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**MOBILE BANKING AND MOBILE PAYMENTS: CHANGING
BANKING SERVICES IN FINLAND**

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ABSTRACT

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The purpose of this thesis is to examine how mobile banking and mobile payments services will change the banking sector in Finland, and what role non-bank companies from the IT and telecom industries will play in this process.

The thesis consists of a literature review and a qualitative study. The literature review forms a comprehensive overview of mobile banking and mobile payments services. The qualitative research was conducted as a descriptive study, focusing on the views of bank and non-bank players.

The results show that banks have a significant advantage over their IT and telecom rivals in regards to their service offering, financial buffer, and status as trustworthy institutions. The banks' embrace of mobile financial services will change the Finnish banking sector into one, with a light branch network focused on sales power, and a heavy emphasis on new mobile devices providing service power regardless of time and place.

FOREWORD

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Helsinki, 18.12.2013

Mikko Joutsen

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ABBREVIATIONS

3G / 4G = Third / Fourth generation mobile telephony systems

APP = Application

ATM = Automatic Teller Machine

CC = Contact Center

EDGE = Enhanced Data Rates for GSM Evolution

GPS = Global Position Satellite

GPRS = General Packet Radio Service

GSM = Global System for Mobile Communications

IT = Information Technology

M&A = Mergers and Acquisitions

MNO = Mobile Network Operator

MFS = Mobile Financial Services

NFC = Near Field Communication

OS = Operating System

OTA = Over-the-air

OTT = Over-the-top

PDA = Personal Digital Assistant

POS = Point of Sale

SIM = Subscriber-identity Module

SMS = Short Message Service

TELCO / TELECOM = Telecommunications Company

TSM = Trusted Service Manager

UMTS = Universal Mobile Telecommunications System

WAP = Wireless Application Protocol

1 INTRODUCTION

The purpose of this thesis is to study the role/impact of mobile banking and mobile payments in Finland. It is a subject of interest due to the widespread use of mobile phones, smart phones and tablet devices. In Finland and worldwide, this has resulted in more and more consumers using their mobile devices to service their banking and payments needs. Since the mobile banking and payments markets are relatively new in Finland and amongst continues change and development, as is the entire banking and retail markets (The Economist 2012c), it offers a unique glance on how bank and non-bank players alike have a new service channel with which they compete for the same customers.

This new setting has the potential to change the banking and retail sectors more than any other technological change since the introduction of the credit card (Van Dyk 2011). As addressed by Crone & Liebenguth (2012), if banks do not address the scale and scope of this ongoing change they run the risk of losing customers, business and ultimately money to non-bank players offering rival services. Finland is an ideal focus point for the study as the country is technologically developed, has excellent banking infrastructure, ongoing mobile banking and payments initiatives, and widespread adoption of different mobile devices.

This thesis provides an understanding of the ongoing changes happening in the Finnish banking sector, the impact of mobile banking and payments services amongst this change as well as the role of IT and telecommunications players in it. These themes are examined through interviews of major Finnish banking and finance institutions as well as international companies in the telecom and IT fields. The contribution of this thesis to the academic literature, does not solely lie on mobile banking and payments, but also on the disruptive effects a revolutionary new technology can have on a traditional and relatively stable market.

1.1 Objectives, Methods and Limitations

The objective of this study is to answer the following questions:

Q1: How will the Finnish banking sector change due to mobile banking and mobile payments?

Q2: What is the role of IT and telecommunications companies in this new field?

Answers to the research questions are obtained from interest group interviews of relevant stakeholders in the mobile banking and payments fields in Finland. These include the three largest banks in Finland (Nordea, OP-Pohjola and Danske Bank¹), as well as, large international IT and telecom companies that operate in Finland (Ericsson, Nokia and Google). An illustration of this setup is portrayed in figure 1. A review of relevant literature including books, articles and earlier research is used as support for the study.

¹ As of 15.11.2012 Danske Bank is the new name of Sampo Pankki. Even though the research for this thesis was conducted prior to the name change, all references to the bank are attributed to its new name, Danske Bank. More information about the change in name can be found on Danskebank.fi (2012) and Kauppalehti (2012).

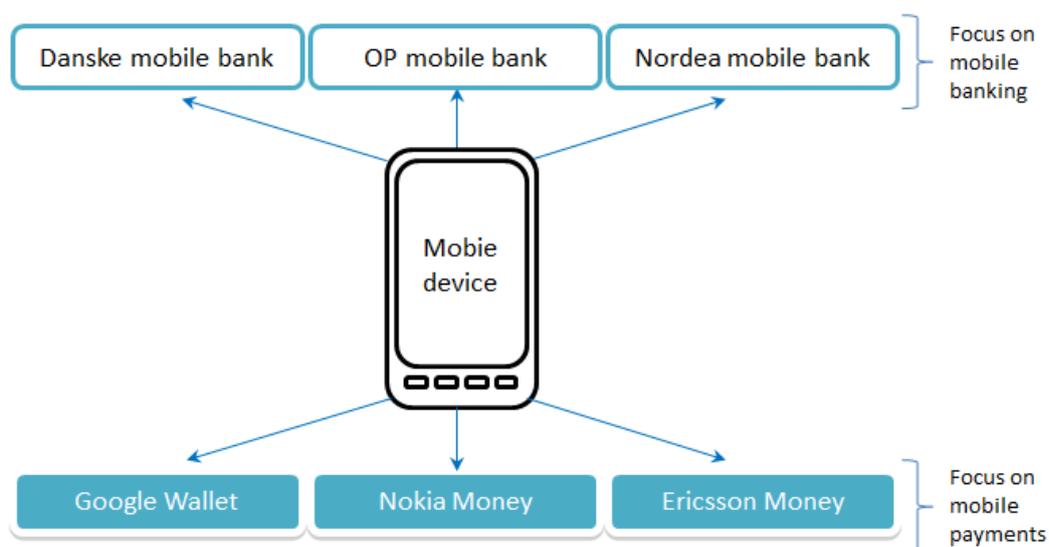


Figure 1: MFS Stakeholders

This thesis focuses on the mobile banking and payments industry in Finland, and mainly from the viewpoint of banks versus IT and telecom companies. The setup is of particular interest, due to the fact that banks in Finland have rarely faced such serious competition from non-bank players. Now, owing to new technical solutions and the sheer scale and scope of the operations of global IT and telecom players, there exists the possibility that these new non-bank players could, through their diversified service offering and easily approachable technologically savvy mobile applications, rise up to challenge the strong foothold that traditional banks have held in catering to the banking and financial needs of consumers in Finland.

It should be noted that the examined telecom and IT companies offer mobile payments services in addition to their non-bank services. The banks, on the other hand, offer mobile banking services as a part of their existing banking and financial services portfolios. Both mobile banking and payments are addressed equally in this thesis. Bank and non-bank players alike are competing for the same customers in the end. Non-bank players can add banking functions to their mobile payments services and bank players vice versa. This setup is a key for examining how banks and non-banks fare against each other in the mobile financial services arena as well as exploring what kind of impact this has on the Finnish banking sector.

Furthermore, this thesis focuses only on mobile banking and payments initiatives from a Finnish point of view. MFS schemes in developed countries differ from those of developing ones not only due to geographical location, but also according to technological, economic, social and political circumstances surrounding each market sector. Finland offers an interesting perspective into examining mobile financial services since the country has a well-established banking infrastructure, high Internet penetration amongst its inhabitants through different devices, and an active involvement by the government in developing the country's Internet capabilities.

In July 2010, Finland became the first EU country that made having an Internet connection a legal right (Ministry of Transport and Communications 2012; MVF Global 2012). On a weekly basis, Finns that using the Internet adds up to over 3.7 million users, which is 88 % of the population aged 15-79. Mobile phone Internet connections make up 17 % of all connection types in Finland making it the third most common type of connections (TNS Gallup 2012). The use of smartphones in Finland, which is one of the most relevant devices for mobile banking and payment services, has become more common leading to Internet use on a mobile phone in a broadband network more than tripling to 29 % in 2009 – 2011 (Statistics Finland 2011a). Also, 42 % of Finns had a smartphone in use in the spring, 2011 (Ibid.).

1.2 Structure of the Study

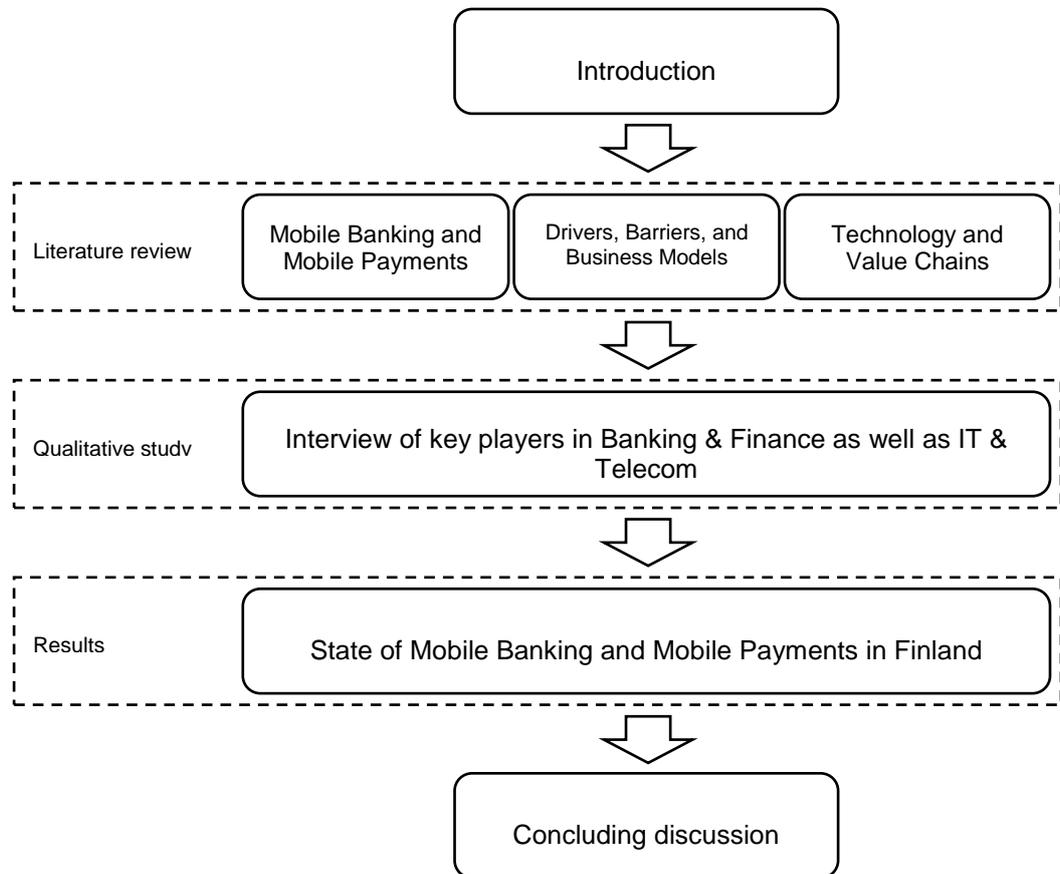


Figure 2: Structure of the Study

As figure 2 depicts, this study consists of three main parts: a literature review, qualitative study and results. Chapter 1 introduces the main objectives, methods and limitations of the study. Chapter 2, 3, and 4 contain the literature review that establishes a comprehensive overview of mobile banking and mobile payments. Chapter 5 introduces the data and methodology used in the qualitative study, and showcases the interviews that were conducted with key personnel responsible for mobile banking and payments initiatives in companies from the banking, IT and telecommunications sectors in Finland. Chapter 6 builds a picture of the mobile banking and payments environment in Finland, based on the literature review and conducted interviews. Chapter 7 follows up with the concluding discussions.

2 MOBILE BANKING AND MOBILE PAYMENTS

2.1 Definitions

Due to the varying use of terms relating to mobile commerce and mobile financial services, it is important to understand the definitions attached to them. Especially, since different information sources often attach different meanings to the same terminology. This variance of terms and definitions is a strong indicator of the state of constant change in the industry. While technology and services rapidly develop, the related terminology tends to be lagging. It has resulted in the lack of a common terminology and definitions getting attached to terms, according to what best please the author. In such circumstances, it is easy to get confused about what is actually being discussed.

This chapter examines the key vocabulary in the mobile framework and how they are defined in academic as well as industry texts. The examination follows a path outlined in figure 3 according to which mobile banking and mobile payments constitute a part of mobile finance, which in turn is a component of mobile commerce.

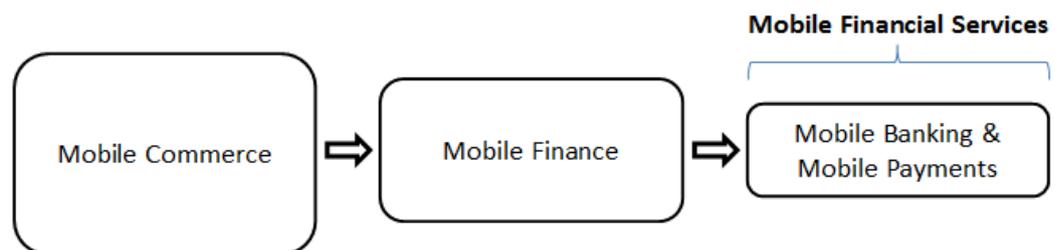


Figure 3: From Mobile Commerce to Mobile Financial Services

Mobile Commerce (m-commerce) according to Singh, Srivastava & Srivastava (2010) is defined mobile commerce as the delivery of products and services via wireless technologies that enables Internet commerce activities, without the restriction of time and space through a hand held device such as a cellular phone or Personal Digital Assistant (PDA).

Mobile commerce can also be understood as electronic commerce (e-commerce) or a part of it as defined by White and Ariguzo (2011, p. 135). Goldmanis et al. (2009) recognize e-commerce as any business conducted online. By a more specific definition, Nelson & van Ketel (2005) define e-commerce as the buying and selling of goods and services on the Internet or other electronic network by firms or individuals. Statistics Finland (2012) has the most detailed definition of e-commerce. E-commerce, electronic commerce, or Internet commerce refers to buying or ordering goods via the Internet for a consumer's consumption, regardless of whether the goods are paid for later via invoice or immediately via electronic banking, credit card, electronic payment or similar. Internet commerce consists of orders made on electronic platforms and sent over the Internet, as well as commerce in online stores. Electronic commerce comprises of both domestic and foreign electronic commerce.

For the purposes of this study, electronic commerce is understood as incorporating all commerce that is conducted over an electronic network, specifically the Internet. Mobile commerce is a part of e-commerce and refers to electronic commerce conducted through mobile devices such as mobile phones, smart phones¹, tablet computers, laptop computers and other mobile devices.

Mobile Finance (m-finance) refers to the use of mobile technology in financial services. Castello (2004) understands the concept as the freedom to conduct financial transactions when and where users choose helping them to overcome the shortcomings of physical infrastructure with services such as mobile banking, mobile payments and remote banking². M-finance allows its users the ability to access financial information, manage financial transactions, and make choices related to purchases via wireless or Internet enabled devices. In the scope of this thesis, m-finance encompasses all aspects of banking, payments and finance that have a mobile feature, e.g. mobile brokerage.

¹ There are different definitions of what constitutes as a **smart phone**. In this thesis the definition as used by *Statistics Finland* (2011b) is applied. A smart phone has the following qualities: it uses either 3G or 4G mobile networks, has a wider keyboard than a basic mobile phone, the keyboard can be either mechanical or a touch screen, and different applications and games can be loaded onto it.

² **Remote banking** according to *Castello* (2004) refers to the work-line in financial services, e.g. the information, customer support and transactional needs of financial services professionals that are conducted using the data capabilities of the mobile devices.

Mobile Banking as defined by Singh, Srivastava & Srivastava (2010) is a channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone. Pousttchi & Schurig (2004) have a more thorough dissection of the term. According to them mobile banking is a subset of electronic banking (e-banking¹) – the logical development of electronic banking made possible by the ever-increasing spread of Internet-enabled phones and PDA's. Pousttchi & Schurig further define mobile banking as the type of execution of financial services in the course of which, within an electronic procedure, the customer uses mobile communication technology in conjunction with mobile devices. The mobile communication can be carried out via different technologies, e.g. GSM/GPRS, EDGE or UMTS.

Mobile Payments according to Heyer & Mas (2011) is synonymous with mobile money. It is a system that allows users to hold money in a virtual stored value account maintained in a server by a service provider, e.g. a telecom, and operated by users through their mobile phone. Users can deposit or withdraw cash with a mobile money agent, send money to other mobile phone users, buy airtime, pay bills and store money.

¹ **Electronic banking** (e-banking) as defined by Pousttchi & Schurig (2004) is the execution of financial services via the Internet.

Mas & Radcliffe (2011) use the terms e-payments and e-money in the same respect. The latter is understood as having monetary value that is recorded in electronic media, exchangeable for physical cash at par value, and backed by liquid bank assets. E-payments are transfers of monetary value that occur entirely by electronic means, involving the crediting and debiting of electronic accounts, whether these are bank deposits or e-money. All-in-all, mobile money is a loose term for an e-payment system that is based on e-money issued by a non-bank service provider that is combined with a dense network of cash merchants numbering typically in the thousands.

Mobile Financial Services (MFS) is often used as a synonym for mobile finance. Sirpa Nordlund, Executive Director of the Mobey Forum¹, refers to the term in *The Paypers* (2012), “the MFS ecosystem is a busy place, where traditional banks rub shoulders with mobile network operators (MNO’s), handset manufacturers, service providers and some of the biggest names on the web.”

In the literary review, an overlapping of definitions is evident. In general, mobile banking and mobile payments most commonly encompass the terms mobile money, mobile wallet, mobile money transfer and mobile ticketing. For the purpose of this study, mobile banking and mobile payments are grouped together as mobile financial services. This definition excludes certain aspects that can be attributed to m-finance such as remote banking.

