Mobile Payment Approaches:

Industrialized Countries and Developing Countries

Diplomarbeit

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1 Introduction

Money! Money has always been a symbol of wealth, power, prosperity and success. This has been true centuries ago, and so it is now, but the form of money has substantially changed over time. When ancient people realized the inconvenience of bartering, they introduced commodity money such as gold or silver coins. The coins did not only appear to be a convenient medium of exchange but also served as an account unit and provided a possibility to store value. Commodity money has been the most popular payment method up to several hundred years ago until paper money was introduced. Paper money provided benefits over coins as it was much lighter and, thus, easier to transport. Later on, during the 20th century, checks became a popular payment method, followed by credit and debit cards that allowed faster and easier payments with a higher security. With the widespread of the Internet, electronic payment methods have begun to win customers' acceptance from the beginning of the 21st century on.[1] This short outline of payment methods development demonstrates that these methods undergo a permanent evolutionary process, and it becomes evident that the phases between introductions of new payment method are becoming shorter.

This diploma thesis deals with the most recent payment method known as the mobile payment, which is expected to become very popular in the near future. As suggested by its name, mobile payment relies on the use of mobile phones[2] for payments and transactions. Mobile payment has arisen from the wide adoption of mobile phones and its importance for the customer. Mobile phones have become constant companions of modern people in industrialized and developing countries. According to the International Telecommunication Union, every resident of a developed country possesses at least one mobile phone, while in developing countries more than 57% own one. As illustrated in figure 1, the diffusion of mobile phones was rapidly and constantly growing over the last decade in both industrialized and developing countries and reached 68.2% on a global level in 2009.[3]

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[1] Cf. Mishkin, F. S. (2009), pp. 57-59
[2] The terms mobile phone, smart phone, cellular phone, and cell phone in the context of this thesis are used interchangeably.
[3] Cf. ITU (2010)
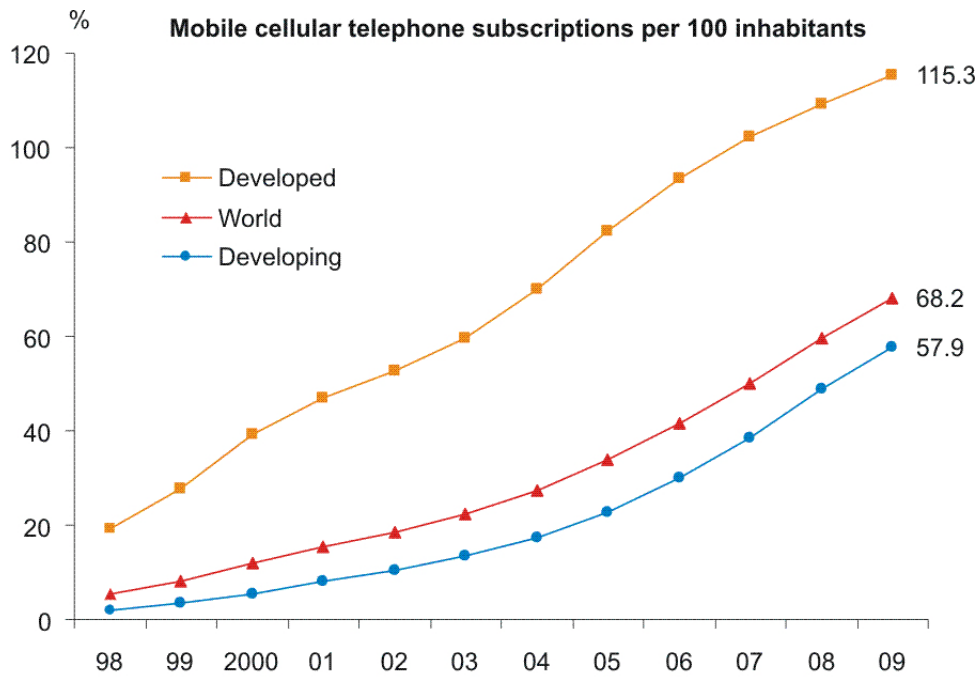
Figure 1: Mobile cellular telephone subscriptions per 100 inhabitants

Source: Adopted from ITU (2010)

Mobile phones are considered to be the most successful technological development in the world's history in terms of adoption of the service.

