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Managing Customer Value: A Study of Mobile Applications

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Abstract

Digitalization has brought new business opportunities, including utilization of mobile applications. In order to succeed, firms need to manage the customer value properly. The objective of this study is to identify factors that contribute to the customer value of retail mobile applications, and introduce the best practices. In addition, key indicators to measure the success are introduced.

The research questions are first answered by a comprehensive literature research followed by empirical research consisting of interviews, analysis of customer feedback and practical business case. Finally, all the findings of literature and empirical research are compared in order to form conclusions. The aspects of the study range from the mobile applications as part of the bigger picture of business models and channels, going through customer behavior, marketing, usability and gamification from customer value point of view, all the way to indicators to measure the success.

Retail mobile applications have good customer value and positive business effects when implemented and managed correctly. This is also supported by the practical business case showing increase in sales factors. A successful retail mobile application has the look and feel of a retailer, offers personalized, updated features and services for the customers considering dynamic customer behavior, agile targeted marketing, interactivity, and usability aspects. Customer loyalty is built step by step originating from customer value, engagement and satisfaction. Gamification features potentially improve customer value and loyalty, but should be implemented wisely. Mobile applications should consider consistency to other channels. Omni-channel approach and exploration of platform economy related opportunities are recommended.

Utilizing indicators in connection to data and analytics is extremely important in order to succeed in customer value management of mobile applications. Selection of indicators should be based on the objectives and strategy of a firm. Key success indicators for retail mobile applications measure conversion in application and in-store, customer loyalty, customer life-time value, and application usage.

This study contributes to existing research by combining key aspects of customer value management of mobile applications in retail context. Potential value from gamification features, introduction of success indicators, and elaboration of theory on real business context complement this study to a fundamental guideline to be utilized for further research and business decisions.

Keywords Mobile applications, Retail, Customer value, Loyalty, Gamification, Indicators

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Tiivistelmä

Hyödyntääkseen digitalisaation tuomat liiketoimintamahdollisuudet, kuten mobiilisovellukset, yritysten tulee hallita asiakasarvoa oikealla tavalla. Tämän työn tarkoitus on löytää vähittäiskaupan mobiilisovellusten asiakasarvon kannalta tärkeimmät ominaisuudet sekä esitellä parhaat mittarit mobiilisovellusten hyötyjen mittaamiseen.

Tutkimuskysymyksiin etsitään ensin vastauksia laajan kirjallisuuskatsauksen avulla, jonka jälkeen vastaavia aihealueita tutkitaan empiirisesti haastattelujen, asiakaspalauteanalyysin ja käytännön myyntivaikutusten avulla. Lopuksi johtopäätökset muodostetaan analysoimalla ja vertailemalla löydöksiä. Työn aihealuetta lähestytään kokonaisuuden näkökulmasta, huomioiden mobiilisovellukset osana kokonaisvaltaista liiketoimintaa, liiketoimintamalleja ja kanavia. Aihealuetta tarkastellaan asiakasarvoon liittyen asiakaskäyttäytymisen, markkinoinnin, käytettävyyden ja pelillistämisen näkökulmista, linkittyen lopuksi hyötyjen mittareihin.

Oikein toteutettuina ja hallinnoituina vähittäiskaupan mobiilisovellukset vaikuttavat positiivisesti asiakasarvoon ja tuottoisasti liiketoimintaan. Tätä tukevat myös löydökset kasvaneista myynnin osatekijöistä käytännön myyntivaikutusten tutkimuksessa. Hyvä vähittäiskaupan mobiilisovellus heijastaa kivijalkakaupan ja kauppiaan tunnelmaa, tarjoaa henkilökohtaisia, päivittyviä ominaisuuksia ja palveluja asiakkaille huomioiden vaihtelevan asiakaskäyttäytymisen, ketterän, kohdennetun markkinoinnin, vuorovaikutteisuuden, ja käytettävyyden näkökulman. Asiakkaiden lojaalisuus rakentuu askeleittain lähtien asiakasarvosta, sitoutuneisuudesta ja tyytyväisyydestä. Pelillistämisen avulla voidaan kasvattaa asiakaarvoa ja lojaalisuutta, kunhan se toteutetaan järkevästi. Mobiilisovelluksissa tulee huomioida yhtenäisyys muihin kanaviin. Omni-channel – mallia ja alustatalouden tarjoamien mahdollisuuksien tutkimista suositellaan.

Mittareiden hyödyntäminen yhdessä tiedon ja analytiikan kanssa on erittäin tärkeää mobiilisovellusten asiakasarvon hallinnassa onnistumisen kannalta. Mittareiden valinnan tulisi perustua yrityksen tavoitteisiin ja strategiaan. Vähittäiskaupan mobiilisovellusten menestyksen avainmittareiden tulisi mitata sekä sovelluksen että kivijalkakaupan konversiota, asiakaslojaalisuutta, asiakassuhteen kokonaisarvoa, ja sovelluksen käyttöä.

Tämä työ täydentää olemassa olevaa tutkimusta yhdistäen tärkeimmät eri näkökulmat mobiilisovellusten asiakasarvon hallintaan liittyen vähittäiskaupan toimialalla. Pelillistämisen tarjoamat hyödyt, avainmittareiden esittely, ja teorian tarkentaminen käytännön liiketoiminnan kontekstiin tekevät tästä työstä perusteellisen ohjenuoran jatkotutkimuksen sekä liiketoiminnan päätösten tueksi.

Avainsanat Mobile applications, Retail, Customer value, Loyalty, Gamification, Indicators

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Abbreviations and Acronyms

API	Application Programming Interface
ARPU	Average Revenue per User
BSC	Balanced Score Card
CLV	Customer Lifetime Value
CoA	Cost of Acquisition
CUSAMS	Customer Asset Management of Services
GPS	Global Positioning System
HTML	Hypertext Markup Language
ISO	International Organization for Standardization
KPI	Key Performance Indicator
LVS	Lifetime Value Scorecard
MSP	Multi-sided Platform
NPS	Net Promoter Score
QR	Quick Response
ROI	Return on Investment
U.S.	United States
VI	Vertically Integrated
WoMI	Word of Mouth Index

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1 Introduction

One of the most significant transformations that are occurring in the world of today is digitalization. It involves many fields of everyday and business life, and there is a considerable need to holistically understand this effect. (Hagberg et al., 2016) Digitalization has increased rapidly also in retail business and seems to lead the way to capture the customer value also in the future. Number of existing studies, including McCormic et al. (2014), Bonfiglio (2016), Spillecke & Perrey (2012) and Peltola et al. (2015) emphasize the importance of proper management of digitalization and customer value. Digital revolution brings new business models with multiple opportunities and challenges to firms. Succeeding in retail business of today requires continuous monitoring and management of business environment. In addition to traditional brick & mortars there are many other channels and platforms all of which need to be managed optimally together in order to meet the customer needs, maximize the customer experience and outperform competitors. Having a customer centric business model is a key to success nowadays. This together with a statement by Bonacchi et al. (2008), “The value of the firm is the sum of the value of the firm’s customers along its life cycle”, is a justified reasoning for the customer value point of view in this study.

One potential way to utilize the opportunities of digitalization are mobile applications. According to Zhang and Adipat (2005), mobile applications are software systems that operate on mobile devices, allowing access to information regardless of time and place. A total of 26 mobile applications are used by an average consumer in a month (Ingram, 2016), which emphasizes the need of an application to outperform others. In case of mobile applications, success requires more than just usable technology – applications need to engage the customers (Kim et al., 2013).

Due to many influencing elements in retail context such as different types of customers and their dynamic behavior, retaining the customer value of mobile applications is challenging in the long term and needs proper management in order to make customers loyal and gain business value. Managing customer value also requires relevant indicators to measure the success. As this topic is quite new, the existing literature is relatively limited in comparison to more traditional topics. Due to rapid development of digital solutions and mobile applications, part of the existing research findings also obsolete relatively quickly. In addition, the literature is scattered, having concentration on certain areas in retail mobile applications and customer value context, thus missing a comprehensive guideline.

This study aims to identify factors that contribute to the customer value of retail mobile applications, and introduce the best practices. In addition, key indicators to measure the success are introduced. All of this is accomplished holistically, considering different aspects having effect on customer value, and incorporating also practical business point of view. Potential of gamification in increasing customer value of retail mobile applications is investigated as a novel approach. The objectives of this study, including research questions are introduced in more detail in chapter 1.2.

This study can be considered a case research. Empirical research based on K-Group, the case company of this study and their K-ruoka mobile application are used to elaborate the theoretical findings of wide literature review on real business context. Finally, all the findings are analyzed and compared together in order to form conclusions. The methodology is introduced more comprehensively in chapter 1.2.

This study contributes to existing research by combining key aspects of customer value management of mobile applications in retail context. Potential value from gamification features, introduction of success indicators, and elaboration of theory on real business context complement this study to a fundamental guideline to be utilized for further research and business decisions. As with every research, there are also limitations in this study that should be taken into account when evaluating and applying the results. The possible limitations are associated to factors such as quality of material used, empirical procedures, and human interpretation. More detailed information about limitations can be found in chapter 7.1.

As Bonacchi et al. (2008) formulate it, in customer value management it is important to have a systematic approach in addressing the issues of customer value such as estimating customer lifetime value (CLV), customer segmentation, identifying additional customer value sources, measuring profitability and managing to improve customer profitability. These are closely related to the approach and structure of this study, which is illustrated in Figure 1. This study basically consists of two main areas, the literature review and empirical research, following the structure presented.

The literature review in chapter 2 starts from introducing mobile applications as part of the bigger picture of business models and channels. First, the opportunities of platform economy and omni-channel approach are discussed, after which digitalization and mobile applications in retail context are presented. Customer value theory and value concepts, including aspects of customer behavior, marketing, usability and retention, are presented in chapter 2.3. Opportunities of gamification that means the use of game elements in other context (Brigham, 2015), are investigated in chapter 2.4 as a potential means to increase the customer value and loyalty. Indicators to measure the success of retail mobile applications are presented chapter 2.5. Main indicators related to the above mentioned aspects of customer value are introduced and key indicators are recognized.

Chapter 3 introduces the methodology of empirical research, providing detailed information on data collection and analysis procedures. The findings of empirical research are presented in chapter 4, and cross-analyzed together with literature findings in chapter 5. Finally, chapter 6 presents conclusions and recommendations from theoretical and managerial point of views. The findings of this study together with limitations are discussed in chapter 7.

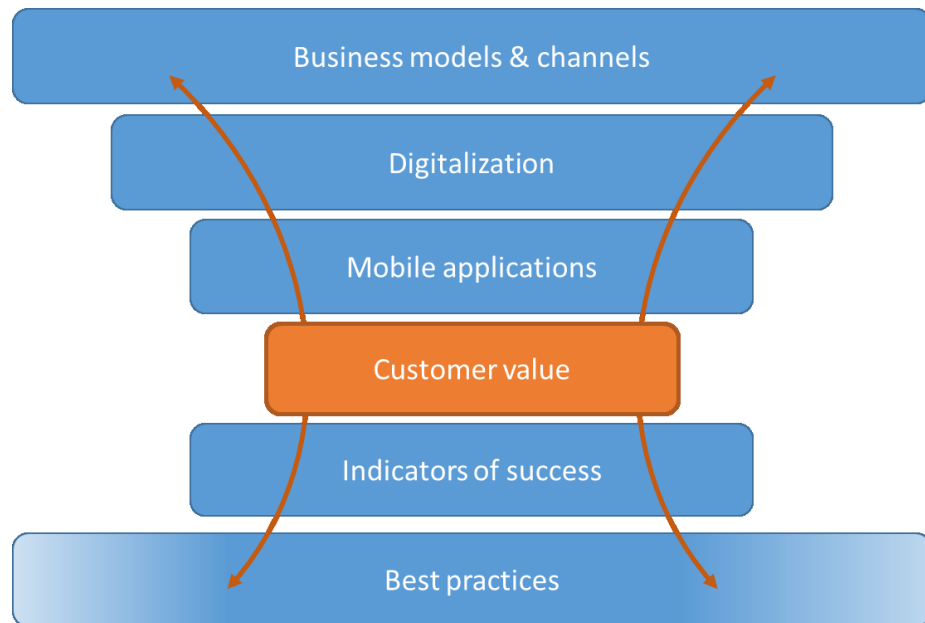


Figure 1 Structure of the contents of this study

1.1 Introduction of case company

The case company of this study, K-Group consists of Kesko and K-retailers, having more than 1500 stores in eight countries. Kesko operates three divisions: grocery trade, home improvement and speciality goods trade, and car trade. Chain business model is the main business model of Kesko in the Finnish market. This means that the retail stores in Kesko's chains are run by independent K-retailer entrepreneurs, which applies to all food stores, agricultural stores, building and home improvement stores of K-Group in Finland. Own retailing is the principal business model outside Finland. The advantage of this business model is that it facilitates agile and flexible operation of the retailers according to local customer needs. (Kesko, 2016)

The grocery trade division operates in Finland and Russia, having approximately 900 retailers with locally tailored food stores in Finland. The food stores of K-Group provide the customers with low-priced and high quality food, and aim at having the highest quality in Finland. (Kesko, 2016)

K-Group aims to serve customers in different stages of the purchasing process as well as possible, offering the products and services they need. Also taking advantage of multi-channel solutions and other opportunities of digitalization have been recognized. The objective is to provide the customers with the best digital services in 2017, keeping in mind the customer centricity and quality. (Kesko, 2016)

K-Plus Oy, a subsidiary of Kesko, maintains and manages a customer loyalty system, K-Plussa, operated by chains of K-Group and K-Plussa partners. K-Plussa information can be utilized in order to better meet the customer needs, considering customer privacy. (Kesko, 2016)

1.1.1 K-ruoka mobile application

An important part of the digitalization strategy of K-Group is K-ruoka mobile application. It provides features such as smart shopping list, personal benefits, and store-specific offers that help customers in the in-store and at home. After its launch in October 2015 it was

among the most downloaded free mobile applications in Finland. At the end of the year 2015, K-ruoka application was available to Android, iPhone and Windows Phone operating systems, and about 120 000 customers had downloaded it by the beginning of March 2016. (Kesko, 2016)

The shopping list can be shared in the K-Plussa card household to different devices and allows real time update. In addition, K-ruoka application offers inspiration and ideas for cooking, and has almost 6000 recipes available with search and suggestion functionalities. The application also suggests products to the customers they might be interested in based on their shopping history. (Kesko, 2016) Customers can also view the opening hours of their preferred store and see the stores on map. (K-ruoka.fi, 2016)

A special attention has been paid to usability and visuality of K-ruoka application. User-friendliness is improved in collaboration with the users. (K-ruoka.fi, 2016)

Current metrics

As with the features of K-ruoka application, the current state of metrics is also a dynamic concept. At the time of making this study, the measurements related to K-ruoka application and its success are done mainly by utilizing Google Analytics, Plussa customer system data, usability tests to customers, and Net Promoter Score (NPS) questionnaires. Some of the indicators are monitored real-time or with a delay, and some are acquired on ad-hoc basis. (Interviews, 2016; Meetings, 2016)

Google Analytics contains indicators, such as users, active users, new users, retention, notification users, user location (city), sessions, screen views, active screens, device and model, and application version. Some of the information can be viewed user specifically. In addition, there are indicators to monitor the fulfillment of different goals related to chosen application features and user actions.

A new analytics software has been taken into use during spring 2016, which allows more detailed analytics.

1.2 Introduction of objectives and methods

The opportunities and challenges of digitalization and mobile applications presented earlier lead to formulation of the following research question and supporting questions:

Research question: **How to retain customer value in retail mobile applications?**

1. *Supporting question:* How to increase customer value through gamification?
2. *Supporting question:* What are the key indicators to measure the success?

The objective of this study is to find the best practices on managing customer value of retail mobile applications, adapting the structure presented in the beginning of this chapter. In more detail, this means identifying features that maximize the customer benefits, and key indicators that should be used to measure the success of the retail mobile applications.

The research questions are first answered by literature review and then by empirical research. Since the customers, retailers and Kesko can be recognized as the three main stakeholders around the success of K-ruoka application, empirical research consisting of interviews of Kesko personnel and retailers, analysis of customer feedback and practical business case are used. This combination allows optimal coverage of the key areas from

research and management point of view, providing information from different aspects considering the schedule and scope of this study.

Based on the research questions, objectives and structure, the method of this study is case research (Yin, 2009; Saunders et al., 2007). Theoretical findings of literature review are elaborated on the context of the case company through empirical research. According to Ketokivi and Choi (2014), this can be considered theory elaboration that is a mode of conducting case research.

More detailed information about the empirical procedures and their reasoning can be found in chapter 3.

2 Literature review

2.1 Outlook on business models and channels

Before discussing the retail mobile solutions and customer value it is useful to understand the bigger picture. In the world of today there are multiple choices for firms on how to design and operate the business. Alternatives exist in the structure of business framework regarding the firm, customers and other parties but also in selection of channels between the parties.

Hagiu and Wright (2015) present different choices of business models and compare multi-sided platform (MSP) to alternative models, including vertically integrated (VI) business model (see Figure 2). In VI mode services are produced by the firm itself to its customers (“Side” B) whereas in MSP mode the firm has a platform through which independent parties (“Side” A) provide the service to the customers directly. In other alternative modes the input is supplied to the firm by other parties, and the firm delivers the goods or services to the customers. In general, the term multisided platform means a platform that enable interactions between two or more distinct parties that are onboard and affiliated by the platform. The choice for the firms of how much they are involved in the multisided economic model has remarkable economic trade-offs (Hagiu & Wright, 2015).

According to Ailisto et al. (2016), platform economy and digital platforms can be seen as remarkable new facilitator of business opportunities for firms. In more detail, digital platform economy reflects a market where digital platform based business has a significant share. Low fixed investment costs, data based algorithmic business models as well as low unit and transaction costs are characteristic to platform economy.

There are different types and classifications of platforms, from transmission to innovation, that allow creating new type of value. The value is created through new services that are produced, delivered and consumed through digital platforms. The services connect and interpret the information flow through the platforms, and are typically built on products and services of third parties. (Ailisto et al. (2016)

More detailed discussion about business models and platforms is excluded from this study but can be found in literature: e.g. Hagiu and Wright (2015), and Ailisto et al. (2016).

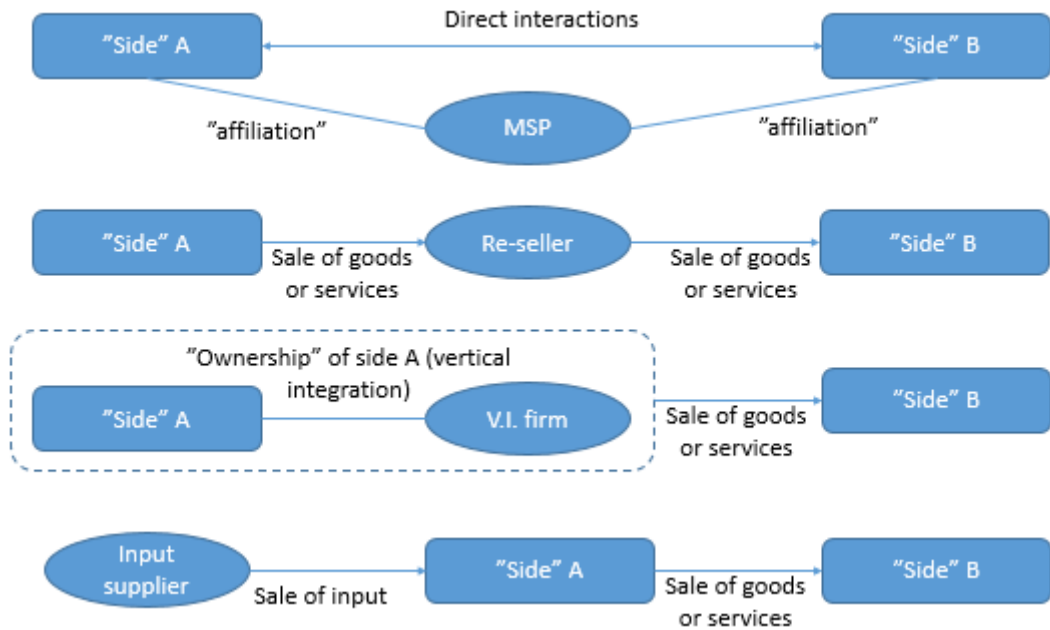


Figure 2 MSP and alternative business models (Hagiu & Wright, 2015)

Bell et al. (2014) discuss different information delivery and fulfillment channel combinations as shown in matrix in Figure 3. According to McCormic et al. (2014) offline means channels such as physical store, catalogues and TV shopping whereas online channels cover smartphones, tablets and computers taking advantage of internet and applications. Quadrant 1 of the matrix indicates traditional retailing, in which the delivery of all information is done offline and customer picks up the product from physical store. Quadrant 4 of the matrix represents pure-play online retailers, in which information goes to the customers online and customers get the products through delivery (Bell et al., 2014). Quadrants 2 and 3 represent hybrid experiences (Bell et al., 2014) in which customers can search product information in one channel, make purchases through second channel and select delivery or pick-up through a third channel (McCormic et al., 2014). This is called multi-channel retailing (McCormic et al., 2014).

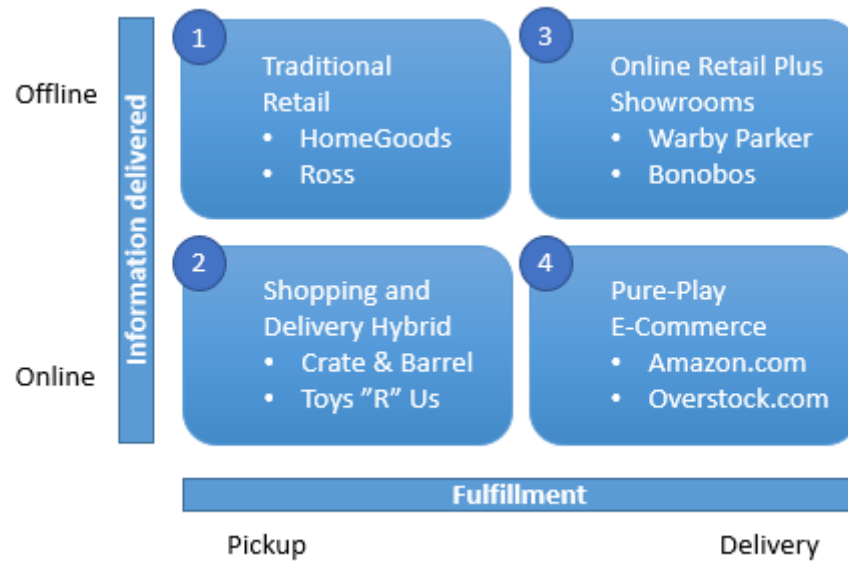


Figure 3 Information and fulfillment matrix (Bell et al., 2014)

As customers have adopted to using new technologies and have high expectations on information availability there is pressure to retailers to satisfy the increasing customer needs. In order to succeed, retailers need to be innovative and adopt omni-channel operations in their business. (McCormic et al., 2014) According to Bell et al. (2014), the emergence of retail strategies in quadrants 2 and 3 of the matrix initiates “omni-channel revolution” that can improve the customer experience and performance outcomes for retailers. Omni-channel originates from customer centricity (Bonfiglio, 2016), and means seeing all the channels as one seamless operation (McCormic et al., 2014). It can be seen as advanced integrated multi-channel concept. Since in omni-channel thinking customers do not see the firm as divisions of separate units but have a single perception of the organization, it is important to remember that the adoption of new channels and integration should be done wisely by retaining consistency across different channels. (McCormic et al., 2014).

The topic of this study is approached from the perspective of alternative models (Figure 2) retail business having multiple channels out of which online information channels, more specifically mobile applications are focused. The potential of MSP and best practices considering channels are further covered in the empirical part of this study.

2.1.1 Summary

Alternatives exist in the structure of business framework regarding the firm, customers and other parties but also in selection of channels between the parties. Multi-sided digital platforms offer many new, economically viable choices compared to traditional and alternative business models.

As customers have adopted to using new technologies and have high expectations on information availability there is pressure to retailers to satisfy the increasing customer needs. Firms need to be innovative and provide the customers with multiple channels. In omni-channel thinking, customers see the organization and different channels as one unified entity where they have the freedom to choose the channel they prefer. On the whole,

it is important to remember that the adoption of new channels and integration should be done wisely by maintaining consistency across different channels

2.2 Digital retail revolution and mobile solutions

According to Spillecke and Perrey (2012) one third of the people in the world have online access and over 200 million new internet users are established annually. Bresnahan et al. (2014) mention that internet has lowered physical barriers to digital innovation. This together with the rise of electronic markets and platforms has created new opportunities and made it cheaper and easier to develop and distribute mobile applications. Spillecke and Perrey (2012) say that the share of mobile connections of all internet connections exceeds already 60 percent. Also tracking online user behavior and preferences has become easier due to more allowing attitudes towards information collection and automated systems. Actually, half of the consumers share their shopping information online.

Retail industry has changed permanently due to digitalization and companies are taking advantage of both online and offline channels (Peltola et al., 2015), as introduced in chapter 2.1. In order to survive in the changing economy and multi-channel markets retailers need to be customer centric and able to provide the customers with an optimal shopping experience matching customer needs, behavior and preferences (Amato-McCoy, 2011; Spillecke & Perrey, 2012; Peltola et al., 2015). To do this retailers need to take advantage of the following trends introduced by Spillecke and Perrey (2012):

- End-to-end digitalization – influence of new technology on multiple functions of retail business
- Converging sales channels – offline and online channels are merging
- Digital localization – increasing localization and personalization in digital media
- Social media impact - opinions forming occurs increasingly online
- Content as retail success factor – users want new and varying content

According to Amato-McCoy (2011), customer engagement is a must for retailers to succeed. Therefore, retailers are increasingly taking advantage of mobile strategies and solutions in order to engage customers in stores. Mobile solutions increase both the speed of customer interaction and sales. Spillecke and Perrey (2012) say that digitally oriented customers use mobile devices also for offline shopping i.e. searching and comparing products and prices in the in-store. This is supported by Saarijärvi et al. (2014) mentioning that customers who are in the possession of a smartphone perceive retail mobile applications valuable in the in-store environment.

When evaluating the potential for mobile solutions, the following aspects should be considered from a retail executive point of view:

(Brinker et al., 2012)

- Recognizing the ways how mobile can bring value and revenue for the business
- Evaluating the expected impact of mobile on market (short term and long term)
- Identifying the time schedule of actions needed
- Evaluating mobile opportunities and potential profits against other investments taking into account limited resources of the firm

According to Rhoden (2011) a successful mobile application works properly, uses advantages of mobile channel and provides the customers with content that leads to interaction and engagement by meeting the customer needs. In case of a retail mobile application this means the following features:

(Rhoden, 2011)

- Alerting customers about deals at near locations
- Offering coupons and in-store deals by taking advantage of the location based services
- Enabling customers to gain maximum benefit from their relationship with the firm that is behind the application
- Offering consistency and convenience
- Improving the overall customer experience

Value and engagement are discussed more thoroughly in chapter 2.3.

According to Brinker et al. (2012), it is important to notice that also competitors and other outside parties may easily enter the retailer stores through mobile applications in customer smartphones. A study by Deloitte points shows that 37 percent of the customers that used a smartphone during their last shopping trip, utilized an external website or application for comparing prices and finding deals. Indeed, customers often use retail in-stores only for showrooming before buying the product from some other place. In order to reduce these threats proactive actions in customer experience management are needed. One way to outperform the competitors is to invest in improved and dedicated mobile applications. The study of Deloitte shows 21 percent higher in-store conversion rate for customers using a dedicated mobile application of the retailer in comparison to customers who do not use a dedicated application. The probable reason for this is the personalized shopping experience provided to the customers through the dedicated mobile application. Bell et al. (2014) emphasize the importance of product information by mentioning that there is increase in sales and traffic in physical stores of those traditional retailers that provide customers with accurate inventory and price information online.

Ingram (2016) mentions that customers will not prefer having a number of different store specific mobile applications since the adoption rates of that type of applications are usually not very high. Actually, 76 percent of the customers stop using single-retailer applications during the first 30 days of use. Instead of a retailer owned application, a universal application that works everywhere and but still has the look and feel of a retailer would be more engaging and profitable.

2.2.1 Mobile services and shopping process

In order to better understand mobile solutions in retail context it is useful to have a look at some definitions and framework. New means of doing business facilitated by technological improvements in mobile communications can be called m-commerce equal to mobile commerce or mobile business (Picoto et al., 2010). Saarijärvi et al. (2014) use word m-services to describe the “content and transaction services that are accessed and/or delivered via a mobile handheld device based on the interaction or transaction between an organization and a customer”. Consideration of m-services should not be limited to too narrow perspective, focusing on customer value creation only in the in-store, but instead having a broader perspective as shown in Figure 4. When m-services support also pre- and post-purchase activities, points of interaction between the retailer and the customer increase

(Saarijärvi et al., 2014), which potentially improves conversion rates and has an effect on sales revenue (Brinker et al., 2012). Thus, retailers that are focusing only on m-commerce, and therefore missing the utilization of stages in customer shopping process, are in a risk of overlooking a great opportunity (Brinker et al., 2012).

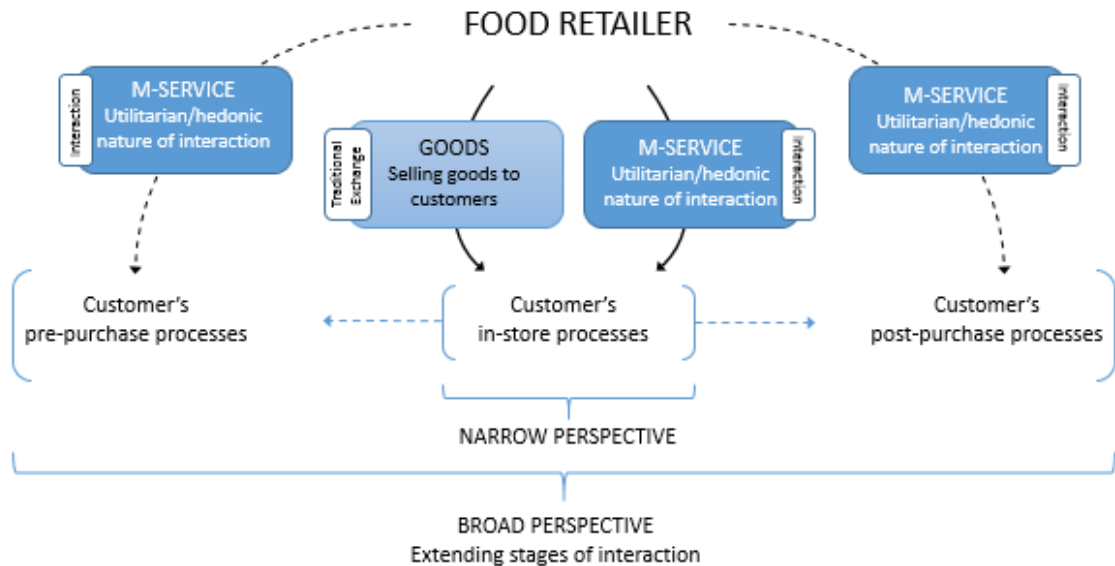


Figure 4 Taking advantage of m-services to extend stages of interaction between retailer and customer in customer shopping process (Saarijärvi et al., 2014)

Also the study by Deloitte suggest that retailer mobile applications i.e. m-services should influence the customers at each stage of the shopping and decision-making processes, most importantly in the in-store. Service contents should be tailored according to varying customer needs at each stage. Figure 5 shows the shopping process stages in which the customers are most likely to take advantage of their smartphone. The closer the in-store shopping and purchase moment get the more likely the customers are to use their smartphone related to that shopping-trip. (Brinker et al., 2012) While in the in-store, customers prefer their phones to other methods when going for assistance as shown in Figure 6 (Lobaugh et al., 2014).