¹ The Mobey Forum is a bank-led not-for-profit organization that drives for a sustainable and prosperous mobile financial services ecosystem. The organization also deals with issues related to mobile, contactless, proximity and remote payments in addition to mobile wallets. Nokia, Nordea and Danske Bank are part of Mobey Forum. (Mobey Forum 2010a & b)

An important note in the scope of this thesis is the definition of what constitutes a mobile device. Pousttchi & Schurig (2004) make a distinction between mobile devices, they exclude notebook computers, which are easily transportable but whose use is typically stationary. According to them the use of banking applications on a laptop computer with a WLAN connection underlies the rules of electronic banking, not the special rules of mobile banking. This thesis does not share the same exclusion of laptops from mobile devices. They are considered as one mobile device among many even though a larger focus in this thesis is placed on smart phones and other devices that are truly mobile with a user interface that differs from that of a stationary device, e.g. desktops and laptops compared to smart phones and tablet computers.

A further description of the services encompassed in MFS is given in chapter 2.4. In addition, in chapter 6, a detailed summary is given of how the interviewees defined these same concepts. The similarities and differences of the definitions between literary review and the qualitative study are also discussed.

2.2 Background

2.2.1 Evolution of Banking and Payments Services

Mobile banking and payments services are not a new invention. The first coming of mobile financial services was at the turn of the 21st century when rapid changes gripped the banking environment. Deregulation, harmonization, increased competition by new players from the non-banking sector, product innovations, globalization, technological advancements and digitalization led to a market situation where competition for customers became intense. As a result, banks developed innovative service products and offered a wider range of financial services through multiple channels, one of which was a wireless delivery channel available via mobile phones and Personal Digital Assistants (PDA's). Mobile financial services were considered to form an important innovation in the banking sector. The development in mobile services was preceded with decades of other changes affecting the Finnish banking environment. (Aspara et al. 2012; Suoranta 2003)

In the **1970's** the MikroMikko computer replaced traditional cash registers. This enhanced and streamlined the work of the only service channel by automating manual processes. In the **1980's** ATM's brought about further developments in efficiency and automation with the intention of decreasing cash services. Simple functions were no longer offered as a person-to-person service, but were transformed into a self-service. A key feature of this era was the automation of processes as described by DeYoung (2005).

The **1990's** brought about payment terminals, which again shifted person-to-person services to self-services. As customers got used to paying their bills by themselves on a payment terminal, a natural migration occurred among the same users to the web bank when it was introduced. The web bank was a similar experience; once again customers paid their invoices by themselves.

This led to the point that a majority of invoices were paid through this new service channel, the web bank, and no longer at the bank branch offices or payment terminals. As a result, the use of payment terminals dwindled in Finland leading to a point that two of the biggest banks in the country, Danske Bank and OP-Pohjala, took their payment terminals out of service in 2011. (OP-Pohjala 2010; Danske Bank 2010b)

Further, in the **1990's**, contact centers (CC's) were commissioned into use at banks. With the CC's, efficiency played a key role and technology was its enabler. CC's became a much more efficient and cheaper service channel than branch offices. CC's and the web bank brought about a new way of doing banking. Customers in Finland were quick to adopt these new ways of conducting banking functions because they were familiar with self-service.

The Finnish banking crisis of the 1990's effectively cut in half the amount of bank branch offices in the country. As with payment terminals, since there were fewer existing branches, consumers had to adapt to new service channels that were more easily accessible. Banks were keen on pushing their customers towards these new and more self-service focused service channels; since they were cheaper, more efficient, and available regardless of time or place.

A prime example of the transformation sweeping across the banking industry was the efforts of Sonera, a Finnish telecommunications provider, to launch new procedures for electronic money transactions with its SmartTrust service (Sonera 1999). Sonera's aim was to provide users a service with which they would be able to type their digital signature into their phone. It was the world's first mobile solution for e-commerce and online banking. Fuelled by SmartTrust and its possibilities, Sonera joined forces with Leonia Pankki (the predecessor of Sampo Pankki) and Tieto, a security specialist company, to offer mobile banking via WAP-based mobile phones. The service would use the SmartTrust digital signature and encryption technology.

Sonera also applied for and received a Finnish banking license. The firm had the ambition of becoming a financial hub, as it would provide an access point for customers to use their financial services, which were made available by an actual bank: Leonia Pankki. (Sonera 1999; Telecompaper 1999; Whioam.com 1999; Danske Bank 2012)

Sonera had high ambitions for its SmartTrust service. Its goal was to secure a leading role as a global supplier of wireless security solutions. Sonera saw business possibilities especially with offering banks and e-commerce companies the possibility of conducting their business securely around the world. The SmartTrust service was an open solution, which was independent of handset manufacturers, mobile operators, service providers and the SIM-card. The technology was compatible with WAP, GSM, Bluetooth and future generations of mobile communications networks. Many co-operation agreements were signed with companies in different industries, especially banks and payment providers. The market for wireless e-commerce was seen as being in the early stages of development but with immense growth potential. (Sonera 1999; Kutler 1999)

Great expectation and optimism surrounded Sonera's SmartTrust service. Its worldwide breakthrough was, however, sidelined because of the trouble the company faced due to its expensive UMTS deals in Germany and ultimately the burst of the dotcom bubble in the early 2000's (Taloussanomat 2004). Sonera and its SmartTrust service showcase, how the Finnish telecom industry exuberated optimism for new technological services that held the possibility of propelling telecom companies into new areas of business, one being the banking and financial service industry.

There have also been other technological advancements and non-bank ventures that have not turned out to be success stories. In the beginning of the 21st century the WAP revolution was one such story brought on by Nokia's rise to being the leading handset manufacturer in the world from 1998 to 2012 (Gartner 2012). The company's WAP endeavor was not as successful as was hoped, due to shortcomings in the system's user interface. The system was slow, clumsy, and in a way ahead of its time. People did not have a natural need for mobile financial services, which did not support using WAP. (Helsingin Sanomat 2001; Gow & Smith 2006, p. 74-75)

Only in recent years through the development of mobile devices – their processing power, screen size, user interface and data connections – has a need and demand for mobile banking and payment services developed. MFS services are also much more refined, as they are fast and easy to use. This has made mobile banking and mobile payments a simple and pleasant user experience.

2.2.2 Developed vs. Developing Countries

There are fundamental factors that differentiate mobile banking and mobile payment initiatives between developed and developing countries. In **developed economies** mobile financial services failed to take off at the beginning of the 21st century due to poor user interfaces, slow service, limited use and a variety of competing services. MFS is now making its second coming, due to the rapid increases in the availability and adoption of smart phones and services available to them. As Visa Europe president and chief executive Peter Ayliffe puts it, "...the growth of mobile phone services and e-commerce, together with the evolution of the mobile handset into the smartphone, present two of the most significant opportunities for the payments technology industry" (Middleton 2011).

For customers in developed economies, the opportunities of mobile financial services have translated into increased affordability, convenience and security for conducting banking services over a hand held device. For businesses it has meant the possibility of reaching vast numbers of new customers (Jenkins 2008).

In terms of **developing economies**, the challenges and opportunities of MFS are quite different. The potential for MFS is large as it offers to facilitate the flow of money among rural and poor families at much lower transaction costs, bringing the bank to those currently unbanked (Jenkins 2008). Mobile banking also has great potential in facilitating financial inclusion, which reduces poor people's vulnerability to shocks and increases their ability to invest in income-generating activities and assets (Dolan 2009). The concept makes use of the fact that developing countries usually have a large portion of the population that is unbanked but has easy and cheap access to mobile communication. One success story comes from Kenya where the adoption of the M-Pesa has 18 million users who now move 20 % of the country's GDP via text messaging (Van Dyk 2012).

Looking closer at M-PESA, the service was launched in Kenya in 2007 by Safaricom. By 2009 the service had 7 million users. Primarily young male urban migrants were the first to use M-PESA to send money back to their families in the countryside. In 2009, the use of the service expanded to pay for everything from bills to services. Using mobile money became a faster, cheaper and safer way to transfer money than traditional bank transfers, which tended to be slow and costly. It is estimated that the incomes of Kenyan households using M-PESA increased 5-30 % since they started using mobile banking services. (The Economist 2009)

Although, mobile banking and payments services have been a success in many developing countries, it is only slowly becoming more widespread. According to The Economist (2009) the progress of mobile banking and payments has been impeded by banks, which feared that mobile operators would “eat their lunch”. In many countries mobile money has been blocked because operators do not have banking licenses and their networks of corner-shop retailers do not meet the strict criteria for formal bank branches.

The regional successes of mobile banking have however changed many banks' views on mobile money and they are starting to see it more as an opportunity than a threat. As The Economist (2009) notes, “banks should see (mobile money) as an exciting chance to exploit telecoms firms' vast retail networks and powerful brands to reach new customers”. Joint ventures between banks and operators would also help to overcome regulatory requirements.

Looking at mobile financial services in emerging and developed economies, Sirpa Nordlund (The Paypers 2012) points out that in **developed markets** the emphasis needs to be on the speed of the transaction, convenience and value, as the vast majority of people have bank accounts and a host of other banking and financial services to accompany them. In **emerging markets**, however, there are huge differences in terms of infrastructure and a banking network. Mobile payments has huge potential in markets where infrastructure is scarce, as it enables two parties to send and receive payment and exchange funds using the mobile channel anytime and anywhere. This allows the transfer of funds or payment of a bill with little more than a mobile handset and the payee's payment reference or phone number. The payment received can then be redeemed as airtime, goods or cash depending on merchants. This size and potential of these services in emerging markets is a very attractive prospect for MFS stakeholders.

In **developed economies**, mobile financial services have raised hopes and promises of large rewards. According to Van Dyk (2012) it is "the biggest thing in retail since the credit card got us talking about a cashless economy". Many different players in different industries are now working hard to develop and promote new ways, on how to use and implement mobile financial services. All parties involved see mobile financial services as a unique business opportunity, where there is great potential for profit.

Evidence of this is clear from the host of announcements in 2011 and 2012 by high-value companies and market leaders in their respective industries such as Visa, MasterCard, Google, Nokia, Ericsson, RIM, Samsung, Vodafone, Orange, Verizon, AT&T, PayPal, Facebook, and others that heralded strategic partnerships, joint ventures and/or individual service rollouts in order to get first mover benefits in the mobile banking and mobile payments markets. Customer adoption and interest in mobile services have been key factors in fuelling corporations' interest in MFS. It was noted by Sirpa Nordlund, Executive Director of the Mobey Forum, an industry non-profit group that encourages the use of mobile technology in financial services, that players in the mobile banking and payments fields are, "...beginning to recognize the potential of mobile payments technology and how it could revolutionize the payments landscape". (The Paypers 2012; Kauppalehti 2012)

In addition, Sirpa Nordlund highlights the importance of banks in this new mobile banking and payments field, "Banks have a vital role to play and the future health of the ecosystem depends on them keeping pace with the major new players entering the market such as Google and PayPal. The power and reach of these organizations could, conceivably, see them dominate entirely. Banks must ensure that they avoid becoming marginalized into a 'transaction only' role." (The Paypers 2012)

Although, banks face potentially serious competition from non-bank players in the mobile banking and payments fields, Sirpa Nordlund goes on to explain that "Of all MFS stakeholders, it is the banks that have the loyalty and trust of the end users. This core strength sets them apart from the other players and will carry them forward into the MFS domain. Banks have experience in data security, brand equity and reliability, access to risk management data, own a large existing customer base, and have strong customer loyalty. It is clear to see that the banks should have a seat at the MFS table, but they need to act soon". (The Paypers 2012)

The need for banks to quickly respond to the prospects of mobile banking and payments is evident from PayPal's announcement that it expects to process \$7 billion in mobile payments in 2012, almost double the amount recorded in 2011 (The Paypers 2012). This is evidence of a significant shift away from traditional banking and reflects a growing trust in the PayPal brand, which banks must respond to if they are to remain competitive. Ericsson has also optimistic growth expectations for the mobile commerce industry. The company predicts that the m-commerce industry will process more than \$800 billion globally by the year 2016. (Ericsson.com 2012)

In Finland, mobile financial services are slowly gaining momentum, as service providers are finding ways to promote the technology and come up with angles that will let them have a share of the promised rewards MFS is believed to bring. The increased interest in MFS has resulted in frequent news titles about the subject. As an example, Kauppalehti (Erkko 2012) featured an article about Nokia coming up with a mobile payment strategy, due to the company including NFC technology in its last Symbian based smartphones. According to the article Nokia had been involved in mobile payments since the 1990's, but plans had not taken off until recent years.

2.3 Service Channels

The technology involved in mobile services has created a completely new service channel for banking and financial institutions as well as the non-bank companies hoping to get in on the action. Traditional banking channels still exist in today's world but their function is changing and some are being completely replaced by the mobile. The mobile service channel brings about a fundamental change as it is rich in content and can be tailored to the demands of each individual end user. In other means, a novel aspect causing change, in a field often regarded as traditional and conservative.

A feature of this chapter is that an overview of the service channels involved in banking and payments services is conducted from the view of banks. The mobile channel is highlighted with the following chapters examining its service offering.

According to Monitise¹ CEO Alastair Lukies, banks are looking at mobile phones as their fifth customer service channel after branch offices, ATM's, Internet banking, and phone banking (Goode 2008). In terms of this thesis, the latter four mentioned services channels form what can be described as traditional banking channels, with one inclusion: a considerable amount of communication between banks and their customers is carried out via mail. Therefore, mail is the fifth service channel and mobile the sixth, as is shown in figure 4.

¹ Monitise is a technology and services company that delivers mobile banking, payments and commerce networks worldwide (Monitise 2013).

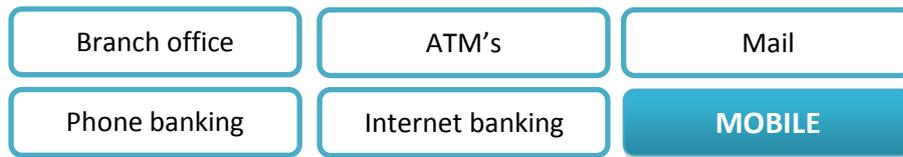


Figure 4: Banking Service Channels

Mobile is the sixth and newest service channel brought about by new technological innovations and service models. In the past, customers had to conduct their banking business mainly through stationary channels (e.g. visiting a branch office or an ATM) or semi-mobile channels (e.g. calling a bank's call center or accessing its web bank through a computer). Nowadays, due to the mobile service channel, they have a wider range of options available at their disposal that allow them the use of financial services anytime, anywhere, and on almost any device.

Call centers and Internet banking can be argued to be included in the mobile block, as they too can be accessed through a mobile device. However, they are not meant to be the primary channel utilized on new mobile devices, such as smart phones and tablets. User interfaces and service features have been optimized for these new mobile devices, and often they differ quite considerably from those of other service channels. There is even considerable difference between different operating platforms within the mobile service channel itself. The vast array of mobile devices that allow consumers to use banking and payments services have been grouped together into four main categories that are presented in figure 5.



Figure 5: Mobile Banking and Mobile Payments Devices

Mobile phones and smart phones are generally, what first come to mind when discussing the mobile service channel in terms of banking and payments. They have been the primary driver of change, as they have become more readily available to consumers. However, there are a host of other devices that can be understood as mobile that allow for the same (or at least partly the same) access to services, as with mobile and smart phones. These are laptops, tablet computers, contactless cards, and any other devices that allow for mobility and the use of banking or payment features.

2.4 Services Offered

Mobile banking and mobile payments entail a large entourage of different financial services, which in this thesis are grouped into two main service groups, mobile banking and mobile payments services. Each service group is then made up of several service bundles, as shown in figure 6 and 7. Each individual service bundle consists of a host of banking and/or payments services. This chapter presents the most common service bundles of mobile banking and mobile payments that reflect the service offering of the companies examined in this thesis.

2.4.1 Mobile Banking Services



Figure 6: The Mobile Banking Service Group

The **mobile bank** service bundle has features such as account balance information, invoice payments, bar code reader, money transfers, currency calculator, messaging to bank personnel, and finding the nearest branch office or ATM. These services are intended to be accessed through a mobile bank app on a mobile device.

The **tablet bank** has in essence the same services as the mobile bank, but with the exception that they have been customized for the tablet device. Due to slightly different features between tablet and smart phone devices, such as a larger screen size, tablets are able to display more information allowing for more possibilities compared to a smaller screen size smart phone.

The **mini netbank** service bundle has many of the same services as the mobile and tablet bank. An end user may browse their account balances, transactions, pay invoices and access market information. The service bundle is intended for mobile devices equipped with an Internet browser, and not necessarily a specific app to access banking services. Therefore, it does not make use of all the features that a smart phone or tablet has, e.g. GPS with which the nearest branch office or ATM can be located.

The **automatic telephone service** allows users to listen to an automated voice that tells them their account and credit card balance, and transaction information. The same information can also be ordered to their mobile phone as a text message. Some service providers deliver both of these services together, while others have separated them into an automated phone and **SMS service**. Few service providers have even defined their own **notification service** that sends automated SMS messages to customers about their balance information. The services offered in all three bundles are quite limited.

A key factor in the different mobile banking service bundles offered for different mobile devices is that customers will not use each device and service bundle to carry out all their banking functions at all times as pointed out by Adams (2012). It can rather be seen related to the situation. For example, a smartphone will not be the most popular device to access investment information, due to limited screen size, and the device is generally being used on the go. Accessing detailed and complex investment information is not likely to take place under such circumstances. A tablet device, under more relaxed surroundings, would be held as a more viable option for a customer to prefer.

Even though similar banking services are offered through different mobile devices, the use of one device does not rule out the use of another. Nowadays, customers are expected to own more than one mobile device, as well as, use more than one mobile banking service. This is a particular feature of the mobile service channel, where different services are tailored for different devices, so that they are interoperable.

2.4.2 Mobile Payments Services



Figure 7: The Mobile Payments Service Group

The mobile payments service bundles characterized in figure 7 form the basis for the mobile payments service group. They are synonymous with mobile money and mobile wallet services. As their name suggests, mobile payment services are focused on different ways of electronically transferring money, from one party to another, either remotely or in close proximity.

In-store payments refer to the physical act of payment in a store environment. They revolve around proximity and contactless payments, which means that the customer is able to quickly and conveniently make a payment either by scanning, tapping, swiping or checking in with a mobile device that recognizes the point-of-sale terminal upon becoming in close enough proximity with it (be in via direct contact or without). With in-store payments the mobile device can take on the form of a variety of options, e.g. payment card, mobile phone, smart-phone or NFC sticker.

