

Technology acceptance of mobile payment in Germany, Finland, USA and Kenya

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1 Introduction

1.1 Relevance and Motivation

Mobility has become an essential part not only in our everyday life, but also in the global economic market. Being available and able to operate at anytime and anywhere is a feature of modern society.¹ Ubiquity and flexibility are just a few keywords distinguishing the economy. Out of this, the adoption of mobile information and communication technologies arises with an increasing rate, allowing the users to bridge areal distances and their stationary dependency. This development opened new ways such as the flexible integration of associated business processes, situational communication and application processes.² Propelled by these important aspects, mobile devices have gained more and more importance. According to mobiThinking.com over 5.3 billion mobile phone users exist today and the tendency is still rising³ (s. Fig. 1).

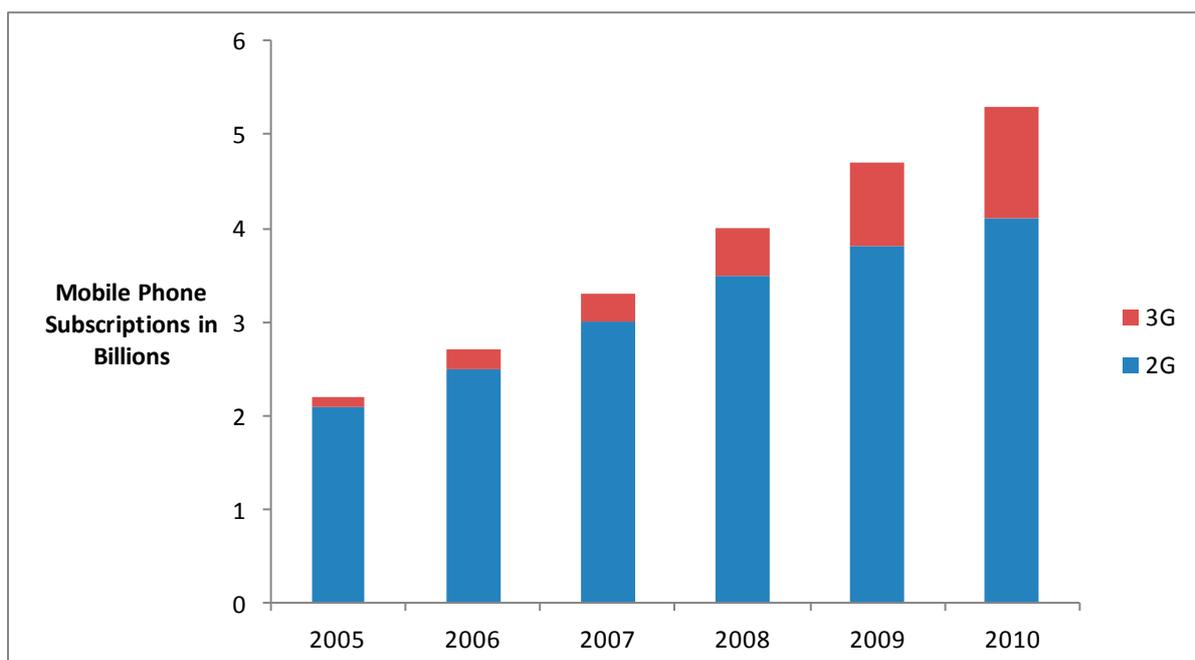


Fig. 1: Global Mobile Cellular Subscriptions

Source: Own Illustration based on ITU World Telecommunication/ICT Indicators database (2010, p. 1).

In the early days of mobile devices, such as PDAs or mobile phones, the mobile device's functions were very specific and limited to only a few core purposes.

¹ Cp. Paavilainen (2002, p. 1).

² Cp. Teichmann/Lehner (2002, p. 1).

³ Cp. Mobithinking (2011):

Nowadays, mobile devices have developed to a more universal device with seemingly limitless functions and new related devices emerging, like the tablet PC or the iPad. Taking the mobile phone as an example, in the beginning its primary function was to make phone calls and later to send text messages. However, its evolution has proceeded at such a fast pace that, by not only adding new information and communication technologies but also additional functions and features, it has become a universal minicomputer for all kinds of tasks. To mention a few examples, today's mobile phones allow the user to use multimedia based applications such as the Internet, to make video conferences, to take pictures, to organize one's daily life, to read eBooks, to listen to music, to play games, and to purchase goods.⁴ In our society, the mobile phone has become a status symbol both in private but also in professional terms and can be customized by its user. Next to keys and wallets the mobile phone is a permanent companion making a ubiquitous usage for the owner possible.⁵ The various numbers of mobile devices help to enhance the population's interest and to constantly open up and develop new business models.

