a positive effect on user perception of the usability of a product (Preece et al., 2015). Agreeing with the theory, Bøhler also highlights the importance of visual design in creating quality user experience:

“Visual aesthetics is super important. It adds a lot to user experience. If the user thinks the design is aesthetically appealing and evokes nice feelings, they are more likely to come back” -says Bøhler.

According to Bøhler, Peil team had a visual designer in the beginning, however, he also adds that after the initial design was developed, it has not been hard to maintain the app without a separate visual designer.

Document analysis does not show any research done regarding visual design. However, Larsen states that the visual design of Peil derived from its focus on simplicity and usability, rather than user wishes. Such an approach corresponds with the original UCD philosophy of prioritizing usability over the aesthetic design (Norman, 1986). In other words, designers should focus on how the look of the product supports the usability aspect, highlights the
options available, makes distinctions between sections and clarifies important interface features (Garrett, 2011, p.137). Accordingly, Peil chose to utilize visual design for supporting the usability of the app to make the news easily accessible and readable by simplified visual concept.

4.1.4 Tests and empirical measurements

Peil utilizes various tools for testing the app and its specific aspects with the users. Bøhler repeatedly mentions the ongoing process of conversation with beta users where they evaluate users attitudes about new concepts and ideas. In addition, the UX team arranges usability tests every month with the new users every time, to eliminate bias by the possible feeling of belonging beta users might have developed towards Peil.

Usability testing

In HCI field, there are two perspectives commonly taken for usability measures – to focus on objective measurements of user performance, and to focus on users’ opinions and their perception of interaction (Preece et al, 2015). Bøhler clarifies that Peil utilizes objective measurement perspectives and usually conducts two-folded usability tests focusing on user performance. The first part consists of short interviews to establish what kind of news person the participant is. The second part consists of actual usability testing where participants are given specific tasks or asked to freely explore the interfaces, depending on the unit being tested.

“We usually give them some time to explore first, and then you always dig deeper into specific things. We film that as well and we see if they misunderstand something, or if they do not see a function at all”. – Explains Bøhler.

Such exploratory user-based testing is a common practice in HCI literature and usually performed on a formative level early in the development process (Lazar et al., 2017). The goal of formative testing is often to test how interface components are perceived by users rather than how well it serves user to complete a task (Rubin & Chisnell, 2008). Contrary, summative testing is applied when high-level design choices have been made. Goal of such tests is to evaluate effectiveness of design choices and validate the product with the users (Lazar et al., 2017).
According to Larsen, Peil is not a finished product and even though already in usage, it is still in a formative phase. This explains the formative character of usability tests conducted by Peil, which serves as a detector of possible interface flows with the aim of fixing them and modifying the product.

Lazar (2017) suggests that it is near to impossible to find all the flaws of the interface. Instead, designers should focus on finding and fixing major flaws (Lazar et al., 2017). In case of Peil, Bøhler informs that such major flaws are defined after usability tests by sorting them by amount and severity.

“We do planning sessions every Monday, and then we look at what we can do. If there are some flaws, we need to fix them before going on implementing the new ideas.” – says Bøhler in the interview.

In addition, Peil utilizes a feedback function for gathering users perceptions and opinions. Feedback functionality is embedded in the interface which gives the users a possibility to evaluate the app at any time and express their satisfaction or dissatisfaction with the product or its specific features.

Notification study
Document analysis also reveals that Peil relies on users feedback and test findings while implementing any new concept or function. One example is the notification study, consisting of three separate documents:
1. Editorial plan for diary study;
2. VG Next – Notification research;
3. Notifications study.

Editorial Plan for diary study is a document for the Peil team, describing the goal of the study, as well as how the study should be conducted. The goal of the study was to test three specific aspects:
1. Use of emoji
2. Top stories notifications
3. Afternoon brief notifications
Editorial plan was supported by another document *VG Next – Notifications Research* that specifies the questions Peil team needed answers to. Document also includes a detailed process of how the diary study about notifications was to be conducted and explains steps that needed to be taken in pre, during and post-study phases.

Diary research comprises the following steps:

- Pre-interviews to ask Ida what she thought she wanted.
- 2 weeks of sending notifications to 6 Idas (6 participants).
- Survey every day with the same questions to get immediate reactions.
- Interviews after the test to get overall opinions.

(Adapted from internal document *VG Next – Notifications research*, 2017).

According to the study findings, users initial skepticism towards notifications drastically changed by the end of the diary research.

Document also depicts a selection of notifications in terms of content and explores what topics should be notified. General, brief, and breaking stories were shown to be acceptable notification topics. Research also tested if users would like to receive personalized notifications. Results suggest that participants views diverge in this regard, and more testing is necessary.

Notification research shows the diversity of research techniques Peil employed to test a single function and gather the voice of users. Diary research used in notification study is often addressed to research usage patterns, as well as the presence of frustrating experience among users interacting with a product. (Lazar et al., 2015, pp.136-138). If done incorrectly, notifications might evoke frustrating experiences among users, which contradicts the user-experience goals Peil thrives to achieve.

**Content testing**

Document analysis further reveals that Peil places a significant focus on content testing. Peil research timeline document clearly states that “if the content does not work, it does not make much sense to make nice buttons”(Bohler, 2019). Consequently, Peil repeatedly conducts content evaluations and new editorial concepts are always tested with the users. Through content testing, Peil created general editorial guidelines the news team should follow.
Key points of the guideline are presented below:

- Avoid difficult words.
- Explain difficult concepts if they are necessary to use.
- “Everything” should be explained – do not assume that the terms and concepts are commonly known.
- News with political content should be explained without explicit use of the word “politics”.
- Talk with – and to – the readers.
- Always communicate with a language the readers understand.
- Be friendly, helpful and informal.
- Use easy words and phrases.