Online payments or remote payments refer to making payments through a mobile device by either logging on to an online service to make a payment, or having the payment charged directly to a customer's mobile account. Online payments can be characterized as electronic payments, made with a mobile device that does not require any contact with a physical POS terminal.

Money transfers in the mobile context refer to transferring monetary funds, from one party to another, through a mobile device. Mobile money transfers, allows a person to send money directly to another person's mobile phone or mobile wallet account using a mobile Internet connection, telephone call or SMS message. Mobile money transfers are much like a traditional account transaction except that the entire process happens through a mobile device, and the value chain supporting it can involve a variety of different parties, e.g. money transfer agencies, telecoms and banks.

International remittances are to a great extent similar to money transfers, except that they are settled in an international setting, through remittance transfer providers, such as banks and credit unions.

Ticketing is the process of ordering, paying, obtaining and validating tickets through mobile devices regardless of place or time. Mobile ticketing can be used with any service that requires a ticket as proof of purchase, e.g. parking meters, movie theaters and public transportation.

The same principal as with mobile ticketing can be extended to **offers, coupons, gift cards and loyalty cards**. Combining these services with mobile payments is one of the fundamental features in mobile wallet services, such as Google Wallet and Apple Passbook. Offers, coupons, gift cards, and loyalty cards can be used to gather purchasing power into one place. This makes them worthwhile and convenient for consumers to use, and attractive for retailers to supply.

Airtime top-up or transfer revolves around prepaid mobile credits that can be purchased online, at over-the-counter retailers and even ATM's. Upon purchase, the prepaid credits are stored in an electronic account, after which they can be used for messaging, data services or sharing with another mobile phone user, who is often another prepaid customer of the same mobile operator.

Basic banking services creates its own service bundle in the mobile payments service group, as it provides convenient and often necessary services that amplify the user experience of other payments service bundles. They are also an obvious service to offer consumers, as most payments services require a bank account, debit card or credit card to work. Basic banking services in the mobile payments service group consists mainly of accessing account information and making account transfers. These features are the same as in the mobile banking service group. This is clearly an overlap between the two service groups, and thus, a reason for why mobile banking and mobile payments services can easily be confused with one another.

3 DRIVERS, BARRIERS, AND BUSINESS MODELS

The MFS industry has many of the same traits, as any other information economy, i.e. it is driven by the economics of networks as described by Shapiro & Varian (1999, 173-175)¹. In a network economy, the value of connecting to a network depends on the number of other people already connected to it. In addition to this fundamental aspect, mobile banking and mobile payments have their own set of drivers that increase positive network effects as well as barriers that hinder them.

Informa (2011) has listed the drivers and barriers of NFC, which are illustrated in figure 8. Many aspects of the list apply to technologies impacting mobile banking and mobile payments. Therefore, the drivers and barriers of mobile banking and mobile payments are, in some extent, examined through those of NFC.

¹ See also Dolan (2009, Appendix 2) for a detailed categorization of the different players in the mobile money ecosystem along with their assets and capabilities, incentives, roles, limitations and constraints.

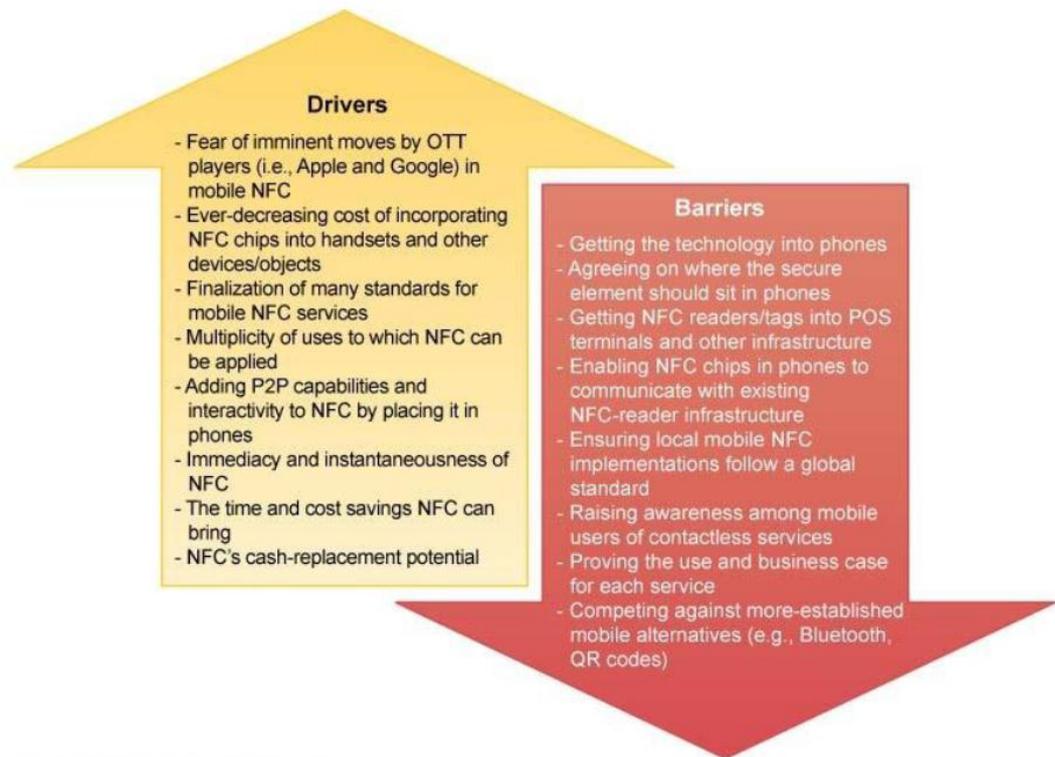


Figure 8: Drivers and Barriers of NFC (Informa 2011)

There is a whole host of technologies used to develop and produce mobile payments services, as described by Dahlberg et al. (2008). Nevertheless, a high-level holistic understanding of the technology base, especially of mobile payments, is lacking. NFC forms an exception to this, as it is a standardized and industry wide accepted communications technology with a host of practical implications. Therefore, its use in mobile communications as well as payments has been well documented. As noted by Kent (2012), the mobile industry made a solid movement in 2011 toward establishing NFC as a standard feature on smart phones and major payment networks. As an example, Visa and MasterCard, issued incentives to merchants to adopt payment terminals capable of accepting NFC payments.

3.1 Drivers

Achieving **critical mass** for a new technology or business model is crucial in its successful implementation (Informa 2011). In terms of contactless payments, this issue is looked at from an aspect of how consumers as well as retailers can be encouraged to adopt this new way of paying (Walmsley 2012). Retailers face the cost of installing the payment terminals into their shops and are only interested in doing so, if there is a prospect of significant benefit. In other means, if there are enough consumers to use the new payment devices and services. Consumers, in general, are also only interested in adopting the form of payment, if there are significant benefits that can be achieved from it compared to other payment options. An additional key factor derives from how widely available the new payment terminals are, in other words, how widely accepted the new payments devices are.

Critical mass can also translate into **economies of scale and scope**. The more devices NFC technology is incorporated into, the more inexpensive it becomes. As identified by Informa (2012), a central driver in the adoption of NFC is the ever-decreasing cost of incorporating NFC chips into handsets, and other devices and objects. Heyer & Mas (2011) also address this issue, and explain that a basic characteristic of the mobile money business is that the model depends on volume: being able to capture a large number of relatively small transactions.

In relation to this, Mas & Radcliffe (2011) identify three fundamental characteristics of why mobile money systems struggle to achieve scale incrementally. First off, **network effects**: the value to a customer of a payment system depends on the number of people actively using it; meaning the more people on the network, the more useful it becomes. This however, requires momentum in order to reach a critical mass of customers, making it difficult to attract early adopters when there are only a few users.

Secondly, a **two-sided market**. In order to grow, mobile money systems have to attract both customers and retailers simultaneously and aggressively. Thirdly, **trust**: customers have to become comfortable going to non-bank retail outlets and initiating transactions through their mobile devices. The best way to build trust is having the mobile money system reach critical mass quickly, so that existing customers become the prime mechanism for drawing in new customers. Gradualism is likely to lead to failure.

To achieve these fundamentals, mobile money deployments need to achieve critical mass as quickly as possible. Mas & Radcliffe (2011) recommend three actions to reach this goal. Create enough urgency in customers' minds to learn about, try and use the service; invest heavily in marketing to establish awareness of the product in a large end-user segment; incur considerable customer acquisition costs to ensure that retailers are adequately incentivized to promote the service.

Mobile banking and mobile payments service providers are faced with the dual challenge of obtaining **critical mass in both the consumer and retailer markets**. Doing so requires large investments, giving the edge to players who are already dominant market players, such as Visa and MasterCard, as well as the banks and financial institutions that are partnered with them. The payments market is also a very low-income industry that, as earlier stated, prefers large players with an established presence in the market to smaller ones and especially new players, allowing them to slim down their value chain. This translates into larger profits for fewer players. As said by Zilvinas Bereisis, a senior banking analyst at Celent, "It takes a considerable investment just to get into the market. The value is probably insufficient to justify the cost. Contactless cards have been around for quite a few years but we're nowhere near critical mass" (Walmsley 2012).

A relevant issue that has an effect on achieving critical mass is **consumer acceptance of the new technology**. Issues affecting this are the **ease, speed** and **safety of use**. Payments can be made easier, faster and safer, which is a real advantage for establishments that attract large numbers of people or that face problems with long queues. Heyer & Mas (2011) further stress the importance of speed in the mobile money model. Speed is essential, as it enables to generate a marketing buzz and trigger simultaneous interest among users and merchants.

In addition, end users need to understand, how to use a new payment system. As such, **market education** is an important issue, as demand will not arrive without it (The Paypers 2012). One of the main difficulties that payment providers face in relation to this is explaining to customers, whether individuals or retailers, how the new technology works and what benefits it will bring them. (Walmsley 2012)

Security is a central issue in the mobile banking and payments field. As noted by Sirpa Nordlund in The Paypers (2012), "...new payment technologies make stakeholders justifiably nervous." However, banks are well equipped to deal with most security issues, as they are similar to those faced in other service channels, such as Internet banking. The main challenge behind the security aspect concerning mobile banking and payments services is not so much with the issues faced by service providers; but in reassuring, educating, and convincing consumers that mobile banking and mobile payments are a secure and viable option that is as safe as a contact transaction or an online payment.

Another central issue is **convergence** and **interoperability**. Current business models in the contactless payments industry rely too much on tie-ups between banks and telecommunication companies, rather than adopting an open platform necessary for interoperability. Sirpa Nordlund, Executive Director of Mobey Forum, believes banks and other payment providers must move towards an open platform, if contactless payments are to become more commonplace. As Nordlund puts it, “We have closed systems now. Users of a mobile wallet should have the right to choose. In the same way that you might choose different providers for your personal business email accounts, you should have choice in how your [mobile] wallet works”. (Walmsley 2012)

3.2 Barriers

The cost of implementation is one of the most significant barriers standing in the way of banks as noted by The Paypers (2012). Being the first mover on the mobile banking and mobile payments arena requires heavy investment in products, services, infrastructure and a client base, all without the guarantee of consumer engagement. The same is even applicable for non-bank players entering the market. As such, it is very difficult for players to succeed alone, especially with a dependence of mobile networks and handset providers.

Co-operation and **splitting profits and costs among value chains members** is also, a difficult hurdle to overcome. With a large value chain it becomes increasingly difficult to co-ordinate operations and responsibilities, as well as, to divide the profits and costs among each member. The desire to break rank increases and value chain partners may end up competing against each other.

Walmsley's (2012) citation of Sirpa Nordlund adds to the argument of co-operation, "No-one can do this alone, nor should they. Value-added members of the chain offering services need to get together with other members of the chain offering other services. It has to be attractive enough for the consumer. But for there to be freedom of choice, a lot of companies realizes co-operation needs to be there or nothing will happen."

In *The Paypers* (2012), Nordlund makes a case about the revenue side of mobile banking and mobile payments. As she puts it, "inevitably conversations relating to MFS deployment usually come back to the subject of how money can be made." Payment functionality in itself is not seen as enough to drive the adoption of MFS. Further stimulants for consumer adoption are needed. Coupons, discounts, marketing and ticketing among all other manners of new mobile services that reward mobile wallet users with benefits that are not available elsewhere are required for consumer convenience and adoption.

Trust is an essential component in banking services. It is the reason why people give banks and other financial institutions their money, as they trust the bank in its safekeeping. Trust was also a key empirical finding by Aspara, Rajala & Tuunainen (2012, 5-6) in examining what were the most important issues concerning the attitudes of young customers towards retail banking. Overall, it was concluded that not much customer value can be created with trust as such, but lack of it prevents customers from adopting new services or even makes them switch the banking services provider.

Trust is not only a key component of the relationship between a customer and a bank, but also in the adoption of services that rely on technological devices. Data collection by the banking institution falls as well under the trust category. Trust as a determinant of consumer's willingness to engage in specifically online business has been the focus of Greenberg et al. (2008). According to their research, an individual's trust to the Internet and online businesses is made up of various risks related to issues such as privacy and security in online transactions.

An important factor that is not evident from figure 8 is regulation. According to Heyer & Mas (2011) **regulation** can help mitigate and control risk, and thus, helps to secure trust (especially in new MFS schemes). Banking and finance is a heavily regulated sector covering issues such as, money laundering and terrorism financing, security and consumer protection, agent regulation, bank licensing regulation, outsourcing regulation, account pricing regulations, and interoperability rules. These same issues and the regulation related to them, affect the mobile banking and mobile payments industries. Service providers as well as end users must comply with the regulatory requirements.

Even though regulation is put into place, to ensure security and to grow trust among the value chain participants, it is a difficult scale to balance. Too much regulation, to both service providers and end users, can serve as a barrier of entry for new market participants. Hindering market entrants stifles competition and innovation. However, too little regulation leaves market participants vulnerable to misconduct, which in turn does nothing to build trust but instead destroys it. Depending on how heavy the regulatory environment is, regulation can be either a driver or a barrier examined in the context of figure 8.

3.3 Business Models

As discussed by Walmsley (2012), mobile banking and payments services will develop new business models, such as those of Google Wallet and iZettle. The latter works through iPhone, with a cloud-based payments application designed for small businesses and domestic service providers as well as young people who are rapidly abandoning cash. Building this kind of technological solution and business model that complies with all industry regulations takes time, effort, skill and innovation. Although, new business models are created, as Jacob de Geer, CEO of iZettle puts it “I believe we will see new payment models that will develop parallel with existing solutions, but I don’t see existing payments models disappearing.”

This thesis identifies three core business models for bank and non-bank companies to follow. They are the bank-led, non-bank-led and collaborative model. In the **bank-led model**, the service channel is controlled in all aspects by one bank or many. Non-bank parties can be used to carry out specific purposes such as coding, consultation or distribution. This business model is followed by all of the banks examined in this thesis i.e. Nordea, OP and Danske Bank.

In the **non-bank-led model**, the service channel is in principle controlled by non-bank companies. However, there is usually at least one bank or another financial institution providing the core banking or payments services, as with Google Wallet. Even though the service bears Google’s name, the company has teamed up with a payments provider (MasterCard) and a bank (Citi) to create the service (MasterCard 2013; Citi 2013). The same approach was also used in principle by Nokia Money and Ericsson Money.

Collaborative model, the Mobey Forum believes that the MFS ecosystem must adopt a collaborative model, in order to develop a trusted and workable marketplace. Banks and other stakeholders need to join their efforts in developing business models, which are open and work to the strengths of all involved. As put forth by Sirpa Nordlund, “Far from competing with new players, banks should look to offer simple and effective banking services in a trusted environment... By fostering strong industry alliances with other key entities in the ecosystem, such as handset manufacturers, MNOs and service providers, banks will be able to become part of a complete, consumer focused solutions.” (The Paypers 2012)

No matter what the business model in place or the parties involved, for MFS schemes to work there is a need for one party to assume the role of a **Trusted Service Manager** (TSM). The primary role of a TSM is managing Over-The-Air (OTA) the lifecycle of NFC and other mobile applications. The process begins with the consumer applying for a mobile service with the service provider, e.g. a bankcard from a bank or a transit pass from a transport company. Once the service has been approved, the service provider will use the TSM to install the application remotely onto the consumer’s mobile phone without any interference from the user. (Tuikka & Isomursu 2009, 199-201)

In essence, the TSM operates behind the scenes providing a suite of technical OTA services that makes the described process possible. It provides a single point of contact for service providers to access their customer base through mobile networks. A TSM must fulfill three important requirements: no compromise on security, minimal impact on existing systems and support for multiple operators. (Ibid.)

4 TECHNOLOGY AND VALUE CHAINS

Although many different technologies exist that make mobile banking and mobile payments services possible, this thesis focuses on three: SMS, Cloud Computing and NFC. These technologies are widely adopted, and can be used over a variety of different standardized radio technologies (e.g. WLAN, GPRS, EDGE, GSM, and BLUETOOTH). Each one of these core technologies has a unique value chain that has been built around it, and between them there is a difference in the approach that is used to offer mobile banking and mobile payments services. As with chapter 3, the main focus is directed at NFC. Figure 9 illustrates in a general way, which technologies that are used for respective mobile financial service.