Mobile payment is one of these future business models allowing customers to do designate electronic payments via their mobile devices.⁶ Money and the way to pay have always played an important role in the history of mankind. In today's society, people who are under time pressure have the ability with mobile payment to make their life easier by making payment more convenient. If implemented correctly, mobile payment could make long queues at checkouts or ticket automats a relic of the past and could also make payments more convenient in general. An example would be transferring money to one's family or friends. Mobile payment opens new opportunities in everyday life. The possibilities and opportunities are huge and mobile payment has a realistic chance to become the future standard payment method. The idea and hype around mobile payment is not entirely new. The advantages of mobile payment have already been seen in early 2000, when the mobile payment service provider Paybox entered the market in several countries. Despite the possibilities of mobile payment and despite many leading expert's predictions, the advance of mobile payments, could not keep pace with the development of mobile phones and other mobile technologies (e.g. Location Based Services). Hence, Paybox Germany

⁴ Cp. Greif/Mitrea/Werner (2007, p. 136-138).

⁵ Cp. Giordano/Hummel (2005, p. V).

Cp. Bretbacher et al. (2010, p. 237-240).

Cp. Meckel/Schmid (2008, p. 208-209).

⁶ Cp. Hu/Lee/Kou (2005, p.11).

was discontinued in 2003.⁷ So far, mobile payment has only been successful in certain countries. Especially in Europe, the countries are far behind the predictions.⁸ The success in some developing countries and the lack of success in developed countries has shown that the adoption of mobile payment is not only a matter of a society's level of industrial or technological development. In Germany, mobile payment has halted in a more developmental stage, while in a developing country such as Kenya, mobile payment has been a great success. Countries like South Korea, Japan and Kenya have successfully shown how to implement a well working distribution grid accepted by all participants and different players.⁹ The success or failure of a mobile service, like mobile payment, depends heavily on the acceptance of the consumer.¹⁰ Without the customer's acceptance innovations will fail as the past has already shown.

1.2 Purpose and Research Questions

The purpose of this thesis is to explore whether mobile payment is or can be accepted by the consumers. We will identify the reasons and factors why a consumer accepts or rejects the use of mobile payment. For this purpose, we will focus on the consumer and carry out a technology acceptance analysis. The recent state of the mobile payment system and its development is examined to understand what a person demands and expects from mobile payment. We will learn which mobile payment technologies are available and if they can add an additional value for the consumer. Furthermore, we will determine the technology acceptance of customers face to face with mobile payment in general and for Germany, Finland, USA and Kenya. This research includes further questions on what requirements and preferences the consumers expect from mobile payment. Which mobile payment scenarios do they prefer? Which aspects need to be improved to increase the acceptance? Do they trust in mobile payment providers, and do they feel secure? Will the opportunities outweigh the risks which could arise from its use? We will answer these additional questions during the progress of this thesis. The results and the indicators will be compiled and aligned with a SWOT analysis to finally derive recommendations for action.

⁷ Cp. Heise (2003).

⁸ Cp. Karlsson/Taga (2004, p. 73).

⁹ Cp. Karlsson/Taga (2004, p. 78).

¹⁰ Cp. Dahlberg et al. (2007, p. 8).