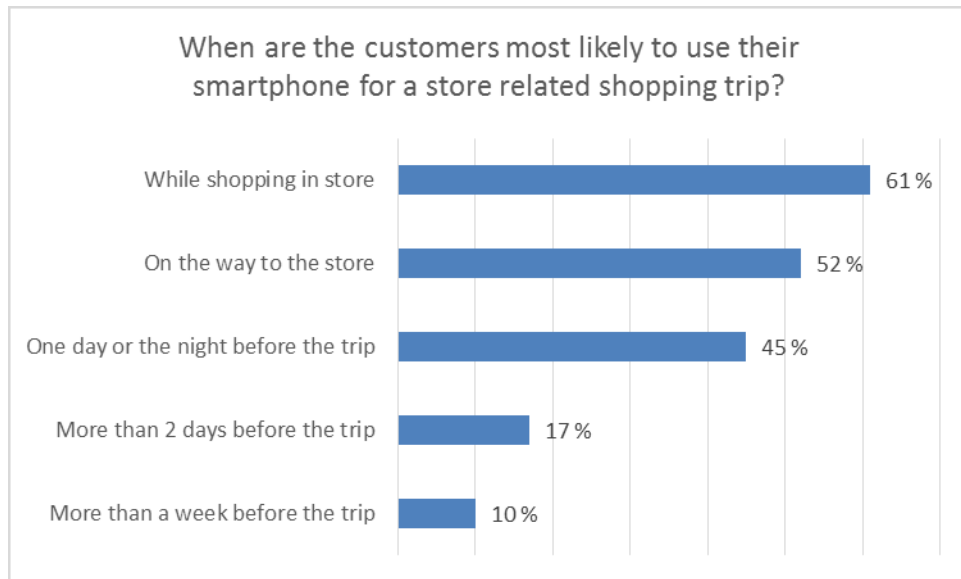


Figure 5 Percentage of mobile shoppers likely to use their smartphone in different stages of a store related shopping journey (Brinker et al., 2012)

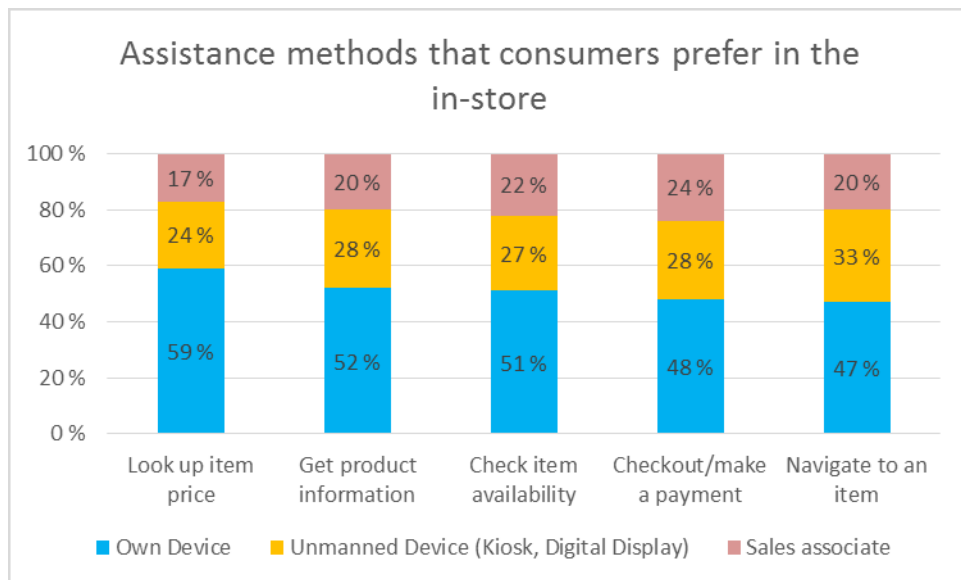


Figure 6 Assistance methods that consumers prefer in different situations in the in-store (Lobaugh et al., 2014)

2.2.2 Retailer as a mobile user

Komulainen et al. (2007) studied the value perceptions of retailers using a mobile service for advertisement to their customers. The findings showed that the motivation and ability of retailers to use a new type of service that is technology intensive vary. For some retailers the threshold benefit to use the service is to be among the first ones in the market using a new type of service while others consider the commercial effectiveness instead. All this has an effect on the source and type of value the service offers to the retailers. To increase the success, retailers should be informed about the commercial benefits of the mobile service in comparison to traditional options. Also technical quality of the service needs to be ensured and turnkey solutions should be offered to the retailers if necessary. (Komulainen et al., 2007)

Using mobile services not only allow easier spread of advertising to the customers through advertisement sharing options but also improves the public image of a retailer as a modern and forward looking company. Mobile advertising services allow retailers to reach customer segments that traditional channels of marketing would not be capable of. Also personalized communication to specific customers groups and follow-up of marketing effects become easier using mobile services. (Komulainen et al., 2007)

2.2.3 Mobile application types and advantages

Portability and performance of mobile devices combined with telecommunication technology have improved over time, which has allowed mobile devices to be much more than only a basic telephone (Bresnahan et al., 2014). With mobile devices being online is very easy and flexible and allows customers to make purchase decisions regardless of time and location (Spillecke & Perrey, 2012; Saarijärvi et al., 2014). Customers are constantly in the reach of mobile devices which allows them to combine device functionality, interaction and information search during their shopping process (Ström et al., 2014). Mobile advantages related to portability, awareness, location and accessibility are also mentioned by Nayebi et al. (2012) and Brigham (2015). Yang and Kim (2012) also add personalization as a unique characteristic of the mobile channel.

Location-specificity of mobile provides retailers with opportunities to offer targeted, location specific services to the customers. Despite some privacy concerns related to location targeted services, the number of customers that have adopted these services is rapidly increasing. (Shankar & Balasubramanian, 2009)

Portability benefits of mobile originate from the small size and ease of carrying. Mobile devices also fit in hands easily and are therefore constantly in companion to the customers and used continuously. This provides a retailer with an opportunity to reach its customers quickly and almost any time. A drawback of small size is limited screen area of the mobile device which might set restrictions to the delivery of information intensive content. (Shankar & Balasubramanian, 2009) This is also related to the usability issues that are introduced in chapter 2.3.4.

Bresnahan et al., (2014) mention that mobile applications as general purpose technology have many different uses but present the following classification:

1. Applications serving as entertainment services, such as games
2. Applications removing annoyances from the everyday life of a mobile user (e.g. maps)
3. Applications providing a new potential medium for advertising

Considering different alternatives of mobile applications from technology point of view, Budiu (2013) presents a division of mobile applications into native, web and hybrid applications. **Native mobile applications** are developed platform specifically and fully utilize the device features such as Global Positioning System (GPS), contacts and camera. Installation is available from the application store and access to this type of applications is done by icons on the home screen of the device. Native applications can also work offline and take advantage of notification system of the device. (Budiu, 2013)

Web mobile applications are actually not real applications but rather websites. The appearance and feel is similar to native applications but the implementation takes advantage of a browser and HTML5 language. Installation of web applications is done from a website and access to the application occurs through an icon on the home screen that is a bookmark

to that website. As increasing number of websites use HTML5 nowadays, the difference between web applications and normal web pages is not that clear anymore. (Budiu, 2013)

Hybrid mobile applications are a combination of native and web applications. Similar to native applications hybrid applications are downloaded from application stores and utilize device features. Similar to web applications hybrid applications use HTML and browser with an exception that the browser is actually embedded in the application. Hybrid applications also reduce development costs by allowing the use of same components of HTML code on different operating systems of mobile devices. For example, Walgreens and Banana Republic apply hybrid approach in their mobile applications. (Budiu, 2013)

All of the above mentioned mobile application types have their pros and cons (Budiu, 2013). For example, many smartphone users consider a mobile-optimized version of a website, including only basic information and transaction tools insufficient (Brinker et al., 2012). Summarization of advantages for different mobile application types is shown in Table 1. Star ratings were evaluated based on written text in Budiu (2013). Three stars rating means that a mobile application type performs the best in a given category in comparison to other types. In conclusion, there is no general best practice in the selection of a right mobile application type. The selection is case specific and should be based on unique needs of a firm.

Table 1 Performance of mobile application types in different categories (adapted from Budiu (2013))

	Device features	Offline functioning	Discoverability	Speed	Installation	Maintenance	Platform independence	Content restrictions, approval process, fees	Development cost	User interface
Native	***	***	*	***	**	*	*	*	*	***
Web	*	*	***	*	**	***	***	***	**	*
Hybrid	**	*	*	*	**	***	***	*	**	*

2.2.4 Examples of retail mobile applications

In order to better understand retail mobile applications and services, some real world examples are introduced. The purpose of the examples is to provide a brief outlook on the market to see how theory is applied in practice. It can be seen that some companies offer more than one application. All the applications are provided through application stores, which means that they are of either native or hybrid type, referring to discussion in chapter 2.2.3.

Many of the applications have recipes, shopping list features and offer deals. Some are more specialized in assisting customers in product and information search, and include scanning features. Part of the applications take advantage of personalization and have features that increase customer value before and after the shopping trip more than others. Some even use rewarding systems, which are related to gamification that is discussed in chapter 2.4.

Amazon Shopping is a mobile application by Amazon, a large online retailer. It includes for example the following features:
(Google Play, ref.03/2016)

- Allows customers to shop millions of products worldwide on all Amazon sites
- Product search, voice search, details and reviews of products from Amazon and other merchants
- One-click ordering, order tracking, automatic shipment notifications, customer assistance and wish lists
- Allows scanning of product barcodes and images for price comparison and availability check
- Deals of the day and check out deals
- Sharing and sending of product links

Appie is a mobile application of Albert Heijn, a Dutch supermarket chain. It offers personal assistance for daily shopping including following features:
(Google Play, ref.07/2016)

- Creation of a simple shopping list
- Sorting of the shopping list
- Product finder and voice recognition
- Barcode scanning with smartphone
- Choosing from previous purchases
- Bonus offers and their moving to the shopping list
- Browsing of thousands of recipes that can be added to the shopping list
- Saved recipes and shopping list available also on other devices through personal sign in
- Ordering and store pick-up of groceries
- Pick-up time selection and possibility to modify order until the day before the delivery

Banana Republic's BR is a mobile application of Banana Republic and other Gap stores with following features:
(Google Play, ref. 03/2016)

- Browsing and searching the latest fashion in all categories
- Detailed product information, including color and size availability
- Scanning of product barcodes in the in-store to provide customers with product information
- Direct buying from bananarepublic.com
- Liking products and sharing them to family, friends or the user itself

Carrefour is a mobile application of France based international retail chain having own mobile applications for different countries. Carrefour UAE application includes the following features:
(Google Play, ref.07/2016)

- Access to mobile application, webstore, e-commerce service and loyalty website through single login
- Viewing of membership points
- Management and viewing of membership vouchers
- Saving and scanning of membership card
- Best deals and promotions
- Store locator

- Shopping lists
- Contacting and Carrefour services
- Multilingual

Flow powered by Amazon is an augmented-reality application related to Amazon. It can decode web addresses, barcodes and Quick Response (QR) codes by taking advantage of image and text recognition:

(McCormic et al., 2014; Google Play, ref.03/2016)

- First a photograph is taken of a product
- The item is price matched and cost on Amazon is displayed
- Enriching information for example on sound bites and trailers are provided

Food Lion is a grocery chain in the U.S. with 1300 supermarkets. It has a customer loyalty program called MVP. Customers who sign in to that program get coupons delivered to their mobile devices. Food lion also includes the following features:

(Saarijärvi et al., 2014)

- Weekly specials
- Management of shopping lists
- Locating stores
- Recipes in categories including desserts, healthy menus, drinks and holiday recipes
- Alerts for in-store events and new products

HarvestMark assists retailers and customers in tracing food products and suppliers. It is a third party service and the consumer version works as mobile application but also online. HarvestMark also has the following features:

(Saarijärvi et al., 2014)

- Product codes input and bar codes scanning
- Information about product origin, producer, manufacturing practices, farming, packaging and safety related issues
- Results pages for every registered product

ICA has 2200 food retail stores in Norway, Sweden and Baltic region, and provides its customers with a mixture of mobile applications listed below:

(Saarijärvi et al., 2014)

- ICA Handla application includes shopping lists, recipes and weekly advertisements
- ICA Grillfest has partly the same features as Handla but concentrates in providing customers with barbeque related recipes and tips
- ICA ToGo includes store information and mobile coupons

Kraft's iFood Assistant is a mobile application of Kraft Food, an American organization in grocery processing and manufacturing, including the following features:

(Saarijärvi et al., 2014)

- Ideas and recipes that can be transformed into shopping lists
- Search of recipes based on ingredients that the customers have at their home
- Saving of favorite recipes and synchronization of receipt box with customer account in kraftfoods.com

- Viewing of recipes in stages and in video format, which adds post-purchase value to customers
- Updating of shopping list by scanning of product barcodes both in the in-store and at home

Meijer's has more than 200 stores and operates in North America. It has different mobile applications providing customers with help in the in-store activities: (Saarijärvi et al., 2014)

- Applications for recipes, coupons, planning of meal and wine matching
- Find-It application for in-store product locating in Meijer stores

Publix mobile app is an application of Publix Super Markets, a supermarket chain in the U.S. with the following features: (Saarijärvi et al., 2014)

- Creating customer profile
- Shopping lists
- Automatic arrangement of shopping lists by store isle
- Categorized recipes by for example ethnic, slow cooking and child-friendly
- Video recipes
- Weekly offers
- Scanning of pharmacy products for prescription renewal

REI –Shopping app is a free mobile application of Recreational Equipment Inc., an outdoor gear and apparel retailer in the U.S. for its customers. The application is one of the top retail applications on iTunes and has the following features: (Amato-McCoy, 2011)

- Search and purchase
- Scan product bar codes in stores
- See customer reviews for products
- Receive discounts
- Access membership information
- Locate stores
- Contact customer service

S-Group's Foodie is a mobile application of S-Group, a Finnish collaborative enterprise that offers retail services in Finland, Baltic region and Russia. Foodie includes the following features: (Saarijärvi et al., 2014; Google Play, ref.07/2016)

- Personalized food recommendations for customers based on customer preferences
- Sharing of shopping lists within family and friends for further modification
- More than 10000 recipes
- Product information
- Store opening hours
- Store feedback
- Ordering and delivery
- Learning of customer preferences through application usage

Stop & Shop Supermarkets Scan It! is a mobile application of the Stop & Shop Supermarket Company, a U.S. based pharmacy and grocery retail chain with 390 stores. It assists customers in self-service concept with the following features:
(Saarijärvi et al., 2014)

- Allowing customers to scan groceries and put them in their bags
- Payment of groceries without opening the bag
- Personalized offerings based on customer shopping history
- Earning of discounts through scanning

Tesco Groceries is a mobile application of Tesco, a worldwide multi-channel retailer with over 6800 stores. The application includes the following features:
(Tesco website; Google Play, ref.03/2016)

- Search and shop of over 50 000 products
- Value deals and vouchers
- Home delivery and store collect services
- Last minute order update possibility
- Favorites with filtering functionality
- Personalized favorite lists based on shopping history for registered users
- Viewing of membership rewards

Walgreens is a mobile application of Walgreen Company, a pharmaceutical retailer in the U.S. and has the following features:
(Walgreens website; Google Play, 03/2016)

- Refilling of prescriptions by scanning of prescription label
- Status tracking
- Rewards point system
- Setting of pill reminders and alerts for pick-up and refill
- Live doctor consultation through video
- Printing of photos
- Coupons, deals and weekly advertisements
- Limited time offers
- Viewing of reward points
- Automatic assisting features when opening the application in the in-store
- Store locating

Whole Foods Market's Missions app is a mobile application by Whole Foods Market that assists customers in having a healthier lifestyle. The application takes advantage of small games, so called missions, in order to activate users. Users are rewarded by medals and awards when completing the missions. Also sharing of health information and achievements are included. (Saarijärvi et al., 2014)

2.2.5 Summary

Increasing amount of people are online worldwide and retailers are taking advantage of digital channels in their business. In order to succeed, retailers need to be customer-centric and be able to fulfill the customer needs and provide superior customer experience. This requires adoption of omni-channel thinking, utilizing personalization and localization in

services, and providing the customers with a dedicated mobile application with new and varying content.

A successful mobile application has the look and feel of a retailer, provides the customers with personal and relevant deals from nearby in-stores, taking advantage of location. The service needs to be consistent, offering features for all the stages of customer shopping process. Customers are most likely to use their mobile device on their way to the in-store or inside the store. Dedicated mobile applications help outperforming competitors and increase in-store conversion.

Retailers should be informed about the commercial benefits of mobile applications in comparison to traditional channels. Benefits include reaching of new customer segments and personalized communication to targeted customers. It is important to provide the retailers with turnkey solutions when necessary and ensure the technical quality of the services.

Mobile devices have several benefits over other devices and channels. Advantages include continuous and easy presence to the user, offering the customers flexible shopping. The relatively small size of mobile devices allows better portability but limits the screen size.

Mobile applications can be classified in different ways, from entertainment service to advertising medium. Considering the technology point of view, native, hybrid and web mobile applications have their own strengths and weaknesses. Native applications are the most suitable to utilize device features, function offline and provide a good user interface, while the other two are easier to maintain and offer platform independence.

Many competitor mobile applications have recipes, shopping list and deals, and some include also barcode scanning and mobile payment features. Some competitors, such as ICA and Amazon offer more than one application. Personalization and features for also stages prior and after the in-store visit of customer shopping process are provided.

2.3 Customer value

Bresnahan et al. (2014) mention that there is a huge variety of different mobile applications for customers to choose from. This causes tough competition between application developers who have challenges in identifying the right target customers and attracting them to get sustainable revenue eventually. (Bresnahan et al., 2014) In order to succeed in customer value creation food retailers need to recognize the right resources and service activities that support customer value creation. Therefore it is important to understand why, when and how customers perceive the value potential of groceries. (Saarijärvi et al., 2014)

According to Rhoden (2011), the solution to succeed is to create a customer-centric mobile applications that bring value to customers, are relevant and drive engagement. Applications business model should be connected to the overall digital strategy of a firm with focus on customer value, needs and behavior. Although mobile applications have unique firm specific features there are still some common characteristics that every application should have related to appeal, functionality and performance (see Figure 7). These are in connection to the following conditions that a mobile application should fulfill in order to be customer-centric:

(Rhoden, 2011)

- Offering value to new and returning customers
- Rewarding customer loyalty

- Having longevity in the content
- Having features that improve customer experience
- Delivering what is promised
- Taking full advantage of software and hardware

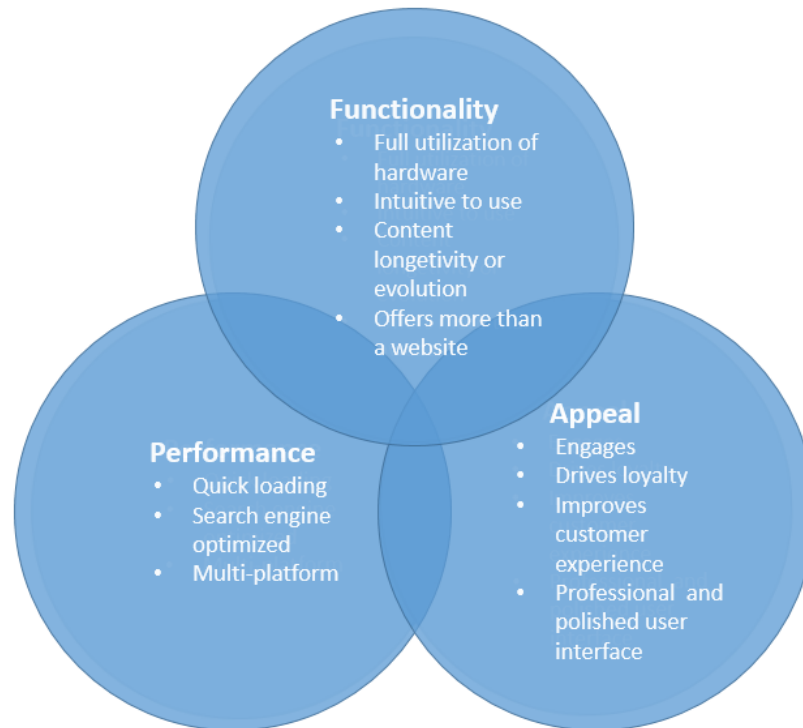


Figure 7 Key elements of a successful mobile application (Rhoden, 2011)

Aspects like these rise demand for more detailed description of value definitions, influencing factors and linkage between different concepts. These are the topics of discussion in this chapter.

2.3.1 Value concepts

According to Graf and Maas (2008) there are multiple approaches in literature related to customer value, out of which two theoretically differentiable ones can be recognized: *Customer value from a customer perspective* means customer perception of value of a product or service created by a firm. *Customer value from a firm perspective* means evaluation of attractiveness of individual customers or groups of customers from a firm point of view. Accordingly, term *customer value* can be used in referring to customer perspective and term *customer lifetime value (CLV)* in referring to the firm point of view. (Graf & Maas, 2008)

As the emphasis of this study is in the customer value and its creation, value to a firm is only discussed in a general level and to the extent that it is related to the customer value. More detailed information about CLV and components affecting the value to a firm, such as revenue models and cost structure, can be found in Bonacchi et al. (2008), Chan et al. (2011), Komulainen et al. (2007), Picoto et al. (2010), and Vannieuwenborg et al. (2012).

Value creation and capture in general

Fischer (2011) discusses value creation and value capture from the firm point of view and presents a general framework of value concepts including customer value (see Figure 8). Therefore, this is a useful approach to start the discussion of customer value as it can be connected to the bigger picture. According to Fischer (2011), *value* in general is related to the fulfillment of the needs of a customer. *Use value* means customer perceived benefits of a product or service. It may also refer to what the customer is willing to pay for the product or service at most. Use value is subjective, which means that the perceived value of the same product or service differs among customers. *Exchange value* is related to the monetary amount of transaction from buyer to seller when a product or service is exchanged. Usually it is less than the *use value*. *Opportunity cost* is considered as the cost of delivering the *use value* from the business point of view. It is the cost required by resources such as labor, supplier input and capital. (Fischer, 2011)

Fischer (2011) considers value creation as “total societal value created by the actions of not only the focal firm but multiple other parties as well” and defines the *value created* as the *use value* without the *opportunity cost*. It can be thought as new acquired value from the business perspective, which is a profit from investing in the *opportunity cost*. The conditions for profitable business require that the *use value* is bigger than zero and *opportunity costs* smaller than the *use value*. This implies that the customer has a central position in successful value creation. Given the above mentioned aspects the *value created* can be seen as independent of both the monetary *exchange value* of the products or services and the costs occurring to the firm due to resources necessary to create the product or service. (Fischer, 2011)

Value captured means shares of created value among different parties. The share to the customers equals to *use value* minus *exchange value* and is called customer surplus. All the business parties share the difference that is between the *exchange value* and *opportunity cost*. (Fischer, 2011) More detailed information about value creation and value capture can be found in Bowman and Ambrosini (2000).

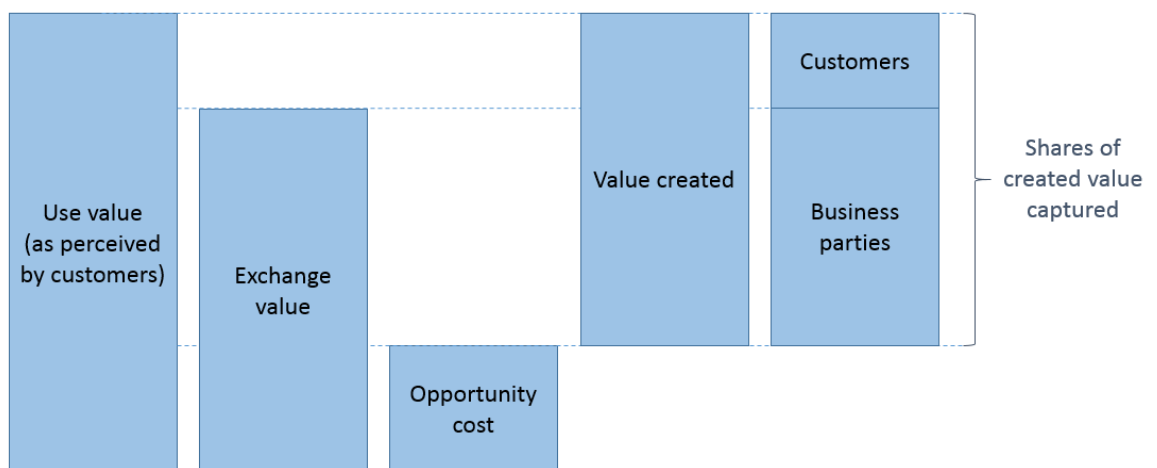


Figure 8 General framework of value concepts (adapted from Fischer (2011))

Extended view on value chain

As the framework of value concept presented by Fischer (2011) is quite general, it is useful to have a more extended view on the value creation process and structuring of customer

value. Bolton et al. (2004) present a *customer asset management of services (CUSAMS)* framework that is a specification of how the complete service business value of customer assets is constructed from customer behavior influenced by marketing instruments. It is a good basis for better understanding the formation of customer value and value to a firm over time. In order to make it more generally suitable for mobile services business, the original CUSAMS framework was modified based on information in Kim et al. (2013), Busacca et al. (2008), Dovaliene et al. (2015) and Saarijärvi et al. (2014). The modified CUSAMS framework is shown in Figure 9.

In the modified CUSAMS framework mobile application and service attributes influence on customer perceptions of the services and the relationship with the firm. This further has an effect on duration, deepness and breadth of the relationship through customer behavior. Revenues generated to the firm depend on the customer behavior and price. The price can be considered as absolute price of the application or an application related purchase. The higher the price the lower the perception of price fairness. In addition, competitor pricing policies have an effect on price fairness. Finally, when costs of all the required actions to produce the services and fulfill the customer needs are taken into account, the CLV is achieved. Moderators such as competition, consistencies in services and pricing, and nature of services affect the perceptions and behavior of customers. (Bolton et al., 2004) The pure price path to revenue here can be seen as linking to exchange value in the general value framework by Fischer (2011), while the short term customer perceptions can be considered as part of the use value. The revenue coming through customer perceptions and behavior in the long term, adds an extra dimension of revenues which can be seen as missing in the general value framework.

Bolton et al. (2004) mention that getting new customers has traditionally been considered more expensive to a firm than keeping the existing ones. Long-term customers have also been considered more profitable which has led to emphasizing the importance of customer loyalty and retention as a source of CLV. However, also other behavior of customers and usage of services should be considered as they influence on business performance. (Bolton et al., 2004) In addition, Keiningham et al. (2007) point out that turning loyalty into profits is not easy. (Keiningham et al., 2007)

Customer value, satisfaction and loyalty are discussed in the chapter below. Customer behavior, marketing and usability aspects are discussed in chapters 2.3.2, 2.3.3 and 2.3.4 respectively.

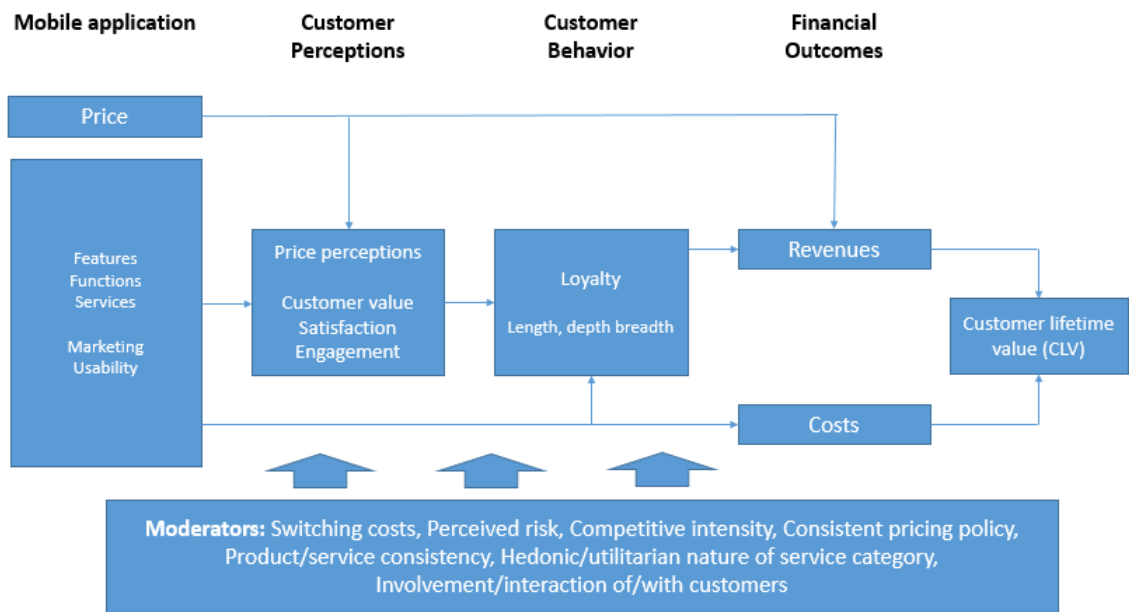


Figure 9 Overview of modified CUSAMS framework (adapted from Bolton et al. (2004))

Opening the mid part of modified CUSAMS framework

According to Kim et al. (2013) “engagement is a state characterized by energy, involvement, and efficacy and is conceptually described as a behavioral flow without any intentional mindset: e.g. control, attention, focus, curiosity, and/or intrinsic interest” (Kim et al., 2013). On the other hand, Suh (2015) mentions that engagement can be viewed from behavioral and emotional point of view. Behavioral engagement is related to the level of physical involvement of a person in doing specific activities. Emotional engagement is related to the involvement, satisfaction and enthusiasm of a person for an activity, referring to a positive state of mind. In mobile services engaging features and functions bring value and satisfaction which leads to customer loyalty (Kim et al., 2013).

Busacca et al. (2008) discuss the linkage of customer value, satisfaction and loyalty. Customer value can be seen in three forms: *desired value*, *expected value* and *perceived value*. *Desired value* means normative value expectations. It is the desired value of a customer based on the reference standards and objectives of a customer. *Expected value* means predictive value expectations of a customer related to various options of choices. It is based on the beliefs of a customer influenced by the promises of a firm. (Busacca et al., 2008) *Perceived value* means “a subjective perception of the trade-off between multiple benefits and sacrifices relative to competition” (Komulainen et al., 2007) and depends on specific use experience (Graf & Maas, 2008). It can also be thought as perceptions of received value (Busacca et al., 2008), which means the “ultimate value for the users, where the acquisition and ownership of a product fulfilled their goals” (Setijono & Dahlgaard, 2007). Thus, related to the general value framework of Fischer (2011), the received value can also be considered similar to customer surplus.