(Adapted from the internal document of Peil Content testing, 2017)

These guidelines are closely adjusted to the characteristics of Peil users, identified through user research and presented by persona Ida. As mentioned above, Ida is a young non-reader, who has a need for quick, easy news updates. She is not putting any effort into searching for and reading the news. Consequently, it is highly unlikely that she is willing to put any effort in learning new terms and phrases. Therefore, editorial content should match her needs and level of knowledge. This is no different from the adjustment of an interface to the user expertise. Tidwell (2010) discusses that users motivation and willingness to learn is often quite low if sophisticated interface design conventions are used. Therefore, she suggests that subject-specific vocabulary used in the interface should be in line with the user’s level of knowledge and unfamiliar terms should be explained (Tidwell, 2010).

Retention rate

Another measurement used for evaluating the success of Peil is the retention rate. Retention rate is the measure of number of users who continued using Peil after some time from downloading the app. Bøhler explains that it is a success measurement because users only stay if they are satisfied, and when users are satisfied it is a success.

“If people are satisfied, they usually want to stay, and we have seen a very steady increase over the past six months” - says Andreas.
Line graph below shows the increase in retention rate from 2017 to mid-April 2018.

![Line graph showing increase in retention rate](image)

Figure 12. Adapted from *How we do user research in Peil* by V. Heltne (2018)

However, statistics do not say much about why users stay or leave the app. In user-centered product development, it is vital to understand the rationale behind users certain behavior and specific interaction with the product. If the user abandoned the app, “why” questions will assist the designers to know what went wrong and accordingly fix it. Knowing why your users do certain things will guide you solving the right problem (Tidwell, 2010, p.1).

 Appropriately, Peil team tried to understand why people keep using the app and why certain users stopped using it. This would guide the team to understand what problems need to be solved in order to increase the retention rate. Retention study plan is documented in a separate document which I did not get access to. However, as an UX researcher at Peil, Veronica Heltne declares in her presentation about user research in Peil (2018), retention research was mostly done with the interview and survey techniques and 300 NOK gift card was offered as incentive for those who do not use the app, in order to increase the chance of participant recruitment.

*Iterative process*

Peil follows an iterative approach and utilizes the design-test-measure-redesign model (Preece et al., 2015). First iterations took place after developing the first prototype. The figure below, retrieved from internal documents, shows the bottom-up approach of Peil development highlighting the iteration between development of prototypes, testing, going back to the users to specify their needs and back to prototyping again.
As seen from the figure, translating user needs into the conceptual design and defining the value proposition was not a one-time fix, but a process of a continuous conversation with the users.

Similarly, iteration is central on a product level and comprises ongoing testing with the users and accordingly refining the design solution. As discussed in the theory chapter, iterative design is a vital principle for user-centered product development and takes place at any level of a design process (Preece et al., 2015). Evidently, Peil fully utilizes this principle of UCD for constant improvements to make itself more attractive and usable to its users.
4.1.5 Business strategy and future plans

Peil does not yet have an established sustainable business model and is still in an exploration phase.

According to Larsen and Bøhler, after the initial user research, the idea of payments was fully rejected simply because users were not willing to pay for the offered news service. Besides, Larsen explains that they are trying to build the identity of Peil which is distanced from VG ad, and is “more of a friend to the user than a business and something that you have to pay for” (Larsen, personal communication, November 2018).

Larsen also notes that it is not yet fully decided whether Peil should itself be profitable and sustainable business or if it should purely have a value of bringing young users back to the news, educate them and convert them into VG readers. In that case, Peil would merely have a function of marketing the VG outlets, in the same way as first digital editions of newspapers were primarily serving the purpose of marketing the print papers (Krumsvik, 2006). However, Larsen sees this strategy as very challenging, because it does not bring a tangible economic profit, and thus is not easy to evaluate its success.

Bøhler also argues that Peil needs to establish a sustainable business model and he considers the advertising to be a solution. However, in order to avoid annoying experiences traditionally evoked by advertisements, they try to have the same user-centered philosophy towards ads as towards the content.

“No one likes adds, right? But we have a goal to do adds in a way that is actually useful for our users, matches with our value proposition and have actual value for the users” - states Bøhler.

Peil is collaborating with *VG Partner Studio*, which is a content marketing entity within VG that produces stories for commercial actors. These stories are then exposed as news stories into the app. Bøhler and Larsen note that so far, they have received very positive feedback about the mentioned advertisement strategy.

“Users thought adds were a good match, they were easy to skip, easy to interact, and had same value propositions as we offer in Peil - to make you smarter in a quicker way and to inform you about something” - says Larsen.
However, the challenging part according to Larsen and Bøhler is that they have to be very selective towards advertisements to keep it relevant for their users. This provides a challenge of not being able to attract as many advertisers as needed to select relevant ads from.

To determine the usefulness and value of such adds, Peil conducted in-depth research with the users. Research objectives, process and outcomes are presented in a document *Ads in Peil*. According to the document, the goal of the research about adds was to test the following hypothesis with the users:

> “we believe that having quality ads as a natural and integrated part of the user experience can have value for the user and be highly efficient for the advertiser” (*Ads in Peil*, 2018).

The study tested three main constructs:

- Native adds
- User payments
- Relationship with VG

Ads were tested by following steps:

- Place ads in the feed over one week
- Measure engagement rate
- Conduct interviews with users

Tests were run from 18th to 22nd of June in 2018.

Users reported that the ads were indeed a good match, relevant, easy to skip and had informative value for them.

The study also examined users relationships and attitudes towards VG. This was relevant research topic because of the ongoing discussion about whether Peil should stay its own product, or to be a product inside VG.

> “With VG they are not reaching the audience that Peil is reaching. So, instead making a separate product, they just want to put our content into VG, which sounds doable, but I don’t think we believe that is the solution for now. I believe that would create more noise, while we want to create a space that does not have noise, so it is contradicting our purpose.” – Explains Bøhler.
Although research findings reveal high trust and positive relation towards VG, whether Peil should be part of VG or stay its own product is still a topic of discussion and no decision has yet been made. When it comes to user payments, findings suggest that users are unenthusiastic to pay for the current offering. Users mentioned that more content, exclusivity, and personalization are important for them, that Peil lacks for now (Ads in Peil, 2018). Here we come across with the topic of personalization of content again. Users clearly report that the current solution of Peil is not enough for them to be willing to pay for it. They once again report the need for personalization. Thus, the challenge of content aspect is not merely a deviation from user-centered design practices in other disciplines, but also a matter of a conflict between making a profitable product or maintaining a journalistic value.