1.3 Structure of this Thesis

This thesis is structured into 8 chapters (s. Fig. 2). **Chapter 1** gives an introduction to the context, relevance and problems arising from mobile payment. This chapter also defines the research question and the purpose of this thesis in more detail and introduces the methodology and line of action for the following chapters. **Chapter 2** explains the necessary theoretical basis to understand the subsequent procedures. This includes the conceptual basis, inter alia: mobility, mobile business and mobile commerce. Chapter 2 also includes an overview about the most used mobile devices. Once the basis is outlined, **Chapter 3** examines the business model of mobile payment. This contains basic and necessary framework conditions for the implementation of mobile payment, followed by a description of mobile payment scenarios and mobile billing processes. Afterwards we take a look at the technological frameworks and the different technological approaches in the mobile payment sector, such as text message (SMS)¹¹ or the Near Field Communication (NFC) technology. **Chapter 4** covers the status quo and development status of mobile payment, especially in Germany, Finland, the USA and Kenya. This comprehends the application fields of mobile payment, the available and used technologies and the use cases of mobile payment. The chapter ends with a summary of the mobile payment status for each country. **Chapter 5** investigates the underlying framework for the acceptance of mobile payment and takes a closer look at the terms of acceptance and innovation, as well as their historic development. Furthermore, the results of the acceptance research are presented, including an overview of the current acceptance models, such as the Technology Acceptance Model (TAM) by Davis. After the selection and compilation of a suitable research model we present the relevant constructs for the analysis. The empirical study is based on a literature review and a conducted expert survey. It is followed by the presentation and evaluation of our empirical study of the technology acceptance of mobile payment for Germany, Finland, the USA, and Kenya. **Chapter 6** consists of a SWOT analysis, and a face to face comparison of the strengths and weaknesses of mobile payment, as well as the opportunities and risks. The SWOT analysis is kept with regard to mobile payment more general, otherwise the report would go beyond the scope of this thesis. The SWOT analysis is based on an international expert

¹¹ The term SMS and the term "text messaging" will be used as a synonym.

survey, a consumer survey, and a detailed research of the literature. The chapter is closed with a summary and evaluation of the corresponding results. **Chapter 7** extends the previous chapters and derives recommendations for the implementation of mobile payment that meets the needs and requirements of customers. Out of this we will gather information and give a forecast about the future development and market potential of mobile payment. Ultimately we will end this thesis in **Chapter 8** by summarizing all essential findings, and by giving a conclusion and future prospect about the research question and the technology acceptance of mobile payment.