Instead of recognizing pure value concepts only, it is more beneficial to understand the nuanced elements of customer perceived value including the identification of their sources (Andrews et al., 2012). According to Dovaliene et al. (2015), customer perceived value can be divided into different dimensions: *Functional value* is related to the usefulness of a product or service depending on attributes such as performance, characteristics, desired functionalities, reliability, effectiveness and quality. *Social value* includes personal

interaction, connectedness, developing commitment or trust and network or relational benefits. *Emotional value* describes the feelings and emotions such as pleasure, excitement, adventure or aesthetics that a product or service creates to the customer. *Epistemic value* means the curiosity that a product or service offers to the customer. It is related to the value that comes for instance from testing of new services or learning to do things in new ways. In addition, Andrews et al. (2012) introduce the concept of *conditional value* which means value that depends on the conditional situation such as anticipated or unexpected events.

Customer satisfaction is related to “the perceived difference between desired value, expected value and perceived value” (Busacca et al., 2008). Generally, the bigger the unfavorable differences from customer point of view the larger the negative impact on customer satisfaction. Customer satisfaction leads to customer loyalty through different levels as shown in Figure 10. Satisfaction starts cumulating from the results of perceptions that the firm has fulfilled the expected value. This leads to further trust of a customer in the future behavior of a firm and its products or services. When a customer does not evaluate the offers from competitors anymore, the next level on the path of loyalty is reached. (Busacca et al., 2008)

On the level of behavioral loyalty a high level of trust exists and shopping for a customer is convenient and easy. This is a short term situation and competition and changes in technology may alter it. Level of mental loyalty is achieved when the value offered to a customer by a firm outperforms alternatives and competitors over time. At the level of full loyalty a customer perceives that his/her loyalty positively affect the profitability of the firm. In this case loyalty can be seen as generating extra value that can be used to credit loyal customers. (Busacca et al., 2008)

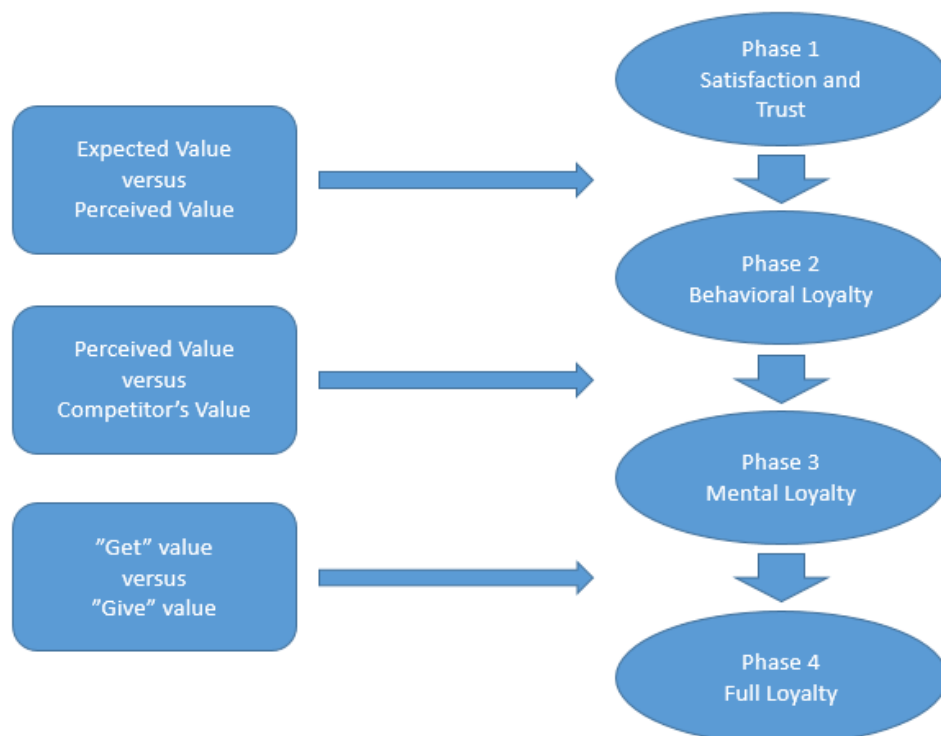


Figure 10 Formation of customer loyalty (adapted from Busacca et al. (2008))

Differing interpretations

Fischer (2011) points out that there are also alternative definitions in literature to the concepts presented. For example *value created* may also be defined as the *use value* less the *exchange value*, which refers to customer surplus. Also the value creation can be seen as creation of *use value*. (Fischer, 2011)

Busacca et al. (2008) present that the evaluation processes, behavior and attitudes of customers related to moving on the next level of loyalty are based on different value configurations. According to Dovaliene et al. (2015) this value initiated approach is acknowledged in scientific literature stating that customer satisfaction comes from customer perceived value and this is the main lead in establishing long-term relationships with the customers. This is supported also by Xu et al. (2015) who studied the perspective of customer value, satisfaction and loyalty related to mobile applications.

Dovaliene et al. (2015) mention that that most of the researchers see the customer perceived value and satisfaction coming from customer engagement. Engagement leads to customer perceived value and satisfaction and this eventually leads to customer loyalty. According to Setijono and Dahlggaard (2007) it is very difficult to make distinction between customer value and satisfaction. For that reason these two concepts are always closely connected and their relative sequence depends on the context they are applied. In empirical studies the order of concepts has been from satisfaction to engagement to customer perceived value (Dovaliene et al., 2015).

As a summary of the above discussion, there are different considerations related to value definitions and sequential order of different concepts. For the purposes of this study it is sufficient to remain at the level of use value and call it simply a customer value as it includes the value perceived by the customers and results to value captured by business and customers. Accordingly, value creation can be considered as creation of use value (i.e. customer value). The sequential order of customer value, satisfaction and engagement can be considered indeterminate and conclude that these concepts are predecessors to customer loyalty.

2.3.2 Customer types, behavior and motivation

The shopping habits of customers are changing and many factors have an effect on customer behavior (McCormic et al., 2014). Infact, there is no average customer (Bonacchi et al., 2008). Some of the customers have trust and faith to the firm while others are merely satisfied. There are even customers that continue purchasing even if they are not satisfied. In addition to time and effort, making a customer loyal requires understanding and managing customer behavior from a dynamic perspective. (Busacca et al., 2008) Therefore it is useful to understand how different customers, their behavior and motivation can be categorized.

Consuming habits and motivation

The choice decisions of customers depend on how they see the difference between the value dimensions introduced in chapter 2.3.1. This is related to the consuming habits of the customers: *Consuming as experience* means using the object of consumption to “impart shared definitions of reality”. The objects of consumption are embedded in the social worlds of the customers. Also subjective, emotional reactions of the customers to consumption objects such as hedonic, aesthetic and experiential dimensions of consuming are captured. *Consuming as integration* means customers taking advantage of the object in

arranging the elements of their self-concept or identity. For example, a customer may get integrated into the social world through the consumption object. *Consuming as classification* means using the object of consumption to compare oneself to others. *Consuming as play* means using the object of consumption for a playful interaction with other customers. (Andrews et al., 2012)

Typically customer shopping behavior is influenced by more than one type of motivation. Yang and Kim (2012) introduce the concepts of *utilitarian* and *hedonic* shopping motivation that can be seen as structuring a number of motivations. *Utilitarian* shopping motivation is related to time savings, efficiency, achievements and convenience. It considers activities related to shopping as work. A customer that is guided by utilitarian shopping motivation values financial benefits and functional features of products or services. *Hedonic* shopping motivation emphasizes the psychological sensations and emotional feelings of a customer. It is related for example to shopping for entertainment purposes, excitement, adventure, creating social interactions, good feeling, collecting information about new fashion and trends (idea motivation) and personal satisfaction. (Yang & Kim, 2012)

Customer shopping motivation may depend on the characteristics of a shopping channel (Yang & Kim, 2012). Due to advantages of mobile introduced in chapter 2.2.3, such as localization and personalization, customers may experience different motivation when using mobile in comparison to traditional shopping channels. According to Yang and Kim (2012), in addition to finding information and solving problems customers use their mobile phones also for having fun through different entertainment features. Therefore hedonic and utilitarian shopping motivations exist simultaneously in the mobile channel. Yang and Kim (2012) studied the shopping motivation of primarily U.S. customers having largest group of respondents between ages 19 and 30 years old. The findings of their study suggest adventure, efficiency, idea and good feelings as main motivations in mobile shopping. According to Bolton et al. (2004) firms that provide customers with hedonic experiences will have stronger effect of commitment on cross-buying and the length of the customer relationship in comparison to utilitarian experiences.

Different types

Andrews et al. (2012) recognized three characteristic groups of customers in their study of mobile users: *Pragmatists*, *connectors* and *revellers*. *Pragmatists* consider mobile phone as a functional tool for personal communication. They do not show emotions related to mobile technology or use their mobile phone for playful purposes. Instead, they consume for experience and integration. Related to the value elements introduced in chapter 2.3.1, functional, conditional and emotional dimensions can be identified for the pragmatists. *Connectors* resemble pragmatists but value more connectability. This means that in addition to their own ability to connect to others they also wish others to contact them. Connectors consume for experience and classification, recognize the social value of their phones as important but do not value playful use of it. Functional, conditional and emotional value elements can be identified for the connectors. *Revellers* enjoy using their mobile phones and are not afraid to show positive emotions related to that. Their engagement to the functions of their phones is higher than in others groups and they consume for experience and integration. Functional, conditional, epistemic and emotional value elements can be identified for revellers.

Karpischek et al. (2012) categorized mobile application users based on their usage activity: *Dormant users* install the application and may sometimes open the main page but never

have any other interaction with the application. *One-time users* have only one communication with the application in their lifetime but the length of the interaction is long. Dormant and one-time users are classified as inactive users. *Active users* cover the rest of the user base that are not inactive, meaning that they have multiple interactions and application usage. They also have a tendency to become more focused the more they use the application. (Karpischek et al., 2012)

One way to manage the diversity of customers is to segment customers into groups based on their market behavior including demographic characteristics such as occupation, education, personal income, marital status, sex and age (Bonacchi et al., 2008). Karpischek et al. (2012) analyzed focus value distributions of mobile users using a mobile bargain finder application for iPhone. The users were sorted to groups by age, income, gender and education. A finding in the case of their study was that there is not significant variation of focus values between these groups.

Gerpott et al. (2013) studied mobile internet use behavior of customers in Germany including demographics and type of mobile device perspectives. According to their findings, the difference in adoption of mobile internet is more pronounced between young and old customers than between genders. A typical mobile internet user is more likely to be young and male. The young age factor is supported by Ström et al. (2014) mentioning that students and young unmarried office workers had the highest mobile internet usage in a study about Japanese users of mobile internet. Related to the mobile phone type of a customer, Gerpott et al. (2013) discovered a much higher intensity of mobile internet use among customers using iPhone 3 or 4 in comparison to Android users. On the other hand, Android users generated much more mobile internet traffic compared to users of other than Google's Android or Apple's iOS operating system. In other words, assuming that "other" segment refers to Microsoft's Windows Phone, a rough conclusion can be made that iPhone users would be the highest in mobile internet use, Android users on the second place and Windows Phone users as third.

Customers can also be categorized based on the likelihood that they would recommend the firm and its services to other people, which reflects their loyalty and satisfaction. This is measured by Net Promoter Score (NPS) in a scale of 1-to-10, which will be discussed in chapter 2.5.1. *Promoters* are customers giving an NPS score of 9 or 10, meaning that the firm has improved their lives. Their behavior is loyal and they talk about the firm to their friends and colleagues. The level of energy and enthusiasm of promoters is high, they answer to surveys and their feedback to the firm is constructive. (Freed, 2013)

Passive customers are not loyal but passively satisfied, perceiving the value they paid for but nothing more. They give a score of 7 or 8 and may easily change to a competitor for cheaper prices or due to appealing advertising. A goal of the firm is to improve its products, processes and services to a level that increase customer value in order to turn some of the passives into promoters. *Detractors* give a score of 6 or less and are dissatisfied on the firm and its services. They communicate bad information about the firm to their friends and colleagues. If they cannot change to another firm, they become complaining customers. This leads to increased costs for the firm as the personnel need to respond the complaints. Firms can try to find the root cause behind the disappointment of detractors, apologize and find ways to solve the issue. If no economically reasonable solution can be found to the complaints, it is recommended to the firm to avoid acquiring this type of customers. (Freed, 2013)

It is good to remember that the presented customer types are only generalizations and in reality the type and behavior may vary by context. For example, the promoter for a smartphone may not be the promoter for toilet paper. (Freed, 2013) Moreover, detractors may recommend an item that makes them feel trendy (Freed, 2013), thus relating to the effect of shopping motivations.

2.3.3 Value through marketing

Customer value is the basis for all marketing decisions (Dovaliene et al., 2015). Mobile marketing improves activities in the value chain of a retailer for instance through enhanced communications and interaction between the retailer and the customer. This adds perceived value to the customers and outcome value for the retailer. Shankar et al. (2010) mention that using mobile channel has positive influence on brand satisfaction, usage of traditional channels and marketing investments in customer relationships. Mobile marketing can thus be seen as an opportunity to improve loyalty of the customers (Shankar et al., 2010). Related to the modified CUSAMS framework (Figure 9), marketing actions that simultaneously increase customer loyalty, usage of service and additional buying have the best outcome in form of customer lifetime value (Bolton et al., 2004). However, according to Ström et al. (2014), in comparison to alternative means of marketing only few studies consider mobile marketing to deliver higher relative value to the customers and retailer. (Ström et al., 2014) This gives reason for further research in this chapter.

Mobile marketing is defined as “a set of practices that enable organizations to communicate and engage with their audience in an interactive and relevant manner through any mobile device or network”. Due to special features and limitations in screen and keyboard size of mobile devices, mobile marketing is different from Internet and traditional marketing. The value from Internet retailing services to the customers compared to traditional retailing come from lower prices and search costs, wider selection of products, better personal decision-making and increased brand relationship after the purchase. (Ström et al., 2014)

Brands are advised to turn passive activities into interactive ones (Hasen, 2012) and drive customer engagement by taking advantage of mobile applications (Ingram, 2016). Customers should be provided with an instant possibility to respond to commercial messages at the moment of impression (Hasen, 2012). Also for this purpose it might be useful to smoothly integrate mobile into other media mix and advertising channels (Hasen, 2012), which is related to omni-channel concept discussed in chapter 2.1. According to Shankar et al. (2011) increasing amount of customers are taking advantage of social media services such as Facebook, LinkedIn and Twitter when making their shopping related decisions. Therefore, it is important to consider opportunities of also these media for promotion purposes and utilize their interaction potential in communications and improvement actions.

The interaction should be value adding and encourage customer buying process. The actions could range from promotion and information of items to localized personal discounts and loyalty programs. In practice this may be coupons sent to customer mobile device, calling to a call center, watching a demonstration video, accessing a mobile promotion site, writing and reading customer reviews or completing a transaction. In fact, the share of location based marketing and mobile wallet in retail mobile services will increase. (Ingram, 2016)

Taking care of customer service issues is easy in mobile. Retailers utilize mobile to provide customers with answers to their queries online, tracking of order features and post-purchase

services. For example, offering the customers a feature that allows them to review products and read product reviews of other customers may be efficient and improve store traffic and awareness of brands and the firm. Customers are also offered payment services through mobile. (Shankar et al., 2010)

In order to be successful, it is important to learn to manage the customer touchpoint of mobile applications to meet and exceed the expectations of the customers (Salz, 2014). This requires recognizing and understanding the target customer segments and their behavior (Shankar et al., 2010). All the activities should be chosen based on the marketing objectives and mobile strategy of the firm. (Hasen, 2012)

As discussed earlier, there are number of actions to create customer value through mobile marketing. Figure 11 by (Conti, 2012) shows popularity of different mobile marketing types in April 2012 among business executives worldwide that utilize mobile as a marketing channel. Marketing through mobile website and mobile applications can be seen to be the most used marketing methods, while location based mobile marketing was among the least popular methods. However, it is worth considering the date of the source and the earlier comment of Ingram (2016) that the share of location based marketing will increase. In fact, according to another survey, location based mobile marketing was already among the most popular methods used by U.S. companies in 2010 (Cohen, 2016).

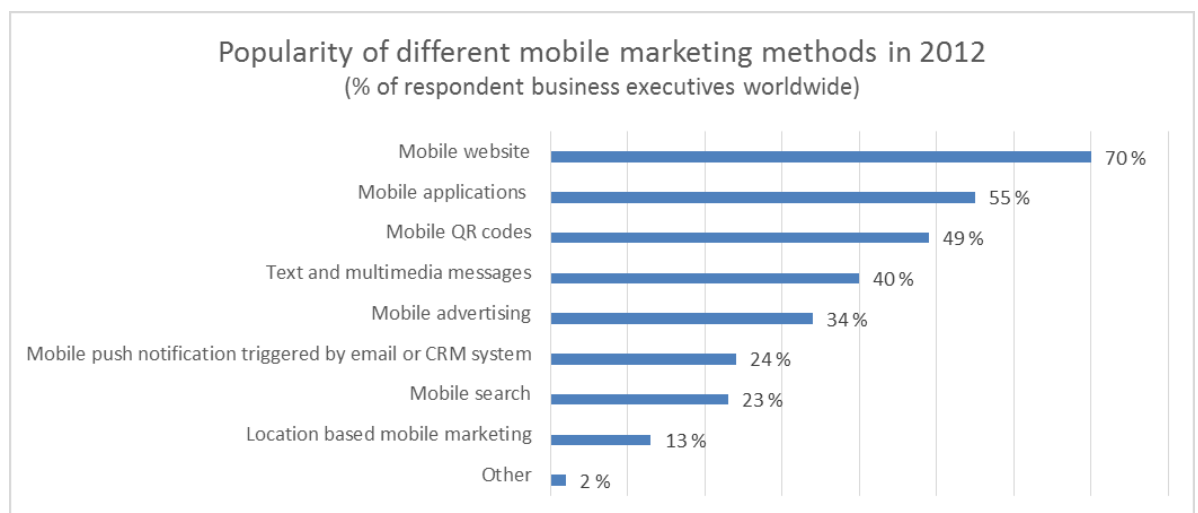


Figure 11 Types of mobile marketing in use by business executives worldwide in April 2012 (adapted from Conti (2012))

In order to emphasize the customer point of view, Figure 12 (Young, 2015) shows the most important reasons of mobile advertisement influence on consumer purchase decision. The relevance of the content to existing needs of a consumer, attractive deals or discounts, connection to known brands, and location specific and personalized advertisement were considered the most influencing reasons.

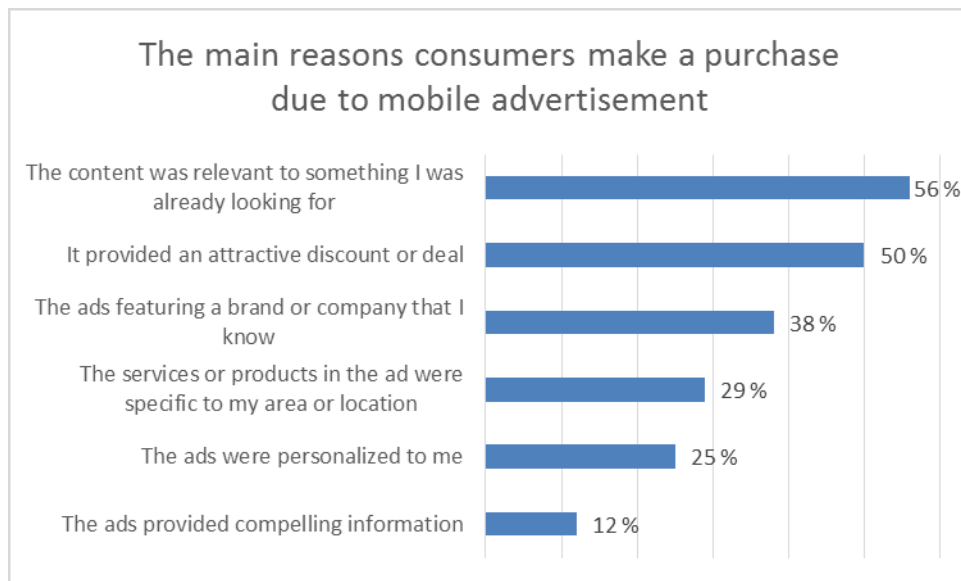


Figure 12 The most important reasons of mobile advertisement influence on consumer purchase decision (Young, 2015)

Direct marketing

Retailers use mobile medium in advertising by sending marketing messages to customers periodically. Typically the advertisement takes advantage of pictures or video and highlights special offerings or new products. Mobile can also be utilized in providing customers that are near physical stores with instant offers. This induces immediate shopping due to expiration deadlines of the offerings. The success of instant offer marketing depends on if the customers are attracted to and have a need to the item that is offered. Also customer perceived cost savings in comparison to the value of their own time have an influence on the success. (Shankar et al., 2010)

General direct marketing promotions such as coupons, direct mail and telemarketing have a direct effect on sales. They often concentrate on economic benefits such as discounts which may lead to positive perceptions of price by the customers. On the other hand, excessive amount of direct marketing such as “junk mail” may cause negative value perceptions to the customers. (Bolton et al., 2004) This is related to Spillecke and Perrey (2012) mentioning that having overly frequent contacts to the customers may scare customers away in order to avoid “spamming”.

According to Ingram (2016), customers refuse receiving push notifications half of the time. However, 90 percent of text messages are opened by customers within the first minutes after receiving. This is due to familiarity of customers with text messages type of communication. Although direct marketing promotions may have a positive influence on service usage in short term, the effect is negative in the long run (Bolton et al., 2004). Similar to this, Spillecke and Perrey (2012) mention that contacting the customers with high frequency may increase the sales in the short term but has a negative impact on customer value in the long run.

Especially in the U.S., many customers have an obsession with cutting out traditional paper coupons in order to get discounts or other advantages in the in-store (Spillecke & Perrey, 2012). Taking advantage of mobile coupons as a primary tactic in marketing is increasing among the retailers. The coupons are typically used by retailers to retain customers, increasing loyalty and advance customer purchases. Customers like the mobile coupons and this provides retailers with good returns on their investments as the costs remain

modest. Typically, a customer gets the coupons by asking for them from the retailer based on retailer advertisement of coupons in other media such as print or in-store. The customer who respond get their coupons and can redeem them during the purchase in the in-store. Coupons may also be delivered periodically to customers who are close to a physical store and have agreed to receive them. Since the customers have the freedom to self-select the offering, mobile coupons as a marketing tactic is quite effective. Retailers can also measure the returns directly and gain more information about customers. A disadvantage of using mobile coupons is that they make customers sensitive to coupons which might weaken the equities of relating brands. Overall, the success of using mobile coupons depends on getting the customers to agree on receiving the coupons. This can be facilitated by offering good value propositions. (Shankar et al., 2010)

Mobile advantages such as time and place attributes need to be considered in mobile coupons marketing. Customers are more likely to redeem the coupons the closer the in-store they are. However, product type, redemption history, coupon face value and expiry length have a greater influence on customer behavior. The higher the face value, the more likely a customer downloads the coupon, and is also willing to do more effort in order to redeem the value. Considering the times, Monday and Thursday have the highest redemption rates, which might partly be explained by the higher number of non-full time working customers visiting those times. Moreover, redemption rates are higher in the mornings in comparison to other times of the day. Related to the delivery of coupons, the first coupon received by the customer is more likely to be redeemed than the other coupons. (Danaher et al., 2015)

It is also possible that using mobile coupons increase the competition between retailers. A customer might receive competing coupons from several retailers which may lead to comparison of offerings and choosing the best one. A solution to the competition issue for retailers is to deliver coupons on products that are different from competitor's products. (Shankar et al., 2010)

Relationship marketing

Marketing instruments such as loyalty programs that extend beyond short-term direct marketing actions, concentrating on customer relationship improvement belong to relationship marketing. They can be classified to social programs and economic reward programs providing customers with economic or social benefits respectively. Considering the time horizon, a division to instant and delayed rewards can be made. According to Bolton et al. (2004), there are not many studies on how the relationship marketing influences on customer behavior. It has been shown that the affective evaluations of the customers are positively influenced by social programs. Bolton et al. (2004) argue that economic reward programs have an influence on the economic considerations and price perceptions of the customers about the relationship with the firm. (Bolton et al., 2004)

In the short term, economic reward programs have a positive effect on usage levels of services. However, this is not true in the long run. In comparison to economic reward programs, the effect of social programs on service usage levels in the short term is small. However, the influence also exists in the long run. Related to chapter 2.3.2, the influence of social programs on customer behavior is greater in firms that provide hedonic experiences or serve customers that are highly involved. (Bolton et al., 2004)

Further aspects

In order to better understand marketing effects on customer value it is useful to introduce the concepts of push and pull marketing. Push marketing is “a strategy intended to sell out an existing supply of a product” while pull marketing means methods that a firm uses in order to raise demand for a product. Modern pull marketing takes advantage of different media channels in order to motivate customers to take actions themselves and get them interested in the firm and its offering. (Marketing-Schools, 2012) These can be also used in combination: Retailers may for example improve customer loyalty of their store network by attracting customers to mobile pull media with the help of mobile push media (Ström et al., 2014).

Customers may also perceive irritation from mobile advertising and push advertising (Ström et al., 2014) which is related to the above introduced concept of push marketing. Comparison of text message and multimedia message push advertising shows that multimedia affects positively on customer perceived entertainment and informativeness. However, irritation is higher in case of push advertising using multimedia messages. This is due to cognitive overload and distraction. There are also contrary findings in other studies showing that multimedia message advertising is less irritating than text messages. Therefore, in order to minimize the irritation of customers, combining text messages and multimedia pull advertising in the form of mobile websites is suggested. The irritation may also be decreased by filtering messages or asking permissions from the customers. In addition, the customer perceived value of push advertising is influenced by the degree of relevance and personalization of the advertisement content, and timing and frequency of messages. Adding incentives increases the value perceived. (Ström et al., 2014)

Considering challenges set by ethical awareness and green values of the customers, retailers may for example emphasize and establish partnerships and links to green retailing or charity in their mobile marketing. As privacy and online information security are valued by customers, it is also important to consider them in mobile marketing. (Shankar et al., 2010)

2.3.4 Usability point of view

As the features and multitasking use of mobile devices have increased by the time, there is a risk that usability might decrease in some context (Harrison et al., 2013). Ma et al. (2013) mention that the task completion rate in usage of mobile web on different mobile phones is between 38 and 75 percent with an average success rate of 59 percent. This can be considered low in comparison to success rate of 80 percent in case of personal computer based testing of websites. In addition, 73 percent of mobile web users consider loading of sites too slow and 48 percent of users experience difficulties in reading and using mobile web applications.

For all types of software, the usability aspects should concentrate on improving efficiency of use, easiness of learning and user satisfaction (Nayebi et al., 2012). According to Harrison et al. (2013), International Organization for Standardization (ISO) considers *effectiveness, efficiency and satisfaction* as traditional usability attributes. The list can be extended by *learnability, memorability and errors*, which may also be seen as included implicitly in the above mentioned attributes. ISO also considers quality-in-use as consisting of usability and flexibility in use. *Effectiveness* is associated to completeness and accuracy of user actions when achieving specific goals. *Efficiency* means “resources expended in relation to the accuracy and completeness with which users achieve goals”. These are also related to Budiu (2013) saying that responsiveness of a mobile application is the key to its

usability. *Satisfaction* was already introduced in chapter 2.3.1, and means that a user has positive attitude related using the product and feels comfortable. *Learnability* means the easiness for a user to learn to use the system and get things done. *Memorability* means the easiness for a user to remember how the system works, even after some time of not having used it. *Errors* means that it should not be easy for a user to make errors when using the system. Possible errors should be able to be recovered easily and major errors should never occur. (Harrison et al., 2013)

Zhang and Adipat (2005) introduce also *simplicity* and *comprehensibility* attributes. *Simplicity* means the “degree of comfort with which users find a way to accomplish tasks”. It is related for example to the quality of menu structures and design of navigation in mobile applications. *Comprehensibility* or readability means the easiness for a user to understand the content in mobile devices. The way the information is presented in mobile devices has a significant influence on how the user understands the content.

In addition, Harrison et al. (2013) suggest that *cognitive load* should be taken into account as an important aspect of usability in mobile context. Due to their mobile nature, limited size and multitasking properties, mobile devices may be associated with cognitive overload or other mobile specific issues that are challenging to model with traditional usability models (Harrison et al., 2013; Zhang & Adipat, 2005). *Cognitive load* may refer for example to a situation when user is typing a text message while walking. The walking speed of the user is reduced due to distraction of using the mobile phone. The other issues include mobile context, varying location of the user, use environment, other people, interaction, connectivity, screen size, screen resolution, processing capability and data entry methods. (Harrison et al., 2013)

The following factors should be taken into account in evaluation of usability: (Harrison et al., 2013)

- User – person in an interaction with the product
- Goal – the intended outcome
- Context of use – product use environments (physical and social), users, tasks and equipment (software, hardware, materials)

Zhang and Adipat (2005) mention that in some existing studies it has been reported that users can find relevant information from documents more efficiently if there are summary and keywords shown in the beginning. Considering the design of menus and link structures, choices in the menu should be clear, easy to understand, consistent over the sites and allow users to predict the influence of their actions based on their earlier interaction. A list of choices on a screen should be designed short enough in order to minimize the cognitive load for the users. The design should also allow users to complete tasks with as little interaction with the device as possible. If the information can be fitted on a single screen, scrolling can be minimized. Taking advantage of hierarchical menus and offering a possibility to return to previous page or directory help users to perform more efficiently with the mobile application. Usability may also be improved by offering personalized features and control of display to the users. (Zhang & Adipat, 2005)

Related to the data entry methods, using the soft keyboard of mobile devices is more accurate than other methods such as speech recognition. However, the keyboard is challenging to use when moving. Speech recognition may be helpful for disabled users but have high rates of error. Thus, all the methods have their advantages and disadvantages.

There are also solutions that accommodate multiple different methods of data entry. (Zhang & Adipat, 2005)

Finally, the selection of right usability attributes for a mobile application evaluation should be based on the type of application and objectives of the usability study (Zhang & Adipat, 2005). This is related to the measurement of usability which will be discussed in chapter 2.5.3.

2.3.5 Retaining customers

As customer retention is related to the discussion about customer value and loyalty in the chapters above, it is logical to examine it more detail here in the last chapter. Customer retention can be seen as part of a wider concept called lock-in. According to Amit and Zott (2001), lock-in is associated to switching costs, customer motivation to engage in repeat purchases and network loyalty among strategic partners of firms. Network effects are excluded in this study but information can be found in Amit and Zott (2001).

In the past, the low quality of customer service provided by retailers and others has caused 64 percent of the customers to switch companies. The customers have left away angry promising that they would never return. It has been reported that 54 percent of customers worldwide consider customer service, frequency of communication, product options and quality more important than lower prices. Nowadays, the importance of good customer service is even more critical as the customers can easily share and broadcast their experiences through mobile devices and services. (Hasen, 2012) According to Bonacchi et al. (2008) customers having a long relationship with a company, such as loyal customers, remain loyal more probably than newly acquired customers. Thus, the retention rates of loyal customers are higher than of others (Keiningham et al., 2007).

Customer retention can be improved in many different ways. Efficiency features and complementary offerings of products and services provide relative benefits to the customers. The higher these benefits the more likely the customers are to stay with the firm. (Amit and Zott, 2001) This is supported by Spillecke and Perrey (2012) mentioning that mobile applications that lock-in customers by offering them clear benefits, such as improved in-store experiences or time savings, are going to be successful.