“We are part of a company that has commercial interest of course, and Peil has to be sustainable, but I believe we also have a responsibility to innovate for and bring value to the people that are not commercially that attractive as somebody who is 40+ and has more money to spend on news” – notes Bøhler.

To summarize, as Larsen explains, the future plan, for now, is to build an appropriate business model, continue talking to the users and advertisers and try to find a perfect fit between them. He believes that even though no sustainable business model has yet been established, positive user feedback is a sign of success.

“For now, our biggest confirmation that we are doing something right is the feedback we get from the users. On average, twice a day, we get emails saying- thank you very much, you solved my problem. And that’s just from random users, which is actually something for us, because no one ever wrote us an email before and thanked us for what we were doing.” – notes Larsen.

4.1.6 Interdisciplinary teamwork

Document analysis highlights the importance of involving interdisciplinary team into all phases of user research and the whole product development process. As mentioned earlier, Peil team consists of members from various disciplines such as UX designers and researchers, Journalists, developers and product manager. Consequently, different roles are interested in
different research questions and look at the development from several angles. The figure below presents the roles working for Peil and their main interest areas:

![Figure 15. Adapated from a compilation of Peil development timeline, by A. Bøhler, 2019.](image)

As a result, research timeline documents emphasize the essentiality of involving the whole team into the UX research process.

![Figure 16. Emphasis on engaging the whole team into UX research. Adapted from How we do user research in Peil by V. Heltne (2018)](image)

Documents also present cross-disciplinary sync-meetings conducted every other week where they discuss research related topics, share insight about research findings, and identify possible new research questions. These sessions serve as planners for upcoming activities. Non-participant observation notes taken during the interviews verified the document and interview findings. Interview subjects for this research, product manager Geir Larsen and UX
lead Andreas Bøhler were very knowledgeable regarding all aspects of Peil development. For example, Larsen was able to recall the process of initial user research and analysis in detail. UX lead, Andreas Bøhler, was also very familiar with potential business model of the product, which is not primarily a task of an user experience designer.

Participant observation during the presentation of survey findings, conducted within the scope of this thesis, also confirmed that all team members participate in the discussion about each aspect of the product. Even though the survey findings were mostly concerned with UX aspects, the cross-functional team attended the meeting including developers, user researchers, UX designers, journalists, and the product manager. Each of the roles had different questions during the presentation and discussion of the survey findings. In addition, the observation also revealed that Peil team works in a shared office environment and the team members have close collaboration regarding every aspect of the product development.

Involving various skills into the design decision-making process is considered as an essential part of the user-centered design approach. Preece et al. (2015) emphasize the vitality of integrating a multidisciplinary team into the design process, which in turn results in generating more ideas from different perspectives and producing creative and original design solutions. (Preece et al., 2015).

4.1.7 Why UCD?

Having worked many years for VG, Larsen finds the shift from traditional towards a user-centric approach highly necessary for a successful innovation into the media field. He argues that traditionally, newspapers have had mostly one-way conversation with their readers and there was no culture for asking users if the media product is useful to them. He further explains that in traditional media, the success of a change was usually measured quantitatively.

“The method was to put something on the front page and see if it flies, then measure everything and try to understand the users” – says Larsen.

However, he further mentions that, in NextGen, they made a conscious choice to be user-centric from the beginning, and understand the users first before developing the product. He
notes that this way of working was new to him two years ago, but now he has been convinced that it is an essential approach for gaining a competitive advantage to the media market.

“We have proven that this way of working is the quickest way to actually meet user needs and create a successful product. And to be quick is very important in today’s competitive, innovative environment”. – Adds Larsen.

Both, Larsen and Bøhler note that media industry does not fully utilize the possibilities of mobile platforms and continue using traditional newspaper structure in a digital format.

“I think traditional news services are not really doing enough to extract the full potential of digital products, it’s very much like wrapping a physical newspaper into a screen, which I think is a shame, because there is so much more that you can do in terms of news production and presentation. We are trying to utilize these possibilities we have through user-centered design approach.” – states Bøhler.

Larsen further adds that being user-centric and listening to the voice of users has been a missing piece in media product development until now.

4.2 Survey findings and analysis

As mentioned earlier, the main goal of the survey conducted in this thesis is to answer the following research question:

**RQ 2.** What is the relationship between users satisfaction with specific UX aspects (usability, interaction design, visual design, content) of news app Peil and overall user satisfaction with Peil as a media product?

In addition, by measuring users attitudes towards Peil for further comparison with initial product objectives, the survey serves as supplementary evidence for understanding a complex phenomenon of user-centered design approach within the media context.
Since the survey at hand includes both, open-ended and closed-ended questions, I will follow the common approach of analyzing a survey with mixed data types and will separate quantitative and qualitative data for further analysis (Lazar et al., 2017).

**Quantitative data analysis and findings**

For analyzing the quantitative dataset, descriptive statistics and correlational analysis have been applied. The dataset was first cleaned up and screened for possible errors, as the parts of data were manually entered by participants and there was a high possibility of human error (Lazar et al., 2017). Data was then coded in numbers according to a pre-developed codebook and prepared for analysis using the SPSS analysis tool for Mac, version 25.0.

Correlation analysis was used to determine the relationship between users satisfaction with each UX aspect and overall user satisfaction with Peil. This analysis was chosen because it is commonly used to assess relationships between variables (Lazar et al, 2017). For example, in HCI research, “correlations can indicate which product dimensions (e.g. ease of use, speed, features) are most strongly associated with users overall satisfaction” (Müller et al., 2014, p. 256).

Because the data is ordinal, and not normally distributed, Spearman’s Rank-Order correlation analysis has been used as it is a non-parametric version of Pearson product-moment correlation and measures the direction and strength of association between variables (Hardy, 2004).