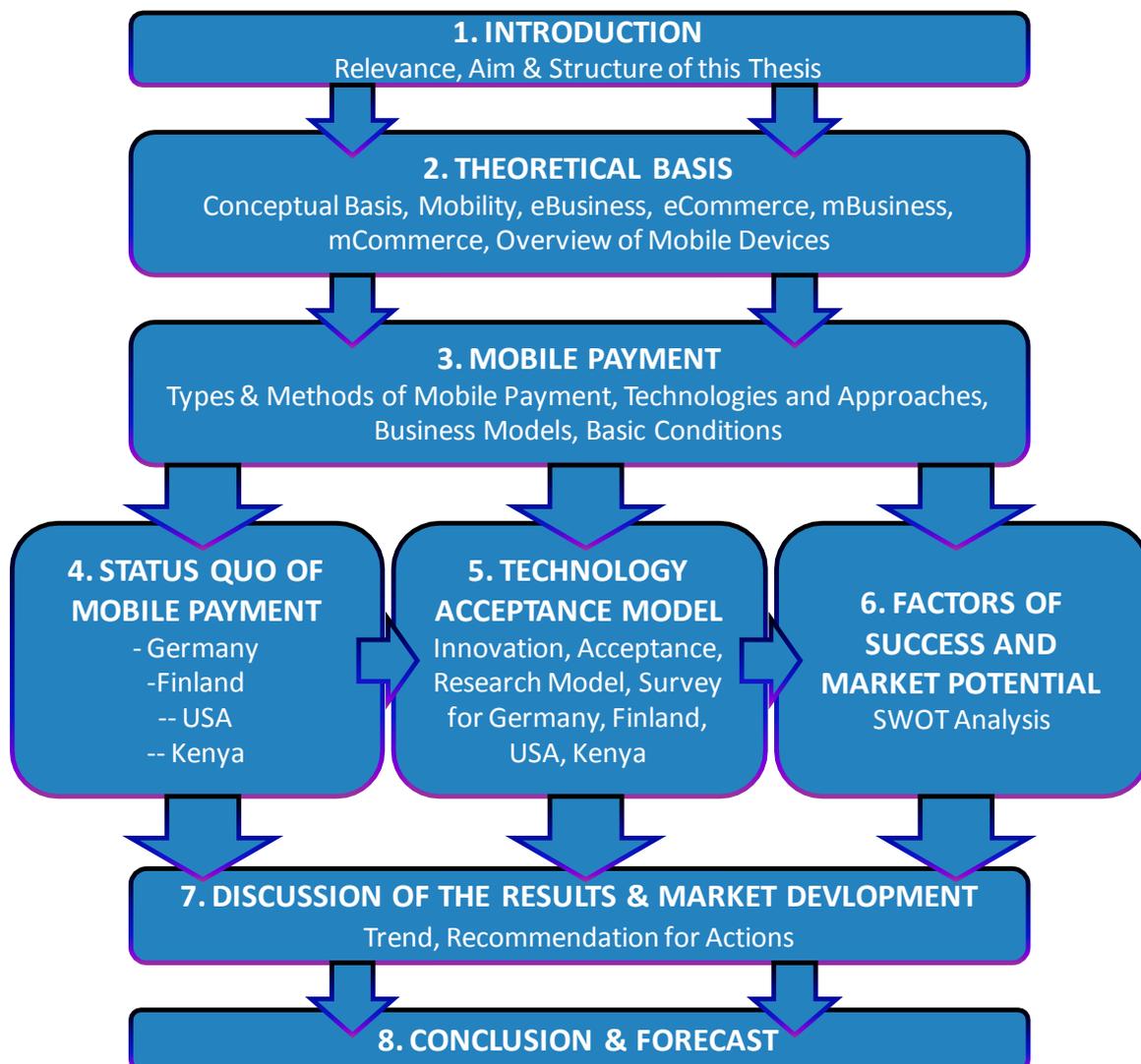


Fig. 2: Structure of this Thesis

Source: Own Illustration

8 Conclusion and Forecast

The purpose of this thesis was to carry out a technology acceptance analysis of mobile payment for Germany, Finland, the USA and Kenya, in order to find out whether mobile payment is or can be accepted by the consumers. The analysis should determine the reasons for the acceptance or rejection of mobile payment. Besides the main research question, additional hypotheses have been proposed that should be discussed and answered in the course of this thesis. To answer these questions, our research model, based on the TAM of Davis and in the context of a qualitative expert survey (N=11), was supplemented by the constructs: mobile payment scenarios, costs, perceived trust and perceived security. The empirical study consisted of a sample of N=306 respondents and was made up of an online and street survey. The respondents were asked about their perception, attitude and acceptance towards mobile payment and the single constructs. Finally, the results of all the previous chapters have been collected and summarized to identify the success factors of mobile payment in a SWOT analysis. Based on these fundamentals and our empirical study, specifically made for this thesis, we identified and evaluated the strengths and weaknesses of mobile payment, its opportunities and threats to it. Before answering the research question, we will first answer the subordinate questions as following:

- What requirements and preferences do the consumers have?

The consumers stated that most important for them was security (80 percent) and reliability (62 percent) of the mobile payment system. Furthermore, trust in the mobile payment providers and not wanting to pay additional or hidden costs gained 57 percent of the answers. Fifty-six percent of the respondents stated that mobile payment should be easy to use and adopt, while the same percentage of the participants preferred a fast mobile payment system/process, e.g., speed of the transactions.

- Which mobile payment scenarios do the consumers prefer?

Asking the participants in what use cases would mobile payment be useful for them, the vast majority considered mobile payment, particularly relevant for purchasing tickets. Seventy-five percent of the respondents preferred the purchase of tickets for public transportation, followed by tickets for events and mobile apps at 56 percent,

and parking tickets at 51 percent. Also, 45 percent of the respondents answered with online shopping, followed by 41 percent for the purchase at a vending machine, and 33 percent of the people would use mobile payment at retail.

- Which aspects need to be improved to increase the acceptance?

Security is the main reason why consumers are still concerned about using mobile payment. According to experts and the literature, mobile payment is much safer than paying with a credit card or direct debit because of new technologies such as NFC. Still, there is doubt and hesitation among the consumers. This might occur out of the reason that consumers, in general, lean towards uncertainty and rejection regarding new and unfamiliar innovations. So, the reasons might not lie in the security itself, but in the mind of the consumers. As with every new technology the mobile payment providers must convince the consumers and communicate to them the benefits and advantages of mobile payment. Now that well-known brands and companies such as Apple, Google, and eBay have entered or are about to enter the mobile payment market, the right time for a mass adoption of mobile payment looks better than any time before. Furthermore, the mobile payment providers have to process mobile payment without any additional costs. Consumers are not willing to use mobile payment if they have to pay additional fees. Mobile payment must have a clear distribution of roles and incentives along the value chain. At the moment, it seems that there are too many players with too many solutions.

- Do the consumers trust in mobile payment providers and do they feel secure?