Loyalty programs, that are part of relationship marketing introduced in chapter 2.3.3, exist to reward customers making repeat purchases with special bonuses. For example, a U.S. retailer Barnes and Noble has a collaborative reward program with Master Card. Using the Master Card customers collect bonus points which can be used eventually for purchases in Barnes and Noble. (Amit and Zott, 2001) According to Stockmann website, similar type of arrangement exists between a Finnish airliner and retailer, Finnair and Stockmann. A mobile application of Starbucks allows customers to make pre-orders for their drinks. It is tied to the existing loyalty scheme of Starbucks, supports mobile payments and offers detailed location information of nearest coffee shops to the customers. The application had three million downloads within the first year and also generated lots of positive discussion around it. (Spillecke & Perrey, 2012) Loyal retail customers may get locked-in for example by mobile marketing through product matching. By using a mobile application such as Amazon Flow, introduced in chapter 2.2.4, customers can have product matching service through taking photographs of products. This type of feature decreases the willingness of a customer to change to a competitor store, thus increasing retention. (Shankar et al., 2010)

Another way to improve customer retention is to establish dominant design proprietary standards, such as patented shopping cart of Amazon, for services and products. Retention

can also be improved by providing customers with safe and reliable transactions, allowing customers to customize information, or offering services and products according to their needs. From the firm point of view, personalization of information, services and products for the customers can be achieved through data-mining methods based on past actions of the customer. It is also possible to compare purchase patterns of a customer with those of another customer that has similar patterns recognized and make recommendations of products and services based on similarities. In this case, the more interaction exists between the customer and the system, the more accurate recommendations are achieved. This further motivates the customer to use the system and creates a positive loop of feedback. (Amit and Zott, 2001)

Increasing the trust in fairness of customers to the firm, for example through open customer reviews and ratings, improves retention (Amit and Zott, 2001). A modern and dynamic way to do this is to utilize social media or virtual forums around the products or services for customer communication (Hyrnsalmi et al., 2014).

The reward schemes and interactive feedback systems referred in this chapter and earlier in this study are part of a concept of gamification which is introduced in the next chapter.

2.3.6 Summary

As there are number of different mobile applications on the market, retailers need to understand the mechanisms of customer value perceptions. Mobile application business should be connected to the digital strategy of a firm, providing customer-centric features related to appeal, functionality and performance in order to outperform other applications.

There are number of concepts related to value, having differing interpretations in the literature. Customer value refers to value perception from customer perspective, while customer lifetime value reflects the firm point of view. A general approach to understand value creation defines the value created originating from customer perceived use value, considering costs related to price and production. A more extended approach can be used to describe customer lifetime value for mobile applications, in which mobile application and service attributes influence on customer perceptions of the services and the relationship with the firm.

Customer value appears in forms of desired, expected and perceived value. The perceived value can be further divided into dimensions of functional, social, emotional and conditional value. Customer satisfaction is related to the perceived difference between expected, perceived and desired value, and loyalty is built step by step starting from satisfaction and trust until full loyalty. The sequential order of customer value, satisfaction and engagement can be considered indeterminate and conclude that these concepts are predecessors to customer loyalty.

There are different customer types and behavior, which causes challenges. Making a customer loyal requires understanding and managing customer behavior from a dynamic perspective. Customers have different reasons to consume products and services, and their shopping motivation can be viewed as utilitarian or hedonic, that exist simultaneously in the mobile channel. Classifications of customer types can also be based on mobile usage, demographic factors or satisfaction levels. It is good to remember that the theoretical customer types are only generalizations and in reality the type and behavior may vary by context.

Mobile marketing improves the value chain activities in retail business by for example better communication and interaction between the customers and the firm. Brands should move from passive activities into interactive one, taking advantage of mobile applications. The interactivity should be value adding and encourage customer to proceed in the shopping process. Potential application features include promotions, product information, localized, personal discounts, loyalty programs, and everything between these. In order to success in mobile marketing, customer touchpoints need to be managed properly and customer needs have to be fulfilled and exceeded. Therefore, it is important to recognize and understand the target customer segments and their behavior. Customer value should be basis for all mobile marketing decisions.

Mobile marketing can be divided into direct and relationship marketing, including push and pull marketing. Direct marketing such as instant offers are valued by the customers, but should be done wisely by asking permissions from customers in order to avoid negative effects. The benefits of direct marketing depend on the value of the deal, and if the customer needs the marketed product. Dimensions of time and location should be considered in mobile marketing, and the frequency of marketing messages should be appropriate. The effect of direct marketing promotions on service usage can be positive in the short term, but are negative in the long run. Relationship marketing refers to marketing instruments such as loyalty programs that extend beyond short-term direct marketing actions, concentrating on customer relationship improvement. In the short term, economic reward programs have a positive effect on usage levels of services. However, this is not true in the long run. The effect of social programs on service usage levels in the short term is small, but the influence also exists in the long run. Retailers may for example improve customer loyalty of their store network by attracting customers to mobile pull media with the help of mobile push media.

Maintaining usability of mobile applications may be challenging due to increasing number of features and multitasking. The usability aspects should concentrate on improving efficiency, ease of learning, and user satisfaction among other attributes. When evaluating usability of mobile applications, user, goals, usage context and application type should be considered.

Customer retention can be seen as part of a wider concept called lock-in, and can be improved in many different ways such as loyalty programs, or efficiency features and complementary offerings of products and services that provide relative benefits to the customers. Also, increasing the trust in fairness of customers to the firm, for example through open customer reviews and ratings, improves retention.

2.4 Increasing value through gamification

“You have to learn the rules of the game.

And then you have to play better than anyone

else.

Albert Einstein”

(Schönbohm & Urban, 2014)

As the number of smartphones have increased and game design tools have become easier to use, digital games are part of everyday life for most of the people. Due to the advantages

of mobile devices discussed in chapter 2.2.3, users can play games almost anywhere. The concept of gamification is related to marketing actions such as points systems and reward programs that were discussed in chapters 2.3.3 and 2.3.5. Strategies and elements that are based on game are taken advantage of in gamification to improve learning, motivation, engagement, retention and problem solving of the customers. However, gamification is technically different from other game concepts such as games, game-theory, gaming, applied games, serious games, gameful design and simulation. (Brigham, 2015)

According to Brigham (2015), gamification can be defined as “the use of game design elements in a non-game context”. It is a powerful and important strategy to motivate and affect people (Bunchball, 2010). Unlike a game, gamification is typically utilized in achieving goals such as healthier lifestyle. In addition, there is no clear end, middle or beginning in gamification as it is not a self-contained unit. (Brigham, 2015) As a topic of research, gamification is still quite novel and is experimental as a strategy. It is currently applied for example in libraries and education to increase engagement and instruction of users. (Kim, 2015)

People have played games in different forms since the era of cavemen and competition is strongly present in human psyche (Bunchball, 2010), in which gamification takes advantage of (Brigham, 2015). When implemented correctly, gamification offers users the feeling of progress and accomplishment which further motivates them. Typically, there are definite goals given in gamification that the users are aiming at but the techniques and process of achieving the goals is determined by the users themselves. Therefore, the user has an opportunity to achieve a personal best and outperform other users but also a freedom to fail. (Brigham, 2015) For example, loyalty programs can be made more effective through game type of elements such as earning the points, competing and chasing the goal. Since people are typically motivated by the challenge of chasing a reward, achievement levels and leaderboards will improve the aspects of gaming. Users get satisfaction when accomplishing milestones and reaching the goal. (Bunchball, 2010) Elements of gamification are introduced in more detail in the next chapter.

2.4.1 Game mechanics and dynamics

Mechanics and dynamics of game are closely related. The report of Bunchball Inc. (2010) defines game mechanics as “the various actions, behaviors, and control mechanisms that are used to ‘gamify’ an activity”. These aspects together provide the user with an engaging and compelling experience. Game dynamics refer to motivations and desires that create the motivational and compelling nature of that experience. In other words, game dynamics are the reason why people get motivated by game mechanics. The interaction of game mechanics and human desires is shown in Figure 13. Green dots indicate the main desire that a certain element of game mechanics fulfills, and blue dots indicate the other areas to which that element has an effect. For example, a desire for rewards can be fulfilled primarily by points but also by challenges and virtual goods. (Bunchball, 2010)

In more detail, game mechanics are techniques, tools and widgets that are utilized in constructing blocks for gamifying an application. They can be used together or separately to create motivational user experiences around basic content or functionality of an application. People love getting rewarded by earning and achieving **points**, which makes the points a well motivating element. Points are utilized to reward users in different ways and can be categorized in order to cause different behaviors of users within the same application. They can also be utilized to indicate status as users spend points for unlocking contents or purchasing gifts and virtual goods. (Bunchball, 2010)

Levels are used to indicate a milestone or level of accomplishment that a user has achieved in a community. This achievement should be given status and respect in certain amounts. Typically, levels are considered as thresholds in leveling up in the system based on participation. **Challenges** introduce missions to be accomplished by the users and finally give rewards. They set goals for the users and give the feeling of working for an achievement. Typically, challenges are configured based on actions tracked by a firm and users are rewarded with badges, trophies and achievements when reaching milestones. An important factor in making challenges and levels effective is to provide users with a forum where they can present personal achievements. This might be implemented as a user profile displaying badges or a trophy case. For example, some airlines have different colored membership cards for their customers indicating the frequent flyer status. (Bunchball, 2010)

Virtual goods mean intangible and non-physical objects that users can purchase for use in online games or communities. They allow users to reflect their personal identity through customization and that way “show off” to other users. Virtual goods may also be taken advantage of in selling them to the users upon real money, which brings revenue to the firm. **Leaderboards** are utilized in gamification to display and track desired actions. They show users how they are succeeding in comparison to other users and thus drive user behavior through competition. In competitions users can challenge other users and try to achieve the highest score in a certain activity. After all the participants of the competition have finished with the activity, the best one is rewarded and others might get a consolation prize. The value of competitions can be increased by allowing users to share their results and that way challenge new users to participate. (Bunchball, 2010)

By creating an experience through game mechanics around an application for example, it is possible to satisfy fundamental desires and needs of the users and drive their behavior. Receiving **rewards** motivates people as they consider it value given for an action. A reward can be intangible or tangible and is given to the user after a certain action or behavior with an intention to make that behavior to reoccur. The main reward mechanism in gamification occurs through earning points or similar incentives. In addition, the desire for rewards can be satisfied by leveling up, virtual goods or completing achievements. (Bunchball, 2010)

Most of the users are after fame, prestige, attention, **status** and recognition. In order to satisfy these needs users are engaging themselves in activities. Leveling-up is the main element of game mechanics to drive these dynamics. Some of the users get motivated if they have to work hard for **achievements**. This type of people search for challenges, set appropriate goals for themselves and try to get recognition for their achievements. **Self-expression** is related to the need of users to express their originality, autonomy and emphasize their unique personalities over other users. Typically, virtual goods allow users to satisfy this need, regardless of how the goods are earned. (Bunchball, 2010)

Competition, combined with rewarding and comparison to other users, can lead to higher levels of performance. All the game mechanics are linked to the desire of competition but leaderboards, such as top ten lists, is the primary means. **Altruism** or unselfishness refers to giving gifts as a strong motivator in communities where relationships are valued. **Gifting** is a powerful mechanic for acquisition and retention in gamification. Acquisition occurs by giving a gift to another person which causes that person to be pulled into the application and further sending gifts to his/her friends through incentives. Retention refers to user being pulled back into the application in order to redeem a received gift. Since all the gifts are not

equal, a motivated gift-giving user will invest in more valuable expression. This means more money spent or longer time used for creating or earning the gift. (Bunchball, 2010)

Game Mechanics	Human Desires					
	Reward	Status	Achievement	Self Expression	Competition	Altruism
Points	●	●	●		●	●
Levels		●	●		●	
Challenges	●	●	●	●	●	●
Virtual Goods	●	●	●	●	●	
Leaderboards		●	●		●	●
Gifts & Charity		●	●		●	●

Figure 13 Interaction of game mechanics and human desires. Green dots indicate the main desire that a certain element of game mechanics fulfills, and blue dots indicate the other areas to which that element has an effect. (Bunchball, 2010)

2.4.2 Different types of players

In addition to determining the target group of a gamification project, it is important to consider different player types (Kim, 2015). Players mean individual persons, such as customers, who participate in the gamified experience (Robson et al., 2016). In this study they are referred also as users or participants. According to Kumar (2013) there are generally two types of motivations: intrinsic and extrinsic. In gamification, intrinsic motivation means internal motivations such as meaning, autonomy and mastery. Extrinsic motivation comes from external techniques of motivation such as trophies or money. Intrinsic and extrinsic motivation are also related to the discussion of customer types and motivation in chapter 2.3.2.

Robson et al. (2016) reason that player types can be described by two dimensions as shown in matrix in Figure 14: orientation and competitiveness of a player. Orientation means the degree of player orientation towards other players versus the player itself. Competitiveness means the degree of competitiveness of the player. Related to these dimensions, Robson et al. (2016) present four types of players: *strivers*, *scholars*, *socialites* and *slayers*. They argue that most of the participants in gamified experiences can be allocated to these types and to the quadrants of the matrix respectively. *Strivers* are highly competitive and are self-oriented. They concentrate in improving their performance over time or achieving the personal best score. *Slayers* are very competitive but contrary to strivers they have an orientation towards other players. They desire to know their placement in comparison to others. *Scholars* are self-oriented and have low degree of competitiveness. They enjoy learning and understanding about the gamified experience. *Socialites* have an orientation towards other players and are not highly competitive. They enjoy getting to know other players and interpersonal relationships.

Kim (2015) categorizes the player types as: *player*, *socializer*, *free spirit*, *achiever* and *philanthropist*. These are also related to the discussion about game dynamics in the previous chapter. *Player* gets motivated by extrinsic rewards such as prize or gift certificate which increases engagement and participation of the user. All the other types are motivated by intrinsic factors such as exploration, social connections, personal achievement, sense of

purpose and self-expression. In more detail, *Socializer* is motivated by relatedness and social interactions, *free spirit* by autonomy and wide selection of possibilities, *achiever* by mastery and individual achievements, and *philanthropist* by purpose and cause of the gamification. Instead of emphasizing only one type of motivation over the others, all the types need to be taken into account when designing gamification. The estimated positions of player types by Kim (2015) in association to typologies by Robson et al. (2016) are shown by green areas in the Figure 14.

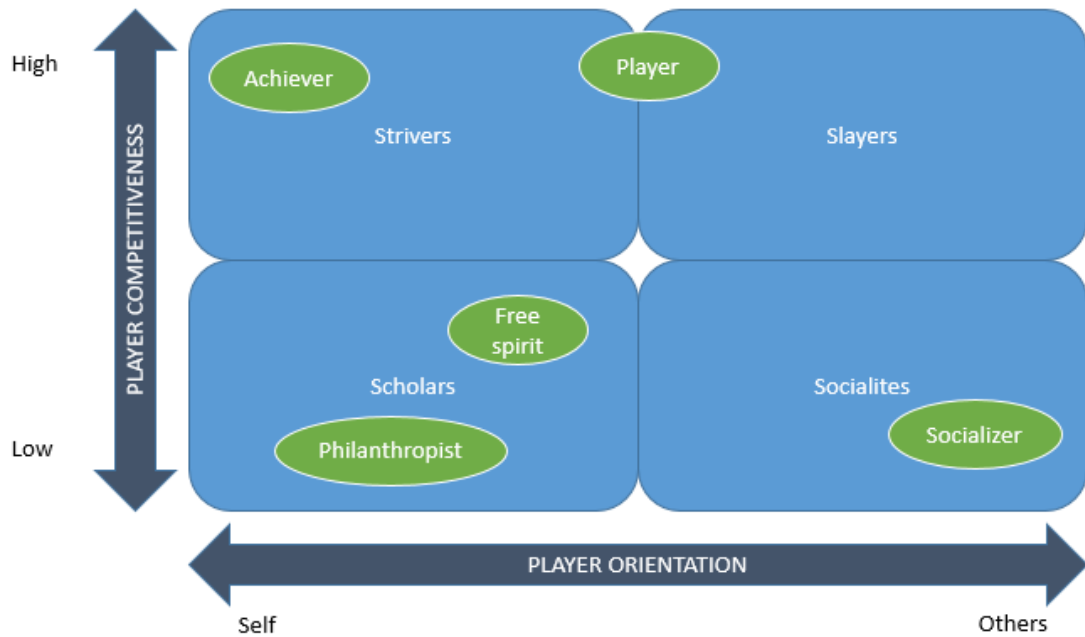


Figure 14 Typology of gamification user types (adapted from Robson et al. (2016) and Kim (2015))

In addition to player types, demographic factors such as age, gender and culture may have an influence on user perception of a gamified application. This is related to the discussion of customer behavior in chapter 2.3.2. Kim (2015) mentions that male students are likely to enjoy the competitive perspective of video games about two times more than female students (Kim, 2015). In contrast, Seaborn and Fels (2015) mention that there has also been a finding in a research that female students are at least as much engaged by factors of gamification as male students (Seaborn & Fels, 2015). This is supported by Koivisto and Hamari (2014) finding that women get more social benefits from using of gamification in comparison to men (Koivisto & Hamari, 2014). Considering the influence of so called serious games on different types of students, academic outcomes of students having lower grades and less self-motivation improve after playing the game in comparison to better performing students (Kim, 2015).

Related to the age factor, people under age 32 play games in Facebook in order to relieve their boredom or pass time, whereas people older than age 32 do it in order to help others and get help and support from others (Kim, 2015). According to Koivisto and Hamari (2014) age does not have a significant direct influence on majority of the user perceived benefits from gamification, but the ease of use decreases mainly by the increase of age (Koivisto & Hamari, 2014). Kim (2015) mentions that cultural factors such as individualism and collectivism have an influence on what people expect getting as an outcome of playing games related to social interaction, diversion, recognition and entertainment. Moreover, the expected outcomes have an effect on the usage patterns of the

game. This is supported by Seaborn and Fels (2015) saying that demographic factors and associated expectations affect the effectiveness of gamification. For example, age and familiarity of users towards gaming have an influence on use and interest.

2.4.3 Challenges and successful execution

Despite the number of benefits around gamification there are also many reasons why gamification should not be used (Brigham, 2015). Gamification has been criticized as relying exclusively on extrinsic rewards such as points and badges, with the expense of intrinsic motivation advantages (Seaborn & Fels, 2015). According to Brigham (2015), it is not simple to design and implement gamification. Designing gamification contents can require lots of time and effort as it might require creation of prototypes, storyboards, flowcharts or computer code. Also, applying game elements may be challenging and too difficult for most people. Kim (2015) emphasizes that users will disengage from gamification, if it is experienced as attempting to manipulate their behavior. Therefore, the autonomy of users should be respected in all actions.

According to Robson et al. (2016), engagement in gamification originates from the connection between the experience and the users involved. Therefore, it is important to align the game mechanics and the dynamics, emotions and rewards that create value for the users. Choosing the right mechanics requires understanding of different player types, their desires, motivations and behavior. In order to avoid the decrease of intrinsic motivation by time, Kim (2015) suggests designing of gamification that is independent of external rewards. Users might, for example, be offered possibilities to set their own goals and constraints for achieving the goals. This may allow them to understand the relevance and meaning of gamification in a given context and reduce the controlling aspect of rewards. Since people are assumed get motivated in gamified applications typically by extrinsic motivators (Brigham, 2015), it might be challenging to engage users without extrinsic motivation and tangible rewards (Kim, 2015). Brigham (2015) adds that it is also possible that a user has intrinsic motivation regardless of the intentions the application was designed for. An activity might also have intrinsic and extrinsic motivations coexisting independently.

The designers of gamification mechanics and dynamics should think one step further from basic features – a fun and playful experience should be created as an outcome (Kim, 2015). Seaborn and Fels (2015) suggest that the overall success of gamification may be increased if the intrinsic motivators of users are utilized in the design of the system and especially extrinsic motivators. According to Kim (2015), the right level of tangible rewards to use depends on the purpose of gamification. Intrinsic motivation in one-time activities, such as promotional campaigns, is not influenced by the negative long-term effect of extrinsic features. Robson et al. (2016) mention that rewarding of players should take place immediately after a good performance. Otherwise, there is a risk that the desired behavior is not repeated as the user perceived connection between completion and reward will be blurred by time. Also, rewarding simple behavior may gradually build more complex, desired behavior.

Related to learning through gamification, Kim (2015) points out that finding a right combination of game mechanics and dynamics may be challenging. For example, acquisition of demonstrative knowledge which requires repetitions and association, may be improved by game mechanics such as points, feedback, time pressure, progress bars and countdowns. This is because that type of game mechanics can invoke game dynamics such as perception of urgency in users which makes the completion of repetitive tasks more

exiting. However, the degree of challenge should be in an appropriate level in order to activate and excite the brain (Bunchball, 2010).

Considering the strategy for gamification, there is probably not a single right solution or combination of elements for a gamified system. Seaborn and Fels (2015) recommend to design the gamified systems selectively considering the special characteristics of the targeted user population. However, this has a risk that other user groups are not appealed to the solution (Robson et al., 2016). Seaborn and Fels (2015) add that also flexible and inclusive design, offering something for everyone is possible. In this case, customization and personalization can be allowed in order to accommodate individual users.

According to Kim (2015), in gamification projects in general it is important to consider different outcomes of the project beforehand and prioritize the desired ones. When there is a clear goal for the project, the design and evaluation of the project will be easier. In other words, it is not recommended to blindly consider a certain game dynamics, mechanics or aesthetics as ideal solution while not taking into account the right fit into the overall context and goal. Brigham (2015) mentions that different game-based elements may also have different degrees of difficulty in implementation as shown in Figure 15. Basic rewards are relatively easy to implement while elements with more dimensions and complexity require more expertise. Implementation and development process of gamification from a firm point of view in more detail is excluded in the scope of this study but information can be found in Herzig et al. (2015).

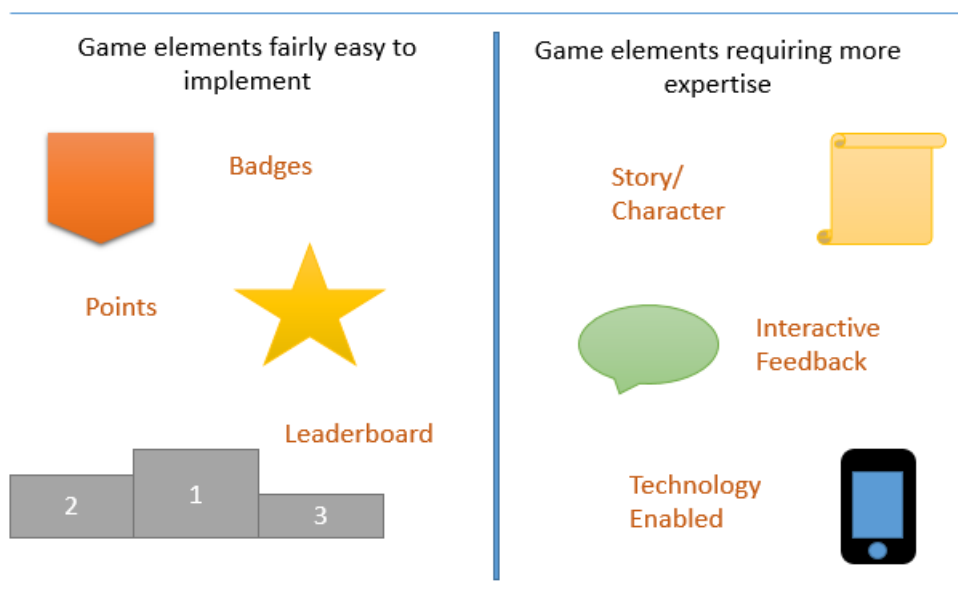


Figure 15 Difficulty of implementation of different game elements (Brigham, 2015)

2.4.4 Gamification in practice

Gamification has been applied in different business contexts, including mobile retail applications. The purpose of this chapter is to have a brief look at some of the practical implementations of gamification.

Frequent Flyer Programs that are provided by almost every large airlines are in fact complex games. Customers earn miles or points when flying, advance to higher status

levels and complete challenges that are rewarded. This causes the customers to use the airliner where they have the best level and most points, even if they were not satisfied to the service all the time. (Bunchball, 2010)

A number of health and wellbeing related gamification exists. An online game and social network, Fitocracy, utilizes game elements such as badges and points in order to get users to improve their fitness. Users can view the ongoing progress of their exercises and are offered a possibility to share the information with other users in their social network. Another example are Fitbit, BodyBug, Nike and Jawbone UP providing users with acceleration sensor or GPS based monitoring of physical activity, such as number of steps, calories burned or average speed. The users can set goals for themselves and follow their advancement through a special website or mobile application. Virtual rewards are delivered based on the activity of a user. In addition, users have the possibility to interact with other users. (Zuckerman & Gal-Oz, 2014)

Walgreens provides customers with points of purchases but also health related activities and goals setting. For example, by filling out a prescription a customer earns 500 points, and every 5000 points has a redeem value of five dollars. Also engagement with other users through the application is offered.

Marks & Spencer uses a loyalty card to reward their customers with points. The points have zero monetary value but can be exchanged to benefits such as promotions or events. (Hobbs, 2015) Carrefour provides customers with loyalty points in connection to in-application checkout and allows viewing history data, while Nectar offers points to customers that use Yahoo search engine (IGD's 'Apps to watch', 2013).

According to IGD Innovation Tracker report (2013), loyalty cards and mobile are a natural combination and retail sector will increasingly follow the example of Walgreens. Time bound offerings will be utilized more and more in order to bring excitement and inspiration. For example, MeatPack, a shoe retailer in Guatemala has had a tactic of "hijacking" customers from competitor stores in a mall by utilizing GPS. When entering a competitor store, a customer is sent a time bound mobile coupon entitling to a 99 percent discount at MeatPack. The discount decreases by one percent in each second from the time of delivery until the customer enters the MeatPack store.

2.4.5 Summary

Gamification can be taken advantage in mobile applications by utilizing game based strategies and elements in order to improve customer value and loyalty. Proper combination of game mechanics such as points, levels and leaderboards, and game dynamics are used to utilize the inherent competitive nature of a human through the feeling of advancing and achieving.

As with the mobile users, there are different types of players and motivations associated to gamification, all of which need to be considered when designing gamification. Due to dynamic user behavior and differing opinions in existing literature, it is difficult to draw solid conclusions on the user motivation towards gamification based on demographic factors.

Number of examples have shown the utilization of gamification in practice. However, gamification has its own challenges and should be implemented inconspicuously, respecting the autonomy of the users. The challenges caused by extrinsic rewarding can be

mitigated by considering intrinsic motivation factors in the planning of the gamification and especially extrinsic motivation factors.

In order to succeed in gamification projects, clear objectives should be set and sufficient time needs to be reserved for prototypes and development work. The planning should go one step further from basic features, and understanding of different player types, use context and goals are required.

2.5 Indicators to measure the success

Before discussing the indicators it is useful to have a brief look on the linkage of indicators to the overall measurement practices. According to Kaplan and Norton (1993), measurement should be seen as an integral part of the strategy and management process of a firm. Many firms have number of different physical and operational indicators that are derived from ad-hoc processes and are bottom up. Balanced scorecard (BSC) offers a comprehensive framework of indicators based on the strategic objectives and competitive demands of a firm. There are four different perspectives in the scorecard: financial measures, customer satisfaction, internal processes, and innovation and improvement. Each of these perspectives include limited number of selected indicators that are critical. The advantage of the BSC in comparison to traditional cost-benefit measurement is its focus also on human issues (Kim & Park, 2009). According to Kaplan and Norton (2000), KPI scorecards are typically a checklist or ad-hoc collection of indicators, missing a linkage to a coherent strategy. Therefore, using such KPI scorecards may be dangerous. Instead, the indicators should be carefully and holistically selected, linking to the coherent strategy of a firm and consider desired outcomes.

Including some of the aforementioned aspects, Iloranta and Pajunen-Muhonen (2012) present the following criteria for a good indicator:

- Is clearly connected to goals and strategy
- Is simple and easy to understand
- Is followed where actions can be influenced
- Has sufficient coverage and balance considering the goals
- Is used as a tool for continuous development

In this chapter, different indicators related to the topic of this study are presented and discussed briefly. The above discussion highlights the importance of holistic thinking also in this scope, especially when deciding about the key indicators to measure the success of retail mobile applications. Indicators, measures and metrics are considered having the same meaning in this context. Measuring systems and processes are mainly excluded in this study but information can be found for example in Kaplan and Norton (1993).

Classifications

According to Freed (2013), it is easy to assume that all the indicators are valid despite their shortcomings, especially if the indicator is widely known and used by firms. However, calling something an indicator does not guarantee the reliability, accuracy, credibility, preciseness or actionability of it. Perez (2015) says that a successful indicator matters to the business of a firm and to the department that is utilizing it. Also, different departments may prefer different indicators than other departments. Indicators can be classified in different ways, which may assist in the selection of the right ones. Okes (2013) presents the following list as some common terms related to process management metrics:

- *External vs. internal focus*: External indicators, such as market share, concentrate on measuring trends and feedback from the operating environment of a firm. Internal indicators, such as financial performance, measure the use of firm's resources.
- *Effectiveness vs. efficiency*: Effectiveness indicators, such as customer satisfaction, measure the level of stakeholder satisfaction. Efficiency indicators, such as productivity, measure how well a firm utilizes its resources.
- *Leading vs. lagging*: Leading indicators measure future outcomes predictively. For example, customer satisfaction may be predicted by effectiveness of customer service training. Lagging indicators, such as customer satisfaction level, concentrate on measuring outcomes of past activities.
- *Outcomes vs. controls*: Outcome metrics, such as number of products produced within a period of time, concentrate on measuring results after the process. Control metrics, such as speed of the process, are taken advantage in stabilizing or adjusting the performance of the process.
- *Monitoring vs. ad-hoc*: Indicators for monitoring, such as number of deliveries, are useful continuously over time, while ad-hoc type of indicators are only used to solve specific cases in a shorter period of time.
- *Objective vs. subjective*: Objective indicators, such as cost or time, are easily quantifiable. Subjective indicators, such as customer perceptions, are more difficult to be quantified but may be more useful when there is interaction with people.

According to Freed (2013), indicators should be about things that one cannot observe with own eyes, such as customer expectations and attitudes. These non-observable things should be evaluated for cause and effect, and relevant issues should be separated from trivial ones. The things customers complain about loudest are likely to differ from the ones that actually have an influence on their future behavior. If the measurement takes advantage of small samples in generalization, costs are reduced but the reliability of the results remains.

Approach through lifetime value scorecard

According to Bonacchi et al. (2008), performance measurement systems of internet firms typically concentrate on measuring web data such as cost of acquisition, cost of service, number of customers, and churn rate. Using these indicators separately, however, does not provide useful information for decision making. Growing the customer base does not automatically mean that the value of the firm would increase. Therefore, firms should move the focus to the management of relation between the cost of acquisition (CoA) and customer lifetime value (CLV). To increase the value of the firm, CLV needs to be higher than CoA. Based on similarities in internet and mobile services, this can be seen applicable also to mobile applications business.