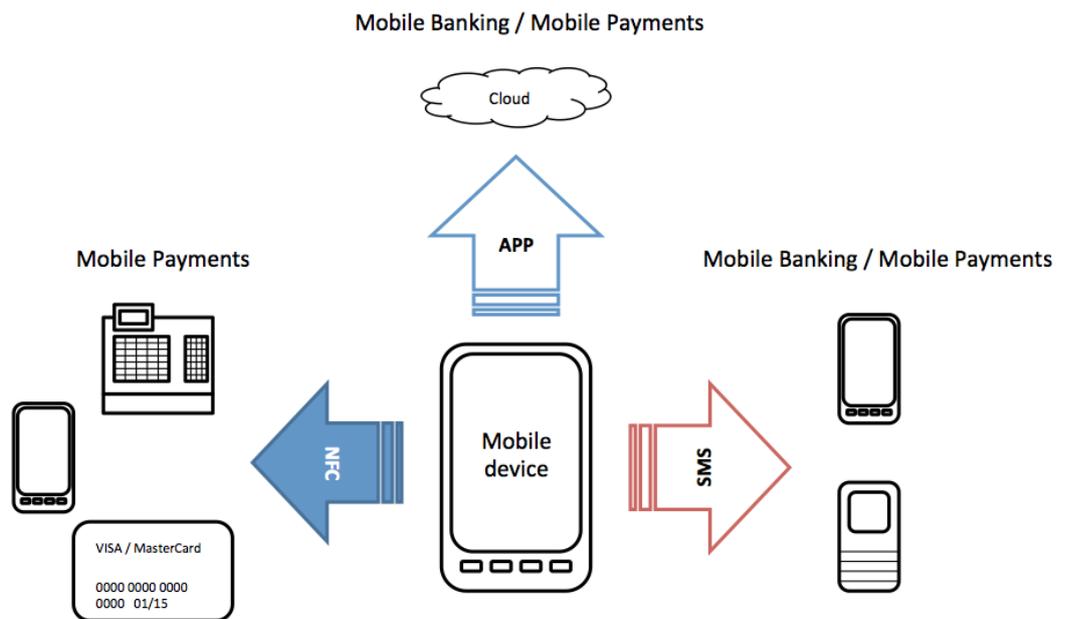


Figure 9: Main Technical Solutions Adopted for MFS

The value chains of mobile banking and mobile payments services discussed in this thesis differ from a more traditional view of the mobile service value chain, as discussed by Vihinen (2007, 10-12). According to his presentation, mobile operators have a prominent role in the value chain because they provide the customer interface to the users of the services, and usually have ownership of the customer relationship. This is not necessarily the case with MFS. In MFS value chains, and especially with mobile banking services, banks already tend to have customers relationships that are much stronger and longer than those of the operators'.

4.1 SMS Based Structure

The short message service (SMS) based structure is primarily aimed at developing world regions, where mobile phone users can buy vouchers at corner shops to top up their calling credit. Mobile money services allow these small retailers to act like branches by allowing them to exchange cash to credit on a mobile money account. As a result, money transfers can be done via text messages to other registered mobile money users, who can then exchange the credit for cash again at local corner shops. Money can even be sent to unregistered users, who receive a text message with a redeemable code that can exchange credits to cash. (The Economist, 2009)

The relevance of the SMS based structure is not as predominant in developed countries, as it is in developing ones. In the context of this thesis, SMS based services are still offered by the banks examined, but their main area of interest lies in apps and cloud computing. The diminishing value of SMS based services is also evident from the discontinuation of Nokia Money and Ericsson Money, which was primarily SMS based services.

4.2 Apps and Cloud Computing

Cloud computing and apps provided to mobile devices are the present and most common way for mobile financial services, especially mobile banking services. The banks examined in this thesis; Nordea, OP, and Danske Bank, all have their own mobile banking app for smart phones and tablet devices. Google as well, has an app based service for mobile devices called Google Wallet.

Apps provide a customized user interface for end users, to access electronic services stored on a cloud server through their mobile device via mobile communication technologies such as WLAN and 3G/4G. Apps provide much if not all the same services available through an Internet browser. The difference is predominantly in the user interface, which differentiates the user experience between apps and browsers.

4.3 Near Field Communication (NFC)

Near Field Communication (NFC) is a short-range wireless connectivity technology that has evolved for a combination of existing contactless and interconnection technologies. Communication between two NFC-compatible devices occurs when they are brought within four centimeter of each other. NFC technology follows universally implemented standards. Due to the transmission range being so short, it is held as being an inherently secure technology. (Tuikka & Isomursu 2009, 31-32)

As stated by the NFC Forum (2012c), NFC compliments many popular consumer level wireless technologies by utilizing key elements in existing standards for contactless card technology. NFC can be compatible with existing contactless card infrastructure, and enables a consumer to utilize one device across different systems.

The NFC technology standard was developed to address dilemmas that arose from different contactless standards. NFC harmonizes and extends existing contactless standards. The world's leading consumer electronics and mobile device manufacturers, semiconductor producers, network operators, service companies, and financial institutions, among other industries, support NFC leading to a complex value chain as is evident in figure 10.



Figure 10: The NFC Ecosystem (NFC Forum 2012e)

In the scope of this thesis, all the interviewed companies held an interest in NFC or were following it closely¹, because of its broad appeal and possibilities. NFC devices can support and interoperate with existing contactless card applications and infrastructures, giving rise to the technology's use in all sorts of applications such as access control, payment, and transport (NFC Forum 2012c).

Figure 11 illustrates how NFC fits in with other wireless technologies in terms of data rate transfer and range. In addition to being compatible (as well as backwards compatible) with other wireless technologies, NFC also extends the ability of contactless card technology by enabling devices to share information at a distance less than four centimeters with a maximum communication speed of 424 kbps. This translates into the possibility to, e.g. share business cards, make transactions or provide credentials for access control systems with just a simple touch. (NFC Forum 2012c)

¹ During the time this thesis was written, Nokia, Google and Ericsson were all part of the NFC Forum (NFC Forum 2012d). Nokia and Nordea have also been a part of the Smart Touch Project for piloting NFC technology in the EU organized from 2006 to 2008 by VTT Technical Research Center of Finland. For more information about the Smart Touch Project see Tuikka, T. & Isomursu, M. 2009. Touch the Future with a Smart Touch.

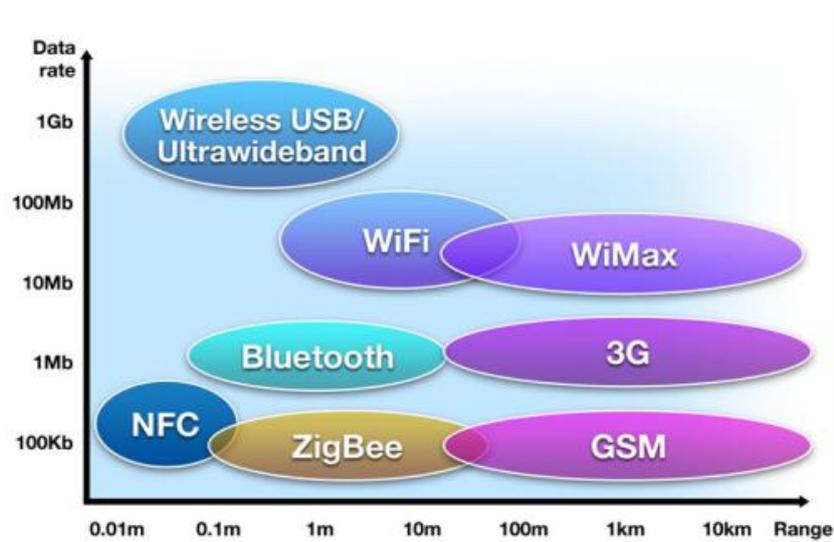


Figure 11: NFC and Other Contactless Technologies (NFC Forum 2012c)

NFC is, among consumers, gaining interest as a deal-making driver for mobile banking and payments. According to forecasts by the research house Yankee Group, the value of NFC-based transactions will grow significantly in coming years, from \$27m to \$40bn in 2014 (Middleton 2012).

5 INTEREST GROUP INTERVIEWS

5.1 Data

The aim of the study is to examine how mobile banking and payments services will change the banking sector in Finland, and what role non-bank companies will play in this process. In addition, the conducted interviews bring light to issues and concerns that the interest group representatives had of mobile financial services.

The interviews were carried out with representatives from the banking and IT/telecom industries in Finland. All together seven interviews were conducted with six different officials¹. Their contributions were extremely valuable as all of them were experts in their field. A detailed account of the persons interviewed can be found in table 1.

Table 1: Interviewees

| Interest Group | Representative | Position | Interview Date |
|------------------------|---------------------------|---|-----------------------|
| Nordea | Martin Karlsson | Head of Mobile Banking | 16.4.2012 & 22.5.2012 |
| Nordea | Juha Risikko ² | Head of Mobile Payments | 21.5.2012 |
| OP-Pohjala | Mika Käyhkö | Development Manager | 27.4.2012 |
| Danske Bank | Ari Häll | Chief Consultant, Business Planning | 13.4.2012 |
| Nokia Siemens Networks | Hans Wolf | Senior Consultant of Strategic Partnering | 13.4.2012 |
| Ericsson | Tomas Korseman | Head of Strategy and Business Development | 11.5.2012 |

¹ Interview with Martin Karlsson had to be conducted on two separate occasions due to time constraints

² Also part of the Mobey Forum board of directors, <http://www.mobeyforum.org/About-Us/Board-of-Directors>

The companies, from which the individuals were interviewed, represent significant actors within the Finnish banking and finance sector as well as the IT and telecom sector. Nordea, OP-Pohjola and Danske Bank are the three largest banks in Finland with a combined market share of 75.3 %, as shown in figure 12. All of them also offer mobile banking services, which have been launched in Finland in short order, one after the other, following Danske Bank's initial kick off in September 2010 with its iPhone app (Danske Bank 2010a; Vaalisto 2010).

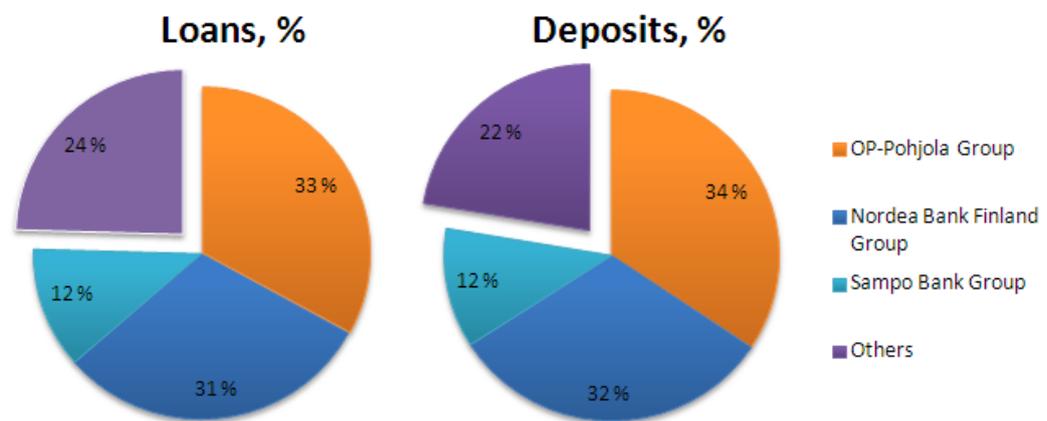


Figure 12: Banks' Market Share, Finland 2011 (Federation of Finnish Financial Services 2012)

Nokia is one of the largest phone manufacturers in the world (Gartner 2012), and its interest in mobile banking echoed those of international rivals such as Ericsson and Google. The company was included in this study because of its significant impact on the Finnish economy. Nokia has contributed a quarter to the country's growth from 1998 to 2007 and generated almost a fifth of its exports (The Economist 2012a). The company is also the market leader in the Finnish mobile phone market with a share of 81 % of active handsets (Riikonen & Smura 2012).

Nokia Siemens Networks (NSN) is a data networking and telecommunications equipment company that specializes in mobile broadband. It is a joint venture founded in 2007 from the telecoms equipment manufacturing operations of Nokia and Siemens (Financial Times 2006). In 2011, the company was the fourth largest telecoms equipment manufacturer in the world (Yee 2012). Hans Wolf from NSN was interviewed for this thesis due to his extensive experience in the mobile payment field, and his in-depth knowledge about Nokia's mobile payment development.

Ericsson is a Sweden-based communications technology company that is engaged communications infrastructure, services and multimedia solutions (Financial Times 2012). Until August 2012 it was the world's largest telecoms-equipment-maker (The Economist 2012b).

Nokia and Ericsson both offered their own mobile payments service under the names Nokia Money and Ericsson Money. The focus of both companies was with mobile money and mobile wallet enterprises. At the time this thesis was undertaken, both mobile money initiatives were still ongoing. However, during the course of this study the mobile financial service industry landscape has changed immensely and both initiatives were discontinued: Nokia Money in March 2012 (Salminen 2012; Thomas 2012; Ray 2012) and Ericsson Money in April 2012 (Ericson.com 2012). Both companies had a refocusing of corporate strategy that placed a greater interest on core group functions and less on peripheral services.

A special interest was also directed at Google's mobile wallet service – Google Wallet. No interview of any key official was obtained for the purpose of this thesis. However, due to the amount of publicity surrounding Google Wallet owing to press releases, promotions and industry publications (Google 2011; Magana 2011; Palmer 2011; Nokia Siemens Networks 2011; Economist 2012; Erkkö 2012; Paybefore 2012; Van Dyk 2012) most of the interviewees were familiar with the service providing a common and relevant topic of discussion.

Due to the significant amount of different services and service providers in the MFS market, other IT and telecom companies with still on-going MFS projects could have been examined in addition to Nokia Money, Ericsson Money and Google Wallet. Prime examples are PayPal Here (Mas & Radcliffe 2011; TMF 2012), iZettle (SWIFT 2012; Walmsley 2012) and Apple Passbook (Apple 2012). In the Finnish context, the non-bank companies that were chosen for this thesis gave an adequate representation of large multinational IT and telecom firms that have a considerable presence and interest in Finland, and offer (or have offered) mobile financial services.

An essential point to emphasize is that payment providers, such as Visa and MasterCard, are not a focus in this thesis even though they have a significant stake in the mobile financial services industry. Visa and Visa Europe¹, are prime examples of this. The companies have adopted a wide and open approach, as: they launched Visa's own digital wallet service, V.me, in 2012 (Palmer 2011; Visa Europe 2012); they are a part of Google's mobile wallet service (Business Wire 2011b); they are also a part of the joint digital wallet venture Isis with AT&T, Verizon Wireless and T-Mobile USA (Reardon 2011); they have certified NFC-enabled smartphones from Samsung, LG and RIM for use with its PayWave mobile payments application (Middleton 2012); acquired Fundamo i.e. a leading platform provider of mobile financial services (Business Wire 2011a); obtained a controlling share in Monitise i.e. a technology and services company delivering mobile financial services networks worldwide (Middleton 2011; Monitise 2012b); made a strategic investment in Square i.e. a disruptive mobile payments startup company (Rao 2011); and launched the world's largest mobile payments partnership with Vodafone (VanillaPlus 2012).

¹ Visa Inc. and Visa Europe are separate, independently operating companies, with Visa Europe operating in Europe with an exclusive, irrevocable license in perpetuity. Visa Inc. and Visa Europe are mutually invested in each other's success and united by a common global brand. (Visa 2012b)

In addition to Visa's extensive involvement in the MFS arena, it is a leading global payments technology company and has a close relationship with banks and financial organizations in addition to governments, businesses and consumers (Visa 2012a). Therefore Visa (along with other large payment providers) can actually be seen as a strategic partner to banks as well as IT and telecom companies. This is the reason why the company is only briefly introduced. The real interest of this thesis lies with banks, IT and telecom companies and how they stack up against each other concerning MFS.

5.2 Methodology

Research can be primarily divided into two different groups: quantitative and qualitative. The difference between them according to Bryman and Bell (2007, 28-29) is that quantitative research can be understood as a research strategy that emphasizes quantification in the collection and analysis of data. It measures the object of interest with numbers and entails a deductive approach that focuses on the testing of theories. Qualitative research, on the other hand, focuses on words rather than quantification in the collection and analysis of data, and refers to inductive reasoning that places emphasis on the generation of theories. Despite their differences, Bryman and Bell point out that there is no reason to establish too much of a division between the research methods as they can complement each other. Alasuutari (2001, 32) also calls attention to the same issue. Both qualitative and quantitative analysis can be used in the same research, as they share the same principle of logical evidence that is based on objective observations, not subjective preferences.

However, Bryman and Bell (2007, 425-427) do stipulate on the differences between the methodologies. They note that in quantitative research the researcher is not present in the same way as in qualitative research, where the personality of the researcher can affect the study in its data collection phase. They also bring up the static nature and generalizability of quantitative research while qualitative research is more of a process that aims to understand the subject of study in its own context.

The purpose of this research is to build a concise picture of the Finnish mobile banking and payments industry, by interviewing key agents in the interest groups examined. A quantitative research method would not be appropriate, as the study does not aim to explain or test existing theory; but rather to describe a phenomenon, examine its extent, and make an account of its consequences.

Since the interest group was made up of six individuals, a qualitative approach was a more suitable research method as supported by Alasuutari (2001, 212-214). Alasuutari recommends following a qualitative approach in such a case, where there is only a small amount of observations available. A quantitative approach is more suitable when many observations are obtainable, therefore making it easier to discover quantitative relations.

The qualitative research this thesis adopts can be classified as a positive descriptive study, being of a similar nature as research conducted by Suoranta (2003). A typical aspect of such a study is, as described earlier, the attempt to explain and make predictions of the subject under investigation.

Another option to conducting interviews would have been a survey study, where a question form would have been sent out to the interest group representatives about mobile banking and mobile payments. However, due to the complex and relatively new nature of the subject at hand, a survey study would have been inadequate in bringing to light the varying interests, views and opinions surrounding the topic. An interview approach provided an excellent way for the interviewees to emphasize important aspects from their own point of view, which might have otherwise been left undisclosed on a survey form.

Interviews can be sorted into four different categories according to their nature: structured, half-structured, theme, and non-structured interviews. A structured interview follows strict guidelines previously established by the interviewer. The question format and order is the same for each interviewee and the answer options are limited to what the interviewer makes available. Half-structured interviews are less stern allowing interviewees to answer in their own words. With theme interviews only the interview topics are determined in advance, and can be discussed in any order. In a non-structured format the interview resembles an ordinary conversation where the person conducting the interview and the person being interviewed discuss topics that can differ from one interviewee to another. (Eskola & Suoranta 2003, 86)

The different interview forms have different goals. The aim of a structured interview is the reliable measurement of theoretical concepts. With half, theme and non-structured interviews it is to find answers for a more comprehensive research problem making these forms of interviewing the most common in qualitative research. (Blumberg et al. 2008, 385-387; Eskola & Suoranta 2003, 86-88)

The interviews for this thesis are conducted as a combination of the half-structured and theme interview styles. Detailed questions of four main topics were prepared in advance and were the same for each interviewee. This provided a framework for the interview to revolve around. It also gave the possibility to deviate from the interview questions and create a meaningful discussion around the topics of the study. Furthermore, it allowed the interviewer to ask additional questions if an interviewee only lightly touched upon a certain theme or brought up a completely new and significant one. A structured interview would have been too confining and a non-structured interview could have focused too much on a specific topic.