Survey questions that were measuring the variables used in the correlational analysis were marked as obligatory. Consequently, no missing values have been registered. Four main variables has been identified representing user satisfaction with different UX aspects of Peil:

1. Perceived usability of Peil.
2. User satisfaction with media content of Peil.
3. User satisfaction with interaction design of Peil.
4. User satisfaction with visual design of Peil.

Each construct, except for visual design, was measured with several questions. Variables derived from each question were then computed in SPSS and four variables of interest have been identified for further analysis.
Figure 17 shows four main variables that are being analyzed and smaller measurement constructs from which these four variables have been derived.

Qualitative survey data analysis

Qualitative data derived from the survey is one type of text and belongs to the “audience content” (Lazar et al., 2017). “Analyzing text content involves assigning categories and descriptions to blocks of text, a process called “coding” (Lazar et al., 2017 p. 303). For analyzing open questions in the survey data, an open coding technique has been applied. Open coding is usually first stage of qualitative data analysis and refers to identifying interesting phenomena in the data and assigning them labels or codes. (Lazar et al., 2017, p. 306). Codes were derived from in-vivo technique, which implies that code labels are the terms used by participants themselves. This type of coding ensures that “the concepts stay as close as possible to the participants own words” (Lazar et al., 2017, p. 306). Codes were then grouped into concepts and thereafter into categories that were used for analyzing open questions.

4.2.1 Did Peil reach its target audience?

Respondents profile

In total, 132 responses were obtained through the survey. Gender distribution was presented by 39 % male and 61% female users. The majority of respondents have been Peil users between 1 to 6 months, and 70% of users reported using the app every day. However, such high percentage of daily users might be a result of under-coverage bias. Survey was exposed only during one day, which might have excluded many users that do not use Peil daily.

Most of the users discovered the app via Snapchat (38%), some via advertisement (22%) and via friends (21%).
Age distribution

The age group of 18–25, which is defined as a primary target age group, accounted for the majority of the users. Next largest user group was the users younger than the target group (13-18), followed by the users older than the target age group (25 +).

Figure 18. Survey respondents distribution by age.

This indicates that Peil did reach its primarily defined user group (18 – 25) which represents the majority of the respondents, however, the users between 13-17 are following with only 4% difference, and users aged older then 25 constitutes 22% of the total number of users. Because the share of the target user group is not significantly higher than other age groups, taking in consideration possible coverage and response errors, we cannot be sure whether the majority of Peil users fall into the target group of 18-25. However, we can certainly say that Peil has a much broader age range of users than it was initially planned.

Other than the age group, it is important to assess whether Peil reached its specific target audience represented by persona Ida. Looking at the respondents primary motivation for downloading the app shows that they do report to have similar motivations as persona Ida. Question about the primary motivation for downloading Peil was an open-ended question and analyzed through in-vivo coding.
Categories that were derived from the analysis are shown in the graph below:

![Motivation for downloading Peil](image)

Figure 19. Users’ primary motivation for downloading Peil

Results show that the majority of the respondents downloaded the app for easy and quick access to the news with the aim of being up to date in a short amount of time. This corresponds to Ida’s needs about effectiveness and efficiency, which the app was primarily based on. This sheds some light on the earlier discussion regarding whether limited user research (16 interviews) would allow Peil to reach the user population. It can now be argued that Peil did reach its persona Ida and Peil users do have the same goal as Ida, however, age range seems to be noticeably broader than predefined age group (18-25).

### 4.2.2 Users expectations met?

To assess users perception of whether Peil meets their expectations or not, taking a closer look at their primary motivation is necessary.

Findings from the graph above (Figure 19) show that almost half of the respondents’ main motivation for downloading Peil was to get an easy and quick access to the news updates. 18,2% of the respondents wanted to be generally updated on current news, followed by 16,7%, that primarily downloaded the app for accessing the summery of most important news. 12,1 % of the respondents reported that they wanted the news “right to the point”, short, precise and not with too much “unnecessary” text.
To what extent the respondents think Peil fulfilled their primary expectations is presented in the graph below.

![Graph showing user expectations](image)

Figure 20. To what extent users think Peil met their primary expectations.

As seen from the graph, the majority of users reported that Peil does meet their initial expectations to a very great extent.

4.2.3 What are most important UX aspects for Peil users?

Respondents were asked to choose three aspects that are most valuable for them about Peil.

![Graph showing important UX aspects](image)

Figure 21. The most important aspects of Peil from users perspective.
As shown in figure 21, the three most important aspects are related to effectiveness and efficiency (usability aspect), news relevance, and fulfillment of users news-consumption needs (Content aspect). Interaction design aspect (well-structured news and easy interaction with the interface) is also important for 18 % of the users, followed by visual design, which has a high value for only 9,4 % of users.

4.2.4 User satisfaction with usability of Peil

Users perceived usability of Peil was measured through their perceived effectiveness, efficiency and learnability of the app. 70% of respondents reported that Peil helps them achieve their news related goals effectively, while only 3 % of respondents reported that they often fail to use Peil in effective way. 78% of respondents assessed Peil as efficient and reported that it does not require long time to find what they are looking for in the app. When it comes to the learnability aspect, vast majority (83%) of the respondents reported that it did not take long time to learn how to use the app.

Combined scores of effectiveness, efficiency, and learnability, obtained by computing all variables, are presented in the graph below. Due to the ordinal nature of the data (Likert scale), Median was used as central tendency measure for computing the combined scores.

Figure 22. User satisfaction with perceived usability aspect of Peil.
As seen from the graph, the majority of respondents (76.5%) evaluated the usability aspect of Peil as extremely satisfying and very satisfying.

### 4.2.5 User satisfaction with interaction design of Peil

Interaction design aspect was measured by combining the following variables: 1) ease of navigation through Peil, 2) intuitiveness while navigation 3) understandability of interface design features; 4) Information architecture.

56% of respondents find it very easy to navigate through and find what they are looking for in Peil. 72% reported that they navigate through the app intuitively, without thinking too much (less cognitive load), and only 10% of respondents find some interface features confusing. (For example, shaking the phone for giving feedback and whether to swipe horizontally or vertically.) When it comes to information architecture, majority of respondents (88%) are very satisfied with how the content is structured on Peil.