"With over 4 billion mobile devices on a global basis, the mobile phone is perhaps the most successful consumer device in history in terms of consumer access, penetration, and usage. The mobile phone offers new possibilities and opportunities for offering a wide range of services to consumers and businesses including mobile payments."[4]

Nowadays people use their cellular phones not only for voice calls and messaging, but also for a wide variety of other services such as picture, tone, and video sharing. This has become possible due to the massive technological progress and the continuous improvement of cellular phones. Moreover, a cell phone is perceived as a personal device since it contains personal information of its user. Many people identify their selves with their mobile phone as it provides a range of possibilities for personalization. A mobile phone is always within a person's reach and provides an anytime anywhere availability. A person seems to be more likely to forget his/her keys or wallet rather than a cell phone. Therefore, providing cellular phones with payment functionality comes naturally. In fact mobile payment has already become a reality – there were over 70 million users of that service in 2009, and this number is expected

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[4] Mobey Forum (2010), p. 5

to exceed 100 million users by the end of 2010, more than doubling the number of users since 2009.[5]

1.1 Objective of the diploma thesis

The objective of the present paper is to identify and analyze current approaches to mobile payment in industrialized and developing countries, with due consideration of the roles of the players involved in the value chain of mobile payment service. The analysis of the implemented business models and the economic conditions is the major focus of the thesis. Although governmental regulations of mobile payment services may have a substantial effect on the diffusion of the service, it is not within the scope of the current analysis. These regulations are, therefore, treated only marginally here, i.e. without a detail consideration of concrete regulations in a given country. A thorough description of the technologies is also not part of the current paper. The thesis deals only with mobile payment solutions available to the mass market and not limited to the users of a certain brand of a mobile phone (such as iPhone) or an operating system such (as Android, Windows Mobile, etc.).

The practical value of the thesis arises from two performed expert surveys. The first survey analyzes the relationships between financial institutions and mobile network operators in industrialized and developing countries and provides projections on future developments of those relations. The data set based on the opinions of 16 highly respected experts from 7 countries provides valuable and unique information for the involved players, especially mobile network operators and banks, and prepares them for future cooperation. The second survey deals with the assessment of economic conditions for the introduction of mobile payment in the Kyrgyz Republic and may be considered as a pre-feasibility study. 3 respondents representing Kyrgyzstan's mobile network operator, bank, and an independent expert participated in the survey.

1.2 Motivation

The choice of the topic for this thesis has been influenced by the interlacement of two factors. First of all, the information communication technology has always been in the scope of the author's interests, who has majored in information systems research with particular interests in electronic and mobile business/commerce. The lectures held by Prof. Dr. Michael H. Breitner and Dr. Nadine Hennigs inspired him to conduct a study on mobile payment services as a diploma thesis. The other motive for writing this thesis was the author's observation that

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[5] Cf. Gartner Research (2010a)

mobile payment services are gaining a special importance for developing countries. He himself was born and attained school education in the Kyrgyz Republic, a developing country. Despite the fact that the author grew up in a well-to-do family, he faced poverty and low living standards around him, especially in the rural areas. His childhood impressions had influenced his decision to also major in development economics. The author had a chance to participate in the development project *Vulnerability in South East Asia* financed by the German Research Foundation (DFG) and organized by the Leibniz University of Hannover, which took place in the rural areas of Vietnam in the spring of 2010. During the five weeks of field work he was travelling with a team of 6 local interviewers through a number of villages and surveyed poor farmers. During that time, the author could observe cellular phones in the areas where one would not have expected to see them. Consequently, the question arose if those cell phones when provided with mobile payment would be able to improve people's lives. This experience was another source of motivation for writing this thesis paper. There is confidence in the idea that development projects do contribute to the wealth improving of the poor and are, therefore, needed badly. In Kyrgyzstan, for instance, there is a large number of such projects and programs. Most of them, however, are focused on the agricultural sector because the poorest people live in rural areas and depend on agriculture. This development approach is reasonable and highly appreciated, however, the author believes that it must be combined with projects facilitating the spread of technology, one of which is definitely the mobile payment. It is his humble aspiration that this paper will contribute to the introduction of mobile payment in the Kyrgyz Republic and hence to the economic development of the country, in general.