An added benefit of conducting a qualitative study was the ability to use more than one method of analysis and freely combining them. As each interview was transcribed, the answers were grouped together to form clusters according to key words and similar themes in each interview. This method for analyzing qualitative results is a combination of using themes and types, as described by Eskola and Suoranta (2003, 160-161).

Using themes or thematizing the research results allows for the comparison of the occurrence of common topics in the results and then identifying the most relevant ones. It is a recommendable analysis method for practical problems, because it makes it possible to easily pick out relevant information. In addition to thematization, the results can be typified i.e. divided into groups that portray a typical example or essential characteristic of a feature. Typification condenses similar topics and themes. It is usually preceded by thematization and is a way to further analyze the results. It not only allows for recognizing normality and consistency among the findings, but deviations from them as well. (Eskola & Suoranta 2003, 174-182)

5.3 Execution

Each interviewee was sent the interview questions in advance. This gave them the opportunity to prepare for the interview, which potentially improved the quality of their answers. There is a complex range of issues and interests surrounding mobile banking and mobile payments, making it likely that not all the interviewees were acquainted with every single topic addressed in the interview question. The interviews were conducted one-on-one either in person or via telephone in Finnish or in English, depending on the interviewee's preference.

The interview questions focused on different aspects about mobile banking and mobile payments, and were divided into four main categories: mobile banking in general, mobile banking services in the company, pros and cons (of mobile banking)¹, and mobile banking services in Finland². Each interviewee received the same question form in order to provide the same starting point for each interview. As described earlier about half-structured theme interviews, the question sheet was used primarily as a framework around which the discussion revolved. An emphasis was placed on what the interviewees had to say about their area of expertise.

The interview questions can be found in appendices 2 and 3. All of the interviews were recorded with the permission of the interviewees. The interviews were transcribed, but have not been attached due to page restraints.

¹ Pros and cons were also referred to as benefits and challenges

² At the time of the interviews the term mobile banking services was used as a synonym for mobile financial services. Mobile payments were discussed alongside mobile banking even though this was not separately specified in the interview questions.

6 RESULTS

The results of the interviews are presented as shown in figure 13. Even though the interview questions were divided into four main themes¹, the results are presented in only two main chapters: 6.1 and 6.2. Such a structure provides more focus to the actual topic of this thesis, which is the Finnish context of mobile banking and mobile payments, the effect they will have on the country's banking sector, and the role that IT and telecom companies will play in its change.

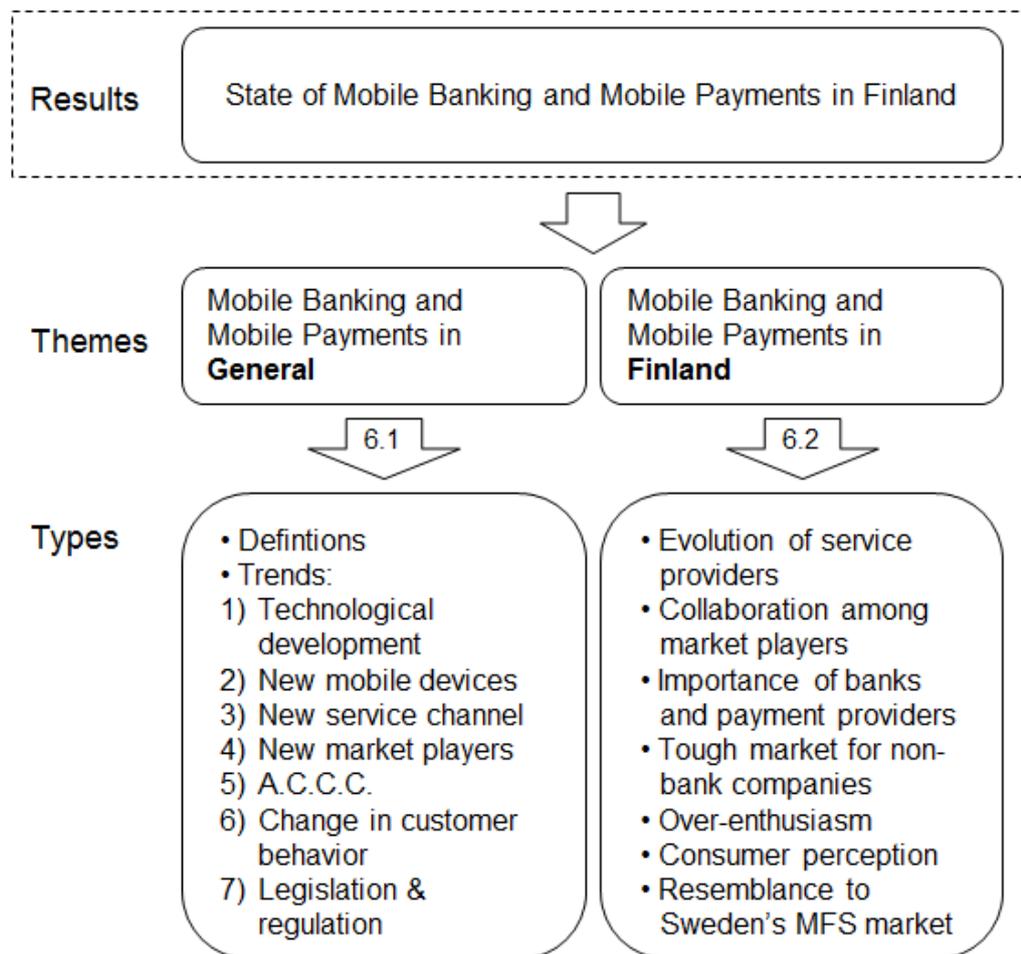


Figure 13: Layout of Results

¹ See appendices 2 and 3.

6.1 Mobile Banking and Mobile Payments in General

6.1.1 Definitions

A difficult challenge to this thesis was determining the appropriate terminology to use when discussing different aspects of MFS, because academic and industry literature was not unanimous. The definitions used throughout this thesis are defined in chapter 2.1. Conducting the interviews with the interest group representatives provided further depth to the terminology, as each individual had their own slightly different view of what constituted as mobile banking and mobile payments.

According to a non-bank representative, the terminology can incorporate different aspects in different circumstances. The concept of mobile banking and its relevance differs according to the world region in question. In developed countries it is not a big issue, due to the high distribution of banks and the fact that people are used to using banking services, regardless if they are mobile or non-mobile. Circumstances where mobile payment solutions are offered with mobile banking features occur mainly in developing countries, where there is no or very limited banking infrastructure and people do not have a real address or means of identification to open a bank account.

According to another non-bank representative, **mobile commerce** is the umbrella name used for the finance industry segment and consists of three subgroups: mobile banking, person-to-person money transfers and mobile payments.

Mobile banking can be either information or transaction based. Information based is basically when a person checks their bank account from a mobile browser or its equivalent. No actual event takes place other than that of accessing information. Transaction based mobile banking refers to mobile specific services that are distributed over the mobile device such as loans, microloans, short-term loan products or even insurance products. This setup was created so that customers, especially in emerging market who have not had a PC before, could for the first time e.g. buy an insurance product and finance it from their mobile wallet.

Person-to-person money transfers are either domestic or international money transfers or remittances i.e. sending money from one phone to another via SMS. The money can be routed into a customer's bank account or mobile wallet.

Mobile payments were described by one of the bank representatives. The concept consists of mobile install payments i.e. making and receiving payments in a physical surrounding such as a shop; person-to-person payments meaning the same as person-to-person money transfers; and buying products and services through the Internet.

For the non-bank representatives, the terminology of mobile banking and mobile payments was described as being dependent on **circumstances**, which were explained as the external factors at play when a customer uses MFS. For the bank representatives it was more of a question of **context**, what factors constitute as MFS when a customer is using them. From the bank representatives' view, mobile banking is considered as a service channel and mobile payments more of a service in that channel. Even the whole issue of mobile is seen as somewhat secondary. As one bank representative describes,

"There is no mobile banking. There is only the bank and different service channels."

From the banks point-of-view, the mobile is simply a new way to access banking services. Key aspects are better accessibility, availability and convenience through a new user interface designed specifically for new mobile devices. Banking services are no longer subject to time, place or any particular end user device.

Comparing the definitions obtained from the interviews there is an apparent distinction between bank and non-bank players. The latter is more focused on the mobile in a broader sense than just MFS. Banks, on the other hand, have a narrower view of MFS and a more business as usual approach towards it.

6.1.2 Trends

A relevant issue for examining how the Finnish banking sector will change due to mobile banking and mobile payments is to document the present day trends that impact MFS. The conducted interviews yielded the following topics:

- 1) Technological development:** In the 21st century, NFC and cloud services are the latest technological developments in mobile technology that are providing a way to really improve the end-user experience in mobile financial services. One non-bank representative described a practical application through payment information storage. Usually, payment information must be inserted manually on a website. Storing that same information in a cloud service in a secure way saves the end-user time making it convenient for the customer. With physical payments, NFC can be used as a contactless payment method to speed up the actual payment process, which again brings convenience to the end user.

2) New mobile devices: features and availability. Present day mobile devices have features in them that older devices did not, e.g. camera, GPS and touch screen. They have increased in their computational power as well as acquired faster Internet connection. All of these attributes have allowed for the creation of product features that were not possible before. This in turn has made the user experience a significant factor with the mobile directing focus on screen size, input device and interface design.

The availability of handsets is also a significant trend that has had an impact on MFS. As smart phones have become more readily available and cheaper, more and more people have gotten a hold of them and, as a result, started to use mobile financial services. This development has been aided by marketing efforts on behalf of service providers in combination with consumers spreading the message to one another by word of mouth.

3) New service channel: One impact of the technological development in banking and finance has been a focus on customer self-service. This in turn has resulted in Finnish customers carrying and using less cash nowadays. As the use of cash has decreased, so has the possibility to acquire cash at dispensaries, e.g. ATM's. With less cash around, more cashless payment options have become available with mobile financial services being the latest development.

In addition to new services, technological development has played a key role in creating a whole new mobile service channel. This has had a significant impact on those channels already in place. Most notably the role of branches is changing from cash and banking services, to counseling and sales while at the same time the amount of branch offices is falling. Fewer branch offices offering fewer services have spurred the creation of more efficient branchless service options. This change is the most visible in the banking and finance industry and the mobile plays a key role in its development.

4) New market players: One of the most interesting developments in MFS is the scope of different market players involved that are competing for a place in the value chain. The development in technology and services has made it possible for non-bank players, even other than IT and telecom companies, to enter in the banking and payments markets to compete for the same customers as traditional banks. Excellent examples of these non-bank players, in the Finnish context, are FOREX and R-Kioski.

FOREX is a foreign exchange bureau that now operates with a banking license¹ and offers a wide range of currency exchange and transaction services (Forex 2012b). R-Kioski is the largest kiosk chain in Finland (Yle 2012) and it has expanded its service offering into ticket, certificate, postal and payments services. The company teamed up with Tapiola bank in order to offer its customers select payment services such as invoice payments (R-kioski 2012).

¹ FOREX obtained its Finnish banking license in 2006 (Forex 2012a).

The arrival of non-bank players into the banking and payments sectors, even though posing a potential threat to banks, was not seen as a serious concern by the interviewed bank representatives. The non-bank representatives did not downplay their impact as much. The consensus by both interest groups was that both bank and non-bank players are providing mobile services, either on their own or in partnerships and alliances with other market players, in order to get an early movers advantage and obtain critical mass for their own solution and service model.

5) A.C.C.C.: Technological development has made possible new services that are fast, easy, and simple to use. On the consumer side, emphasis has been placed on **accessibility**, **convenience**, **context**, and **convergence**. On the business side, the focus is on marketing, cost minimization and efficiency. Of the two sides, the consumer view point matters the most in the short-term to the interviewed industry representatives. Success in short-term MFS initiatives would ensure success in the long-run, where the business side of MFS would come more strongly into play through cost reduction and profit creation.

Discussing the consumer viewpoint, one of the bank representatives went on to say that even more importantly than context, the convenience factor is what is essential in mobile banking. It is relevant through accessibility, which in turn is relevant through user interface design i.e. one of the key features in new mobile devices. Through this dependency, a convergence of services, user interfaces and user experiences will take place, and is in fact already taking place.

Currently, the mobile bank is in essence just another interface to the net bank, according to one of the bank representatives. This aspect will most likely change over time, as there is more of a convergence amongst mobile banking and mobile payments services. At some point, it will not matter on what device a customer accesses their banking and payment services, the user experience will be seamless from one device to another. However, this might result in difficulties determining one device and service channel from another, as it may not be evident when something is mobile or stationary. As described by the bank representative,

“Where does the PC end and where does the phone begin. The laptop is stationary and mobile. It is seen as being stationary, however, because it is a PC. Still, tablet and laptop are quite similar. The difference is in the input device.”

He also went on to say,

“...a payment is a payment and banking is banking. Using Internet bank or your mobile bank, the interface is what is different.”

As services and user interfaces converge, it will push banks and non-banks alike to rethink, how services are perceived and distributed to their customers. The convergence will redefine and re-engineer what is done on mobile interfaces. As an interviewee pointed out, this is something that could and should be done to the Internet bank as well, a simplifying and re-engineering of the business process.

6) Change in customer behavior: The mobility of customers was a central driving force behind the launch of the mobile banking initiative, as described by one bank representative. According to him banking services have become more commonplace, which is why customers want to take care of them on the go, anywhere and at any time. Therefore, banks must be present and available where their customers are. As the bank representative pointed out, in the future a bank cannot demand its customers to either go home or to the nearest branch office every time they want to take care of their banking business. Consumer behavior dictates what and how services are offered.

7) Legislation and regulation: According to one non-bank representative European legislation and regulation is an aspect affecting the interest of operators in positions relating to MFS. Today, there is a European payment services directive in place, also known as the e-money license directive. Under this directive, operators can obtain a license and participate in the payment value chain. Some operators have made use of it, and launched mobile wallet services.

However, even though legislation exists that allows non-bank players to enter the payments field, there is much more legislation and regulation in place that is meant to protect, monitor and control the banking and payments sectors. This form of legislation acts more as a barrier of entry than a boost for would-be non-bank participants.

6.2 Mobile Banking and Mobile Payments in Finland

Table 2: Principal topics of the Finnish MFS market

| STATEMENT | GENERAL CONSENSUS: Agreed / Disagreed |
|--|--|
| The role of services providers will evolve | Agreed |
| Collaboration and an open approach would be most preferable for all participants | Disagreed – reservations on the part of banks |
| Banks and payment providers will remain essential to MFS | Agreed |
| Non-bank companies will have only a small role in the MFS market | Disagreed – reservations with all parties |
| There is a sense of over enthusiasm and hype around MFS | Agreed |
| Consumers remain key to success of MFS | Agreed – importance of merchants also stressed |
| Finland's MFS market resembles that of Sweden | Agreed |

According to a non-bank representative, the Finnish mobile payments market is quite similar to that of Sweden. This view was shared to a certain extent by all of the interviewees. In the non-bank representative's view, banks are going to collaborate and build a real time settlement network, i.e. a national network that can handle real time transactions. The benefit of this is that customers can do person-to-person money transfers in real time. Today, this is not possible, because there is at least a one-day settlement cycle between different bank accounts.

Once a real time payment network is established it can be used for merchant payments as well. This means that payment providers, such as Visa and MasterCard, can be taken out of the picture. This is something that in Sweden is being worked on right now. However, there are lots of political issues involved in it, because banks are making a lot of money with companies such as Visa and MasterCard and they are not happy about losing their business.

Another thing that will affect the mobile payments market is the evolution of merchants into payment providers, e.g. H&M, Ikea, and Carrefour. These companies are paying a significant amount of money to Visa and MasterCard to process their payment traffic. With payments going mobile, merchants have a chance to convert their customer loyalty programs into mirror accounts. These accounts would be connected to customers' bank accounts making payments possible without the involvement of a third party, i.e. Visa or MasterCard. This would effectively exclude them out of the entire payment process, which is their core business.

A non-bank representative was of the opinion that the end result will probably not be so dramatic due to the importance of brands such as Visa and MasterCard, as well as, the unlikelihood of Ikea, H&M, and Carrefour becoming serious payment players. Visa and MasterCard will never go completely out of business; they will be as strong tomorrow as they are today. But at least retailers can provide an alternative to them. These alternatives will most likely end up costing the end user as much as a Visa or MasterCard. As the non-bank representative put it:

“You will probably have to pay for them as a consumer. So if you want a Telia-Sonera Wallet; just like you are paying 10-20 € for your Visa card, you will pay 10-20 € for your Telia-Sonera Wallet.”

Banks will most likely support this development because they cannot only back Visa and MasterCard. Right now banks are looking to have a model in place, where they can certify the payment methods of choice of their customers. So, if a customer opens a bank account and wants a Visa card, a MasterCard, an Ericsson Money Wallet, or something else; the bank will support all these different payment methods. This is a very interesting evolution. Ten years from now, the payments market will most likely look very different from that of today. Visa and MasterCard will not disappear, but there will certainly be new alternatives

A non-bank representative also pointed out that in order for banks to be successful with non-Visa or non-MasterCard products, they would have to go out and acquire the merchants willing to use alternative payment methods. One reason why Visa and MasterCard have such a successful relationship with banks is because banks do merchant acquisition on behalf of them and profit from the arrangement. Therefore, the representative saw it unlikely that banks would jeopardize their relationship with Visa and MasterCard, unless operators have success in acquiring merchants themselves, or European retailers get together and set up a new payment scheme. As a result, banks will have to support these kinds of enterprises, or otherwise they will be left out of the payment value chain.