Graph below presents users satisfaction with the overall interaction design aspect.

![Respondents satisfaction with Interaction Design aspect of Peil](Image)

Figure 23. User satisfaction with interaction design aspect of Peil.

As seen from the graph, 68.1% of respondents are extremely satisfied or very satisfied with the interaction design aspect of Peil.
4.2.6 User satisfaction with media content of Peil

Content aspect was measured by combining three variables: 1) perceived news relevance; 2) feeling of being updated with the help of Peil; 3) the need for other news sources for sufficient news updates. 58% of respondents perceive news on Peil as very relevant, (following by 32 % find the news quite relevant) 72% of respondents reported that they feel updated about current news with the help of Peil, however, 41 % of them still are regularly using other news channels for news updates.

Figure 24. User satisfaction with content aspect of Peil.

Overall, 59 % of users are extremely satisfied or very satisfied with the content aspect of Peil.

4.2.7 User satisfaction with visual design of Peil

Users satisfaction with the visual design aspect of Peil was measured by a single question where the respondents were asked to rate the overall design of Peil on the scale from “very bad” to “very good”.

76
As presented in the graph, vast majority (96.2%) of respondents rated Peil’s aesthetics as very good or good.

4.2.8 Overall user satisfaction with Peil

Users overall satisfaction with the product was measured by a single question where respondents were asked to answer how satisfied they are with Peil. Respondents positively rated the overall product. The graph below shows that the majority of respondents (70%) are very satisfied with the app, followed by 27% that are quite satisfied with Peil.

Figure 25. User satisfaction with visual design of Peil.

Figure 26. Users’ overall satisfaction with Peil.
4.2.8 Relationship between each UX aspect (usability, interaction design, visual design, content) and users overall satisfaction.

Spearman’s rho correlation coefficient was applied to reveal associations, its direction and strength between each UX aspects that were measured and overall users satisfaction with Peil. The line chart below shows user satisfaction with each aspect following overall satisfaction scale.

![Figure 27. Relationship between specific UX aspects and overall user satisfaction.](image)

Correlation tests revealed that the overall user satisfaction of Peil is positively associated with all four UX aspects measured. However, the strength of relationships somewhat diverge. Usability aspect appears to have the strongest positive correlation with the overall product satisfaction of Peil ($r_s = 0.582$). The relationship is significant ($p = 0.01$) and shows that those users who perceive Peil as effective, time efficient and easily learnable, are overall more satisfied with the product.

Next aspect that is strongly associated with overall user satisfaction is interaction design ($r_s = 0.526; p = 0.01$). This depicts that ease and intuitiveness of navigation, as well as understandable interface features and good information architecture, play a significant role in providing a quality experience for the users.
Content aspect also proved to be highly associated with overall satisfaction rate \( (r_s = 0.506; p = 0.01) \). In addition, content aspect was also highlighted as the most important aspect for Peil users (Figure 21). This shows that providing relevant news, sufficient news stories, and creating a feeling of being updated, might result in higher overall user satisfaction. Aspect of visual design has shown to be relatively weaker associated to overall satisfaction score\( (r_s = 0.383; p = 0.01) \). This might be an indicator that users satisfaction with the visual design aspect does not necessarily increase users satisfaction with the app.

Matrix.1.

*The matrix below summarizes the findings of importance, satisfaction scores, and correlation scores of each measured constructs (usability, content, interaction design and visual design).*

<table>
<thead>
<tr>
<th>Aspects measured</th>
<th>Importance for users</th>
<th>Satisfaction score</th>
<th>Correlation with overall satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability</td>
<td>High (25.8%)</td>
<td>High (76.5%)</td>
<td>High (0.58)</td>
</tr>
<tr>
<td>Content</td>
<td>High (46.8%)</td>
<td>Medium (59%)</td>
<td>High (0.50)</td>
</tr>
<tr>
<td>Interaction Design</td>
<td>Medium (18%)</td>
<td>Medium (68%)</td>
<td>High (0.52)</td>
</tr>
<tr>
<td>Visual Design</td>
<td>Low (9.5%)</td>
<td>High (96%)</td>
<td>Low (0.38)</td>
</tr>
</tbody>
</table>

The matrix indicates that content aspect has the highest importance for the users, which corresponds with high correlation between user satisfaction with content of Peil and their overall satisfaction with the product. However, comparing to other UX aspects, users satisfaction score with content itself is relatively moderate (59%). These findings strengthen
the case study findings regarding content aspect being a challenge in user-centric news applications. One important measurement in content satisfaction was how relevant users perceive journalistic content in Peil. News relevance is highly subjective, hence to what extent a user is satisfied with content varies according to what the user perceives as relevant. Document analysis above showed that persona Ida has a need for news related to her field of interest. However, it also has been discussed that Ida is an umbrella term and users within are likely to have various fields of interest. Hence, providing personalized relevant content would be necessary to meet each user's need for relevant news. Although, as discussed above, Peil is a social innovation with the value to be a public servant. Thus, the personalization of news comes in conflict with the value proposition.

Usability aspect scored high in all three measured constructs. It has a high importance for users, which is confirmed by its highest correlation with overall product satisfaction. In addition, respondents are highly satisfied with the usability aspect. This corresponds with the results of a systematic literature review outlined in the theory chapter which shows that the usability aspect is considered to have the biggest effect on overall user experience. (Zarour & Alharbi, 2017).

Interaction design aspects ranked relatively lower on the importance scale. However, analysis shows that users satisfaction with interaction design is highly correlated with their overall satisfaction. This indicates a possible mismatch between what users say and what they do (Mulder, 2006; Lowdermilk, 2013). On the other hand, easily understandable interface and well-structured news (interaction aspect measurements) are highly interrelated with usability aspect. Interactive product cannot meet usability goals and be efficient if users find interface features difficult to use (Preece et al, 2015).