1.3 Structure of the diploma thesis

This thesis is arranged into 8 chapters. **Chapter 1** introduces the topic, formulates the objective, illustrates the author's motivation and describes the structure of the current diploma thesis. **Chapter 2** provides definitions of some major terms relevant in the context of the thesis. Firstly, it concentrates on defining and distinguishing electronic and mobile business/commerce, secondly, it gives a definition of mobile payment in contrast to mobile banking. After the most common mobile payment technologies are briefly explained, the indicators for distinguishing of industrialized and developing countries are provided. **Chapter 3** is dedicated to the description of the process of mobile payment. It illustrates the benefits of the service and the players of the value chain of the service. Moreover, the chapter demonstrates possible application areas of the mobile payment according to the reference model by Poustt-

chi and classifies the service according to several indicators. Finally, two selected scenarios of the mobile payment reference model are described and explained. **Chapter 4** concentrates on the Near Field Communication technology, which is expected to revolutionize mobile payments. It describes an incentive by the GSM Association, illustrates its possible business models and presents an overview on implementation of the Near Field Communication technology in a retail environment. **Chapter 5** gives an outline of the mobile payment services that are currently available in seven selected countries. Ahead of the service description, a classification of countries according to the indicators introduced in chapter 2 is undertaken. The industrialized countries are represented by the following European countries: Germany, Austria, and Finland. Developing countries covered in this study are such African countries as Kenya and South Africa as well as the Asian countries of the Philippines and Kyrgyzstan. **Chapter 6** is devoted to the analysis of the services introduced in chapter 5 and gives an interpretation of the causes of different levels of service adoption. Moreover, it assesses the barriers to contactless mobile payments in developed countries, discusses the different mobile payment services in the developing countries and illustrates the risks of the service. **Chapter 7** provides the author's survey on two selected research questions that arose from the analysis performed in chapter 6. The author succeeded in surveying 19 reputable experts from 7 countries in order to shed light on the posed questions. There were two different surveys: one of which dealt with approaches to mobile payment on a global level, whereas the other concentrates on the conditions for the development of mobile payment in Kyrgyzstan. **Chapter 8** provides the author's conclusions and recommendations. It also gives his prospects to the future development of mobile payment.

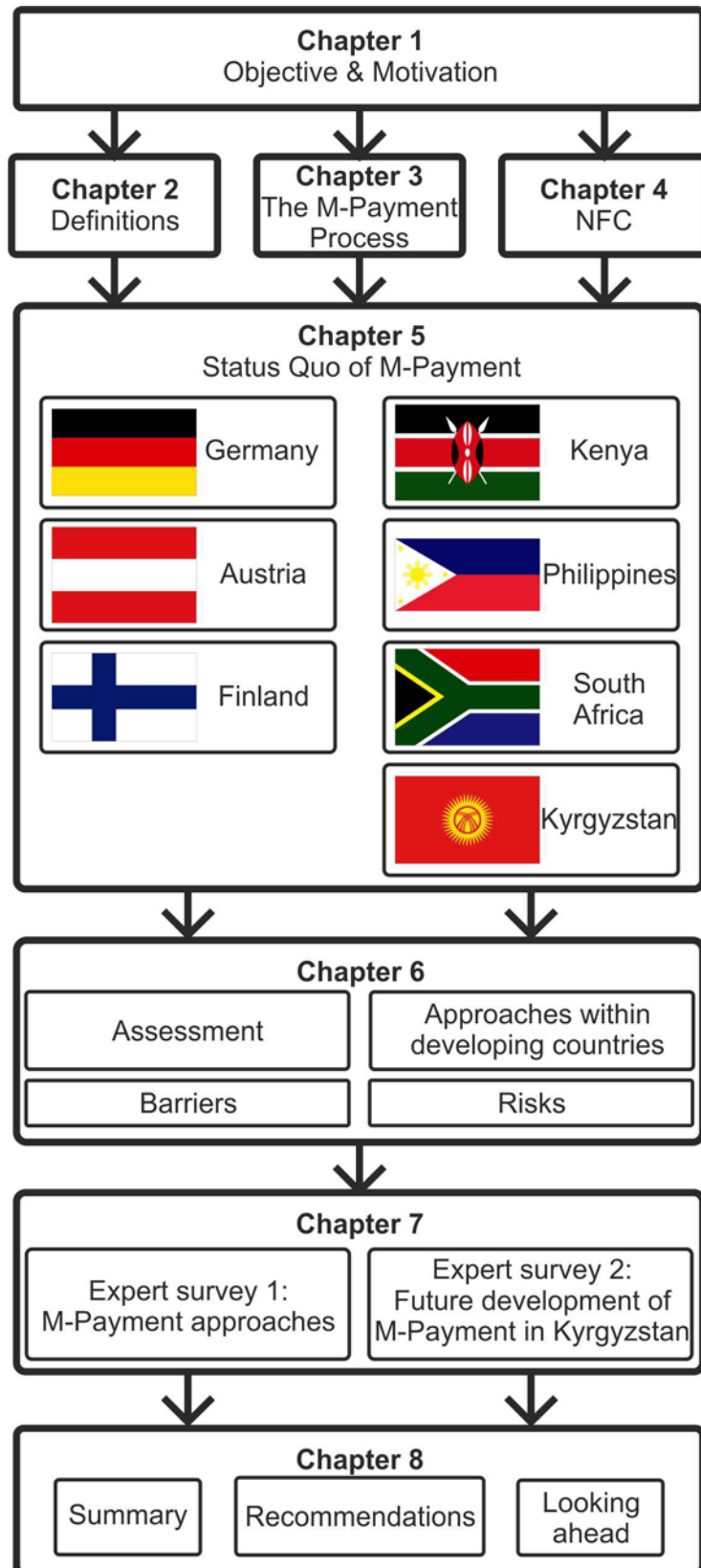Figure 2 illustrates the structure of the thesis graphically.