In order to establish a relationship between financial performance and customer acquisition, Bonacchi et al. (2008) developed a framework called Lifetime Value Scorecard (LVS). It can be used to track the relationships between customer value and customer behavior with a linkage to financial data, and is thus closely related to the modified CUSAMS framework presented in chapter 2.3.1. The LVS aims to offer an early indication of the success of marketing strategies in internet firms. Furthermore, Bonacchi et al. (2008) applied the scorecard to a hypothetical case of mobile value-added services provider. In their case, the services and content are provided to customer mobile phones taking advantage of mainly

wireless networks. A modified framework combining LVS and mobile case framework is presented in Figure 16.

The framework shows how net customer lifetime value can be seen as constituting of three areas. The upper part of the framework is considers the revenue and costs of products and services while the lower part is related to success in acquiring customers. Mid part of the framework introduces the time dimension taking into account usage and retention of customers. The purpose of this framework is to illustrate the connection between CLV, customer behavior and detailed metrics. It is also a convenient start to a more detailed discussion about different indicators in the next chapters.

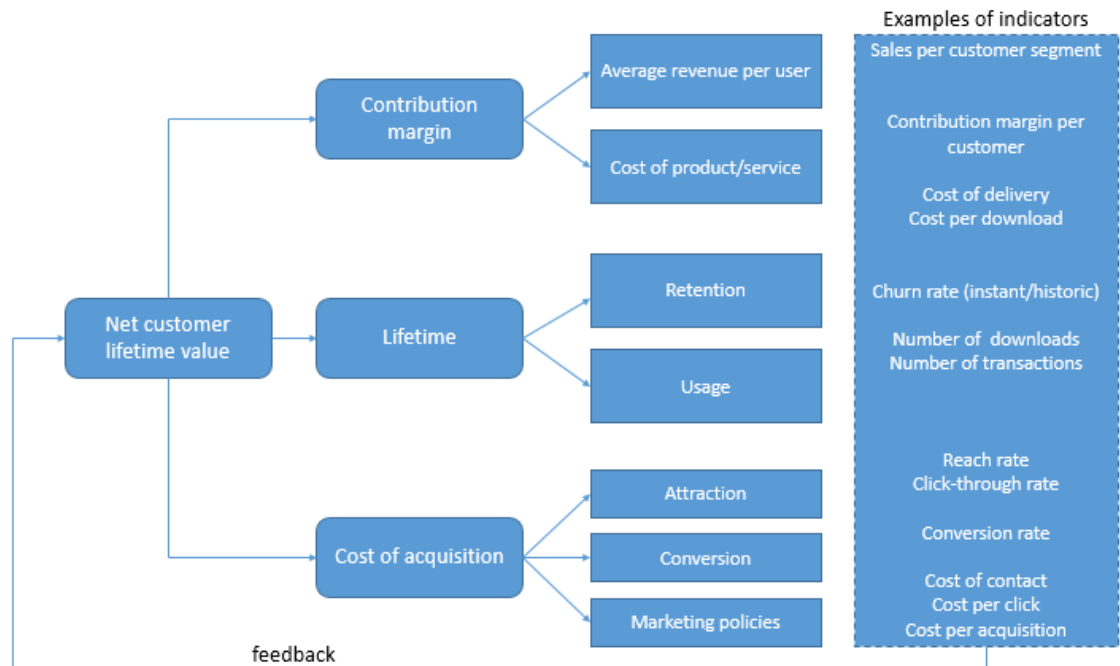


Figure 16 Framework of customer lifetime value scorecard (adapted from Bonacchi et al. (2008))

2.5.1 Overall success measures

According to Freed (2013), the success and competitive advantages of a firm requires utilizing the right tools and assessments in satisfying the needs of the customers. Measuring customer satisfaction allows firms to predict the future business and assists in improvement decisions in order to maximize the returns for investments.

Successful measurement of customer satisfaction not only measures customer experience reliably, accurately, credibly and precisely but also predicts financial results of the future (Freed, 2013).

As already mentioned earlier, CLV is discussed in a general level in this study. It can also be estimated through calculations, typically based on revenue, costs and customer retention over time. However, Bonacchi et al. (2008) mention that calculations have certain challenges and the right procedure depends on the business environment, cost structure and revenue stream of a firm. In fact, more important than the exact value of a customer is to know if the value is increasing or decreasing over time. Information on calculating CLV can be found in Bonacchi et al. (2008), Chan et al. (2011) and Busacca et al. (2008).

Return on investment

Return on investment (ROI) was originally designed for comparing capital projects having investments at single point of time and flow of returns during the following years (Ambler & Roberts, 2008). ROI can be calculated generally as the ratio of profit and cost of an investment (Investopedia, 2016) and is a useful tool for comparing alternative investments (Ambler & Roberts, 2008). More correctly, Ambler and Roberts (2008) describe the ROI with incremental profit and incremental expenditure as shown in Equation 1.

$$ROI = \frac{\text{Incremental profit}}{\text{Incremental expenditure}} \quad (1)$$

ROI is linked to the framework in Figure 16 discussed earlier. In that case the incremental profit can be associated for example to the difference between revenues and costs in customer acquisition or service business in general, depending on the desired perspective. Revenues come from customers, and costs are related to product or service production, and delivery process as well as costs of acquiring customers (Bonacchi et al., 2008). Bonacchi et al. (2008) mention that *Cost of acquisition* in general can be seen as *cost per gross addition*, which includes the selling and other expenses used to acquire the customer.

Life cycle metrics

Life cycle metrics are related to the lifetime part of the framework in Figure 16 and can be seen as including measures such as *reach*, *acquisition*, *conversion*, *retention* and *loyalty*. Indicators that measure interruption of lifecycle include *abandonment*, *attrition* and *churn* (Teltzrow & Günther, 2003). Bonacchi et al. (2008) mention that customers who are loyal to both the firm and its products and services, have the highest lifetime value. For example, related to web services, loyalty can be associated to site visits over time.

Reach measures the gain of awareness and attention of the target population that are potential customers, while *Acquisition* measures the ratio of potential candidates of population that become users but not necessarily make purchases (Bonacchi et al., 2008; Teltzrow & Günther, 2003). *Conversion* rate measures the number of people who take the desired action, such as registration or purchase, out of the amount of visitors to a market place such as website or specific store (Freed, 2013). It is good to notice that the definition for conversion may vary by the context and goals it is used with (Bonacchi et al., 2008; Teltzrow & Günther, 2003). Customer *retention rate* (see Equation 2) is related to repetitiveness of customer purchases over time and concentrates on measuring the churn of old customers (Busacca et al., 2008).

According to Bonacchi et al. (2008), *churn* measures the turnover of customer base over a period of time as shown in Equation 3. It can be taken advantage in tracking customer retention changes over time, and also helps to see the influence of changes in service offerings on customer retention. *Abandonment* measures the ratio of users who commence but do not get to a specific task such as complete the buying process (Bonacchi et al., 2008; Teltzrow & Günther, 2003). *Attrition rate* means the percentage of existing customers that have converted but have gone somewhere else and stopped buying (Bonacchi et al., 2008).

Indicators such as *conversion rate* and *retention rate* reflect the strategic success but due to their qualitative nature they require additional measures of main success factors (Bonacchi et al., 2008). According to Freed (2013), many firms consider conversion rate as one of the

most important indicators due to belief that it can clearly indicate the difference between success and failure. However, it is commonly misused and may be misleading sometimes. Therefore, it is important to understand the industry and the desired actions well before making conclusions about conversion rate measures. For example, a marketing campaign leading to increased sales may show decrease in conversion rate of new visitors but increase in total number of visitors converting.

$$\text{Retention rate} = \frac{\text{Customers at the end of the year} - \text{New customers during the year}}{\text{Customers at the beginning of the year}} \quad (2)$$

$$\text{Churn} = \frac{\text{Number of customers who attrite during the time period}}{\text{Total number of customers at the end of the time period}} \quad (3)$$

Walz (2015) mentions that the *retention rate* of an average mobile application is typically 40 percent after 30 days from the installation, 24 percent after three months, 14 percent after six months, and around 4 percent after one year. However, this depends on and varies by application category. For example, retention over three months for music and dating applications is around 20 percent while news, sports and weather applications are between 50 and 55 percent. The corresponding result for retail applications is around 32 percent.

Net Promoter Score

Net Promoter Score (NPS), according to Freed (2013), is a metric that measures the likelihood of a customer to recommend the service to a friend or colleague for example. It is quantifiable subjective metric, referring to the discussion in the beginning of chapter 2.5, and combines customer satisfaction and loyalty aspects. NPS is collected as a single number score of recommendation in a 0-to-10 scale, ten being the best. This determines if the customers are promoters (9-10), passives (7-8) or detractors (0-6) that were introduced in chapter 2.3.2. It is also possible to ask the primary reason for the score as a follow up to NPS. The result of NPS is the difference between percentage shares of promoters and detractors of all respondents, as shown in Equation 4 (Freed, 2013; SurveyMonkey, 2016). Thus, the result can theoretically range from -100 to +100 (Freed, 2013).

$$\text{NPS} = \frac{\text{Number of promoters} - \text{Number of detractors}}{\text{Number of respondents}} * 100 \quad (4)$$

According to Freed (2013), a firm should aim at high NPS result since it is related to good profits. NPS can be taken advantage of in listening to customers, solving issues that lead to negative experiences and creating services that lead to positive experiences. It may also help to improve the customer focus of a firm through engaging employees to meet their goals of the customer relationship. NPS is popular and widely adopted. It was the fastest growing metric measuring customer experience in the U.S. between years 2011 and 2012. In 2012, 83 percent of the firms in the U.S. asked the NPS question from their customers.

In addition to many of its advantages, NPS has also weaknesses. According to Freed (2013), the score scale of NPS is unbalanced since the scores are classified according to three

customer categories mentioned earlier. This type of classification considers the difference between scores 6 and 7, as different categories, but not the difference between 5 and 6, for example, due to falling into the same category. Furthermore, this causes oversimplification, inaccuracy and lack of precision in NPS results based decision making. Also, margin of error in NPS is often outside the statistical confidence range. Therefore, it is difficult to say for example, if an NPS score of 50 is better than 40. NPS only measures the probability that a customer could give positive recommendations but not the likelihood of saying something negative. That is why it might not be safe to conclude that a customer giving a low NPS score would automatically dislike the firm or its product or service and that this would lead to bad profits. Other way around, NPS is often not a good metric to conclude satisfaction or loyalty of customers either. For example, promoters may easily spread the positive word of mouth. However, drawing conclusions for other metrics based on that might be very dangerous and misleading. This is supported by Keiningham et al. (2007) mentioning that NPS should not be considered as primary or only indicator of customer loyalty. It is not sufficient alone to track the future loyalty behavior of customers and thus the growth of the firm.

Word of Mouth Index - an enhanced NPS

As Freed (2013) mention that NPS is an obsolete metric from the usefulness point of view, they introduce the next generation of NPS called Word of Mouth Index (WoMI). In addition to the likelihood of recommendation it includes the likelihood to discourage other people from associating with the firm. WoMI improves the customer experience measurement and provides the following benefits:

- A single case score – As any measurement with one simple value, WoMI benefits communication related to customer experience between different stakeholders and across the firm
- Valuable insight – Recognizing the true promoters and detractors saves firms from wasting resources for unnecessary actions and helps in customer related decisions
- Proactive data – WoMI includes a question about the reason for negative or positive word of mouth which allows firms to better understand the customer thoughts and needs
- Improvement to NPS – WoMI is a simple upgrade to already existing NPS providing improved precision, accuracy and actionability with no need to replace or remove the current system

2.5.2 Marketing metrics

According to Shankar et al. (2011) there is a lack of generally accepted indicators in shopper marketing. This is supported by Fitzgerald (2002) mentioning that event marketing is missing a standardized and widely accepted method to measure the results. Shankar et al. (2011) mention that traditional indicators, such as *store conversion*, *traffic* and *added sales* are not sufficient. Therefore, it is recommended to consider indicators that capture consideration and attention of the customers (e.g. *brands touched*, *proximity to target* and *dwell time*), nature of customer decision (e.g. *functional vs. hedonic*, *planned vs. unplanned* and *frequent vs. infrequent*), and cross-effects such as *adjacencies of categories*. The measurement could be based for example on biometrics, eye-cameras, path tracking utilizing radio frequency identification, infrared cameras, or handheld scanners. Considering browsing versus buying in online shopping, indicators such as *queries*, *visits*, *click-throughs* and *conversions* should be connected appropriately (Shankar et al., 2011).

Retail marketing, and especially outbound marketing campaigns are about testing and learning. The objectives of pilot marketing campaigns should be clearly defined and relevant indicators need to be specified to track the results. The indicators may include response rate of the campaign for cross-selling offers, conversion rate for acquisitions, or repurchase rate considering overall customer base development. In addition, more general indicators such as revenues, average basket size or profit may be used to further capture the impact of the campaign. Taking advantage of control groups is recommended in measuring the added value of campaigns. There should be a test group that is exposed to the campaign and a control group that is not. (Spillecke & Perrey, 2012)

To measure the success in social media marketing communications, right type of indicators for the purpose need to be recognized. This might be challenging as the number of different performance indicators available is very large and people typically choose easy metrics such as number of clicks. Good indicators allow easy and continuous measurement, and can be applied directly to the objectives of the marketing. Indicators should allow to see the results of the campaign and be suitable for helping in performance improvement through refining tactics and strategies. (Turban et al., 2015) Since social media and mobile applications can be seen as similar to some extent, the social media measures may be useful also in assessing the success of mobile applications.

Turban et al. (2015) introduce categorization of social media metrics in five different areas based on the level of customer involvement: awareness/exposure, brand health, engagement, action, and innovation. Conducting a survey would be the most accurate way to evaluate the improvement in brand awareness. It is, however, challenging and expensive if the survey response rates are small. Therefore, many firms take advantage of other proxy metrics, such as the *number of visitors, page views, number of ad loads on user screen, number of searches related to the brand, search engine ranking of the brand* and *number of registrations or followers*, to measure awareness. These metrics assume users becoming aware of the product features, if they visit the social media content of a firm. Also Sterne (2010) introduces similar type of metrics for social media and adds that the metrics can be viewed as averages, percentages, rates or ratios.

Brand health metrics are used to measure the effect of firm's communications on customers. They are related to the amount of conversation and its positive or negative nature. Also the importance of the brand to the customers and resulting purchases are covered. Examples of brand health metrics include: *number of conversations about one brand versus others, proportions of conversations that are positive, neutral or negative*, and brand influence such as *number of comments or posts of content sharing*. (Turban et al., 2015)

Engagement metrics are selected by a firm based on the objectives and tactics of communication. Some commonly used indicators include the following:

(Turban et al., 2015)

- Number of users consuming the content
- Countable tags, bookmarks or likes related to the content
- Number of membership users or followers
- Number of shares of content to others
- Number of content creating users such as uploaders or review writers
- Virtual world statistics such as length of user visits and interaction with different features

Action metrics are related to the engagement metrics but consider higher level of action. Examples of action metrics include:

(Turban et al., 2015)

- Click-through measures, indicating users that click to visit the content due to a communication message
- Completion of contact form or registration
- Number of mobile application downloads, updates and in-app actions
- Number of scans, sales and other purchase related metrics such as number of purchases or average purchase value

Innovation metrics, such as *number of ideas*, measure customer participation to product or service improvement of a firm in forms of comments and reviews, for example (Turban et al., 2015). These metrics also reflect customer loyalty (Turban et al., 2015), related to the discussion of loyalty levels in chapter 2.3.1.

ROI in marketing

According to Ambler and Roberts (2008), success of marketing can and should be financially evaluated. Focusing on accountability and marketing metrics leads to better profits (Powell, 2012). However, return on investment of strategies and technologies in digital marketing may be difficult to measure. Lopresti (2014) says that according to an online study in 2013, 76 percent of the digital marketers consider measuring marketing performance important but only 29 percent estimated that they are doing the measuring well. The challenge is in the demonstration of success related to intangible and inherent value of certain tools and strategies in digital marketing. Assigning tangible values to intangible aspects of marketing strategy may help in this (Lopresti, 2014).

Measuring marketing performance requires using more than just one variable. In fact, using ROI alone might not be a good practice, since Ambler and Roberts (2008) find several objections to using it as a measure of marketing success. For example, utilizing ROI might hinder the maximum performance as it reaches its maximum value before the maximum point of profit. Other reasons include non-investment nature of marketing expenditure and differences associated to the division nature of ROI calculation in comparison to other, subtraction based methods. Discounted cash flow based metrics such as net present value and CLV may be part of the performance metrics but are not recommended to be used as KPIs in marketing. (Ambler & Roberts, 2008)

As ROI offers a measure of success only on a particular investment, attention should be paid to the desired objectives and context of the measure. For example, ROI could be measured before and after a marketing event in order to compare the actual and projected performance results. ROI is also a good metric in estimating and demonstrating the potential monetary return of a future marketing campaign. (Davis, 2012) For example, related to the framework in Figure 16, ROI of a particular marketing campaign can be calculated using the *average revenue per user* (ARPU) due to the campaign and *cost of acquiring the customer* (CoA) through the campaign. Bonacchi et al. (2008) define the *cost of customer acquisition* as shown in Equation 6, which leads to the ROI calculation in Equation 7.

$$\text{Average revenue per user (ARPU)} = \frac{\text{Revenue from marketing campaign}}{\text{Number of acquired customers}} \quad (5)$$

$$\text{Cost of customer acquisition (CoA)} = \frac{\text{Cost of marketing campaign}}{\text{Number of acquired customers}} \quad (6)$$

$$ROI = \frac{ARPU - CoA}{CoA}$$

$$= \frac{\text{Revenue from marketing campaign} - \text{Cost of marketing campaign}}{\text{Cost of marketing campaign}} \quad (7)$$

2.5.3 Usability and usage metrics

According to Hussain et al. (2012), **usability** of mobile applications can be evaluated by several methods, such as field or laboratory tests. Laboratory experiments provide better control on test variables and users, while field studies excel in consideration of dynamic mobile context and unreliability of mobile networks (Zhang & Adipat, 2005). There are only limited literature and few guidelines on measuring usability, especially in mobile application context. This leads to application developers employing measures that they already know, some of which may be inappropriate to specific applications. The challenge of the usability measurement is in the unique features and novelty of mobile applications and devices, which were discussed in chapter 2.2.3. (Hussain et al., 2012)

From research point of view, controlled experiments and field studies are the most popular methods to measure usability of mobile applications. Other methods include surveys, case studies and informal evaluation. Surveys may be used to improve the understanding of public reactions to mobile systems. (Harrison et al., 2013)

Zhang and Adipat (2005) present usability measures for mobile applications as shown in Table 2. These are linked to the usability attributes introduced in chapter 2.3.4. It is important to notice that due to rapid changes in mobile technology and applications the metrics presented here may need to be updated by time (Hussain et al, 2012).

Table 2 Measures of usability attributes for mobile applications (Zhang & Adipat, 2005)

Usability Attributes	Measuring Variables
<i>Comprehensibility (Readability)</i>	Percentage of correct answers in a predefined test, reading speed (such as number of words per minute)
<i>Effectiveness</i>	Comparison of user performance with a predefined level (such as finishing tasks in 9 minutes, using 2 clicks or less) considering speed, errors, number of steps, task solved in a time limit
<i>Efficiency</i>	Time required to complete tasks, duration used to finish given exercises, and duration spent on each screen
<i>Error</i>	Number of errors made (such as percentage of correctly completed tasks, wrong answers, deviating button clicks from the right path, detour steps)
<i>Learnability</i>	Time needed to accomplish tasks at the first try, amount of training required (such as number of trials and corrections), time spent on training users until reaching a level of satisfaction, learning curve of several uses (such as speed and errors)
<i>Learning Performance</i>	Evaluation of assignments in classrooms (such as exercises, notes and concept maps)
<i>Memorability</i>	Time, number of button clicks, pages and steps required in order to complete tasks after not using applications for a certain period of time (for example 3 days or weeks)
<i>Satisfaction</i>	Attitude of users toward applications after using them (for example level of difficulty, confidence, like/dislike)
<i>Simplicity (Complexity)</i>	Amount of effort required to find a solution, number of selections and button clicks required to reach a destination page, number of menu levels that the users have to go through in order to solve a task, time spent to search for a button to perform a certain function

Usage

“Truly successful apps offer a clear solution to a problem their users face, with success affirmed by users visiting the app repeatedly” (Drell, 2013). Analysis of mobile application usage may reveal detailed information about the application and user engagement such as when and where customers use it, and if there are problems on the way (Preimesberger, 2015). In the evaluation of usage it is important to recognize the active users (Karpischek et al., 2012).

In addition to above mentioned aspects, Preimesberger (2015) introduces the following usage measures related to evaluation of mobile application success, many of which are also supported by Drell (2013):

- Number of views and downloads from application store
- Number of installations
- Actions of users inside the application and most clicked areas
- Frequency of use

- Length of an average session
- Number of active users, devices and sessions in real time
- Type of operating system platform and carrier through which the user is consuming the application
- If the users are still using the application after 10 or 30 days
- Crashes and health of the application
- Non-fatal errors and operating environment
- Latency and response times
- If a user manages to get from point A to point B
- Possible timeouts
- Repeated customer behavior
- Key demographic information and also personal information if allowed

As an example of the importance of these indicators, having over 3-4 seconds of total response time is likely to cause 60 percent or more of the application users to abandon the transaction or even remove the whole application (Whitepaper report, 2015). Considering *frequency of use* for different type of applications, the following benchmarks are introduced (Walz, 2015):

- Dating, music streaming, social games, communication and news – 5-9 times per week
- Photo & video, medical, banking & payments, weather, sports – 3-5 times per week
- Health & fitness, education, retail, food & drink, travel – 1-3 times per week

2.5.4 Gamification metrics

Since people are acting more naturally when playing, measuring gamification may help in getting to know customers better (Pena & Natal, 2014). As with all the other areas, measuring progress or improving on past experiences in gamification requires appropriate metrics. The metrics and targets indicating the success of gamification strategy need to be selected in the planning stages of the project. Moreover, the metrics should be based on the mechanics of the gamified experience, and automatically measure the users as they interact with the gamified experience. (Robson et al., 2016)

Related to the analysis of effectiveness of gamification in the company, Francisco-Aparicio et al. (2013) mention that first things to determine are if the gamified application is fun for the user and managed to improve the motivation of workers through game mechanics. The effect of gamification on service improvement and customer satisfaction can be determined similarly. (Francisco-Aparicio et al., 2013)

The success of gamification can be measured using many of the same indicators introduced earlier in this study. Kumar and Herger (2013) introduce metrics to measure the effectiveness of game mechanics related to gamification at work through business software. The following metrics can be seen as applicable also for mobile applications: (Kumar & Herger, 2013)

- Average number of actions
- Median number of actions
- Number of users performing actions
- Number of times users return
- Progression of users through the experience

- Retention
- Frequency
- Decrease of response time
- Timeliness
- Number of active users
- Sales increase

Gigya website (2016) introduces more gamification specific versions of the aforementioned indicators:

- Top users per challenge (by points)
- Daily activity (number of times that each action is performed for specific challenges per day)
- Daily users by challenge (number of new users that start participating in each challenge daily)
- Users by challenge (number of users that participate in each challenge)
- Users by level (number of users advancing to a new level in each challenge)

2.5.5 Key performance indicators

The idea in using key performance indicators (KPIs) is that they present the technical data in business relevant language using ratios, rates, averages, percentages and graphs. Instead of just presenting tables of data they highlight the change and offer temporal context. Therefore, KPIs drive actions that are critical to business. (Sterne 2010)

Based on a survey in 2015 made to information technology decision makers from 200 firms with minimum of 2500 employees in the U.S. and Western Europe, 85 percent of the firms are taking advantage of KPIs to measure the success of their mobile applications. Nine percent of the firms utilize other methods and the rest are not measuring the success of mobile applications at all. 74 percent of the respondents whose firms take advantage of KPIs at some level in measuring success of their mobile applications, have positive ROI. Considering retail firms only, the percentage is 76. Moreover, the likelihood of reporting positive ROI is higher in the U.S. than in Western Europe. (Red Hat Survey, 2016)

Given the increasing omni-channel orientation in retail business, also measures should be re-thought. There are still many retailers concentrating narrowly on purchases made through devices of customers in measuring the success of their digital investments. Moreover, the investments are prioritized to features promoting on-device conversion. These features may differ from the ones that create value to in-store customers, which leads to lack of capturing the full assisting value of digital devices in customer shopping process. For successful measures of digital investments, the following indicators should be applied holistically:

(Lobaugh et al., 2014)

- Store traffic
- Conversion
- Order size
- Loyalty

According to Freed (2013), higher conversion rate means more revenue and less marketing costs. Therefore, it can be considered as a basic KPI. Dumenco (2011) mentions that

roughly every fourth mobile application downloaded will be used once and then abandoned. This is due to lack of user engagement and because there are more applications available than users have time to use. Thus, tracking engagement metrics, such as *session length*, *session interval* and *retention rate* (Whitepaper report, 2015), is a key part in the success of a mobile applications (Preimesberger, 2015).

From mobile application performance, usage, engagement and business point of views the following indicators are recommended to be used to ensure the success: (Whitepaper report, 2015)

- Performance:
 - Application crash rate
 - API latency
 - End-to-end application latency
- Usage:
 - Monthly and daily active users
 - Devices and operating systems that the application is used with
 - Location and geography metrics
- Engagement:
 - Session length
 - Session interval
 - Retention rate
- Business:
 - Acquisition cost
 - Transaction revenue
 - Abandonment rate
 - Lifetime value
- General:
 - Application star rating

To clarify the meaning of some of the aforementioned indicators, *application crash rate* refers to the average crashes per application load. The value of this indicator is typically 1-2% but depends for example on the type, maturity and usage of an application. API (Application Programming Interface) latency means the time between request and response in application programming interface, which is typically around one second. Respectively, *end-to-end application latency* is related to the response time to applications powering the API's, which also should be around one second. *Application star rating* means the user given rating to the application in an application store. It is a public statement to the application and will have an important influence on the application success in the long term. (Whitepaper report, 2015)

The KPI potential of *frequency of use*, *device and operating system*, *lifetime value*, *retention rate*, *monthly/daily active users*, *session length*, *average revenue per user*, and *user happiness/star rating* are also supported by Drell (2013). In addition, the following indicators are suggested:

(Drell, 2013)

- Who is using the application
- How the application is used
- User demographics
- Time of use (day or night)

- App launch load time
- User acquisition (how existing users have found the application)

Kaushik (2008) introduces KPIs for web business supporting *conversion rate*, *average order value* (related to revenue per user), *frequency of use* and *retention rate*. In addition, the following indicators are suggested:

- Days and visits to purchase
- Task completion rate (of users)
- Share of search (in search engines)

Walz (2015) introduces mobile marketing metrics that matter the most. *Average revenue per user*, *session interval and length*, *retention* and *conversion* are linked to the previously introduced KPIs, and the following measures are suggested in addition:

- Cost per install
- Cost per loyal user
- Application screen launches per session
- Number of customers that are messaged
- Number of customer that respond a prompt or message
- Number of customers that sign up for additional notifications or alerts
- Number of customers requesting less notifications or alerts
- Love ratio

Cost per install is the customer acquisition or advertisement costs divided by the number of customers that installed the application in response to the advertisement, and *Cost per loyal user* means the cost of acquiring an active user. Active may be defined for example as a user who launches the application three times at minimum. *Love ratio* means the percentage of customers who say “yes” (out of “yes”, “no” or “dismiss”) when asked if they love the application. The average benchmark for *love ratio* is 57.75 percent. (Walz, 2015)

2.5.6 Summary

There are large number of different indicators available to measure the success of mobile applications from different aspects, and many of the indicators are overlapping with each other. Some indicators are more suitable for measuring usability or usage, for example, while others are better for evaluating the success of marketing actions or long term effects. This promotes the importance of selecting the right type of indicators for desired purpose. Some of the indicators presented earlier are designed for web, social media or traditional marketing use but can be applied also to mobile applications.

From management point of view, a single number indicator representing profit is preferred (Ambler & Roberts, 2008). However, an indicator should not be selected only based on its easiness or because it is called a metric. Instead, a right type of indicator should be effective and efficient, helping to achieve the desired business goals. It is important to recognize the objectives, strategy and tactics to select the right indicators and KPIs. According to Shankar et al. (2011), different objectives typically lead to utilizing different type of indicators. Ad-hoc type of indicators can be utilized in measuring specific cases for short time periods but monitoring longer periods of time requires more holistic success measures (Okes, 2013). In marketing, for example, ROI might be useful for single point estimations and

demonstrations but taking advantage of control groups may be the best way to measure the added value of a campaign. (Davis, 2012; Spillecke & Perrey, 2012)

According to Salz (2014), most marketers have trusted on two sources of information in determining the performance of their mobile application: application store user ratings and analysis of social trend. Only monitoring possible issues that the customers have with the application, however, is not a good practice (Salz, 2014). NPS is a widely used and popular indicator of customer satisfaction and loyalty, but it should not be considered as primary or only indicator of customer loyalty. WoMI or similar improved NPS may provide better results.

In order to manage performance more proactively, it is recommended to have more leading indicators than lagging indicators. Related to this, it is good to remind that the nature of an indicator may be leading or lagging depending on the perspective of viewing it, person who established it, and the reason of establishing. (Okes, 2013)

KPIs present the information in business language and drive actions that are critical to business. It seems that utilizing KPIs correlates with positive ROI for mobile applications. Based on the discussion in above chapters the following indicators can be recognized as potential KPIs to measure the success of retail mobile applications:

- Conversion rate (both on device and in-store)
- Retention rate
- Customer lifetime value
- Application star rating
- Session length
- Session frequency
- Active users (monthly/daily)
- Average revenue per user/Order size
- Operating system and device

In addition, it might be useful to consider more modern and innovative indicators to measure the influence of a retail mobile application:

- Indicators that capture consideration and attention of the customers (e.g. brands touched, proximity to target and dwell time), nature of customer decision (e.g. functional vs. hedonic, planned vs. unplanned and frequent vs. infrequent), and cross-effects such as adjacencies of categories.
- Innovation metrics, such as number of ideas, and measures of customer participation to product or service improvement of a firm in forms of comments and reviews.

3 Methodology

Due to case research nature of this study, findings of literature review are elaborated on the real business context through empirical research based on K-Group and K-ruoka mobile application. Customers, retailers and Kesko can be recognized as the three main stakeholders around the success of K-ruoka application. Therefore, the empirical part of this study takes advantage of interviews of Kesko personnel and retailers, and customer opinions through the results of an existing NPS feedback questionnaire made by Kesko. In addition, a practical business case, taking advantage of control group study on two time periods was made in order to show the actual effect of K-ruoka application on business and different customer classes. This combination allows optimal coverage of the key areas from research and management point of view, providing information from different aspects, considering the schedule and scope of this study. The findings of empirical part are introduced, analyzed and compared with each other in order to find the right conclusions. The data collection and analysis procedures of empirical material are described in more detail in the following chapters.

In order to better understand the empirical procedures, they are presented here as self-contained methodological entities. Applying the definitions of Saunders et al. (2007), the empirical part of this study, excluding the practical business case, can be considered as cross-sectional case studies. Cross-sectional means that the data analysis is not based on time dimension and the data can be assumed to be collected at a certain point of time. Case study is a strategy for doing empirical research of a certain contemporary phenomenon by taking advantage of multiple sources of evidence. The phenomenon is studied in its real life context and the boundaries between the phenomenon and the context are not very clear. As a controlled context experiment, the practical business case is an opposite of the case study, but is cross-sectional as well.