OTT players such as Google and Apple may have somewhat of a disruptive effect on the payments market, but since it is not in their core ideals to provide payments systems and it is a very low-income business to start with, there is not much interest for them to do so. In a discussion with another non-bank representative about whether or not banks in Finland could face competition from non-bank players, he referred to his own experience in the matter by saying:

“I have participated in this discussion for more than ten years. There is too much enthusiasm in it, and partly a total misunderstanding about what happens if someone talks about mobile payments.”

Mobile payments services from non-bank providers are almost always based on a bank service. This means when an end user gets a mobile payments account, it is cleared by a bank account. Payment is conducted either directly via a bank account or by a credit card, which is linked to the bank account. The setup depends on country specific factors. Generally all payments are based on a bank account.

In the non-bank representative's view there has not been any real success in different MFS initiatives, because the problem with them has always been how to acquire customers. Although PayPal is somewhat of an exception, all others from banks to operators have tried for years to tackle the issue. Regardless of this, there is a fascination and hype around the topic. He went on to say,

“I pushed this already in 2000: you only have your mobile phone. You don't need your credit card; you don't need your cash. Sounds great, but people are conservative.”

People's perceptions and precognitions are important factors that tend to be overlooked in the discussion of new mobile banking and payment applications. Also, when money is involved, service providers encounter a lot of restrictions and regulations concerning money laundering, terrorist financing, and other forms of financial crime. Furthermore, service providers must decide the proper method to acquire customers, which is a very costly process to undertake. There are so many barriers of entry, which indicates that MFS initiatives are quite often running in countries where there are very limited banking facilities. That, however, is where operators could make a difference; either on their own, together with banks or being backed up by banks.

In Finland, the mobile is just another service channel with limited actual use. The non-bank representative expressed his doubt about the real life applications of mobile financial services,

"When would you use it? Possibly when you check your account balance, but to do an account transaction is unlikely. Would you use it at the cashier? Possibly with NFC if it is standardized and available everywhere... Otherwise I cannot see why you would use it. What is the value?"

In terms of the MFS market in general, Visa has a strong starting point, as mentioned earlier, and is extremely active. The company bought Fundamo, which is one of the leading companies in mobile payments. Nokia stopped its payment service and Ericsson is continuing as a mediator. In western countries, money transfer service providers such as MoneyGram and Western Union offer an interesting viewpoint, as they have the payment infrastructure already in place.

Looking at Google Wallet, it has a NFC supported payment system. Google however has its limits. Its mobile wallet service has not been very successful, because it is viewed as being unsafe. Amazon and eBay are also perceived to be unsafe. However, they are only a few shops among many, as described by a non-bank representative. Either you have a conglomerate of shops of which each offer its own payment method, or you have a bank account that can be used as a general form of payment everywhere. If you are an Amazon user and have no interest in other shops, then Amazon provides you with a payment method that only works with Amazon. If you are a Visa user, the credit card company provides you a payment system that can be used almost everywhere. These are just two models among many that will most likely exist in parallel, depending on what the end user wants.

Looking at banks, they may not need so many brick and mortar facilities in the future. Banks are in a very good starting position in terms of MFS, because in the end, almost every player and value chain needs a bank facility and it takes a lot of money and regulatory requirements to create a bank. Some operators that have a banking license choose not to use it due to the differing business nature.

In general, for IT and telecom companies offering mobile payment service, MFS is a great idea, but they all underestimate the real requirements of the business. It is difficult to get numerous subscribers and even harder to get merchants. They are also competing against banks and credit card companies, which already have the expertise in acquiring merchants.

To be successful in mobile payments, both merchants and customers are needed. Without customers, merchants are not interested, and vice versa. Furthermore, it is necessary to fulfill all regulatory requirements. Some operators have addressed this issue and applied for a banking license, but even having it and making the effort to operate with it, is costly. Even if a completely new MFS concept is created, it will take time for people to get accustomed to it. Critical mass is needed for an idea to spread and become profitable. This is a challenging arrangement since payments are a low margin industry and people are conservative when it comes to money and payments. All of these challenges are underestimated in the payments industry because of all the excitement around the new technologies and service models.

The business case for being a part of the MFS value chain is challenging for IT and telecom companies. The more parties that are needed, the more profits have to be spread around each participant and the more unlikely it is that there is any business case left at all. Even if a non-bank player has a strong starting position it is not a guarantee of success. Payment service providers may need to link their infrastructure with other service providers in order to get more business. As an example, one of the non-bank representatives cited Telkomsel Cash or T-cash, an e-wallet service from PT Telkomsel, Indonesia's largest cellular operator. T-cash has millions of customers in areas where there is little banking infrastructure. Even so, they built up an ecosystem where Ericsson and MoneyGram play a role.

Even though mobile financial services are an emerging industry, there is already a consolidation phase going on. There has been an increase in M&A activities that started in 2008 and culminated in 2010-2011. Traditional businesses have mostly watched how the market has developed, done some trials, looked at the business models, waited for what would become successful, and then just bought a relevant company.

New players in the mobile payments market have a tendency to fail because primarily they fail to achieve critical mass. In the view of a non-bank representative, a worthwhile strategy for many players with good ideas would be to try to make their business work, and then see if someone buys the business model or the company. It is a challenging business environment, especially for small market players. The representative summed it up by saying,

“At the moment it is a game of giants.”

In this kind of market or market phase, there are always a few newcomers such as PayPal and Google that are present in the media. All the rest go unnoticed, or are bought out. In this sense, there is a lot of hype around mobile payments.

When discussing the mobile banking and mobile payments markets in Finland with a bank representative, he noted that in the 1990's and early 2000's it was widely held that traditional brick and mortar banks would fade away in the face of new nimbler banks and financial institutions offering only CC and Internet banking services, as well as non-bank companies offering competing payment and banking services. A prime example of this is the case of Sonera trying to act as a financial hub in the turn of the 21st century.

In reality it was the new players trying to enter the banking field that failed. They lacked the trust and experience that traditional banks had built up with their clients over many years. As the bank representative pointed out in Sonera's case, even though the company bought its financial services from a bank and offered them through its own financial hub, it lacked the trust of its customers. Sonera believed too much in its own brand, and that it would be compelling enough to attract customers. People are very conservative when it comes to their money, making them more inclined to trust banks.

Traditional banks and payment services providers have been able to maintain their strong market position throughout the technological changes that have swept over the industry. The new mobile banking and payment services are no different. The entire mobile aspect has a hype factor around it. From the bank's point of view, the mobile is just one way to access the Internet bank. It does not force the banks to re-evaluate their entire business strategy, in the short-term. As noted by one of the bank representatives,

“For the bank mobile services are business as usual.”

Generating business is what is relevant, and it cannot be solely based on a new distribution channel or user interface. The content is what matters. Business can be created, only if something new can be offered. In the long-term however, the vision is that the future of banking services, lays more and more in mobile devices and the prospects they bring. Old operation models and ways of doing business encumber this development.

The effect mobile banking services have had on the banking sector in Finland is that since many services have been taken away from branch offices, this has increased the mobility of bank customers. Services have then been made available through the mobile phone. The fact that services are simply mobile is not the most important issue; it is the improved user experience. Due to more and more banking services being offered through a mobile device, branch offices have shifted from a service to sales point of view. In the words of one of the bank representatives,

“Branch offices are sales power. New mobile devices are service power.”

Competition wise, mobile banking and mobile payment services are not yet an essential factor. In the MFS market there are other players, in addition to banks, who can build great services for new devices. Operators in Finland are focusing on the mobile ID, a form of electronic identification for the SIM card. The idea behind it is ease-of-use. The problem, however, is that operators are not held as a trusted party the same way as banks are. Banks have been obliged to identify all their customers due to government regulations. Operators have not and they are missing the proper network to do so properly. They can build one, but it will cost time and money to do so from the start. Therefore, operators have desired to use the identification services of banks. This has not been a problem for banks, but rather for operators due to the compensation that banks require.

The message that has come from operators is that they would like to offer some financial services to their customers as supplementary services, and make use of their core services as operators. To do this, they can either co-operate with a bank or do as Sonera, and buy financial services from a bank in order to offer them through its own service platform. Banks may not be keen to enter in such an arrangement. As one of the bank representatives put it,

“Our interest is not primarily to aid competitors.”

Since banks have taken an interest in MFS, and have actively developed their own services early on, the view of one bank representative is that there is no real risk to banks from IT and telecom companies. To illustrate his point, he referred to the expansion of Internet banking. Traditional banks in Finland were in such a haste to migrate their customers into their own net banks that new players were left with very few opportunities. The bank representatives said,

“Why would customers change their service provider, if the one they already have could offer the same services as the new players.”

Finnish banks have built their success on service power, and with mobile devices the user volume is large and services are efficient. One of the bank representatives stated that for his bank new mobile banking services have only had a marginal role in terms of business, revenues and costs. Nevertheless, he did admit that the cost benefit was clear when all services could be offered through the same platform. Large foreign competitors can have user volumes that are a million times larger than that of a bank in Finland, but from the service viewpoint, Finnish banks have done a good job in catering to the needs of their customers and doing so efficiently.

From mobile banking services, a natural development in the Finnish MFS sector is the expansion of mobile payments. Remote identification is serving as a pilot project. The aim is to speed up the payment process in shops and online. New players can offer innovative services in this area, but banks are coming up strong behind them. Operator driven mobile payment services like M-Pesa in Kenya have a chance at succeeding in their home markets, because of the lack of banking infrastructure within. In Finland the circumstances are quite different, banking and payment infrastructure are excellent.

As described earlier, the effect of mobile financial services on the banking sector in Finland can be compared to other previous technological advancements, i.e. the smart card from the beginning of the 1990's. The idea behind it was to reduce the amount of plastic cards in a customer's wallet to only one. In practice, the exact opposite occurred, because there were so many competing players with different interests at heart. In addition, consumers did not behave as expected. As summed up by a bank representative,

"The world is messier and more scattered than imagined."

New mobile financial services are similar to this. There are so many competing players and interests involved that not every idea can survive. In such a challenging environment, banks have taken the advantage because they have a clear service format and distribution network. Also, since the 1970's, the Finnish banking system has been a one-stop shop. Services have been consolidated, allowing all banking and payment services to be obtained from the same bank.

Banks are strongly involved in the development of the banking and payments industries in Finland. This creates a difficult environment for new players to enter into, except for domestic companies that already have a significant amount of customer accounts, e.g. S-bank and Tapiola. Presently, the main competitors of banks in Finland, as explained by the bank representatives, are other banks rather than non-bank companies. New non-bank players can enter the market and acquire customers, but they are likely to attain only a niche portion.

The banks examined in this thesis have a strong market position in Finland and are actively taking new service possibilities into use. They are also comfortable in their market position, especially when looking at potential market entrants, because the banking industry is highly regulated and requires a significant amount of trust and investment to enter.

According to one bank representative, even though mobile banking services are mainly offered due to reasons concerning the company's public image, in the future the actual business side of the issue will be more significant. When asked about the possibility of offering fee based mobile applications in the future, the bank representative replied that in his opinion, it was not in the banks' primary interest to separately sell mobile apps to their customers. However, this does not mean that the banks' mobile apps are completely free. Customers pay for mobile services the same way as they pay for using a credit card or net bank, through monthly service fees charged by their bank.

Concerning the change MFS will bring to the banking sector in Finland, one of the bank representatives said that at least in terms of the banks' customers, the mobile will make those who have traditionally used the net bank on a PC or laptop, gradually start to use the mobile channel. Only in an extreme case, would this ongoing change have a significant effect on the market situation, and in such a case it would be more about the overall quality of services offered by banks than just one aspect of it.

For some customers the new banking experience offered through mobile devices can be an essential part in choosing a banking service provider. For others it can be a different aspect. As an example, one of the bank representatives said that customers who are accustomed to visiting a branch office have become annoyed of the fact that more and more banking services have been made branchless, and fewer and fewer branch offices are left standing. For those customers, mobile banking is not an appealing factor taking into account their entire banking experience. In fact, it might prompt them to change to a bank where they feel their needs are better met.

Faced with the possibility of large international IT and telecom companies expanding their activities to Finland and offering their own mobile financial services, one of the bank representatives was not too worried. He said that banks were keeping an eye on the situation. He also said that even though banks could not stop such a player from entering the Finnish market, banks could make sure they retain the choice of offering and developing MFS either by themselves or together with a partner. The choice on a foreign or domestic partner would be a strategic one. Whether or not these non-bank market entrants would pose an actual threat to banks, the representative could not say.

As to what kind of role IT and telecom companies would have in the Finnish MFS market, a bank representative stated he was unsure of what it would be. He cited Facebook as an example. It is a global company and a phenomenon that has expanded globally. Whether or not, Finnish consumers or companies want it, they need to get along with it. The same applies to mobile financial services. If Google Wallet or some other global player has a good payment or banking solution, then it is likely that Finnish consumers will adopt it. Especially, if it is superior to what is available from their bank. This is not necessarily a threat to banks, but rather a possibility that a big player could take control of a certain payment type. But as the bank representative went on to say,

“In what aspects is a customer ready to move their affairs? ...Would a customer be willing to put everything – the handling of their money, accounting, and finances – in to the responsibility of an international stock company? I doubt it. I wouldn’t be ready for it.”

Even if a significant player enters the Finnish market, it will still have to acquire its customers some way. Evidently, they will not simply be receiving clients, unless through partnership and co-operation.

IT and telecom companies have had fewer challenges promoting their new mobile payment and banking applications in developing countries, because there the clientele and market outlook is very different compared to developed countries. In developing countries, many people do not even have a bank account or the means to open one. In developed countries like Finland, the banking infrastructure has established its roots over a long period of time. Gaining a spot within a developed market and building the same kind of trust that banks enjoy is difficult and tends to take time.

Banks have also done a good job at committing their customers. At one of the interviewed banks, the desire is that a customer of the bank is a customer of the group's other services as well, e.g. insurance. Offering a broad product and service range is a good way of establishing a strong customer relationship. It becomes easier for a client to start using additional services, because all of his or her other services have been acquired from the same source. This is a significant challenge to overcome for non-bank players who try to compete for only one part of the customer service offering.

One of the bank representatives said that Monitise is an excellent example of what the MFS value chain might look like in the future of Finland, especially concerning mobile services that have been produced by a partner. Monitise facilitates the offering mobile financial services by its customers. As another example, the bank representative referred to the S-group, which offers a broad range of services from retail to banking. The group, however, does not produce every single service itself. They have partners to do that for them. The group buys services through its partners, and offers them to its loyalty cardholders. It is something that has not been seen before with banking services, but will be more and more probable in the future.

A bank representative concluded the discussion of mobile banking and payment services by saying, it is a very current subject and likely to remain so in the coming years. However, because it is such a current topic it should be discussed carefully for two reasons. First off, the subject is new and there is a lot of uncertainty around its development. Secondly, it is difficult to discuss a topic that is shrouded in doubt and identify threats and possibilities from it. In his words,

“It is difficult to talk about a threat, if it is not even known. What can you say about a contender that is unknown? It can just as well be an associate or partner.”

When asked if new non-bank players in the mobile banking and payments field posed a threat to traditional banks, the bank representative said,

“Saying they are a threat is an overstatement, but they are a potential threat, which banks have to address in some way.”

He went on to say that to a certain point, non-bank companies are a threat to the service models currently in place. There might be some products and services that banks offer that can be taken over by other players, if banks do not protect their business. Concerning the possibility that a bank could expand its MFS offering from mobile banking into mobile payments, a bank representative said that his bank could absolutely do so,

“...Payment services will be developed from the usage perspective and be an integral part of the company’s banking offering.”

Since there are many different players in the MFS market, there will most likely be a need for convergence. A bank representative remarked that for a consumer solution to work well there can only be a handful of viable options available. He was sure there would be different kinds of solutions from different players in the short-term, but in the longer run there would only be a few solutions that are successful in gaining attraction and customer volume. Who would offer these services depends on what kind of business models are in place, i.e. do the players involved want to offer mobile payments, mobile banking, or something else. Most likely, there will be collaboration between different parties.

Even so, in the end consumers will select, what is easy to use and provides value. One of the bank representatives was unsure if consumers would appreciate a setup with too many players, especially if it affected the convenience of the service. As to what market participant presently has the best MFS solution, he replied,

“I don’t think anyone at this point dares to say they have THE solution.”

An interesting result of the study has been to find out, that all of the interviewees were of the opinion that banks have and will continue to have a dominant role in the mobile banking and mobile payments fields. As pointed out by a bank representative:

“Banks hold the accounts no matter what. If Telia-Sonera wins, H&M wins or whoever wins, they (banks) will sit on the accounts.”

7 CONCLUDING DISCUSSION

7.1 Summary

This study presents a comprehensive overview of mobile banking and mobile payments in chapter 2, in order to create a solid theoretical background with which the vastly complex subject can be easily approached. A detailed account is given of the terminology of mobile financial services; the evolution of banking and payment services since the 1970's; the differences between mobile banking and mobile payments in developing and developed countries; the service channels, devices, service groups and service bundles of mobile banking and mobile payments¹.

In addition to the background established in chapter 2, drivers, barriers, and business models, of mobile banking and mobile payments, are presented in chapter 3. Chapter 4 focuses further on two particular subjects that are apparent in the previous chapter, the technology and value chains involved with mobile financial services, using NFC as a prime example. Chapter 5 makes account of the methodology of this thesis and describes, how and why it was conducted as a descriptive qualitative study that used thematization to analyze the results.

Chapter 6 gives a thorough presentation of the results from the six interviewed representatives, from the bank as well as IT and telecom industries. The results describe the state of mobile banking and mobile payments in Finland, through three central portions: an account of the terminology from the interviewees' perspective, the seven main trends affecting mobile banking and mobile payments in general, and the seven central topics affecting mobile banking and mobile payments in Finland.

¹ See appendix 1.

7.2 Conclusion

In light of the conducted research, this thesis has come to the conclusion that due to mobile banking and mobile payments services, the Finnish banking sector is heavily affected by: new technologies, new mobile devices, new services, new service models, new value chains, and new market participants. With so many new factors present, banks must remain vigilant of what their competitors, both bank and non-bank alike, are doing so they will not be dropped out of the MFS value chain. Co-operation, interoperability, and an open model are vital for driving forward new MFS schemes and increasing their consumer adoption. Banks have traditionally been a significant driver of change concerning technological advancements. They should follow the example they themselves have set with the application of technology into banking and payments services since the 1970's, and take an active role in the development of mobile banking and mobile payments services.