When it comes to visual design, its low importance and low correlation with overall satisfaction reveal that this aspect does not affect the overall experience of Peil users as much as other UX aspects discussed. In addition, vast majority (96%) of users are highly satisfied with the visual design of the app.
5 SUMMARY

The main goal of this thesis was to understand a phenomenon of user-centered design within media context and specifically in news applications. Two research questions were accordingly formulated:

RQ 1 How are mobile news applications developed with the user-centered design approach and the focus on user experience?

RQ 2. What is the relationship between users satisfaction with specific UX aspects (usability, interaction design, visual design, content) of news app Peil and overall user satisfaction with Peil as a media product?

I have conducted a case study of Peil as an example of innovative user-centric news applications and mapped its user-centered design development process since the beginning (2016) until March 2019.
In addition, survey research of Peil users has been conducted to reveal how various UX aspects, identified in the theoretical chapter, are associated with overall user satisfaction with a news product.
The theory chapter explained relevant theories and literature from various disciplines about user-centered design, user experience and design principles. These were used as theoretical propositions guiding the research. In other words, the theory suggested how a user-centric product should be developed with the UCD approach. Therefore, it is interesting to look at whether the user-centered design development of news application Peil follows these propositions or whether there are some discrepancies from general guidelines when we are applying UCD in a media context.

5.1 Summarizing Key Findings

Case study results showed that development process of Peil mostly followed three main UCD principles proposed by theory:

1. Peil team placed early focus on users and understanding of their goals.
After defining a target age group of 18-25, initial user research was conducted for understanding target users goals, needs, pain points and motivations. Initial research findings were translated into three personas, from which non-reader persona Ida was chosen as a specific target user. Persona then served as the basis for requirement specification which later on evolved into conceptual models and prototypes.

Initial research was mostly conducted by UX researchers, however, the whole Peil team was involved in the data analysis and discussion. This is because Peil places a huge focus on collaboration between multifunctional, interdisciplinary team members.

2. *Peil has been regularly taking empirical measurements of reactions and performances of the users while interacting with the early prototypes.*

Results showed that Peil has utilized various tools for testing the app and its specific aspects with the users. These measurements include 1. tests regarding incorporating single concepts such as notifications and advertisements; 2.usability tests; 3. evaluating the success of Peil through retention research 4. continuously gathering and analyzing feedback from the users. Tests have been conducted with various research techniques suggested by UCD literature, including interviews, usability evaluations, diary study, think-aloud technique, surveys, and open feedback.

3. *Peil has been actively utilizing iterative design-test-measure-redesign cycle.*

Findings revealed that Peil has been testing each new design concept with the users and modifying them based on user feedback. As discussed in the theory chapter, iterative design is an essential principle for user-centered product development and takes place at any level of a design process (Preece et al., 2015). Results suggest that Peil fully utilizes this principle for constant improvements to make itself more attractive and usable to its users.

In addition, mental model theory, the concept of familiarity and design principles suggested by design theories were all taken into account and applied to the product.

Overall, Peil, as an example of innovative news application has been developed in line with theoretical propositions and has been involving users throughout the design process.

Nonetheless, some discrepancies from general guidelines and theoretical suggestions have also been revealed.
User-centered theory primarily implies that users are in the center of the design process and their voice influences all steps taken throughout the design decision making. However, the news-oriented nature of the app has shown to have an effect on the degree to which users influence design decisions regarding each aspect. Content has been shown to be specifically challenging in this regard, due to the mismatch between the value proposition of Peil and user needs.

As mentioned in the introduction chapter, recent innovations have shifted the focus from what is being provided to how it is being provided (Storsul & Krumsvik, 2013). Evidently, Peil chose to transform the way the news is packaged and delivered (“how” aspect), while it still relies on a traditional approach to “what” aspect (journalistic content). Journalistic content is still chosen by professional journalists with the aim to educate, and inform young citizens. Thus, regardless of persona Ida´s need for personalized news, Peil has resisted to give up its social value in exchange of profit.

However, Peil team has actively been discussing personalization and has been considering this as a potential path for the future. Also, it should be noted that Peil is still in the development process, and is not yet finished product with established business model. Hence, personalization might be one option for bringing economic growth and disrupting established news market.

When it comes to other UX aspects, results show that Peil almost equally prioritized usability, interaction design and content aspects of the app, while visual design was relatively overlooked and utilized for enhancing usability. Correspondingly, survey results revealed that perceived usability, interaction design and content aspects have the highest positive correlation with users overall satisfaction with the Peil, while visual design has shown to have a relatively weaker association with overall user satisfaction.

Perceived usability was shown to be strongest associated with overall user satisfaction. In other words, users who perceive app to be effective, time-efficient and easily learnable are overall more satisfied with the whole experience of Peil. Content aspect was reported to be the most important aspect for Peil users. Content has also shown to be strongly associated with overall user satisfaction.

To summarize, innovative news app Peil followed general UCD and UX guidelines and design principles to develop a user-centric product with a quality user experience. However,
because it is a media product, making content aspect user-centric has shown to be a challenge. Content aspect also proved to be the most important aspect for Peil users, which is again explained by the media nature of the app. However, usability has shown to have the highest correlation with users overall satisfaction. Thus, we can conclude that two most important aspects to place a special focus on while applying UCD in news application development are: 1. usability of the product and 2. journalistic content.

5.2 Methodological and Theoretical Reflections

This chapter provides a reflection over theoretical and methodological limitations and weaknesses of the study and highlights the aspects that could have been done differently. This thesis has provided knowledge about how user-centered design approach is utilized in news applications and what aspects of user experience are strongly associated with overall user satisfaction. Through a case study of news app Peil, I have explored the development process through interviews, document analysis and observations. I have applied theories and practices from UCD and UX, as well as elaborated aspects of UX in a media context. This framework has then been utilized as a theoretical proposition for case study research. I believe this was a suitable approach towards understanding one part of a complex phenomenon of user-centered design within media industry. However, I do see some shortcomings and do not exclude the possibility for improvement.