According to Saunders et al. (2007), combination of primary and secondary data can be used to answer most of the research questions. Primary data refers to the collection of new data while secondary data means reanalyzing data that already exists. In the case of this study, interviews were used to get primary data. Existing customer feedback and the numerical data behind the practical business case were utilized as secondary data.

Limitations related to empirical procedures are discussed in chapter 7.1 together with other limitations.

3.1 Interviews

Interviews were carried out as qualitative case study (Saunders et al., 2007). Seven persons from Kesko and three retailers were interviewed as shown in Table 3. Names of the interviewees are left out in order to remain anonymity of the persons. The interviewees were selected so that their opinions would cover different aspects widely in the context of K-ruoka application. In one of the retailer interviews there were both of the retailers present part of the time. Considering the schedule, scope and structure of this study, the number of interviewees can be considered sufficient in order to get the information needed.

Table 3 Interview dates and interviewees

Date	Interviewee position	Company
May 12, 2016	Sales Director	Ruokakesko Oy
May 13, 2016	Development Director	Ruokakesko Oy
May 16, 2016	Marketing Director	Ruokakesko Oy
May 16, 2016	IT Director	Kesko Oyj
May 23, 2016	Head of Mobile	Kesko Oyj
May 25, 2016	Marketing Director	Ruokakesko Oy
May 26, 2016	Development Manager	Ruokakesko Oy
May 31, 2016	Retailer	K-citymarket
June 2, 2016	Retailer	K-supermarket
June 7, 2016	Retailer	K-Market

The length of the interview sessions were approximately between 35 and 80 minutes. Interviews were mainly guided by the questions list (see Appendix 1: Interview questions) which reflects the structure of the theory part of this study. The questions are in Finnish language due to all interviewees being Finns, and were sent to the interviewees beforehand. Some of the questions were modified for the retailer interviews in order to clarify the topics and accommodate the retailer point of view. Many of the questions are partly overlapping with each other, which is also the case with the real life topics behind them. This helps to cover wider aspects and establish linkages between different areas. Also an opportunity of giving open opinion was provided to the interviewees in the end of an interview session.

The sessions were recorded and transcribed to get the raw data in text form. This raw data from all the interviews was further arranged under the question titles and analyzed. The analysis was based on recognizing the issues that were mentioned the most, but also single potential opinions and ideas were considered to enrich the findings.

The findings of interviews are presented in chapter 4.1.

3.2 Customer feedback

As mentioned earlier, the customer feedback as secondary data was analyzed qualitatively. This was because such data already existed and it would not have been possible do a new large questionnaire in the timeframe of this study. The open feedback was collected by Kesko in connection to an NPS questionnaire sent to randomly selected 20 000 persons who had downloaded K-ruoka application. The questionnaire was sent on March 18th 2016 and the NPS analysis was done on March 31st 2016. As a result, 5220 persons responded, out of which 1261 persons gave open feedback.

In order to understand the open feedback more comprehensively for later analysis, it is good to introduce the NPS score distributions. Overall NPS result of the questionnaire was 35. The relative distributions of different NPS scores in general and by gender are shown in Figure 17 - Figure 19. Most of the respondents gave NPS score 8. Score 9 was the second popular and score 10 was third. It can be seen that females gave better NPS scores than males in general. Considering the linkage between different mobile operating system platforms and NPS score in overall level, Android and Windows Phone users gave more NPS score 10 than iPhone users. However, the share of scores 7-9 were bigger among iPhone users. In females, iPhone users gave relatively more NPS 9 scores than other

operating system users, while the trend for male users of different operating systems in case of NPS score 9 was similar to the overall case of NPS score 10 (i.e. Android and Windows Phone users dominating).

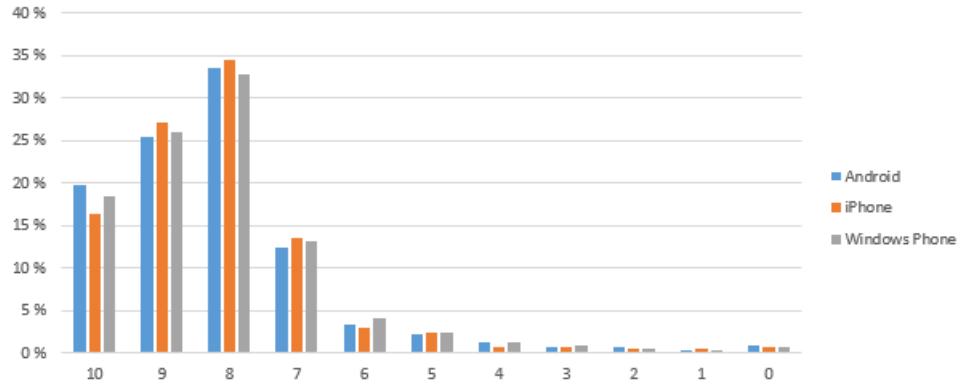


Figure 17 Overall NPS scores distribution in the questionnaire

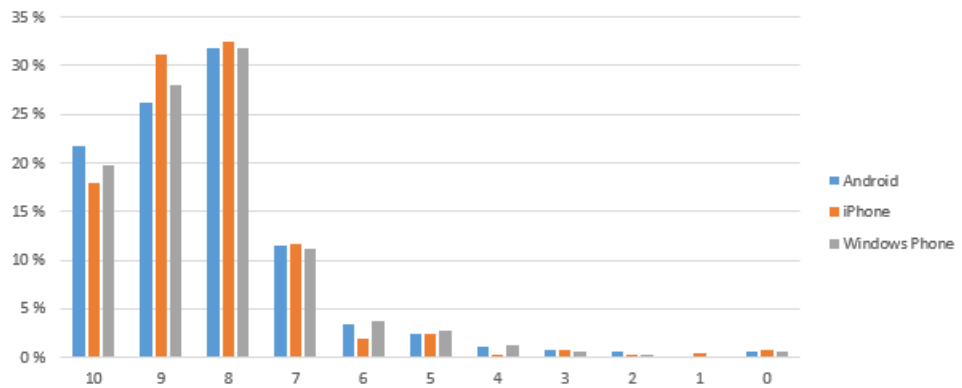


Figure 18 NPS scores distribution for females

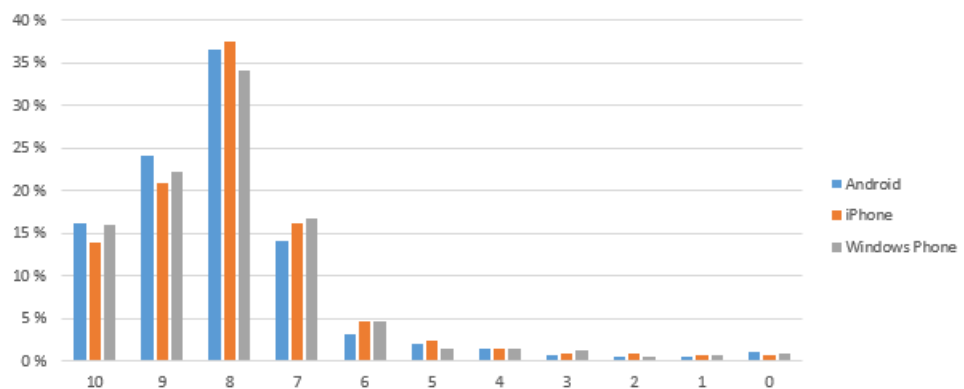


Figure 19 NPS scores distribution for males

Considering the limited time and scope of this study, it was not possible to include all the 1261 answers to the analysis of open feedback. Instead, a main sample of 100 answers was selected (Excel rows from 1 to 100). In addition, a control sample of 10 answers was

selected from rows 501-510. The idea of the control sample is to check the reliability of the main sample. This approach is based on instructions for reliability in Hiltunen (2009).

The open feedback was classified under the interview question titles and analyzed similarly to the interview data, i.e. recognizing the issues that were mentioned the most but also single potential comments. This way it is more straightforward also to compare the customer feedback to interview results and theoretical findings in later analysis. Due to the overlapping of different question titles, the feedback of an individual person might be allocated under more than only one title. The control sample was compared to the findings of main sample to recognize possible similarities or differences and thus validate the reliability of the findings.

The results of the customer feedback are introduced in chapter 4.2.

3.3 Case: Influence of K-ruoka application on sales factors

The practical business case was carried out as an experimental quantitative study taking advantage of control groups. A procedure of classic experiment (see Figure 20) was applied. According to Saunders et al. (2007), this means having two exactly similar groups (experimental and control group) of randomly assigned members, other of which is exposed to a planned intervention. Dependent variable, in this case, means the sales factors such as sales and number of visits, and intervention is the use of K-ruoka mobile application. Also Spillecke & Perrey (2012) recommend to take advantage of control groups when measuring value of campaigns, as explained earlier in chapter 2.5.2. The business case was done in collaboration with Kesko analytics team who prepared the data sample out of population, which was then analyzed by the author of this study.

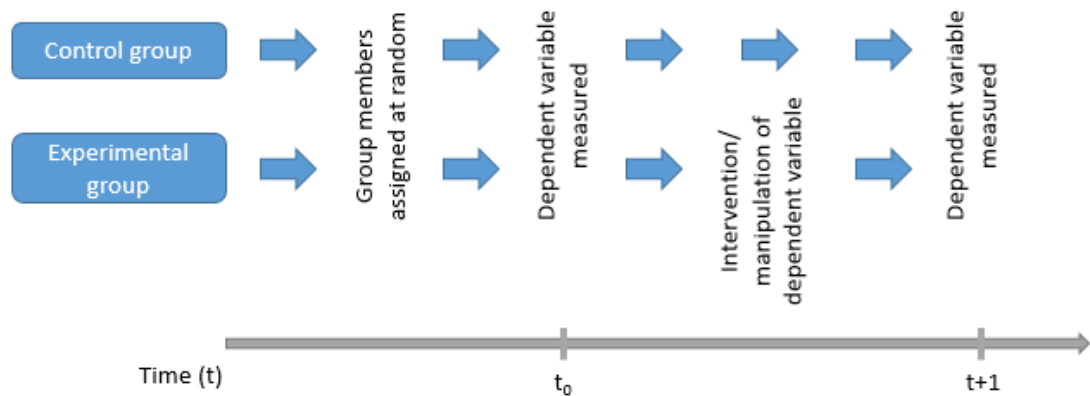


Figure 20 Structure of a classic experiment

Population was all Plussa households out of which the sample consisting of the data of two different groups (experimental group and control group) were formed. Experimental group was formed by including all the households and people within that had downloaded K-ruoka application during week 7 in February 2016. Control group was formed based on selected criteria of similarity to experimental group. This was done by matching the shares of persons in both groups by Ruokakesko customer class, stage of life class and main retail chain of a customer. More detailed description of these classes and information of shares are excluded in this study due to confidentiality reasons.

As a consequence, the size of experimental group was 7 089 persons and control group 1 240 660 persons. The influence of these groups on different sales factors were analyzed during two time periods: four weeks before and after the download week i.e. 18.1.-14.2. (time period 1) and 22.2.-20.3.2016 (time period 2). The totals of these periods are associated to t_0 and $t+1$ points of time in Figure 20 respectively.

The data sample was analyzed in Excel using Pivot tables linked to the database. Three rows of data, where sales was unknown, were left out. The change of sales factors was obtained by calculating the relative differences between time periods for both of the groups. These differences were plotted together to establish the influence of K-ruoka application. In addition to overall results, the differences were plotted by stage of life class and grocery sector class. Since the experimental group and control group consist of similar types and shares of customers (i.e. they represent the same population) and the groups are compared as whole entities, the influence of other factors than K-ruoka application on differences between group results can be assumed diminutive. This is supported by Saunders et al. (2007) mentioning that the intervention is the only explanation for the differences, since the groups experience the same external influences other than caused by the planned intervention.

The results of the business case are presented in chapter 4.3.

4 Empirical findings

In this chapter, the findings of interviews, customer feedback and practical business case are presented. The cross-comparison of these findings and their linkage to theory, are introduced in chapter 5.

Due to features, functionalities and metrics developing all the time it is challenging to determine what is current and what is future. Therefore the emphasis here are on the preferred features and indicators, regardless of the time dimension of their implementation.

4.1 Interviews

K-ruoka application channel as part of the bigger picture

K-ruoka application is considered good application but there are still a lot of things to be done to make it better. Considering the application as a part of the whole organization, Kesko delivers the results, information and guidelines of actions to the retailers in a unified manner. However, the systems are too complicated and difficult to use at the moment, especially when the retailers are often very busy with everyday business. Therefore, the systems should be simplified and automated, having all the functionalities for a retailer available through single login.

Retailers do not always know how to take advantage of the application and some of them are not even aware of the possibilities of digitalization. This leads to defective utilization of the application. Better communication and information about systems and the application to the retailers should alleviate this problem.

The application should give the look and feel of a retailer to customers who use the application, and retailers should be able to contact selected customers with personalized messages. This requires proper utilization of analytics and systems that are easy to use.

Considering different channels, K-Group should provide the selection of channels and services to the customer, who chooses the most desired ones. The channels should be uniform with each other, however, considering special characteristics of each channel related to advantages or limitations. All the services should be seen and improved in a unified harmony.

Kesko has trusted personnel with increasingly good mindset, but there are still challenges, such as large number of different type of retailers, related to formation of unified K-Group. The top management should recognize the potential and importance of digitalization, and question the old fashioned mindset.

Potential of platform economy and different parties

The opportunities of platforms and mobile and K-ruoka application as a platform are seen as a potential option, especially in the future, and this should be further investigated. Different parties could be utilized and connected through interfaces such as APIs, service buses and common logins.

Considering third parties, their already existing solutions could be utilized for example in facilitating more cost efficient testing in the beginning of service lifetime. However, utilization of third parties should be done carefully considering information security and ownership of the customer front-end. It is also good to notice that different tests of new

services should not make the customer experience more difficult or complicated. For the beginning, it would be good to restrict the collaboration to selected key partners only or utilize internal business areas of K-Group.

Most important features and functionalities of K-ruoka application

The most important features and functionalities (referred as features from now on) in order to retain and improve customer value of K-ruoka application are related to making the everyday life of the customer easier. Personalized, appropriately targeted deals, discounts, recipes and real time shopping list including its sharing are seen as important features. The importance varies depending on the customer and the stage of the shopping process. The deals could be even more valuable and more personalized and in addition to the customer value, they should consider the business profitability aspect. Retailers consider the shopping list important for the customer especially in the in-store, and mentioned that there could also be in-store navigation or floor plan in the application.

The features should allow quicker and more agile marketing and communications. After visiting the in-store the customer could be provided with video recipes for example, including options for rating and comments. In order to bring the customer and retailer closer to each other, communality related social features would be needed. This way the customer could customize the application in a desired manner and would be able to express own opinions or other information. One of the first steps in this could be to allow agile message based communication between the customer and retailer.

The application should allow mobile payment with ordering and delivery options. Also a feature of monitoring Plussa points and barcode scanning were desired, and are actually under development already. As with the bigger picture and channels, the features of the application should be developed considering the entire service offering. Visibility and customer point of view should be emphasized.

Mobile advantages

The mobile specific benefits are seen to relate to the almost continuous presence of the mobile device in reach of the customer. With the mobile the deals and discounts are always with the customer and some things can be done faster and easier in comparison to web. Mobile application also facilitates cost efficient communication to selected customers only without distracting other segments. The drawbacks of mobile are related to the small size of the screen and possible difficulties in handling of large amounts of information.

Customer loyalty

In order to retain the customers there should be relevant, practical, personalized and easy-to-use services and content of good quality in the application, which would interest and addict the customers to use the application. These could be relevant products, deals and recipes or health and well-being related services, or combinations of these. In addition, well working push notifications and the possibility of selection related to deals were mentioned. The money is not always the best factor to increase loyalty. Instead, there could be concentration to other things that matter to the customer, also allowing a creation of emotional bond to the customer.

New campaigns were mentioned as a way to get new application users. However, it is important to consider the churn at the same time. Communality related social features may also help to improve loyalty as well as easier way to give feedback, as mentioned earlier.

Gamification features such as rewarding or some other means of differentiation could also work. The customer should be rewarded for increased purchasing behavior instead of after decreased behavior.

Many interviewees mentioned the importance of continuous, active and agile development, and updating of the contents. A challenge is to service all the customers equally well. Especially, the younger generation of customers seems to be challenging to retain. All in all, the actions to increase the customer loyalty should be implemented inconspicuously, avoiding offensiveness. Utilization of data and analytics is considered very important in order to recognize the customer behavior and needed actions.

Activating passive users

Recognition and activation of passive application users are considered challenging. Data and analytics should be utilized in order to recognize the passive users and personalized messages should follow. Features and services that help the customer, offer real benefits and solve real problems should be offered. Possible activation methods could include bigger discounts, new features (also other than food related), giving experiences to the customer, and more personalized services.

Passive users could be reached for example through communicating about the easiness of the application visibly in other media. However, it is important to remember the cost efficiency also related to the activation actions.

Managing different types of customers

The challenge is that there are number of different type of customers and not everyone can be serviced equally. Taking advantage of personalized communication, deals and guiding services allows utilization of the different customer types. Many interviewees mentioned that Plus data facilitates decision making about the behavior of the customers, which allows targeted offering to the right segments. There is also a desire to recognize the best customers, also in the in-store, offer them good quality service and creating emotional bond to them.

The importance of utilizing data and analytics was strongly emphasized also in this case. It was also mentioned that customer behavior could be investigated by asking directly from the customers or through observing service usage. Related to this, it is good to notice that a customer often gives different answers in an interview in comparison to general questionnaires for example. Therefore, in order to form the right observations and conclusions the questions should be well thought and answers filtered properly.

Retailer motivation

The importance of allowing retailers to do more through mobile and increasingly influence to the customers were emphasized. A retailer should be able to differentiate with its own strengths and customers should view the application as a retailers own application. Customers should be provided with a feeling as if the retailer was 'inside the application', ready to communicate and help the customer when needed. Retailer motivation is to get the customers in to the in-store and serve them the best way to make purchases.

As mentioned earlier, the usability of current systems and procedures should be simplified and there should be easy and straightforward options for a retailer to choose from. Retailers should be informed and educated more about the benefits and relevance of application and digitalization in general. There is a good start for the retailer motivation but it may decrease

unless the desired services can be provided quickly enough. Data and analytics should be utilized to show the influence of the application on the in-store sales factors, as well as to prove the profitability of the investments. The information should be easily in the reach of the retailers.

Comparison to competitor mobile applications

The advantages of K-ruoka application are seen to be related to targeted deals and personalized services based on the utilization of data. The strengths include recipes, deals and discounts, appearance and easiness of use. Adding more retailer specific feeling and value to the application, options for mobile ordering, and utilizing more data would increase the benefits.

A comparison to S-Groups Foodie mobile application was made by many interviewees. The advantages of Foodie are longer experience, mobile purchasing, ordering and delivery, store specific products and prices, and barcode reading feature. Difficult menu structure, poor visuality, and too much features in a single application were seen as disadvantages of Foodie.

One of the interviewees mentioned the Swedish ICA mobile applications. ICA is a step ahead in utilizing food, seasons and micro seasons. It is more present in the life of customers than K-ruoka application. Also R-Kioski mobile application was mentioned by an interviewee stating that it is easy to use, and has welcome campaign and collection pass.

On the whole, it is important to consider the differences in strategies, goals and actions of different firms when comparing the mobile applications.

Mobile marketing

Marketing to customers through K-ruoka application should be more personalized, taking advantage of data and analytics. A retailer should be able to market the desired products to the desired customers in a personalized way. As mentioned earlier, a provision or proper systems and tools are needed for this.

Surprising elements and in-store related ideas in marketing to customers were mentioned. Some individual comments pointed out that deals and discounts are emphasized too much. Customer centricity should be considered in the first place and recognize that the valuation between deals, quality, brand products, inspirations and recipes varies by customer. Related to quality and inspirations, there could be more micro seasons related agile marketing, or marketing of local food.

Facilitating communication between the retailer and the customers and bringing the feeling of the retailer and in-store to the application are seen as good ideas. In addition, cross-targeting within K-Group could be taken advantage of in marketing through application.

Prior to personalized, targeted marketing it is necessary to reach the awareness of the customers and have a required number of customers. This could be facilitated by multichannel marketing, taking advantage of also traditional channels.

Some of the interviewees mentioned the importance of good planning and productization prior to execution of campaigns. This allows minimizing possible mistakes in the in-store.

Related to push and pull marketing, push notifications should be targeted. Otherwise customers could consider them as spam. Push marketing is a good start, but the contents of services should also work. The customer should consider the push messages relevant,

instead of giving a feeling of an advertisement. The message should not be too long or difficult to understand, and the customer could also be able to select which messages he or she wants to receive. Therefore, careful planning is needed for push marketing.

Pull marketing is achieved when the application and the whole ecosystem around it is considered desired enough. This could be achieved through seasonal marketing, and image or local food related messages instead of pure product or price oriented messages.

Increasing value through usability

From usability point of view, there are lots of good things in K-ruoka application at the moment. Usability and its improvement are seen as important and should be based on utilization of analytics, instead of guessing. It is important to have a customer centered mindset when developing new features. This includes recognition of the relevance of a feature for the customer related to the time and situation of customer shopping process.

Usability should be personalized and the customer should be provided with options to customize the usability in a desired way. The usage of application should be as intuitive, easy, quick, clear and straightforward as possible, and the number of different steps should be minimized.

Only the most relevant information should be included in the application. Having too much features or showing too much information leads to complexities, which reduces the user experience.

Gamification

The definition of gamification is seen partly as a blurred line. There have been some talk and experiences about gamification, for example, related to utilization of Plussa. Gamification is seen as potential, but not the only option to increase the customer value. Therefore, it should not be invested too much.

A number of potential ideas and examples were brought up by the interviewees, which are excluded due to confidentiality reasons. Interviewees experience that people can be addicted but the method depends on a person. The implementation of gamification should be done wisely and carefully, so that it will be inconspicuous from the customer point of view. Data and analytics should be utilized to prove the functionality of gamification.

Indicators to measure the success

Indicators and measuring are considered generally very important in business and showing the success of the application. They should be utilized much more than before, and the decisions should be based on indicators. However, it is important to consider also other aspect and customer satisfaction in decision making.

The importance of an indicator depends on the business area and the life-time stage of the application. Interviewees mentioned indicators related to conversion and end-to-end value measurement, as well as to application usage. Loyalty could be challenging to measure, while NPS was considered relevant, future oriented and agile indicator that reveals the customer opinion. On the other hand, NPS was considered a little challenging to understand. One interviewee pointed out that it is important to monitor especially the change of the NPS result. Related to indicators measuring the influence of the application on sales factors, the importance of considering other possible influences on the results was mentioned.

Indicators should be relevant, real-time, continuous and clear allowing immediate business actions. The business areas to measure should be based on the strategy. One interviewee mentioned that also 'bad' indicators, such as churn should be monitored, and that all the indicators that are related to complicated issues are good. Clear, automated and analyzed results based on data should be provided to retailers, and should be brought into practice widely and all the way to the in-store level including retailer and retail personnel. There could be both graphical and numerical results available when applicable.

The top three selected indicators based on all the interviews were:

- Conversion (for application and in-store)
- Loyalty and satisfaction (loyalty, churn and NPS)
- Use frequency, number of downloads and its change, and session lengths in different parts of the application)

The conversion should include the influence of push notifications and content creation related to opening of the application, use frequency, visits to in-store and other sales factors. In addition to top three, indicators related to customer life-time value, customer behavior in application through all the shopping process, ranking of in-stores based on good application users, and easiness of making a shopping list and its influence on making customer life easier were mentioned.

On the whole, the indicators should be considered holistically covering all the channels, but also accommodating the special characteristics of different channels. Customer centricity needs to be the mindset also in this case. More talents, especially web analysts are needed, and analytics should be part of the everyday work. Best measures can be achieved by combining data and customer feedback through analytics. Also, understanding of the meaning and relevance of indicators should be continuously increased.

Open opinion

Interviewees considered that all the important issues got covered through the interview questions and associated discussion. Some of the already mentioned issues were emphasized here and couple of new issues were pointed out.

Most of the interviewees mentioned holistic and consistent development of different channels as important, considering the special characteristics of different channels. The collaboration with the retailers should be improved to get them onboard. Retailers should be provided with enough information and systems that are easy to use. The key question and mindset should concentrate on offering better service to the customers. The lessons learned with K-ruoka application should be utilized also in other business areas of K-Group. Individual opinions were mentioned about the importance of having a positive mindset, higher goals and ambition, applying start-up culture, getting new talents, and base decisions and actions on data.

4.2 Customer feedback

The next chapters present the findings of open customer feedback of the NPS questionnaire. The findings are adapted to the structure of interview question titles as discussed in chapter 3.2.

4.2.1 Main sample

K-ruoka application channel as part of the bigger picture

In general, it was mentioned that K-ruoka application is good, and one person pointed out that development is still needed. Some comments emphasized the challenges related to utilizing the application at the check-out in the in-store, which is due to lack of information of in-store personnel.

Related to consistency and channels, one person felt that the discounted products in the application cannot be found in the in-store. Another comment pointed out that the email offerings should not be sent to the customers that are getting the same deals through the application. However, store specific personal deals should be visible also in the application.

Criticism came out related to purchased products, purchase history and determination of personal deals based on those. Some persons felt that the personal deals are irrelevant and could be better targeted. Frequently purchased products list shows items that a customer has not purchased for a long time. In addition, it was mentioned that the personal deals are offered too frequently for the same product.

Most important features and functionalities of K-ruoka application

Download gifts, personal deals and complementary offerings were considered good, but many persons mentioned that used deals should be shown as used or be removed from the application. The deals could be more frequently updated, more valuable, tempting and more versatile.

Shopping list was considered good and easy to compose. Recipes, recipe search, number of different recipes, adding a recipe to favorites, and composing a shopping list based on recipes were seen as positive features as well.

Related to freedom of choices, a customer should be able to change the personal in-store and select multiple stores. Also, a possibility to customize a personal main screen in the application was desired. Couple of persons mentioned the need for showing product prices and total price of the shopping cart in the application. Individual comments emphasized the need for product search, benchmarking of brands, and monitoring of Plussa points in the application.

Mobile advantages

Related to benefits of mobile device and application, it was mentioned that the application travels always easily with the customer. This allows the customer to view the deals in the in-store.

Customer loyalty

Couple of persons mentioned that the usage of application has been very little or they have not had time to use it, even if the application looks good and there is nothing wrong with it. Due to positive comments related to of download gifts, updated weekly offerings and deals in general, these features can be concluded to have a potential positive effect also on loyalty. Respectively, it can be concluded from the comments that the deals should be more versatile, more tempting, and more frequently updated, as well as relevant and targeted for the customer. As an example, one person mentioned that the weekly personal Plussa deals were the reason to download the application. However, not all the customers value deals

and monetary discounts but might prefer something else. Also usability of the application should be good.

Activating passive users

As mentioned earlier in relation to loyalty, some of the customers do not utilize the application very much even if they do not see any shortcomings in it. In addition, some individual comments pointed out the lack of reason to use the application. Based on these opinions and overall findings, it can be concluded that adding bigger number of deals, more valuable deals, updated deals, relevance, and smooth operation of the application including systems and channels around it could help in activating passive users. However, different needs and valuations of different customers should be considered also in this case.

Different types of customers

Based on all the comments in the sample, it can be concluded that there are different customers with own opinions. The opinion of a customer about K-ruoka application depends on factors such as mobile device model, location of living, mobile user experience, life situation, and general attitude and characteristics towards the application. Some of the persons write very short comments as feedback, while others give constructed advice and development ideas. Related to features, some customers like good deals while others prefer recipes. One comment pointed out the difference of customers related to location of living: A customer living in a center of Helsinki might prefer utilization of several stores of K-Group, in contrast to a customer living in country side. Providing customers with options to select and customize the service and features could be one way to increase the value of the application to wider audience.

Retailer motivation

As mentioned earlier, customers prefer finding the products shown in the application in the in-store, and like smooth check-out in the in-store. Based on this, it can be concluded that ensuring consistency between different business areas and channels, and providing the retail personnel with sufficient information would be potential methods also to motivate the retailers.

Comparison to competitor mobile applications

Related to competitors, there was only one comment. It pointed out that Foodie application of S-Group is a step ahead by showing the product prices and related to benchmarking of products.

Mobile marketing

It was widely mentioned that there should be more, better and more tempting deals through the application, which emphasized the push marketing. However, some individual comments emphasized that not all the customers like the personal deals, but prefer cooking instructions, for example. Comments about the importance of relevance and targeting, and freedom of choice can be concluded to emphasize the importance of interactivity as well.

A single comment gave advice to utilize more campaigns in order to get the people to find and use the application.

Usability point of view

Approximately 14 persons emphasized the easiness, functionality and other usability issues in a positive way. The deals were considered to be well visible, application pages versatile, and single login a good thing.

In contrary, around 11 persons emphasized negative usability issues. The application was experienced difficult to use, recipes sometimes challenging to perceive through mobile device, menu structure difficult, and changing of preferred store too complicated. Personal deals were seen as difficult to find and the amount of other deals too big. Moreover, the slowness and bugs of the application were mentioned by several persons.

Better instructions could alleviate the negative usability issues. It is also good to remember not to put too much features into the application.

Gamification

There were no direct comments about gamification in the main sample, but one in the control sample (see next chapter). However, based on the comments emphasizing the lack of reason to use the application, it can be indirectly concluded that gamification features could be one way to activate these customers.

4.2.2 Control sample

The findings of control sample were very similar to the main sample, including topics related to consistency, hiding of used deals, freedom of choices, improvement of main menu, inclusion of Plussa, and application crashes. The new finding in the control sample was a comment that small games could be nice, which is related to the gamification aspect.

4.3 Case: Influence of K-ruoka application on sales factors

As a result of data selection and analysis described in chapter 3.3, positive overall influence of K-ruoka application on sales factors was detected (see Figure 21).

Not all the persons in groups were making purchases during the periods analyzed. More persons were visiting in-store on the second time period in both groups but the increase was bigger in the experimental group. This partly leads to the experimental group outperforming also in other areas of sales factors. The difference between groups in change of sales and number of visits include also the changes due to persons starting or stopping coming to the in-store due to application. Thus, the difference is greater in these total values in comparison to results per person which reveal the average change in the purchase behavior of an individual customer due to application.

Average purchase was calculated by dividing sales by the number of visits. The changes were negative for both groups but better for experimental group. The negative values were due to higher increase in the number of visits compared to the increase in sales.