In light of the academic and industry references presented in this study as well as the conducted interviews, mobile banking and mobile payments are set to expand in the near future; even more than already has been the case. Increasing the mobile financial service offering with more functionality to as many customers as possible, will be a key challenge for banks in strengthening their position in the MFS arena. The more users a banking app or payment method has, the more valuable it is.

Banks will continue to have a strong position in the Finnish mobile banking and mobile payments markets, due to their strong starting position that is owed to a handful of significant reasons. Banks have an established customer base, built on trust and years of interaction. This ranks them high on the list of institutions and companies trusted by consumers. In addition, banks have a large portfolio of banking and payment services at their disposal of which mobile services constitute only a small part. Fruitful relationships between banks and payment providers, such as Visa and MasterCard, are also significant. IT and telecom companies have a daunting task of obtaining these same advantages, especially as security and regulatory legislation pose a significant barrier of entry for new market participants, giving the advantage to banks and allowing them time to adjust to the changes brought on by MFS.

As pointed out in *The Economist* (2012c), the banking environment in Europe is fragmented. New and fast growing mobile banking and mobile payments services are making it even more fragmented. Presently, there exists a host of different mobile financial services based on different wireless technologies and business models. However, the results of this study point out that regardless of environmental factors, the MFS market is already in a state of consolidation. There will remain room for different players and technologies, but taking into account the scale and scope of the players involved, especially large international banks and payment providers, it is doubtful that the MFS market will remain in such a fragmented state for long. Likely a few winning concepts will emerge backed up by the biggest market players leaving room for only small niches.

Concerning mobile payment services in Finland, the advantages they bring compared to other already widely established payment procedures, such as credit and debit cards, can be disputed. Consumers, in general, have a conservative mindset when money is involved making them slow to change their behavior. Even though mobile payments offer a wider range of features than other forms of payment, the argument for or against mobile payments comes down to what is convenient for the customer.

The payment process is already easy with cash, credit and debit cards. Mobile payments has little new to offer. That is why the concept must be sold differently to Finnish consumers. The entire payment chain must be developed to a point, where the end user feels the benefit of swapping the content of their wallet for the content of their phone. User volume will decide the winning concept. As with banking services, there will remain niches for alternative payment forms, but the market in general will consolidate.

Banks alongside payment providers, such as Visa and MasterCard, will remain dominant in MFS market. However, mobile financial services are gradually changing the way people conduct their everyday banking business. Change in behavior is very relevant even though market players stay the same. It forces the dominant players to respond to consumer expectations, because not doing so will leave consumers looking for alternatives.

As the mobile banking and mobile payments fields become more established, it is apparent that there will only be a small share available for IT and telecommunications companies. This niche will further be divided up among non-bank companies that have managed to attract a big enough user base, such as Google, Apple and PayPal. The odds stacked against IT and telecom companies in the MFS market are quite overwhelming: they do not enjoy the same level of trust from their customers as banks do, they do not have the same service portfolio available, they are faced with strict legislation and regulation, and there is not enough reward involved to justify the huge financial investments required to achieve the network effects that banks and payment providers already have.

From the banks' point of view, one formidable challenge is keeping up with the rapidly changing mobile landscape, in order to be present there where their customers are. It may be a viable option for banks to partner up with IT and telecom companies in order to gain access to larger customer segments through different mobile platforms, ecosystems and networks. Another challenge facing banks is that partnering up with non-bank companies must be done in a way that complies with legislation and regulatory requirements. Confronting these issues in Finland has led to MFS becoming the new means of service power. This has pushed banks to make the most visible change to their present day existence by reducing the amount of branch offices they have. In addition to their reduction, the role of branch offices has transformed into one of consultation and sales power.

Banks seem set to dominate the future of mobile banking and mobile payments, unless non-bank players can come up with vastly superior services. Even then, end users must overcome the switching costs associated with adopting a new technology, service model and/or service provider. The possibility of a non-bank company overcoming these obstacles may seem remote but is not entirely unfathomable.

Even though non-bank players may not have the upper-hand in MFS right now, they are gaining valuable experience from offering them. If banks get too comfortable with their present dominant market position, do not actively respond to technological change as well as a constantly evolving market, and make the mistake of not playing a central role in the new value chains of mobile financial services, they run the risk of being surpassed and marginalized by non-bank players. Even so, regardless of this risk, banks have an excellent starting position in the MFS market in Finland, and the only real way for non-bank players to get a share of the market is to work with banks and not against them.

7.3 Limitations of the Study

Aside from the topic and research questions, the conducted research contains limitations that need to be addressed when analyzing and reviewing the results of the study. The limitations concern the validity and reliability of the research. Reliability refers to the consistency of the results and validity to the study actually examining what it is supposed to (Bryman & Bell 2003, 33). The relevancy of these two indicators has, however, been questioned in qualitative studies as they are seen to focus too much on measuring the object of study. Therefore other indicators are used such as credibility, independence, verifiability, authenticity, and generalizability. (Bryman & Bell 2003, 288)

Limitations that affect the listed indicators, in particular the **generalizability** and **verifiability** of the study arise from the empirical study being conducted as a half structured theme interview, which can be problematic in a number of ways. Firstly, even though the individuals interviewed represent their organization, some of their answers are subjective and reflect their own personal experiences. Therefore, all the views and opinions expressed by the interviewees do not necessarily represent the official stance of their respective organization.

Secondly, the results of the interviews are strongly tied to the interaction of the interviewer and interviewee. As a result, there exists the possibility that the interviewer has unknowingly affected some of the interview responses. The likeliness of this is diminished, however, due to the interviewees being experts in their own field. Thirdly, the function and organizational position of each person interviewed differed from one another. This likely affected the interview results, because each interviewee was more inclined to concentrate on their own area of expertise.

In terms of **independence** and **credibility**, it has been a central aim of the researcher to remain unbiased and independent when conducting the study. It should, however, be noted that the researcher has worked at Nordea for several years, which is one of the companies featured in this study. His past assignments have not been involved in mobile financial services, which is why the research can be seen as being objective.

The issue of **authenticity** can be examined by the impartiality of the study, does it fairly represent all the featured interest groups. It is worth noting that, even though an equal amount of companies are examined from both the banking as well as IT and telecom industries, the conducted interviews number four to two in favor of banks. The reason being is that the researcher was unable to obtain an interview from Google, and at Nordea the responsibilities concerning mobile banking and mobile payments were divided between two people. Understandably, this may have an effect on the authenticity of the study even though the researcher made a conscious effort to fairly examine both interest groups.

Taking in to account the documented results, drawn conclusions, and noted limitations, the researcher believes that the study has been successful in its objective.

7.4 Suggestions for further study

An interesting research topic would be to examine exclusively **the security aspect of MFS**, the one-factor versus two-factor security solution. A critical aspect in mobile financial services is the security element and the party that supplies it will have a strong standing in the entire MFS value chain.

Studying the use of NFC technology in financial services and how this effects the way consumers and service providers behave. As this thesis has described, NFC is a technology with a large and diverse value chain that could provide a host of different possibilities with banking, payments, and other financial services. Focusing on the technology's applications could give an idea of what banking and payments services will look like in the future.

Further examining the effect of non-bank OTT players on the MFS market. A worthwhile topic of research would be to expand the focus of this thesis to other non-bank OTT-players, e.g. Apple and Amazon, in order to verify and build upon the presented results and conclusions.

REFERENCES

Academic sources:

Alasuutari, P. 2001. *Laadullinen tutkimus*. Vastapaino, Tampere.

Ariguzo, G. & White, D. 2011. A Time-Series Analysis of U.S. E-Commerce Sales. *Review of Business Research*, Vol. 11, No. 4, p. 134-140.

Aspara, J., Rajala R & Tuunainen, V.K. 2012. *The Future of Banking Services*. Aalto University, Helsinki.

Blumberg, B., Cooper, D.R. & Schindler, P.S. 2008. *Business Research Methods*. McGraw Hill, New York.

Bryman, A. & Bell, E. 2007. *Business Research Methods*. Oxford University Press, New York.

Castello, S. 2004. Innovative Technologies in Microfinance for Latin America: Building Effective Delivery Channels. *Summary of the Microfinance Workshop on the use of information technology to deliver financial services*, October 16 – 17, 2003, San Jose, Costa Rica.

Crone, R. & Liebenguth, H. 2012. What Banks Stand to Lose As Mobile Wallets Make Gains. *American Banker*, Vol. 177 Issue F310, p9-9

Dahlberg, T. et al. 2008. Past, present and future of mobile payments research: A literature review. *Electronic Commerce Research and Applications*, Vol. 7, No. 2, p. 165-181.

DeYoung, R. 2005. The Performance of Internet-Based Business Models: Evidence from the Banking Industry. *Journal of Business*, Vol. 78, No. 3, p. 893-947.

Eskola, J. & Suoranta, J. 2003. *Johdatus laadulliseen tutkimukseen*. Vastapaino, Tampere.

Goldmanis, M., Hortaçsu, A., Syverson, C. & Emme, Ö. 2009. E-commerce and the Market Structure of Retail Industries. *The Economic Journal*, Vol. 120, No. 545, p. 651-682.

Gow, G. & Smith, R. 2006. *Mobile and Wireless Communications: An Introduction*. McGraw-Hill International, Berkshire.

Greenberg, R., Wong-On-Wing, B. & Lui, G. 2008. Culture and Consumer Trust in Online Businesses. *Journal of Global Information Management*, Vol. 16, No. 3, p. 26-44.

Heyer, A. & Mas, I. 2011. Fertile Grounds for Mobile Money: Towards a Framework for Analysing Enabling Environments. *Enterprise Development and Microfinance*, Vol. 22, No. 1, p. 30-44.

Kent, J. 2012. Dominant mobile payment approach and leading mobile payment solution providers: A review. *Journal of Payments Strategy & Systems*, Vol. 6, No. 4, p. 315-324.

Mas, I. & Radcliffe, D. 2011. Scaling Mobile Money. *Journal of Payments Strategy & Systems*, Vol. 5, No. 3, p. 298-315.

Pousttchi, K. & Schurig, M. 2004. Assessment of Today's Mobile Banking Applications from the View of Customer Requirements. *Proceedings of the Hawaii International Conference on System Sciences*, January 5 – 8, 2004, Big Island, Hawaii.

Shapiro, C. & Varian, H. 1999. *Information Rules: A Strategic Guide to the Network Economy*. Harvard Business School Press, Boston.

Singh, S., Srivastava, V. & Srivastava, R. K. 2010. Customer Acceptance of Mobile Banking: A Conceptual Framework. *SIES Journal of Management*, Vol. 7, No. 1, p. 55-64.

Suoranta, M. 2003. *Adoption of Mobile Banking in Finland*. Doctoral dissertation, University of Jyväskylä. School of Business and Economics.

Tuikka, T. & Isomursu, M. 2009. *Touch the Future with a Smart Touch*. VTT Tiedotteita – Research Notes 2492. VTT, Espoo.

Vihinen, J. 2007. *Supply and Demand Perspectives on Mobile Products and Content Services*. Doctoral dissertation, Helsinki School of Economics.

Internet sources:

Adams, J. 2012. Mobile Banking Will Grow 300 % Over the Next Four Years: Aite. American Banker. Web document. Accessed: 23.1.2013. Available: http://www.americanbanker.com/issues/177_243/mobile-banking-will-grow-300-percent-over-the-next-four-years-aite-1055318-1.html?zkPrintable=1&nopagination=1

Apple. 2012. Passbook. Apple.com / ios6 / Passbook. Web document. Accessed: 18.7.2012. Available: <http://www.apple.com/ios/ios6/#passbook>

Balancio. 2011a. Balancion verkkopalvelu oman talouden hallintaan. Balancion.com / Etusivu. Web document. Accessed: 4.8.2012. Available: <http://www.balancion.com/>

Balancio. 2011b. Usein kysytyt kysymykset: Usein kysyttäjä kysymyksiä Balanciosta yrityksenä. Balancion.com / Kysyttyä. Web document. Accessed: 4.8.2012. Available: <http://www.balancion.com/kysyttya-2>

Business Wire. 2011a. Visa acquires Fundamo, signs new agreement with Monitise. Businesswire.com / News. June 9th 2011. Web document. Accessed: 18.7.2012. Available: <http://www.businesswire.com/news/home/20110609005525/en/Visa-Acquires-Fundamo-Signs-Agreement-Monitise>

Business Wire. 2011b. Visa and Google Sign Licensing Deal to Boost Mobile Payment Adoption. Business Wire / News. Web document. Accessed: 17.7.2012. Available: <http://www.businesswire.com/news/home/20110919006695/en/Visa-Google-Sign-Licensing-Deal-Boost-Mobile>

Citi. 2013. Google Wallet: Shopping in a Snap. Web document. Referenced: 26.10.2013. Available: <https://online.citibank.com/US/JRS/portal.c?ID=GoogleWallet>

Danskebank.fi. 2012. Nimenmuutos. Web document. Accessed: 18.11.2012. Available: http://www.danskebank.fi/fi-fi/tietoa-danskebankista/nimenmuutos/pages/nimenmuutos.aspx?sc_cid=rebranding_info|internal|frontpage_banner|0001

Dolan, J. 2009. Accelerating the Development of Mobile Money Ecosystems. Web document. Accessed: 5.1.2012. Available: http://www.hks.harvard.edu/mrcbg/CSRI/publications/report_39_mobile_money_january_09.pdf

Ericsson.com. 2012. Ericsson outlines strategy for its multimedia business. Ericsson.com/Press Releases. Web document. Accessed: 17.7.2012. Available: <http://www.ericsson.com/news/1587729>

Federation of Finnish Financial Services. 2012. Financial Services Statistics 2011. Web document. Accessed: 16.7.2012. Available: http://www.fkl.fi/en/material/statistics/Statistics/Financial_Services_Statistics_2011.pdf

Financial Times. 2006. Siemens and Nokia in €20bn network deal. Web document. Accessed: 04.01.2013. Available: <http://www.ft.com/cms/s/2/3548175a-ff30-11da-84f3-0000779e2340.html#axzz2H1x5AkgD>

Financial Times. 2013. Ericsson / Business profile. Web document. Accessed: 4.1.2013. Available: <http://markets.ft.com/research/Markets/Tearsheets/Business-profile?s=ERIC+B:STO>

Forex. 2012a. Forex.fi / Forex yrityksenä / Liikeidea ja historia. Web document. Accessed: 3.7.2012. Available: <http://www.forex.fi/FOREX-yrityksena/Liikeidea-ja-historia/>

Forex. 2012b. Forex.fi / Palvelut. Web document. Accessed: 3.7.2012. Available: <http://www.forex.fi/Palvelut/>

Gartner. 2012. Gartner Says Worldwide Sales of Mobile Phones Decline 2 Percent in First Quarter of 2012; Previous Year-over-Year Decline Occurred in Second Quarter of 2009. Web document. Accessed: 4.8.2012. Available: <http://www.gartner.com/it/page.jsp?id=2017015>

Goode, A. 2008. Mobile – The ATM in Your Pocket. Juniper Research. Juniperresearch.com / Shop / Whitepaper. Web document. Accessed: 22.8.2012. Available: <http://juniperresearch.com/shop/viewwhitepaper.php?whitepaper=58>

Google. 2011. Google Wallet: Press release. Google, Citi, MasterCard, First Data and Sprint team up to make your phone your wallet. Web document. Accessed: 17.7.2012. Available: <http://gw-press.appspot.com/index.html>

Helsingin Sanomat. 2001. Nokia's Vanjoki Insists WAP is No Flop. HS.fi / English / Archive / Business & Finance. Web document. Accessed: 4.8.2012. Available: <http://www2.hs.fi/english/archive/news.asp?id=20010322IE7>

Informa. 2011. Mobile NFC Services. Extract. Web document. Accessed: 31.8.2012. Available: <https://commerce.informatm.com/reports/near-field-communications.html>

Jenkins, B. 2008. Developing Mobile Money Ecosystems. Web document. Accessed: 5.1.2012. Available: http://www.hks.harvard.edu/m-rcbg/CSRI/publications/report_30_MOBILEMONEY.pdf

KauppaLehti. 2012. Uusi nimi Suomen pankkimaailmaan. Web document. Accessed: 18.11.2012. Available: <http://www.kauppaLehti.fi/etusivu/uusi+nimi+suomen+pankkimaailmaan/201211304103>

Magana, J. 2011. Google Wants to Be in Your Wallet Too. Pyramid Research. Web document. Accessed: 17.3.2012. Available at: <http://www.pyramidresearch.com/points/item/111025.htm?sc=LR110111>
PPGW

MasterCard. 2013. Google Wallet: Paying With a Tap of Goole Wallet? Web document. Accessed: 26.10.2013. Available: <http://www.mastercard.us/google-wallet.html>

Middleton, J. 2011. Visa invests in m-payments platform. Telecoms.com. Web document. Accessed: 18.7.2012. Available: http://www.telecoms.com/35763/visa-invests-in-m-payments-platform/?utm_source=rss&utm_medium=rss&utm_campaign=visa-invests-in-m-payments-platform

Middleton, J. 2012. Visa adds NFC devices to m-payment initiative. Telecoms.com. Web document. Accessed: 7.2.2012. Available: <http://www.telecoms.com/38290/visa-adds-nfc-devices-to-m-payment-initiative/>

Ministry of Transport and Communications. 2009. Access to a minimum of 1 Mbit Internet connection available to everyone in Finland by July 2010. Web document. Accessed: 9.9.2012. Available: <http://www.lvm.fi/web/en/pressreleases/-/view/920100>

Mobey Forum. 2010a. About Us. Web document. Accessed: 7.6.2012. Available: <http://www.mobeyforum.org/About-Us>

Mobey Forum. 2010b. Our Members. Web document. Accessed: 7.6.2012. Available: <http://www.mobeyforum.org/About-Us/Our-Members>