According to the empirical study, 81 percent of the respondents stated that they would trust a bank as a mobile payment provider the most. Following far behind with 46 percent, respondents had trust in mobile network operators as mobile payment providers, while 45 percent had trust in online payment providers. In general, it should be mentioned that 53 percent of the respondents would not consider using mobile payment because of a lack of trust. Sixty-six percent of the respondents do not think that the security of mobile payment is sophisticated enough. Security was the most important aspect. Consumers are still concerned about their privacy, personal data and the protection against hackers or viruses.

- Will the opportunities outweigh the risks which could arise from its use?

The opportunities for mobile payment and the customers seem to be very significant, especially aspects like convenience and accessibility, which can add value to the consumer's daily life. The elimination of regional constraints, such as traveling to the next bank in developing countries or the decrease of waiting time when buying goods, can be promoted by the use of mobile payment. The risk of mobile payment can be mainly seen in the security, trust and costs. If the mobile payment providers are able to handle these challenges, the opportunities for mobile payment could outweigh the risk.

“Time is money” and nowadays, the common way of life supposes that the next attempt at mobile payment has a big opportunity of success. Not at least because of well-known companies such as Apple, eBay, McDonalds, and Google entering the mobile payment market, but because the increasing progression and fast spread growth of mobile devices gives mobile payment a strong market potential. In most of the industrialized countries, there are already more mobile phones than the population itself. Also, in a large part of developing countries mobile phone subscribers have increased and the tendency is still rising. It will only be a matter of time until there are more mobile phone subscribers than people worldwide. Due to our study, we have to consider that even if the density of mobile devices is growing, mobile payment cannot replace other existing payment forms in the near future. It's more likely that mobile payment will complement and establish itself as a supplementary payment option. Thus, according to the expert survey, a co-existence between cash payment, credit card, debit card, checks and mobile payment seems most likely. Currently, the discrepancy between the “readiness” of the customers to use mobile payment and the real usage is still large. While many customers consider using mobile payment, the currently offered mobile payment scenarios are too limited and too country-specific. While in Kenya, mobile payment is part of everyday life, it turns out that in most developed countries it is very complicated to implement a mobile payment system with at least a uniform standard solution. This is due to the dynamic in the mobile market, the large number of players involved and the existing financial infrastructure. While the forecasts of the experts are expecting that mobile payment will break through in about 5 to 10 years, it has to be ensured that the requirements of the customers are met and implemented in the mobile payment

system because, in the end the customers are the key factor for the success of mobile payment.

“Sometimes, innovation isn’t about doing something that is overly complicated; it’s about seeing something that’s right in front of you and seeing it in a way that other people haven’t thought about.”³⁷²

Ultimately, mobile payment has enough potential to establish itself alongside other payment forms. Not at least, because of the smartphones ever increasing influence on everyday life, but because it is a more and more universal device that can replace the wallet and other devices, such as a camera and even game consoles. For the success of mobile payment, the industrialized nations such as Germany, the USA and Finland must implement a secure and uniform standard, make the payment process clear and easy to use. The presented indicators of acceptance must be enhanced and implemented, while the rejection indicators need to be minimized. After the successful implementation in Kenya, increasingly more mobile payment providers entered the market and compete for customers through more additional services and better offers. Among the compared countries, Kenya seems to be the most progressive in mobile payment, followed by Finland, the USA and Germany. This comparison does not refer to the technological aspect, but more in the adoption and total mobile payment package solution.

In the past, the focus was on the technical aspect for the implementation of mobile payment. However, to be successful and gain user acceptance, the essential requirement is to understand and design mobile payment from the customer's point of view, of course without losing focus of technical aspects. If mobile payment meets the user's demands and needs, and thus minimizes existing concerns, prejudices and fears, user acceptance can be increased. The main aspects are security, trust and costs. The expert survey, the literature review and the market study point out that people are especially concerned about these three factors. To answer the research question, whether mobile payment is accepted in Germany, Finland, USA and Kenya, we can say that, to date, the readiness to accept mobile payment is balanced in Germany, the USA and Finland, while in Kenya mobile payment is already accepted. After Kenya, Finland shows the most acceptance towards mobile payment, followed by the USA and Germany. The biggest challenge for mobile payment is to add real

³⁷² Adam Brotman, in van Grove (2011).

value for customers who are not already covered in a better way by other payment forms. With all the current players in the mobile payment market, it will also be a big challenge to promote and communicate a clear and easy to use mobile payment system. Too many different mobile payment systems (process and technology-wise) increase the complexity of the topic “mobile payment” and can seriously endanger the acceptance among people.