Figure 2: Structure of the thesis
Source: Own representation

bank account. Unfortunately, the experts did not recognize the need of cooperation between the banks and MNOs, moreover, Mr. Djumashev sees a possible rivalry between the two. The author is, however, confident that M-Payment is capable of creating benefits to all involved parties including banks and MNOs, but only if it is implemented in tide cooperation. Instead of protecting their market shares, Banks and MNOs should cooperate and provide financial services to the poor residents of rural areas, who are otherwise excluded from those. Mobile network operators could benefit from transaction fees on payments, while banks would increase their customer bases and have access to additional capital. Non-monetary benefits such as improved customers convenience and differentiation are also evident for both. The customer would, of course, benefit in the first way, as he/she would have a savings account, access to credit and possible an insurance service.

8 Conclusion

This chapter illustrates the main findings of the thesis, provides a brief summary, gives recommendations, and delivers an outlook.

The present thesis has identified and illustrated different approaches to mobile payment in industrialized and developing countries. A surprising finding of the thesis is that developing countries in fact are more sophisticated in terms of mobile payment than the developed ones. This results from a higher adoption and diffusion of M-Payment in developing countries. The reasons of higher adoption of the service in developing countries arise from the different levels of development of banking infrastructure, income conditions, technological sophistication, migration and remittances, as well as regulations.

Two other interesting findings of the thesis arise from the results of conducted expert surveys. The first expert survey provided different viewpoints on the future relationship of Banks and mobile network operators. Some experts predict a competition, while others expect cooperation. Although both viewpoints can be justified, the author is confident that the cooperation is beneficial for both parties. The banks can reach unbanked customers and hence increase their available capital and earn additional interests on distributed credits, while MNO can benefit from transaction fees and increased customers' loyalty. This is an important finding that should be considered by Banks and MNOs.

The second expert survey illustrated favorable conditions for the introduction of M-Payment services in Kyrgyzstan, particularly for mobile money transfers. This result is of high impor-

tance not only for national banks and operators, but also for the government and development agencies as well.

8.1 Summary

Chapter 1 of the present thesis states its objective, which is to identify and analyze approaches to mobile payment in industrialized and developing countries, concentrating on the roles and interactions of the involved value chain players and the business models.

Chapter 2 defines major terms in order to provide its clear understanding, as it is common for the terms used in this thesis to have ambiguous meanings. First, the chapter distinguishes between electronic business and electronic commerce, mobile business and mobile commerce, mobile banking and mobile payment. Then it briefly describes the most common technologies used for implementation of mobile payment, these are: SMS, USSD, Java application, and NFC. The chapter also introduces indicators for the classification of countries into either industrialized or developing. These indicators are per capita income, the Human Development Index (HDI), which measures not only monetary welfare, but also the states of health and knowledge and the Global Competitiveness Index, which considers factors included in HDI and additionally assesses the productivity of a country.

Chapter 3 describes the process of M-Payment. First, it enumerates the benefits of M-Payment, which are the high speed of transactions, high security, and anywhere/anytime feature. Then the functions and goals of the most important mobile payment value chain players are represented. The represented players are: mobile network operators, financial institutions, merchants, trusted service manager, suppliers, professional organizations and forums, and the customer. The application areas of M-Payment are represented according to the mobile payment reference model (MPRM) by Pousttchi. There are five application areas which describe purchases in mobile and electronic commerce, at a point of sale, at a vending machine, and between private persons. Next the chapter classifies M-Payment according to payment types: billing, m-enabling, and m-wallet and according to the payment value: micro and macro payments. The difference between remote and proximity payments is also demonstrated. Finally, the chapter illustrates and describes two scenarios of the MPRM. The scenario Stationary Merchant: Person is presented due to its large revenue potential, while scenario Person-to-Person is illustrated because of its importance in developing countries.