Monitise. 2012a. Mobile Money and the Battle for Consumer Engagement. Web document. Accessed: 22.1.2013. Available: http://info.monitise.com/FinextraExtendandDefendWhitePaperNov12_defend-LP2.html

Monitise. 2012b. Monitise welcomes Visa Europe's Mobile Money Network investment. Monitise.com / Press releases. Web document. Accessed: 18.7.2012. Available:

http://www.monitise.com/media/press_releases?id=561

Monitise. 2013. About Us. Web document. Accessed: 22.1.2013. Available: http://www.monitise.com/about_us/who_we_are

MVF Global. 2012. Lead Generation and Internet Marketing in Finland. Web document. Accessed: 6.9.2012. Available: <http://www.mvfglobal.com/finland>

Nelson, D. & van Ketel, M. 2005. E-commerce (electronic commerce or EC). Web document. Accessed: 30.5.2012. Available: <http://searchcio.techtarget.com/definition/e-commerce>

NFC Forum. 2012a. NFC as a Business Driver. Web document. Accessed: 7.6.2012. Available: http://www.nfc-forum.org/aboutnfc/business_driver/

NFC Forum. 2012b. NFC in Action. Web document. Accessed: 6.6.2012. Available: http://www.nfc-forum.org/aboutnfc/nfc_in_action/

NFC Forum. 2012c. NFC and Contactless Technologies. Web document. Accessed: 7.6.2012. Available: http://www.nfc-forum.org/aboutnfc/nfc_and_contactless/

NFC Forum. 2012d. Members. Web document. Accessed: 7.6.2012. Available: http://www.nfc-forum.org/member_companies/

NFC Forum. 2012e. The NFC Ecosystem. Web document. Accessed: 6.6.2012. Available: <http://www.nfc-forum.org/aboutnfc/ecosystem/>

Nokia Siemens Networks. 2011. The rise of over-the-top services demands a smart response. Market trends and impacts: Industry landscape 2011 – Over-the-top players. Web document. Accessed: 17.7.2012. Available at: http://www.nokiasiemensnetworks.com/sites/default/files/perspectives/NS_N-IndustryLandscape-2011_Over-the-top_V01.pdf

OP-Pohjala. 2010. OP-Pohjala-ryhmä luopuu maksuautomaateista. Pohjala.fi / Media / Tiedotteet. Web document. Accessed: 3.8.2012. Available: <https://www.pohjola.fi/pohjola?cid=331319815&srcpl=3>

Otto. 2012. Otto.fi / Automatia / Yhtiö. Web document. Accessed: 3.7.2012. Available: <http://www.otto.fi/automatia/yhtio/>

Palmer, M. 2011. Battle over mobile payments intensifies. The Financial Times web edition. Web document. Accessed: 17.7.2012. Available at: <http://www.ft.com/cms/s/2/cadb9bec-16cd-11e1-bc1d-00144feabdc0.html#axzz1iVsrBSFV>

Rao, L. 2011. Visa makes a strategic investment in disruptive mobile payments start-up Square. Techcrunch.com / News. Web document. Accessed: 18.7.2012. Available: <http://techcrunch.com/2011/04/27/visa-makes-a-strategic-investment-in-disruptive-mobile-payments-startup-square/>

R-kioski. 2012. Maksa laskusi R-kioskilla helposti myös iltaisin ja viikonloppuisin. R-kioski.fi / Tuotteet / Palvelut / Laskunmaksu. Web document. Accessed: 3.8.2012. Available: <http://www.r-kioski.fi/Laskunmaksu.398.0.html>

Ray, B. 2012. Nokia Money shot: Mobile banking service axed. The Register/Financial News. Web document. Accessed: 17.7.2012. Available: http://www.theregister.co.uk/2012/03/12/nokia_money_gone/

Reardon, M. 2011. Visa vs. Google Wallet in mobile payments. CNET.com / News. Web document. Accessed: 18.7.2012. Available: http://news.cnet.com/8301-30686_3-20097429-266/visa-vs-google-wallet-in-mobile-payments/

Riikonen, A. & Smura, T. 2012. Mobile Handset Population in Finland 2005-2011. Web document. Accessed: 3.1.2013. Available: <http://momie.comnet.aalto.fi/2012/05/mobile-handset-population-in-finland-2005-2011/>

Danske Bank. 2010a. iPhone-mobiilipankki aloitti pirteästi. Sampopankki.fi / Media / Tiedotteet. Web document. Accessed: 1.8.2012. Available: http://www.sampopankki.fi/fifi/TietoaSampoPankista/media/Tiedotteet/Pages/20101014_iPhone_10000latausta.aspx

Danske Bank. 2010b. Maksuautomaattien yhteiskäyttö päättyy. Sampopankki.fi / Tietoa Sampo Pankista / Media / Tiedotteet. June 9th 2010. Web document. Accessed: 3.8.2012. Available: http://www.sampopankki.fi/fi-fi/TietoaSampoPankista/media/Tiedotteet/Pages/20100609_laskunmaksuautomaatit.aspx

Danske Bank. 2012. Postisäästöpankista nykypäivään. Sampopankki.fi / Sampo Pankki lyhyesti / Historia. Web document. Accessed: 28.7.2012. Available: <http://www.sampopankki.fi/FI-FI/TIETOASAMPOPANKISTA/SAMPOPANKKILYHYESTI/HISTORIA/Pages/Historia.aspx>

Sonera. 1999. Vuosikertomus 1999. Web document. Accessed: 1.8.2012. Available: <http://web.lib.hse.fi/FI/yrityspalvelin/pdf/1999/Fsonera1999.pdf>

Statistics Finland. 2011a. Internet use outside home and work becoming more common. Web document. Accessed: 9.9.2012. Available: http://www.stat.fi/til/sutivi/2011/sutivi_2011_2011-11-02_tie_001_en.html

Statistics Finland. 2011b. Internet-yhteydet ja Internetin käyttö. Tieto- ja viestintätekniiikan käyttö. Web document. Accessed: 6.9.2012. Available: http://www.stat.fi/til/sutivi/2011/sutivi_2011_2011-11-02_kat_001_fi.html

Statistics Finland. 2012. Concepts and definitions. Use of information and communications technology. Web document. Accessed: 6.9.2012. Available: http://www.stat.fi/til/sutivi/kas_en.html

SWIFT. 2012. Mobile Payments - Three winning strategies for banks. Web document. Accessed: 8.1.2013. Available: http://www.swift.com/resources/documents/SWIFT_white_paper_Mobile_Payments.pdf

Taloussanomat. 2004. Soneran taru alkaa loppua. Taloussanomat.fi / Arkisto. Web document. Accessed: 4.8.2012. Available: <http://www.taloussanomat.fi/arkisto/2004/12/09/soneran-taru-alkaa-loppua/200428658/12>

Telecompaper. 1999. Leonia, Tieto, Sonera to Offer Mobile Banking. Telecompaper.com / General. Web document. Accessed: 1.8.2012. Available: <http://www.telecompaper.com/news/leonia-tieto-sonera-to-offer-mobile-banking>

The Economist. 2009. The power of mobile money. Web document. Accessed: 10.2.2012. Available: <http://www.economist.com/node/14505519>

The Economist. 2012a. The Nokia effect. Web document. Accessed: 3.1.2013. Available: <http://www.economist.com/node/21560867>

The Economist. 2012b. Who's afraid of Huawei? Web document. Accessed: 5.1.2013. Available: <http://www.economist.com/node/21559922>

The Paypers. 2012. The Mobile Payments Market Guide 2012 – Insights in the global mobile financial services ecosystem / Banking on Trust. Web document. Accessed: 10.6.2012. Available: <http://www.mobeyforum.org/content/download/30781/335160/file/Paybefore.com.pdf>

Thomas, K. 2012. Nokia to exit mobile money business globally. The Hindu Business Line. Web document. Accessed: 17.7.2012. Available: <http://www.thehindubusinessline.com/industry-and-economy/info-tech/article2985226.ece>

TMF. 2012. Who Gets The Lion's Share. Web document. Accessed: 8.1.2013. Available: http://www.tmforum.org/ResearchPublications/7097/home.html?q=Business_IQ#TRCPublications/Link47840

TNS Gallup. 2012. Internet-käytön kehitys Suomessa. Web document. Accessed: 9.11.2012. Available: <http://www.iab.fi/assets/Tutkimus/120222NetTrack-2012-IAB-kooste.pdf>

Vaalisto, H. 2010. Mobiilipankki tulee Nokian puhelimiin jälkijunassa. Digitoday.fi / mobiili. Web document. Accessed: 1.8.2012. Available: <http://www.digitoday.fi/mobiili/2010/09/15/mobiilipankki-tulee-nokian-puhelimiin-jalkijunassa/201012782/66>

VanillaPlus. 2012. Vodafone and Visa launch 'world's largest mobile payments partnership'. Vanillaplus.com. Web document. Accessed: 18.3.2012. Available at: <http://www.vanillaplus.com/news/item/1938-vodafone-and-visa-launch-worlds-largest-mobile-payments-partnership>

Visa. 2012a. Our Business. Corporate.visa.com / About Visa / Our Business. Web document. Accessed: 18.7.2012. Available: <http://corporate.visa.com/about-visa/our-business-index.shtml>

Visa. 2012b. Visa Inc. And Visa Europe. Corporate.visa.com / About Visa. Web document. Accessed: 18.7.2012. Available: <http://corporate.visa.com/about-visa/our-business/visa-inc-and-visa-europe.shtml>

Visa Europe. 2012. Visa Europe confirms launch date for V.me digital wallet. VisaEurope.com / News. Web document. Accessed: 18.7.2012. Available: http://www.visaeurope.com/en/newsroom/news/articles/2012/vme_launch_date_announced.aspx

Walmsley, S. 2012. The Banking Olympics. Web document. Accessed: 9.6.2012. Available: http://www.mobeyforum.org/content/download/30278/330406/file/Chartered_Banker_April%20issue.pdf

Whioam.com. 1999. Sonera introduces new mobile banking. Whioam.com / Latest IT News / Software. Web document. Accessed: 28.7.2012. Available: <http://www.whioam.com/sonera-introduces-new-mobile-banking.html>

Yee, L. C. 2012. China's ZTE Q1 net income trails forecast. Reuters. Web document. Accessed: 4.1.2013. Available: <http://uk.reuters.com/article/2012/04/25/zte-earn-idUKL3E8FN8Q220120425>

Yle. 2012. Norjalainen perheyritys ostaa Suomen R-kioskit. Yle Arena / Yle Uutiset. Web document. Accessed: 3.8.2012. Available: <http://areena.yle.fi/tv/1474713/>

Media, non-Internet sources:

Erkko, A. 2012. Nokia haki ideoita mobiilimaksamiseen Aallon opiskelijoilta. *Kauppalehti*. 18.1.2012, p. 7.

Salminen, M. 2012. Mobiilimaksamisen pitäisi kiinnostaa Nokiaa. *Kauppalehti* 13.3.2012.

The Economist. 2012c. Retail Renaissance: Special Report on International Banking. *The Economist*, Vol. 403, No. 8785, (after p. 46) p.3-24.

Van Dyk, D. 2012. The End of Cash. *Time Magazine*, Vol. 179, No. 1, p. 34-35.

APPENDICES

Appendix 1. Mobile Banking and Mobile Payments Service Channel and Service Offering

BANKING SERVICE CHANNELS



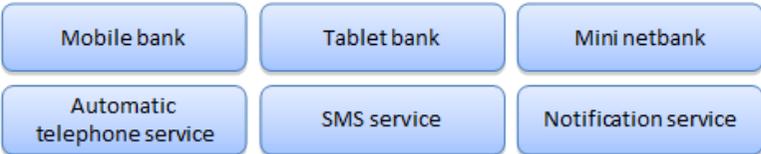
MOBILE BANKING AND MOBILE PAYMENTS DEVICES



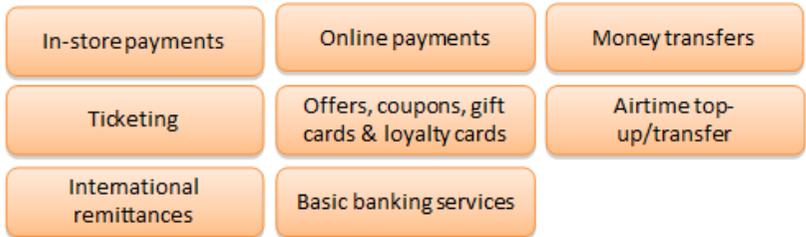
MOBILE BANKING AND MOBILE PAYMENTS SERVICE GROUPS



MOBILE BANKING SERVICE BUNDLES



MOBILE PAYMENTS SERVICE BUNDLES



Appendix 2. Interview questions (English)

Mobile banking services in general

1. How does the company define mobile banking services (mobile banking, mobile payments, mobile money)?
2. What kind of view does the company have about mobile banking services and the benefits they bring? In other words, why does the company offer mobile banking services?
3. What are the current and predicted trends that will have an impact on the development of the mobile banking market?

Mobile banking services in the company

1. What services does the company offer via mobile banking? What other services could be included in it?
2. Are mobile banking services intended to support or replace other banking services offered by the company?
3. What are the main technical solutions that the company's mobile banking services are built upon, e.g. SMS, NFC, apps and Cloud Services...?
4. Through which mobile devices and operating systems does the company offer mobile banking services, e.g. Android, iPhone, Windows...?
5. What is the basis for these decisions?
6. What kind of mobile banking value chain does the company have and what participants are a part of it?
7. In what way do law and regulations affect the mobile banking services offered by the company and its affiliates?
8. How are conflicts of interest solved between the different parties of the company's mobile banking value chain?
9. Who controls the customer data of mobile banking users?
10. In addition to (or instead of) the company's own mobile banking services, could it operate as a part of another company's (or companies') mobile banking service?
11. How have the company's customers reacted to its mobile banking services?

Pros and cons

1. What kinds of problems / possibilities does the company see in mobile banking services?
2. Some of the most central problems of mobile banking services are: the right to privacy, security, the obscurity of mobile banking services among consumers and several competing technical solutions and service models. How has the company resolved these issues?
3. When balancing the pros and cons of mobile banking services, which weighs more?

Mobile banking services in Finland

1. How does the company see the mobile banking market in Finland – present and future?
2. How does the success of mobile banking services abroad affect the company's strategy and operations in Finland?
3. Who are the company's worst rivals in the Finnish mobile banking market – domestic or foreign? IT and telecoms or banks?
4. What view does the company have on how the Finnish bank and finance sector will change due to mobile banking services?
5. What is the role of non-bank companies amongst this change, e.g. Google, Nokia, and Ericsson?
6. Any other comments about mobile banking services?

Appendix 3. Interview questions (Finnish)

Mobiilipankkipalvelut yleisesti

1. Miten yhtiö määrittelee mobiilipankkipalvelut (mobile banking, mobile payments, mobile money)?
2. Mikä on yhtiön näkemys mobiilipankkipalveluista ja niiden tuomasta lisäarvosta? Ts. miksi yhtiö tarjoaa niitä?
3. Mitkä ovat nykyiset ja odotettavissa olevat trendit, mitkä vaikuttavat mobiilipankkimarkkinoiden kehitykseen?

Mobiilipankkipalvelut yhtiössä

1. Mitä palveluita yhtiön mobiilipankkipalvelut pitävät sisällään? Mitä muita palveluita siihen voisi sisällyttää?
2. Onko mobiilipankkipalvelut tarkoitettu tukemaan vai korvaamaan yhtiön muita pankkipalveluita?
3. Mihin keskeisiin teknisiin ratkaisuihin yrityksen mobiilipankkipalvelut rakentuvat, esim. SMS, NFC, apps ja Cloud Services...?
4. Minkä mobiililaitteiden ja käyttöjärjestelmien kautta yhtiö tarjoaa mobiilipankkipalveluita, esim. Android, iPhone, Windows...?
5. Mihin yhtiö perustaa em. päätökset?
6. Minkälainen mobiilipankkipalveluiden arvoketju yhtiöllä on ja mitkä toimijat kuuluvat siihen?
7. Millä tavoin laki ja säännökset vaikuttavat yhtiön sekä sen yhteistyökumppaneiden tarjoamiin mobiilipankkipalveluihin?
8. Miten erimielisyydet ja eturistiriidat ratkotaan yhtiön mobiilipankkisidosryhmien välillä?
9. Kuka kontrolloi mobiilipankkipalveluiden käyttäjien asiakastietoja?
10. Omien mobiilipankkipalveluiden lisäksi / sijasta voisiko yhtiö toimia osana jonkin toisen yhtiön / yhteenliittymän mobiilipankkipalvelua?
11. Kuinka yhtiön asiakkaat ovat ottaneet vastaan mobiilipankkipalvelut?

Hyödyt ja haitat

1. Millaisia ongelmia / mahdollisuuksia yhtiö näkee mobiilipankkipalveluissa?
2. Eräitä mobiilipankkipalveluiden keskeisiä ongelmia ovat: yksityisyyden suoja, tietoturva, palvelun tuntemattomuus kuluttajien keskuudessa ja lukuisat keskenään kilpailevat tekniset ratkaisut sekä toimintamallit. Miten yhtiö on ratkaissut / ratkaisisi nämä asiat?
3. Kun punnitaan mobiilipankkipalveluiden hyötyjä ja haittoja, kumpi painaa enemmän?

Mobiilipankkipalvelut Suomessa

1. Miten yritys näkee mobiilipankkimarkkinat Suomessa – nykyhetki ja tulevaisuus?
2. Miten yhtiön kokemukset ja odotukset mobiilipankkipalveluiden menestyksestä ulkomailta vaikuttaa sen mobiilipankkipalveluiden strategiaan ja toimintaan Suomessa?
3. Mitkä toimijat ovat yrityksen pahimmat kilpailijat mobiilipankkimarkkinoilla Suomessa – kotimaiset vai ulkomaiset? IT ja teleoperaattorit vai pankit?
4. Mikä on yhtiön näkemys siitä, miten Suomen pankki- ja rahoitussektori muuttuvat mobiilipankkipalveluiden myötä?
5. Minkälainen rooli ei-pankkiyhtiöillä on tässä muutoksessa, esim. Google, Nokia, Ericsson?
6. Muita kommentteja mobiilipankkipalveluista Suomessa?