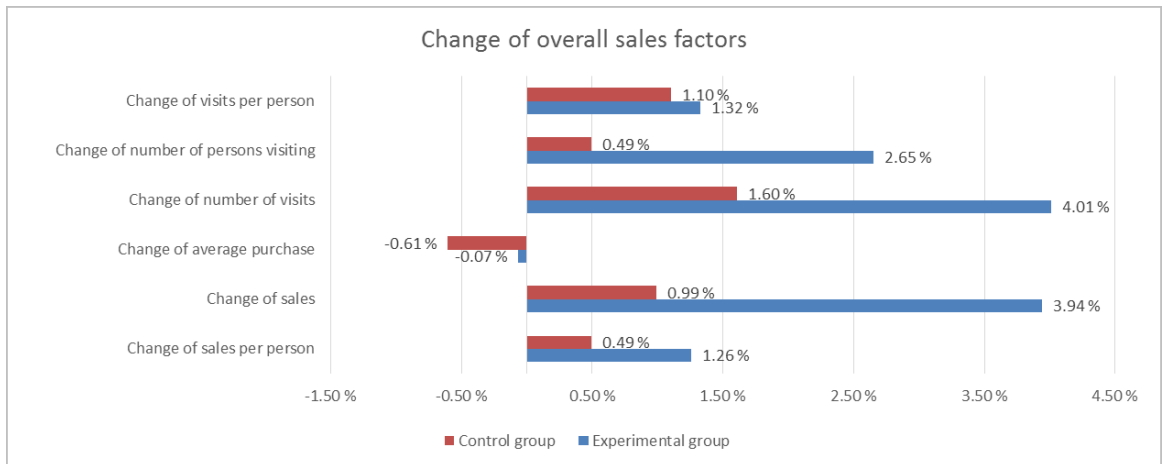


Figure 21 Change of overall sales factors

In order to capture the influence of K-ruoka application in more detail, changes in sales and visits were analyzed by different customer classes. In stage of life classes overall positive effect can be observed (see Figure 22 and Figure 23). B, D and E classes show the biggest increase in sales due to application, while E, F and B have the biggest increase in number of visits, respectively. The meaning of different letters is excluded due to confidentiality reasons.

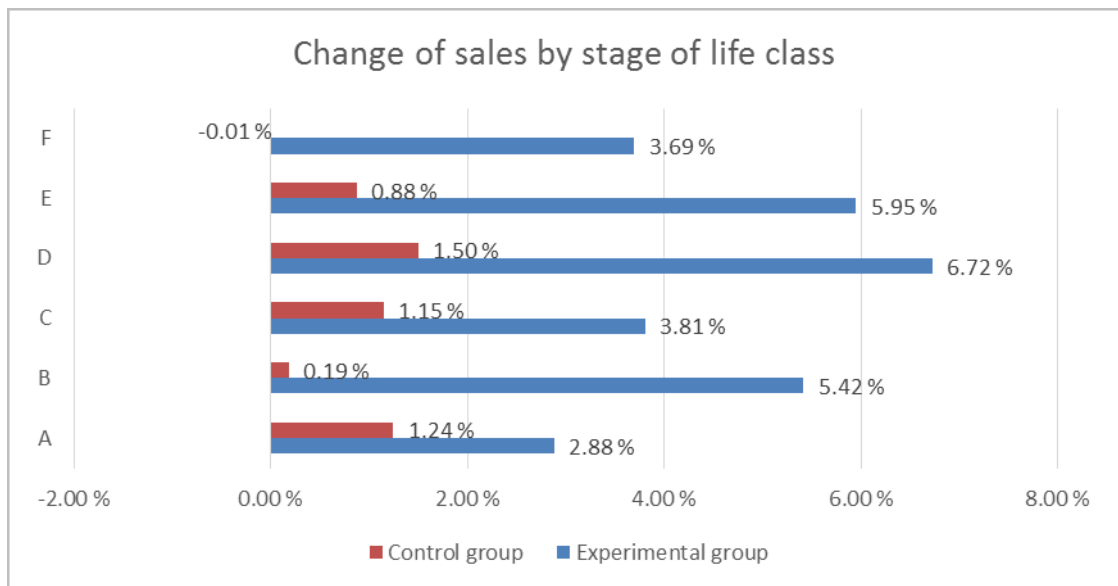


Figure 22 Change of sales by stage of life class

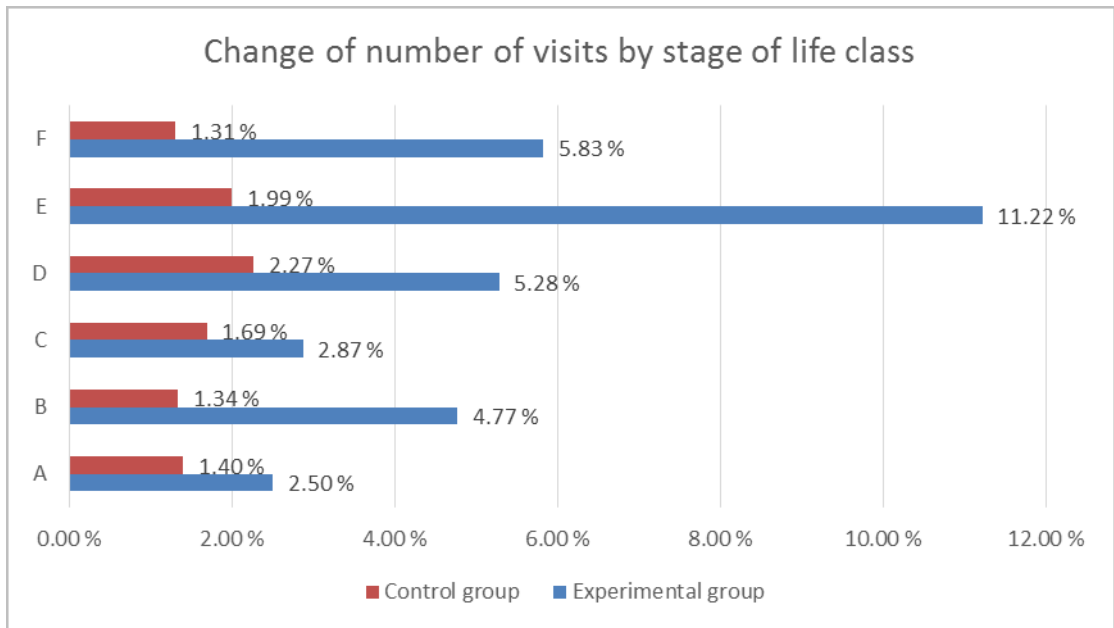


Figure 23 Change of number of visits by stage of life class

The number of individual persons visiting by stage of life class (Figure 24) shows increase due to application in each class, E, B and F having the biggest positive change. When calculating the change of sales per person (Figure 25), D, C and A classes have the biggest increase in the experimental group. This is different from the change of sales results shown in Figure 22. It seems that in classes E, B and F new people are activated by the application to visit the in-store, which shows in greater number of individual persons visiting, increase in the number of visits and bigger sales. However, the change of sales per person (Figure 25) in these classes due to application underperforms other classes. Change of visits per person (Figure 26) shows greatest increase in classes E and D.

C and A classes seem to be moderately influenced by the application both in overall change of sales and change of sales per person. Class D is among the top positively influenced classes in both of these sales measures, but also in change of visits per person, and outperforms especially in the change of sales per person due to application. The low sales per person result in class E in combination to high increase in visits per person means low average purchase in this class.

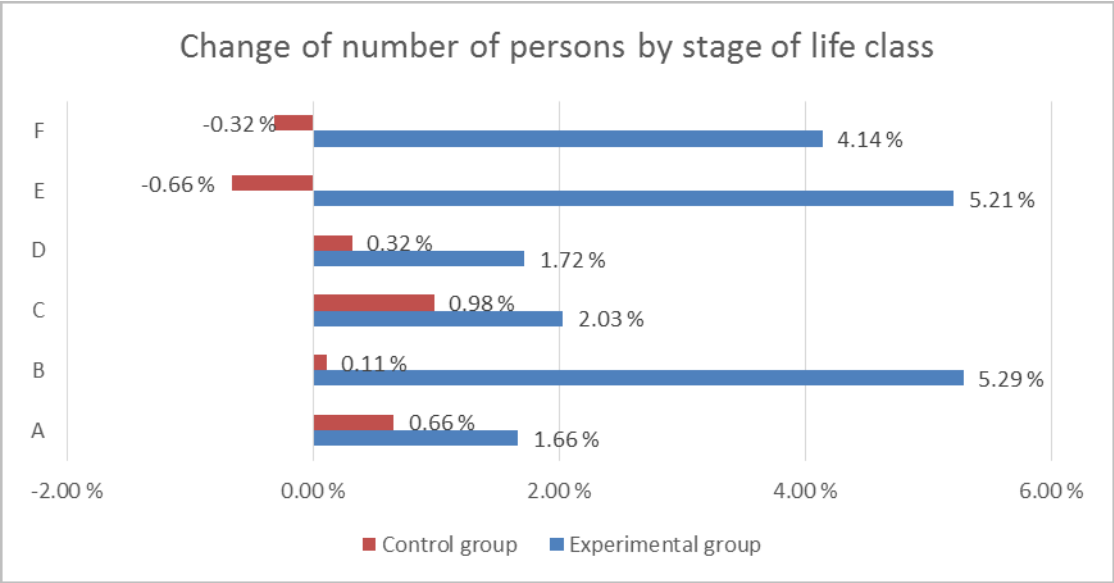


Figure 24 Change of number of individual persons visiting by stage of life class

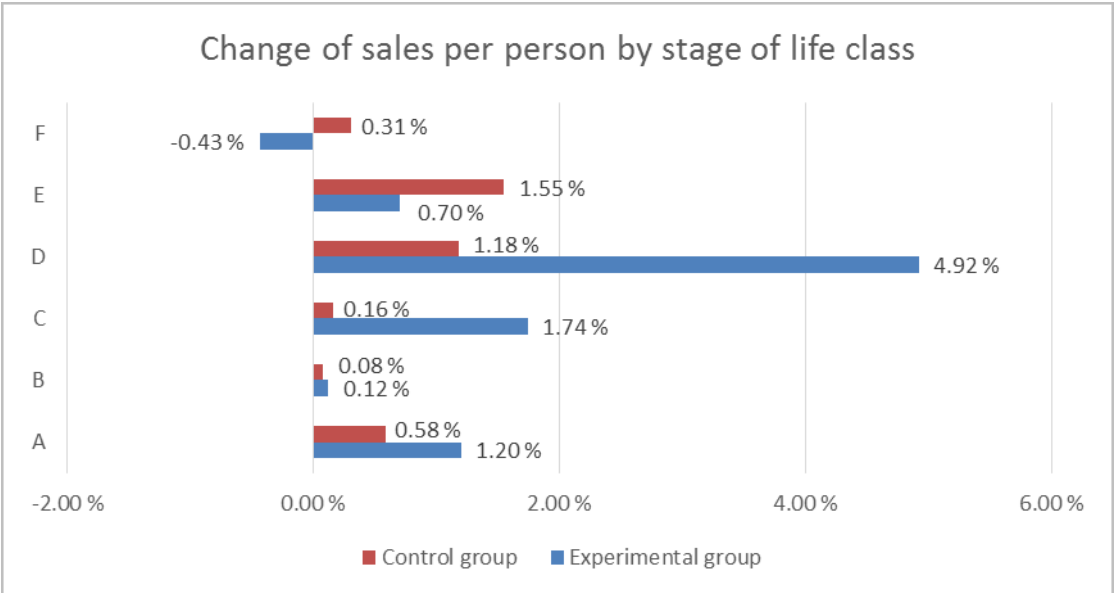


Figure 25 Change of sales per person by stage of life class

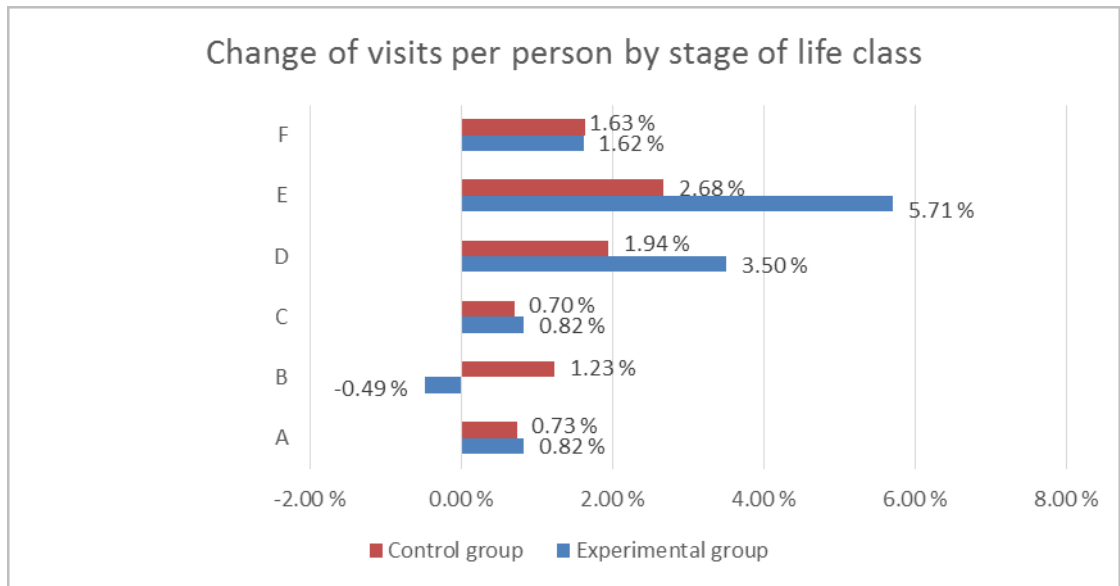


Figure 26 Change of visits per person by stage of life class

Positive effect of K-ruoka application on sales and visits can be seen also in grocery sector classes except for class 2 (Figure 27 and Figure 28). Classes 3 and 4 show the biggest positive changes in sales due to application. In change of number of visits, class 4 shows the biggest increase in the experimental group. Class 4 also had the most increase due to application in the number of individual persons visiting (Figure 29), while class 2 was the weakest in this category. The introduction of grocery sector classes is excluded due to confidentiality reasons.

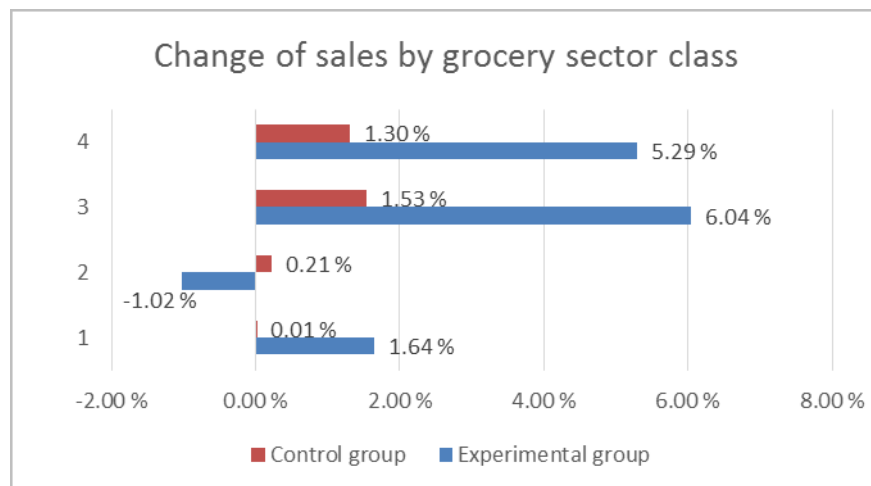


Figure 27 Change of sales by grocery sector class

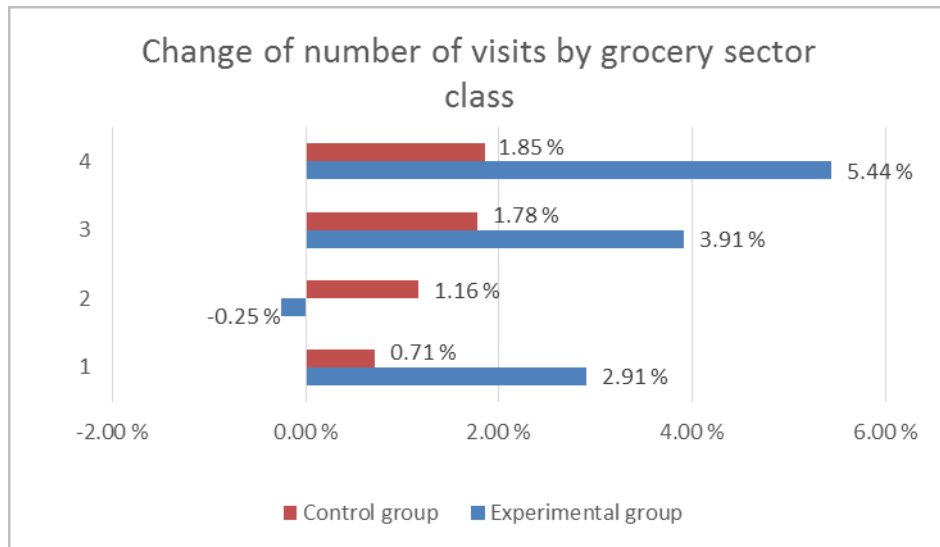


Figure 28 Change of number of visits by grocery sector class

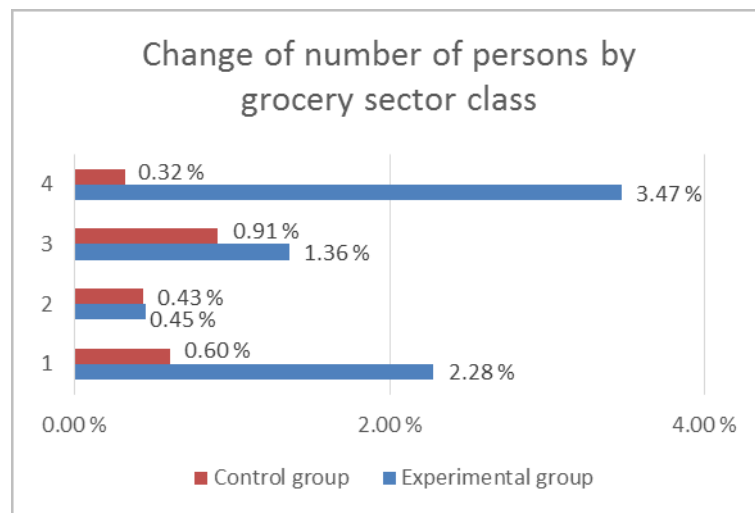


Figure 29 Change of number of individual persons visiting by grocery sector class

In order to find out more information behind the negative change in class 2 in the experimental group, internal changes of sales and number of visits were calculated by stage of life class as shown in Figure 30 and Figure 31. In both cases classes F, E and B are influenced positively by the application, while classes C and A show the most negative effect.

Combining these results with the number of persons in each internal stage of life class (see Figure 32), gives explanation to the overall negative effect of application in grocery sector class 2: internal stage of life classes showing negative effect have relatively more persons than classes that are influenced positively by the application. This can also be seen in change of sales between overall stage of life classes (Figure 22): Classes C and A show the smallest increase in sales due to application.

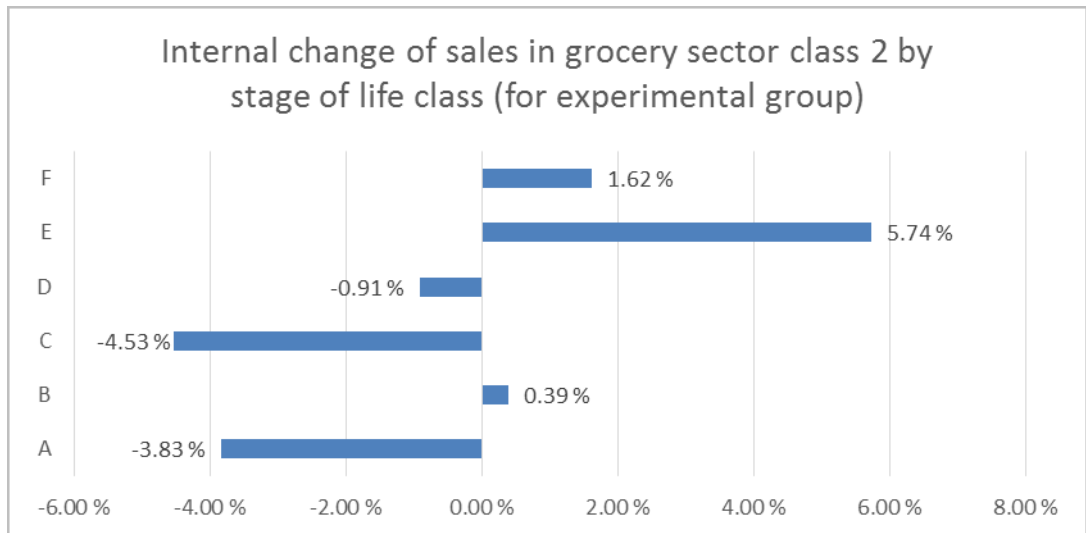


Figure 30 Internal change of sales in class 2 by stage of life class (for experimental group)

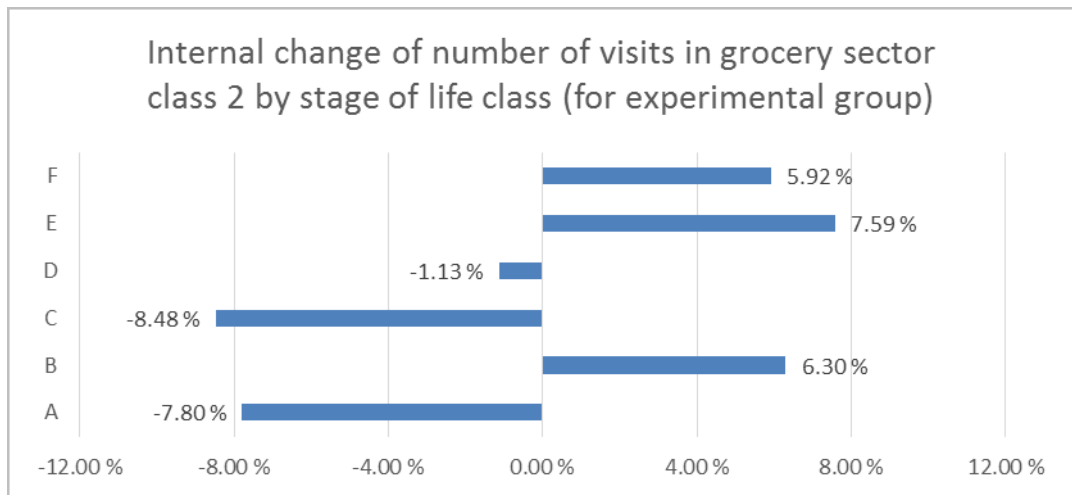


Figure 31 Internal change of number of visits in class 2 by stage of life class (for experimental group)

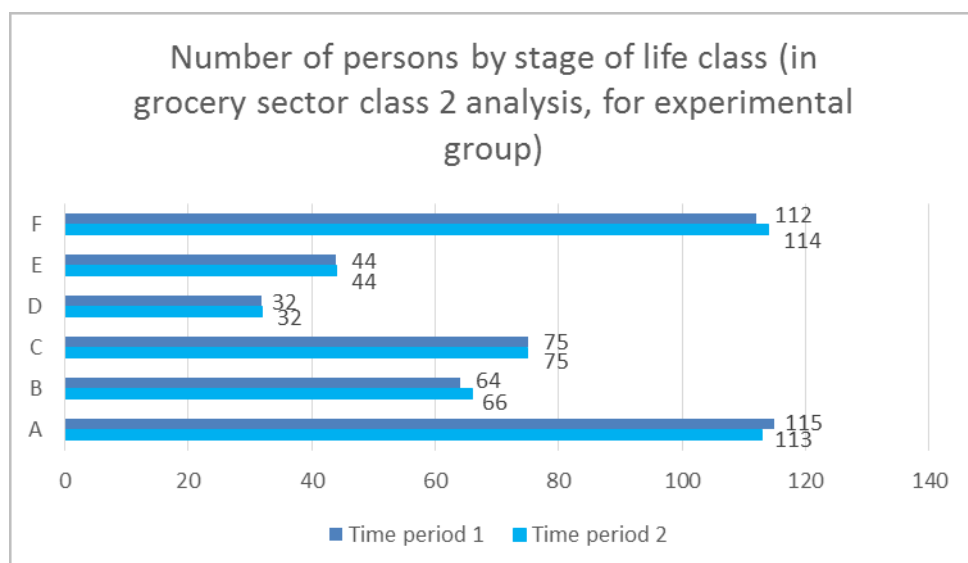


Figure 32 Number of persons by stage of life class (in class 2 analysis, for experimental group)

5 Results and analysis

In this chapter, cross comparison is done between the findings of empirical part, which are further connected to theoretical findings. It can be observed that many findings of empirical part are in connection to each other and are also linked to theory. Classification of main findings from different aspects of customer value management is shown in Appendix 2: Classification of main findings from different aspects

K-ruoka mobile application connects K-Group and customers thus reflecting alternative business models as discussed in chapter 2.1. In relation to information and fulfillment matrix introduced in chapter 2.1, K-ruoka application at its current stage can be seen as a variant of *research online, purchase offline* model (Bell et al. 2014) and thus linked to the quadrant 2 (*shopping and delivery hybrid*) in information – fulfillment matrix (Figure 3). Based on the findings of interviews, the development of K-ruoka application is likely to go into *buy online – pick up in store* and *pure e-commerce* (Bell et al., 2014) direction.

Both the interviewees and customers consider K-ruoka application good but think that there are still lots of improvements to be done to make it better. This is supported by the theoretical finding of high customer expectations on getting information, and adoption of new technologies. According to all findings, different channels, including K-ruoka application, need to be developed as unified entity. However, special characteristics of each channel should be taken into account. The systems should be easy to use: Retailers should be provided with information and proper tools to affect, facilitating dedicated application and personalized, seamless shopping experience for the customers. This requires automation and smart utilization of channels. The lessons learned with K-ruoka application should be utilized also in other business areas of K-Group.

A retail mobile application should reflect the appearance and feeling of a retailer which was emphasized also in the interviews. Having retailers onboard is a key to success, and should be prioritized. Therefore, the retailers should be provided with clear information of the benefits of the application and assistance when necessary. This can be achieved with data and analytics, but requires also proper communication and collaboration.

The potential of platform economy and K-ruoka application as a platform were mentioned in theory and interviews. Benefits can be reached through utilizing interfaces connecting different parties onboard. However, the utilization of especially third parties should be done carefully and step by step, starting from internal collaboration.

The most important features of K-ruoka application are related to deals, recipes, shopping list and personalization, the effect of which are also shown in the findings of practical business case. Interviewees emphasized the importance of making customer life easier through the application, and suggested implementation of communal or social features and freedom of choices to the customers. This is linked to the customer preferences of choosing own in-stores, customization of own screen, and having more tempting features. Theoretical findings support this by suggesting to consider the customer needs in all the stages of shopping process. The importance of having new agile and frequently updated content was mentioned generally. Utilization of location specific services related to marketing and in-store services were suggested in interviews, especially by retailers. Also theoretical findings support this. This is related to the need of product information

mentioned by customers and interviewees. In fact, adding product information could further improve the positive results of the practical business case, as mentioned in chapter 2.2 that there is increase in sales and traffic in physical stores of those traditional retailers that provide customers with accurate inventory and price information online.

The advantages of mobile are generally related to its easiness and continuous presence with the user. The challenge of small display was emphasized by theoretical findings and interviewees, and in negative usability experiences of the customers. A potential benefit of mobile as an individual, personalized and cost-efficient channel was mentioned in interviews.

Competitors have variety of different mobile applications, some even more than one. Similar features to K-ruoka application are found also in competitor applications. Also, competitors have potential features, such as mobile payment, product search and scanning that could be added also to K-ruoka application. Most of the comparison in the interviews and customer feedback was done to S-Groups Foodie application, but also other applications, such as ICA's were mentioned in interviews. ICA was seen to be more present in customers' life than K-ruoka application, which is good to notice when thinking about loyalty and activation adding features.

The fact, that ICA has more than one application is related to the usability aspects of avoiding to have too much content in a single application. This was mentioned by theory, interviews and customer feedback, and is a challenge due to increasing amount of features and multitasking in mobile applications in general. Usability factors such as effectiveness, efficiency, simplicity, learnability and satisfaction are recommended by theory, and seem to be valued also by the customers. Findings of interviews support these and add intuitiveness, which is mentioned also by theory in relation to the recommendation of clear and understandable menu choices. Usability design should be customer-centric, offering personalized usability experience and choices of selection to the customers. This further requires utilization of data and analytics in order to avoid guessing. The variety of different contradictory opinions of usability in the customer feedback reflects the effect of usability evaluation attributes mentioned by theory: The opinion of an individual customer is subjective and may be influenced by the goal of usage, usage context such as phone model and surrounding factors, and the user itself. As the background statistics of the NPS customer feedback questionnaire showed, there were respondents with different phone models, and the level of NPS score was dependent on those but also the gender of the respondent in some cases.

According to theoretical findings in chapter 2.3.1, loyalty is built step by step (see Figure 10). Empirical findings about different types of customers, from passives to collaborators, can be seen to represent the levels of loyalty. Personal, relevant features and quality service that make the customers' life easier are suggested by theory and interviews to increase the customer loyalty. Respectively, customers desire relevant and updated targeted deals, but also prefer good usability. Campaigns, and communal and social features in connection to customer review and feedback systems are mentioned by theory and interviews as one possible way to increase loyalty. Some type of rewarding or loyalty programs could also work, but the implementation needs to be done wisely.

The finding from customer feedback that the application is not used very much even if it is considered good, reflects need of features that activate passive customers. Means for activating passive customer are quite similar to ones for retaining customers. New, updated content, also other than food, good deals, targeted marketing, systems and content that work

properly, and making the customer life easier were emphasized. The deals should be valuable and personalized, and features should get the passive customers excited. Appropriate marketing approach could be related to pull marketing and guerilla marketing, utilizing selected channels. This would also take into account the cost-efficiency point of view mentioned in interviews.

Customers can be classified in many different ways depending on their motivation and behavior. Recognizing and managing different types of customers is important but challenging. Both theory and interviews suggest utilization of data and analytics in order to recognize customer behavior and succeed in personalization which is important in activating and retaining customers, and allows turning challenges of differences into benefits. The data based personalization is already seen as a benefit of K-ruoka application in comparison to competitors but should be increased.

Based on the findings in theory, interviews and customer feedback, mobile marketing should be personalized and interactive through communication and offering choices of selection to the customer. As with the activation and retention, personalized marketing requires utilization of data and analytics in order to properly manage the customer segments. Also cross-targeting inside K-Group could be considered. Deals are commonly emphasized, but are not preferred by all the customers. Therefore, other motivations such as quality and inspiration aspects should also be considered. These are related to recipes, cooking tips, communality and social features as well as agile marketing of micro-seasons. Marketing decisions need to be well planned and based on customer value. Different channels should be utilized in order to get the required target audience for the mobile marketing. Also in this case, the consistency of different channels should be considered.

Push marketing was emphasized in customer feedback as most of the customers seem to value discounted offerings. As with the mobile marketing in general, also push marketing needs to be personalized and targeted. Also location based marketing should be utilized. The actions should be well planned, and the customer should agree on getting push messages. Both theory and interviewees consider push marketing a good starter in order to facilitate benefits of pull marketing. Pull can be achieved through an exciting ecosystem around the mobile. Related to this and earlier discussion about communal and social features, theoretical findings recommend the use of economical reward programs and direct marketing such as push notifications and coupons in the short term, but social programs in the long term. As the social programs influence on the emotional evaluation of a customer, these programs could be targeted to the customers that have hedonic shopping motivation. Economical reward programs could utilize Plussa points, which is related to gamification.