The thesis posed two research questions, which then served as a guide for methodological choices. This led to a mixed method approach, which combines both quantitative and qualitative data to understand a complex phenomenon being investigated (Yin 2014, pp. 65-66). The first research question aimed to understand the process of UCD development of news app Peil. Thus, case study was most suitable, as exploring a process is one of the most common examination phenomenon within a case study research approach (Yin, 2014). The study was limited to a single case study of Peil. In HCI research, single case studies are increasingly used with the cases involving new design methodologies and describe the steps that were taken throughout the process, the details of the eventual design and “the lessons learned that might be of more general interest” (Lazar, et al., 2017, p.162). However, the research question
was interested in UCD process within news applications. Although Peil was used as an example of such applications, ideally, a comparative case study would have provided deeper insight into the topic. Limitations with a single case automatically excluded knowledge about other UCD approaches in news applications that potentially might have been obtained through comparative or multi-case study. However, as already mentioned, the goal of this study was not to generally explore user-centered development in all news applications, but to provide an in-depth understanding of how user-centered approach can be utilized in developing innovative news application and what steps are necessary to take to provide quality user experience.

The process of UCD within Peil was explored through interviews, document analysis and observations. Although, it is important to note that interviews were conducted with UX lead and product manager, and no insight from the editorial team has been gathered. Even though respondents were highly knowledgeable regarding all aspects of Peil development, ideally, perspectives from editorial team members would have provided deeper knowledge on the content aspect from a media perspective.

When it comes to the survey research method, it was chosen to identify what UX aspects are strongest associated with overall user satisfaction in a media context. In addition, survey research was utilized to assess whether Peil reached its target audience, as well as the users attitudes towards specific aspects of Peil. It should be noted that survey results revealed users highly positive attitudes towards Peil regarding every aspect measured. Such extreme positive results can be due to the sampling procedure. Survey relied on self-selected sampling approach. Therefore, there is a likelihood that satisfied respondents were more willing to spend time and contribute in the research and answer the questionnaire. In addition, as already mentioned, the survey was exposed as a story in Peil and available only for current users of Peil. Common sense suggests that users continue using the product if they are satisfied. Therefore, those users who might have abandoned the app due to their dissatisfaction and might have provided different insights were automatically excluded from the sample. However, in this specific survey, the population was defined as current users of Peil, and the study did not aim to expand on all previous users of the app. Therefore, survey results can still be considered credible within the scope of this study.
5.3 Further Research

Limitations outlined in the previous section provide the possibility for future research. As already mentioned, both, case study and survey research were limited to a single case of Peil and it does not give a basis for generalization. Therefore, potential future research of broader scope of cases, as an extension of this thesis, would provide important knowledge into the field of UCD within the media context.

It would also be interesting to conduct a comparative case study comparing the process of UCD in other discipline and within media industry. This would provide more specific insight into the differences and similarities and allow for identifying the specific aspects characterizing user-centered media product development.

In addition, it would be interesting to specifically look at the content aspect within UCD as a continuation of this study. As results revealed, content aspect in news application provides a dilemma between being user-centric and maintaining a journalistic function. Therefore, this would be an interesting topic for further in-depth investigation.
Reference List:

Literature:


**Online:**


Overview over the informants and internal documents:

Interview respondents:

Geir Larsen, Product Manager at Peil. Interview date: November 2018.

Andreas Bøhler, UX Lead at Peil. Interview date: March 2019.

Internal documents:


Peil (2017) *Notification research documents.*


Bøhler, A. (2019). *Compilation of important highlights in Peil development process over the last two years.*
Appendix 1. Survey questionnaire

Brukeropplevelse av Peil

Kjære Peil-bruker,

Denne undersøkelsen er en del av en Masteroppgave om design og brukeropplevelse i medieprodukter av Mzlia Popova ved Universitet i Oslo.
Målet er å finne ut hvordan du opplever Peil, hvorvidt den oppfyller ditt behov og hvilke aspekter av brukeropplevelsen som er viktigst for deg som bruker.
Skjemaet vil ta mellom 5-10 minutter å fylle ut.
Opplysningene du oppgir vil bli behandlet konfidenzielt og vil kun bli brukt til forskningsformål.
Din deltakelse er frivillig og du har til enhver tid rett til å trekke deg fra studien.

Det finnes ikke noe feil svar på noen av spørsmålene. Det er din mening som er viktig!

Spørsmål til undersøkelsen kan sendes til Mzlia på barbarepopov@gmail.com eller peil@schibsted.com

Forrige  Neste

Dette er en anonym besvarelse. Det vil si at utsteder ikke kan koble dine svar mot din identitet.
Powered by EasyQuest

* Hva er ditt kjønn?
  Annet

* Hvor gammel er du?

* Hvor lenge har du brukt Peil?
  - Mindre enn 1 uke
  - Mer enn 1 uke
  - 1 til 6 måneder
  - 6 til 10 måneder
  - Cirka 1 år
  - Annet, spesifiser her
Hvor ofte bruker du Peil?

- Hver dag
- Ukentlig
- 1 gang i måneden
- 1-2 ganger i året
- Sjelden eller aldri
- Annet, spesifiser her

Hvordan oppdaget du Peil?

- Via Facebook
- Via Snapchat
- Via Instagram
- Via en annonse
- Gjennom en venn
- Annet, spesifiser her:

Hvorfor lastet du ned Peil? (Hva ønsket du å få ut av appen?)

I hvilken grad får du dette ut av Peil?