Due to inherent competitive nature of human, gamification could have good potential in increasing the customer value of retail mobile applications. It could improve the motivation, learning, engagement and loyalty of the customers through applying a proper combination of different game mechanics and dynamics to appropriate customer segments. In K-ruoka application context, gamification is seen as one potential option to increase the value but should be implemented wisely and inconspicuously, considering cost-efficiency aspects. As with the relationship marketing mentioned earlier, rewarding elements of gamification could utilize Plussa points. The challenges caused by extrinsic rewarding can be mitigated by considering intrinsic motivation factors in the planning of the gamification and especially extrinsic motivation factors.

Indicators are considered very important. They should be relevant for the purpose and selected based on strategy and goals, considering also the bigger picture and customer

centricity. Interview findings prefer real-time, continuous measurements that are clear to understand. Theory suggests having more leading than lagging indicators, and interviews implied that there should be courage to select also indicators that measure negative issues such as churn. There are lots of different indicators, such as usability, usage, sales, marketing and satisfaction related, in use already to measure the success of K-ruoka application. However, improvement is needed in details such as recognizing the behavior of individual customers, but also in considering the whole system of indicators. The measuring processes should be agile, unified and reach end-to-end all the way to the retailer. Theory recommends using KPIs, as they reflect positive ROI for mobile. In fact, the most preferred and recommended indicators were highly similar in theory and interviews. Conversion, including application and in-store, loyalty, CLV and satisfaction as well as usage indicators, such as session length and frequency were emphasized as KPIs.

The practical business acts as a concrete prove of the success of K-ruoka application at a single point of its lifetime. The case showed overall positive influence of K-ruoka application on sales factors, but also demonstrated the importance of having this type of indicators measuring mobile effect on in-store conversion. As mentioned in chapter 4.3, in stage of life classes E, B and F new people are activated by the application to visit the in-store, which shows in greater number of individual persons visiting, increase in the number of visits and bigger overall sales. Moreover, the number of visits per person in class E outperforms other classes, which in combination to lower sales per person reflects low average purchase in this class. Based on mobile marketing findings in interviews and customer feedback, this might be caused by direct marketing such as deals and push notifications. The high sales in stage of life class D, which is due to increased sales per person, might imply that customers in this class value recipes, cooking tips or other issues that are not directly related to monetary discounts. These conclusions are also supported by the findings of interviews, customer feedback and theory, related to different needs of different customers and importance of personalized service. Classes C and A seem to get activated less but more uniformly in both new visits and sales per person than others. Based on the results of grocery sector class 2, the influence of K-ruoka application on classes C and A needs further research and possibly improvement.

In order to better understand the challenges and opportunities of retail mobile applications in the case company context, current state and recommended actions related to different aspects of customer value management are presented in Table 4.

Table 4 Identification of recommended actions related to different aspects of customer value management of retail mobile applications in the case company context

Aspect	Current situation	Recommendations
<i>Mobile applications as part of the bigger picture</i>	<ul style="list-style-type: none"> • Systems too difficult for retailers • New opportunities and channels emerge through digitalization 	<ul style="list-style-type: none"> ➤ Implementation of easy-to-use systems ➤ Ensuring end-to-end visibility ➤ Getting retailers on-board ➤ Ensuring channel consistency
<i>Potential of platform economy and different parties</i>	<ul style="list-style-type: none"> • Potential in utilization of different parties and K-ruoka application as a platform are seen as a potential alternative, especially in the future 	<ul style="list-style-type: none"> ➤ Utilization of different parties starting small scale, internally ➤ Investigation of platform economy related opportunities
<i>Most important features</i>	<ul style="list-style-type: none"> • Personalized, targeted deals, discounts, recipes, shopping list (including its sharing and real-timeness) 	<ul style="list-style-type: none"> ➤ Addition of payment, and ordering options, barcode scanning ➤ Utilization of location ➤ Social/communal features ➤ More valuable deals ➤ More targeting and personalization
<i>Mobile advantages</i>	<ul style="list-style-type: none"> • Small portable size of mobile phones allows easy and flexible use • Small screen is a challenge 	<ul style="list-style-type: none"> ➤ Further utilization of mobile advantages ➤ Improving fit of contents to small mobile devices
<i>Customer loyalty</i>	<ul style="list-style-type: none"> • Retaining loyalty of especially young generations is challenging • Offering value equally to all customers is challenging due to different customer types 	<ul style="list-style-type: none"> ➤ Further utilization of data and analytics ➤ Well planned marketing and services ➤ Wise implementation of new, relevant features
<i>Activation of passive users</i>	<ul style="list-style-type: none"> • Recognition and activation of passive users is often challenging 	<ul style="list-style-type: none"> ➤ Further utilization of data and analytics ➤ Relevant, valuable and functionable features and offering for passive customers (keeping in mind cost-efficiency of actions)
<i>Different customer types and behavior</i>	<ul style="list-style-type: none"> • Recognizing different customer behaviors and offering equal value to customers is challenging 	<ul style="list-style-type: none"> ➤ Further utilization of data and analytics ➤ Increasing personalization and targeting ➤ Offering selection and customization possibilities
<i>Retailer motivation</i>	<ul style="list-style-type: none"> • Systems and tools are too complicated and time consuming • Lack of information in some cases • Tools for agile and interactive actions could be better 	<ul style="list-style-type: none"> ➤ Easy-to-use systems and tools ➤ Information and education of retailers ➤ Proving application value to business ➤ Allowing agile, more targeted actions of marketing and communication through application
<i>Competitors</i>	<ul style="list-style-type: none"> • Number of retail mobile applications exist in the market worldwide 	<ul style="list-style-type: none"> ➤ Detailed benchmarking of most potential competitor applications to recognize new ideas
<i>Marketing</i>	<ul style="list-style-type: none"> • Mostly direct marketing in use • Personalization and targeting are utilized 	<ul style="list-style-type: none"> ➤ Increasing pull marketing ➤ More personalization, interaction and attractivity
<i>Usability</i>	<ul style="list-style-type: none"> • Increasing number of features and multitasking can be a challenge • Usability of K-ruoka application is quite good 	<ul style="list-style-type: none"> ➤ Retaining good usability when adding new features ➤ Further increasing usability by e.g. offering customization possibilities
<i>Gamification</i>	<ul style="list-style-type: none"> • Gamification is seen as a potential option • There have been ideas and related activities but not implementation yet 	<ul style="list-style-type: none"> ➤ Further investigation of gamification opportunities ➤ Could be tested small-scale first ➤ Maybe combined with social and communal features
<i>Indicators</i>	<ul style="list-style-type: none"> • Indicators are considered extremely important • Selection and utilization of indicators could be better 	<ul style="list-style-type: none"> ➤ Further utilization of data and analytics ➤ Implementation of KPIs ➤ Investigation and implementation of proper measurement processes ➤ Automation of practical business case type of measures ➤ Increasing visibility and awareness of best practices related to selection and management of indicators and measurement processes

6 Conclusions and recommendations

This study introduces the best practices to manage and measure customer value and success of retail mobile applications. Versatile literature research findings elaborated on practical results of empirical part provide a good basis for further research and recognizing practical business solutions. The next chapters present the main conclusions and recommendations from managerial and research point of views.

6.1 Theoretical implications

Retailers need to be innovative, customer-centric and be able to provide superior customer experience through taking advantage of digitalization and omni-channel solutions in order to respond to increasing expectations of the customers. Utilization of mobile applications increases value to customers and business when done properly. The mobile business should be connected to the digital strategy of a firm, providing customer-centric features related to appeal, functionality and performance in order to outperform other applications on the market. A successful mobile application has the look and feel of a retailer, provides the customers with personal and relevant deals from nearby in-stores, taking advantage of location. The service needs to be consistent, offering features for all stages of customer shopping process. There is potential in platform economy and utilization of third parties to create new type of value, but this could be further investigated in retail context.

Customer loyalty originates from customer value, engagement and satisfaction, and is built step by step. These value concepts are influenced by customer behavior, and service features through marketing and usability aspects, which together with the time dimension of the customer relationship leads eventually to formation of customer life-time value. Mobile marketing improves value by better communication and interaction between firm and the customers, while usability aspects should concentrate on improving efficiency, ease of learning, and user satisfaction among other attributes. Customer retention can be improved through many different ways such as loyalty programs, or efficiency features and complementary offerings of products and services that provide relative benefits to the customers. Increasing the trust in fairness of customers to the firm, for example through open customer reviews and ratings, improves retention. Gamification can be taken advantage in mobile applications by utilizing game based strategies and elements in order to improve customer value and loyalty, but should be done carefully. The different classifications of customer types and behavior related to mobile application usage, shopping motivation and gamification should be recognized, understood and dynamically managed in order to succeed. The same applies to target customer segments in mobile marketing. The formation and linkage of different value concepts as well as the influence of relationship marketing on customer behavior in retail mobile applications context could be further clarified through more detailed research. In addition, modeling of customer life-time value in retail context can be seen as a potential topic for further research.

There is a large number of indicators to choose from, and many indicators of other channels can be applied to measure the success of mobile applications as well. A good indicator is effective, efficient and helps to achieve the desired business goals. Selection of the indicators should consider the objectives and linkage to the strategy of a firm. From performance management point of view it is recommended to have more leading than lagging indicators. Despite the wide utilization of NPS, it should not be considered as primary or only indicator of customer loyalty.

KPIs present the information in business language and drive actions that are critical to business. It seems that utilizing KPIs correlates with positive ROI for mobile applications. In addition to traditional indicators, it might be useful to consider more modern and innovative indicators to measure the influence of retail mobile applications.

6.2 Managerial implications

Managing customer value of retail mobile applications includes several aspects that need to be considered. Decisions and actions should be based on customer-centric thinking, and consider the consistency between different channels and services as well as connection to the strategy and goals of the business.

Customer value can be increased through personalized, relevant features that are regularly updated, and agile, interactive marketing through the application. This allows achieving higher levels of loyalty but also helps activating passive customers. Addition of new features should make the customer life easier, and not decrease the easiness and intuitiveness of the application usage and usability. Wise and cost-efficient utilization of gamification and social community features allowing interaction, as well as connection of different parties through mobile platform are recommended to be considered among other options to increase the customer value and reach new business opportunities.

K-ruoka application is considered good, which is also reflected by the results of the practical business case: Overall positive effects of K-ruoka application were shown on sales factors. However, there are still plenty of development to be done in order to retain and improve these positive effects. Also, another similar business case could be executed in order to further validate the findings. Especially stage of life classes C and A could be further investigated, since the effect on those classes could be better. It is recommended to have this type of measures automated in the future.

Although one of the competitive benefits of K-ruoka application is data based personalization, data and analytics should be utilized much more effectively than before. This is one of the key issues when recognizing behavior of different customers, personalizing services, or measuring and proving the success of the application. Indicators measuring the success should be relevant, continuous, based on the strategy and selected considering the business area and service specific issues.

The following measures are recommended as KPIs:

- Conversion (for application and in-store)
- Loyalty (retention and churn)
- Customer life-time value
- Application use frequency and session length

A retail mobile application should have the look and feel of a retailer, and act as personalized, agile communication channel in interaction with the customer. Having retailers onboard is the key to success and should be done in priority. Retailers should be educated about the benefits of the application, provided with easy-to-use systems and tools, and relevant, analyzed information easily available.

7 Discussion

This study can be seen contributing to existing research by combining key aspects of customer value management of mobile applications in retail context. Potential value from gamification features, introduction of success indicators, and elaboration of theory on real business context complement this study to a fundamental guideline to be utilized for further research and business decisions. The combination and linkage of all the aspects around customer value management, especially the connection to real business findings, can be seen to provide significant novelty value for this study. In addition to practical business case results, the importance of retailers, customer-centricity, potential of novel features such as gamification or communality related, utilization of data and analytics, and managing success measures can be recognized as individual main findings of all conclusions that are introduced in chapter 6.

The topic of this study can be seen as current, novel, dynamic and versatile, which makes it challenging but also extremely interesting to explore. The findings have awakened interest in the case company and steps have already been taken towards implementation of some of the findings to practice.

The approach to the topic of this study through introduction of different business models and channels can be seen as right solution, since the opportunities related to business models, and the importance to consider different channels were also emphasized in the interview findings. Network effects and related benefits through collaboration of different parties seem to be a potential field to explore. In addition to boosting current business, new value could be created through additional services, and through creation of new markets. Wise and careful implementation related to new solutions and features, including utilization of third parties and gamification, were seen important especially in the interviews. This is a good point, since protecting own brand and front-end, as well as avoiding customer irritation can be assumed to have a great influence on succeeding in customer and business value creation. On the other hand, excessive carefulness may hinder agile utilization of business opportunities.

Collaboration of different parties is also related to getting retailers onboard the mobile application utilization. In a large retail organization like K-Group, where grocery retailers are individual entrepreneurs, this can be challenging. The recommendations, such as informing retailers about digitalization benefits and good collaboration, in order to succeed in this were quite similar in theoretical findings and interviews. A more detailed and practical research on this, including actual agreements and implementations could be useful, however, if challenges persist.

Recognizing the customer needs and behavior is essential in order to create a dedicated mobile application and offer personalized services and features to all stages of customer shopping process. However, it can be challenging to serve and please all the customers equally, for example from marketing and usability aspects, especially while the customer preferences may change and vary dynamically. The difference of customers considering usability was emphasized in customer feedback analysis, as almost equal amount of users pointed out contradictory opinions on application. This could be due to different application usage skills and demographics of customers, which is also supported by the theoretical findings. This may also raise a question related to utilizing customer opinions in decision making, if the customers can always know what they really desire, especially for the future.

Therefore, it is necessary to include the firm point of view by combining the customer feedback with analytics and business decisions, which is also related to interview findings.

In theoretical findings, the importance to consider the in-store stage of the customer shopping process was emphasized. This may need to be considered carefully, taking into account increasing orientation towards e-commerce business. On the other hand, how easily and how many customers actually adopt online shopping of groceries, and how this affects the mobile application features needed to retain the overall customer value is a good question.

As the brief outlook on competitors showed, there are lots of different mobile application on the market. Some are already more oriented in e-commerce and online purchasing while others have more in-store features. Similar features and functionalities to K-ruoka application can be seen, but it is important to notice that the level and intelligence of these features may have significant differences. Therefore, a more detailed investigation would be needed in order to draw solid conclusions of the competitor benchmarking.

In the literature, there are lots of different explanations and concepts to value and linkage of value, satisfaction and loyalty. This seems to be due to subjective nature of these concepts. Depending on the use and business context, research type and associated customer preferences all the interpretations may be justified. In this study, the need was to roughly clarify the concepts to the level necessary to better understand the customer value aspects of retail mobile applications. If more detailed research on these concepts would be desired, wider literature review supported by empirical research could be useful.

Gamification seems to be known by many people already, but is still relatively new in retail mobile applications context. It might not always be easy to recognize what is gamification feature, game or something else. In addition, one may easily think gamification features too short sighted or based on personal feelings of appealing features. Therefore, the introduction of different game elements and best practices, including recommendations to plan and implement gamification carefully are appropriate. Although frequent flyer programs of airlines might seem appealing, it does not necessarily mean that they would work for retail mobile applications. Instead, other types of relationship marketing and engagement aspects, such as social programs and pull marketing, could be considered. Recognizing own strategy and goals are important also in this case.

In control group analysis of practical business case, the direct influence of K-ruoka application on sales factors can be shown. However, in reality the influence could be even bigger due to indirect effects, such as word-of-mouth activation of new application users outside the groups. Also zero and negative sales, such as refundings, were included in the data sample of practical business case. It can be debated if the negative and zero sales should be part of the analysis, but in this case they can be assumed to belong to the analysis of the K-ruoka application influence. However, this did not cause any visible difference to the overall sales when analyzed. As the practical business case analysis was based on large amount of data, the effect of individual data points can be assumed negligible.

As the practical business case took place only on relatively short period of time, it would be interesting to know what the results would be in another point or longer period of time. Incorporating more customer behavior and relationship perception factors described in the modified CUSAMS framework (see chapter 2.3.1) could allow more detailed analysis of customer loyalty and life-time value. In fact, modeling of customer life-time value could be a potential opportunity to deepen the understanding of customer behavior, and maximize

the value capture. In addition, more analysis can be done by utilizing the data sample, which was not possible in the scope of this study.

Indicators to measure the success of retail mobile applications were introduced relatively widely, but roughly and briefly, in order to find the key indicators for the purpose of this study. A more comprehensive and detailed research, including measurement processes and implementation of best practices would be needed in order to get the full benefit. However, as with also other conclusions of this study, the suggested key indicators are a good starting point for further research.

7.1 Limitations

This study shows the positive effect of mobile applications on customer value in retail business and the need to manage the value. However, before applying the results of this study, it is important to consider some reliability and validity aspects, as well as the use context of utilization.

The selection of interviewees of different positions, correlation of control sample to the main sample in customer feedback, and large sample size of the practical business case can be seen to validate the reliability of the empirical findings at the level that is acceptable considering the nature of this study as a research. Furthermore, the relatively high degree of linkages between empirical findings and theoretical findings imply the existence of right results and conclusions.

As in most of the research, also this study includes a margin of error that accumulates from the validity and reliability of procedures, existing literature, data, and interpretations and decisions made. Due to development of digitalization and mobile applications some of the information in existing literature and research obsolesces relatively quickly. It should also be noticed that information and recommendations in different existing research might differ from each other due to nature, context, methods, objectives or quality of the research. Therefore, even if the existing literature has been selected carefully, it is advised to notice the publishing year, quality and nature of references and consider this also when interpreting the results and conclusions of this study. One way to evaluate the quality of an existing research is to see the number of citations that is made of that research.

In the interviews, the results reflect the subjective opinions of the interviewees, which should be considered when interpreting the findings. Some of the interviewees might be more aware of the current business practices and tools available, and might express more or wider opinions than others. Also the mindset of an interviewee has an effect on the results.

The analysis of customer feedback provides open opinions of the customers pointing out the most prominent issues, but may lack some aspects due to absence of specific questions. Although the total number of responses was quite high, the main sample size might not be representative of the whole population in all cases. Larger sample size or different location of the sample in the population data could lead to some differences in the findings. Considering the time of the secondary data collection, marketing actions and campaigns as well as new releases of application versions may have an effect on customer opinions.

In both, interviews and customer feedback analysis, the results are formed through interpretations of the author of this study. Even if the analysis was done systematically and by the research guidelines, there is always a possibility for small bias.

Internal validity in the practical business case can be assumed to be quite good due to similar characteristics of experimental and control groups. Applying the validity definitions of Saunders et al. (2007) the findings can be attributed to the intervention caused by K-ruoka application in quite good extent. Considering external validity, the findings of the business case may not be widely generalizable or applicable to other context until further research.

The influence of coffee download gift campaign during the evaluation periods of the practical business case should be taken into account when interpreting the results. The free gift may motivate some customer classes more than others, also depending on the type of the gift. Moreover, considering the short term benefits of direct marketing and economical rewards, generalization of the results to longer period of time should be done carefully. The relatively small size of the experimental group in comparison to control group may cause some error, despite the similar characteristics distribution of the groups. A similar case should be done in another time period, and selection of equal group sizes as well as consideration of the timing of campaigns could be useful in order to increase the reliability and internal validity. Also, comparison to corresponding cases of other businesses or competitors would be interesting in order to improve the external validity, but requires necessary information available.

Although this study shows positive effect of mobile applications on customer value in retail business, and introduces the best practices in features and indicators, it is important to remember that these results cannot offer one right solution for every retailer or other businesses. Especially the empirical findings reflect a single firm point of view. Thus, the results should be applied considering the strategy and objectives of a particular business, and carefully interpreting the suitability of the findings of this study.

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9 Appendices

Appendix 1: Interview questions

- Haastateltavan esittely (nimi, asema, tehtäväkuva)
- K-Ruoka mobiilisovellus osana organisaatiota ja liiketoimintaa:
 - (Kesko): Millä tavoin sovelluksen hyötyä asiakkaille, kauppiaille ja keskolle saisi lisättyä liittyen esim. kanaviin ja liiketoimintamalliin?
 - (Kauppiaat): Mietittäessä sovellusta osana kokonaisuutta (eri K-ryhmän kaupat, Kesko, asiakkaat ym. osapuolet, toimijat, tuotteet ja palvelut)
 - Onko nykyinen käytäntö hyvä?
 - Toimiiko sovellus käytännössä halutulla tavalla osana liiketoimintaa?
 - Yhdisteleekö oikeita asioita ja osapuolia halutulla tavalla
 - Välittääkö halutun tiedon halutulla tavalla (oikeanlaisia kanavia pitkin halutuille osapuolille)
 - Voisiko hyötyjä näihin asioihin liittyen kasvattaa jollakin tavalla (jos oletetaan että saisi aloittaa ideoinnin ns. puhtaalta pöydältä)
- Mitkä ovat tärkeimmät ominaisuudet/piirteet sovelluksen asiakashyödyn ja tyytyväisyyden maksimoimiseksi?
 - Asiakkaan ostoprosessin eri vaiheissa
 - Mihin ominaisuuksiin kannattaa panostaa
- (Kesko): Parhaat tavat motivoida kauppiaat hyödyntämään sovellusta?
- (Kauppiaat): Mitkä ovat kauppiaan motivaatiot K-Ruoka sovelluksen hyödyntämiseen?
 - Hyvää/huonoa nykytilanteessa?
 - Miten sovelluksen hyötyä kauppiaille saisi lisättyä?
- (Kesko): Miten erottua kilpailijoista ja heidän sovelluksistaan (esim. S-Ryhmän Foodie ja S-Mobiili)?
 - Mikä on parempaa ja heikompaa kilpailijoilla?
- (Kauppiaat): Miten erottua kilpailijoista ja heidän sovelluksistaan (esim. S-Ryhmän Foodie)?
 - Mikä K-Ruoka sovelluksessa on parempaa tai heikompaa kuin kilpailijoilla?
- Millä keinoilla asiakkaiden lojaalisuutta (asiakkaiden säilyttäminen ja uskollisuus) saataisiin ylläpidettyä ja lisättyä?
 - (Kauppiaat): Miten asiakkaita saisi sitoutettua paremmin asioimaan K-Ryhmässä tai tietyssä kaupassa?
- (Kesko): Miten aktivoida passiiviset sovelluksen ladanneet asiakkaat?
- (Kauppiaat): Miten aktivoida passiiviset K-Ruoka sovelluksen ladanneet asiakkaat (ovat asentaneet sovelluksen mutta eivät ole innokkaita käyttämään sitä)?

- (Kesko): Miten asiakastyypin ja käyttäytymisen tuntemusta voisi kehittää ja hyödyntää?
- (Kauppiaat): Miten eri asiakastyypit ja heidän käyttäytyminen kannattaisi ottaa huomioon/hyödyntää?
- (Kesko): Mobiilimarkkinoinnin keinot sovelluksen asiakasarvon maksimoimiseksi
 - Millaista markkinointia ja millä tavoin sovelluksen kautta asiakkaille pitäisi olla, jotta hyöty asiakkaille ja kauppiaille olisi suurin?
- (Kauppiaat): Millaista markkinointia/mainontaa ja millä tavoin sovelluksen kautta asiakkaille pitäisi olla, jotta hyöty asiakkaille ja kauppiaille olisi suurin?
- Tärkeimmät huomioitavat asiat sovelluksen käytettävyyden kannalta
 - (Kesko): Millainen sovelluksen pitäisi olla jotta se on mahdollisimman helppokäyttöinen ja selkeä ulkonäöltään, sisällöllisesti, toiminnallisuuksiltaan, ohjeistukseltaan?
 - (Kauppiaat): Millainen sovelluksen pitäisi olla jotta se olisi mahdollisimman helppokäyttöinen ja tarkoitukseen sopiva?
- Pelillistäminen (peleissä käytettyjen motivoivien ja koukuttavien ominaisuuksien yms. elementtien soveltaminen muihin tarkoituksiin)
 - (Kesko): Onko pelillistäminen jo käytössä K-Ryhmässä? Millaisia kokemuksia?
 - (Kauppiaat): Onko pelillistäminen jo käytössä? Millaisia kokemuksia?
 - Onko pelillistäminen ollut mietinnässä, suunnitelmissa (onko potentiaalia)
 - (Kesko): Millä tavalla pelillistämistä voisi hyödyntää sovelluksen asiakasarvon, tyytyväisyyden, lojaalisuuden ylläpitämisessä ja kasvattamisessa?
 - (Kauppiaat): Millä tavoin pelillistämistä voisi käyttää asiakas- ja kauppiashyötyjen /motivaatioiden ylläpitämisessä ja kasvattamisessa?

Mittarit

- (Kesko): Parhaat mittarit sovelluksen menestyksen mittaamiseen
- (Kauppiaat): Parhaat mittarit K-ruoka sovelluksen toimivuuden ja menestyksen mittaamiseen
 - Kuinka tärkeäksi ja kiinnostavaksi koet mittarit/mittaamisen?
 - Merkitys päätöksentekoon ja toimenpiteisiin
 - Millainen on hyvä mittari?
 - Mitä asioita ja osa-alueita pitäisi mitata ja seurata?
 - Mitä mittareita on nykyisin käytössä?
 - Miten voisi kehittää?
 - TOP 3 mittarit? (jos saisit vapaasti valita)

Vapaa sana

- Mitä vielä haluaisit sanoa/tuoda esille?

Appendix 2: Classification of main findings from different aspects of customer value management

Aspect	Theoretical findings	Empirical findings (K-ruoka application)	Summary
<i>Mobile applications as part of the bigger picture</i>	Consistency between channels important as well as wise integration; Multi-channel and omni-channel recommended; Look and feel of a retailer through application	Consistency between channels and holistic development important; Systems should be easy to use, allowing retailer-customer interaction; Visibility should be ensured end-to-end	Consistency in channels and services is important for smooth operations and customer satisfaction; Retailer needs should be further considered;
<i>Potential of platform economy and different parties</i>	Potential recognized in platform economy and utilization of third parties	Potential recognized in utilizing different parties; Should be done carefully	Potential is seen in connecting different parties and utilizing APIs, but implementation should be started wisely
<i>Most important features</i>	Deals, discounts; Location utilization, New updated content; Personalization; Consideration of customer shopping process	Deals and discounts; Recipes, Shopping list; Personalization; Updated content; Freedom of choice, Ordering and payment options	Targeted, personalized service and wisely updated content important; Customer centricity important; Deals could be more tempting; More communal/social, and location based features could be utilized; Ordering and payment options should be included
<i>Mobile advantages</i>	Portability, reach, easyness; Small screen is a challenge	Always with the user, personal, easy, fast; Small screen is a challenge	Small portable size of mobile devices allows easy and flexible use of mobile services; Small screen size is a limitation
<i>Customer loyalty</i>	Loyalty builds step by step; Personalization, loyalty programs, quality of customer service and allowing customer reviews/feedback increase loyalty; Data and analytics needed	Relevant, personal easy-to-use services and content, rewarding, campaigns, social/communal features, agility and continuous development increase loyalty; Application should be usable	Services should be relevant for the customer; Well planned marketing and wise implementation of new features and services can increase loyalty; Usability should not decrease; Personalization requires utilization of data and analytics
<i>Activation of passive users</i>	New updated content, valuable deals, pull marketing and relevance to the personal values of a customer could activate passive users	A reason to use is needed; Targeted communication, offering genuine help for the challenges of a customer, and guerilla marketing could activate passive users; Also other than food related content could work;	Features and services that are considered relevant, valuable and functional by the passive user are likely to activate; Recognizing passive users is challenging and requires data and analytics; Cost-efficiency in activation actions should be considered
<i>Different customer types and behavior</i>	Understanding and managing different customers is important; Customer behavior and motivation depend also on channel; Different classifications exist	Recognition and service of different customers is challenging; Data and analytics are needed (especially for recognizing best and potential customers); Personalized deals and communication, as well as offering selection possibilities are a way to offer value to different customer types	Due to different customer types and dynamic customer behavior it is challenging to maximize the customer value equally to every customer; Proper management and utilization of customer data are needed in order to succeed
<i>Retailer motivation</i>	Application should have the look and feeling of a retailer; Retailers should be informed about the benefits of the application, and provided with easy solutions and technical quality	Retailers should be provided with easier systems and services, and allow agile communication with the customers; Benefits of the application should be proved by data; Retailers should be informed about the system and benefits	Retailers get motivated to use mobile application if it allows easy and agile actions for marketing and communication with the customers; Informing retailers about the benefits, and ensuring quality and consistency of service and operations is important
<i>Competitors</i>	Competitor applications offer personalized benefits considering customer shopping process; Features such as recipes, shopping list, deals, and purchasing can be found; Some have more than one application	It is important to consider competitors and their applications; Strengths of K-ruoka application include data, personalization, recipes, shopping list, appearance and good usability; Foodie has longer experience and offers online purchasing, and price and product information	Lots of retail mobile applications exist in the market worldwide, offering partly similar features; Direct comparison requires more detailed investigation of the application features; Strategies and goals of the firms should also be considered in evaluation
<i>Marketing</i>	Mobile marketing should be based on customer value, offer interactive features, have consistency with other channels, and utilize other channels; Management of customer segments is important; Direct marketing and economic reward programs are good in short term, but social programs in the long term; Push media can be used to attract customers to pull media	Required target audience for mobile marketing can be achieved by utilizing other channels; Customer value should be prioritized; Deals, quality, inspirations, and communication are valued, depending on a customer; More personalization/targeting, surprising elements, and interaction could be utilized; Push marketing needs to be targeted and is a good starter; Achieving pull marketing requires tempting ecosystem	Mobile marketing should be well planned, customer value prioritized, and other channels considered and utilized; Personalization, targeting and relevance are important as there are different types of customers

Aspect	Theoretical findings	Empirical findings (K-ruoka application)	Summary
<i>Usability</i>	Increasing number of features and multitasking are a challenge, usability attributes such as efficiency, ease of learning and satisfaction should be considered, as well as user, goal, application and context; Application should be clear, personal and offer selection possibilities	Service design and customer should be in focus; Application should be intuitive, easy, fast, clear and straightforward to use, and provide only necessary information; Personalization and customization possibilities are important; There should not be too much features and content; Actions should not be based on guessing	Usability should be well planned, maximizing customer value by clear and relevant service, features and content fulfilling the customer needs; Utilization of data and analytics is needed in order to avoid guessing
<i>Gamification</i>	Game mechanics and dynamics utilize inherent human desire for competition; gamification improves motivation, learning, engagement and loyalty; Implementation of gamification might be challenging and needs to be well planned	Gamification has potential and there were lots of practical ideas in interviews; Plusa could be utilized; Gamification needs to be done wisely and inconspicuously	Gamification has good potential in increasing customer value of retail mobile applications, but needs to be done carefully; Gamification could be one means also to increase customer loyalty and activate passive users
<i>Indicators</i>	Indicators should be relevant, selected holistically and carefully, and in connection to strategy and goals; Leading indicators are preferred to lagging indicators; Utilizing KPIs correlates to positive ROI in mobile applications context	Indicators are very important and should be utilized more; They should be real-time, continuous and clear; Recognizing relevant indicators is important; There should be courage to also select indicators that measure negative issues; Selection should be done holistically, with customer focus; Practical business case shows positive influence of K-ruoka application on sales factors	Indicators are important in measuring success of retail mobile applications; Selection should be done wisely, considering strategy, goals, business and customers. KPIs related to conversion, loyalty, customer life-time value and application usage should be utilized; Importance of conversion measures is supported also by the practical business case