<table>
<thead>
<tr>
<th>Svært liten grad</th>
<th>Ganske liten grad</th>
<th>Hverken eller</th>
<th>Ganske stor grad</th>
<th>Svært stor grad</th>
</tr>
</thead>
</table>

Hva synes du om følgende utsagn:

- Peil hjelper meg å dekke mine nyhetsbehov på en effektiv måte
- Det tar lang tid å finne det jeg leter etter på Peil
- Jeg mislykkes ofte med å bruke appen effektivt

Veldig uenig | Delvis uenig | Nøytral | Delvis enig | Veldig enig
--------------|-------------|---------|-------------|-----------------|
**Hvordan synes du det å finne frem til saker i Peil?**

<table>
<thead>
<tr>
<th>Veldig lett</th>
<th>Ganske lett</th>
<th>Hverken eller</th>
<th>Ganske vanskelig</th>
<th>Veldig vanskelig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hva synes du om følgende utsagn:**

<table>
<thead>
<tr>
<th>Det tok meg litt tid å lære hvordan Peil fungerer</th>
<th>Veldig uenig</th>
<th>Delvis uenig</th>
<th>Nøytral</th>
<th>Delvis enig</th>
<th>Veldig enig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Når jeg bruker appen, navigator jeg automatisk uten å tenke for mye</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hva synes du om følgende utsagn: "Noen funksjoner i Peil er forvirrande"**

- Veldig uenig
- Delvis uenig
- Nøytral
- Delvis enig
- Veldig enig

Kan du si noe om hvilke funksjoner du synes er forvirrende og hvorfor?

**Hvordan vurderer du appens visuelle utforming?**

<table>
<thead>
<tr>
<th>Veldig dårlig</th>
<th>Dårlig</th>
<th>Hverken eller</th>
<th>Bra</th>
<th>Veldig bra</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hvor viktig er det for deg at Peil ser visuelt bra ut?**

- Ikke så viktig så lenge jeg oppnår det jeg vil
- Ganske viktig
- Veldig viktig
- Annet, spesifiser her:
**Hva synes du om følgende utsagn?**

<table>
<thead>
<tr>
<th></th>
<th>Veldig uenig</th>
<th>Delvis uenig</th>
<th>Nøytral</th>
<th>Delvis enig</th>
<th>Veldig enig</th>
</tr>
</thead>
<tbody>
<tr>
<td>jeg opplever nyhetene på Peil som relevante</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Ved hjelp av Peil føler jeg meg oppdatert på dagens viktigste nyheter</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Nyhetene på Peil er struktureret på en måte som gir det enkelt å finne det jeg vil lese om.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>jeg føler ikke behov for å søke etter nyhetsoppdateringer på andre nyhetskanaler</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**Velg tre aspekter ved Peil som er viktigst for deg:**

- [ ] Effektivitet (å oppnå mål effektivt på kort tid)
- [ ] Relevant nyheter
- [ ] Godt strukturerete nyheter
- [ ] Visuell utforming og design
- [ ] Lett brukbart grensesnitt
- [ ] Å opplyse mitt behov for å være oppdatert på nyheter
- [ ] Annet, spesifiser her:

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**Velg ett eller flere aspekter som du synes peil mislykkes i å tilby:**

- [ ] Effektivitet (å oppnå mål effektivt på kort tid)
- [ ] Relevant nyheter
- [ ] Godt strukturerete nyheter
- [ ] Visuell utforming og design
- [ ] Lett brukbart grensesnitt
- [ ] Å opplyse mitt behov for å være oppdatert på nyheter
- [ ] Annet, spesifiser her:

|  |  |
Generelt sett, hvor fornøyde er du med Peil?

- Veldig misfornøyd
- Ganske misfornøyd
- Nøytral
- Ganske fornøyd
- Veldig fornøyd

Hvis du kunne endre én ting med Peil, hva ville det være?

Tusen takk for hjelpen :}

Om du har noen spørsmål er det bare å kontakte Mzia Popova på e-post: barepopov@gmail.com eller skrive til peil@schibsted.com

Førre  Send inn

Dette er en anonym besvarelse. Det vil si at utsteder ikke kan koble dine svar mot din identitet.

Powered by EasyQuest
Appendix 2. NSD approval letter.

NSD sin vurdering

Prosjekttittel
The role of user experience in the process of digital media innovation.

Referansenummer
724859

Registrert
26.01.2019 av Mzia Popova - mziap@student.matnat.uio.no

Behandlingsansvarlig institusjon
Universitetet i Oslo / Det humanistiske fakultet / Institutt for medier og kommunikasjon

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)
Jens Barland, jens.barland@ntnu.no, tlf: 90169580

Type prosjekt
Studentprosjekt, masterstudium

Kontaktinformasjon, student
Mzia Popova, barbarepopov@gmail.com, tlf: 98446247

Prosjektperiode
01.02.2019 - 20.05.2019

Status
27.03.2019 - Vurdert

Vurdering (1)

27.03.2019 - Vurdert

Our assessment is that the processing of personal data in this project will comply with data protection legislation, as long as it is carried out in accordance with what is documented in the notification form and attachments, dated 27.03.2019. Everything is in place for the processing to begin.
Appendix 3. Informed consent forms for elite interviews.

Informed consent form

Project information
This interview is being conducted as a part of my masters’ thesis for the Department of Media and Communication at the University of Oslo. Thesis investigates innovative design-centered development approach in mobile news applications and will be completed in Mai 2019.
You will have an access to the completed project before it is submitted and published. You then will have an opportunity to review the quotes used from your interview and make any corrections if necessary before handing in.
You have the right to refuse using your personal information or to withdraw from the project at any given time before the thesis is published. Participation in the project is fully voluntary.

Contact information
In case of any questions or concerns, you can contact Mzia Popova on e-mail: barbapopova@gmail.com or by phone: +47 98446247. You can also reach the supervisor for this project, Jens Barland on e-mail: jens.barland@ninu.no or by phone: +47 90169580.

Access to the data
Access to the data gathered through this interview will be confidential and accessed only by Mzia Popova and Jens Barland. Interview data will be kept for potential follow up research purposes up to two years and will then be anonymized no later than Mai 2021.

Consent
I understand and agree that my job title, and other relevant information related to my employment at Schibsted will appear in Mzia Popova’s master’s project for the University of Oslo and will be anonymized no later than 31.05.2021.
Informed consent form

Project information
This interview is being conducted as a part of my masters’ thesis for the Department of Media and Communication at the University of Oslo.
Thesis investigates innovative design-centered development approach in mobile news applications and will be completed in May 2019.
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Consent
I understand and agree that my job title, and other relevant information related to my employment at Schibsted will appear in Mzia Popova’s master’s project for the University of Oslo and will be anonymized no later than 31.05.2021.

[Signatures and dates]