Chapter 4 presents the possibilities of Near Field Communication (NFC) technology for the M-Payment environment. On the one hand, the usability of technology, its additional benefits

and high potential are illustrated, on the other hand, this chapter points out limited supply of NFC enabled mobile phones. Interim solutions such as NFC stickers and NFC memory cards are presented as well, but the author expresses his doubts as for the considerable success of such solutions. The chapter discusses the initiative which promotes NFC M-Payment, the Pay-Buy-Mobile, and explains its four feasible business models. Finally, the implementation possibilities of NFC technology in retail environment are presented.

Chapter 5 describes the status quo of M-Payment in 3 industrialized (Germany, Austria, Finland) and 4 developing countries (Kenya, Philippines, South Africa, Kyrgyzstan). Each country is first assessed according to the indicators introduced in chapter 2. Then the chapter provides detailed description of M-Payment services currently available in the presented countries, while each service is analyzed according to the indicators represented in chapter 3. The German M-Payment market shows several providers of M-Payment, with each of them acting in a single application area. The most widespread M-Payment services appear to be mobile ticketing and mobile parking. Even though there are numerous trials of NFC payments in the country, the current adoption of M-Payment is considered as low. Austrian and Finnish markets demonstrate the presence of a dominant service provider, who enables M-Payments across all application areas. This situation favors the user convenience since only one single registration is required. As a consequence, the diffusion of M-Payment in Austria and Finland is substantially higher than in Germany. Interestingly, the highest adoption rates are observed in Kenya, Philippines, and South Africa. The most common application area of M-Payment in these countries is money remittances, however, other services such as purchase of airtime, at store payments, bill payments, and salary deposits are also available. In Kyrgyzstan, M-Payment services could not be identified in any application area other than mobile commerce.

Chapter 6 is the analytic part of the thesis. It demonstrates that M-Payment in industrialized countries is offered by mobile network operators and independent service providers, while the banks have a "wait-and-see" position. It also shows that Java applications and SMS are the most common ways of realization of M-Payment in the developed world, while developing countries show a preference towards the use of SMS and USSD. In chapter 6.1 the causes of different adoption levels of M-Payment in industrialized and developing countries are analyzed and discussed. It is concluded that there are five factors influencing it. The first factor is the fact that industrialized countries have a well established banking infrastructure, while this infrastructure in developing countries proves to be underdeveloped. Hence, in industrialized countries M-Payment has to compete with already established ways of non-cash payments

trusted by the customer, whereas in developing countries M-Payment possibly presents the only opportunity of non-cash payments. The second cause is the substantial difference in income levels. Low incomes of the developing countries' residents result in a higher price sensitivity and lead to the constant search for more cost-effective ways of spending and payment methods. M-Payment provides an inexpensive alternative to cash payments because it does not create travelling costs and because it is substantially cheaper than any traditional banking services. The level of technological sophistication is the third reason for different adoption levels. While high mobile phone penetration is the prerequisite for any M-Payment services, high Internet penetration is rather a hindering factor, providing the possibilities of Internet banking and hence substituting M-Payment. The fourth cause is seen in high migration and dependence of the residents in rural areas of the developing countries on remittances. M-Payment benefits from the high level of migration and the related remittances as it offers a convenient way for money transfers on the national as well as international levels. The last but not least cause is the stricter regulations of M-Payment by the governments of industrialized countries. Additionally, the chapter demonstrates the presence of favorable conditions for M-Payment services in the Kyrgyz Republic. Chapter 6.2 analyzes the barriers to the diffusion of NFC M-Payment in the industrialized countries. On the demand-side of the market, three barriers are identified. The first barrier is the already mentioned existing payment infrastructure, the second one is the high costs of NFC, and the third one is the network effect of M-Payment, i.e. the utility of each single user depends on the number of users of the service. On the supply-side there are four barriers: the need for standardization and coordination, the public good nature of standards, the lack of established business models, and the lack of clear regulation. Chapter 6.3 compares the business models and the service conditions of the M-Payment services offered in Kenya, Philippines, and South Africa. It identifies two approaches common to M-Payment in developing countries. The approaches differ according to the role of the mobile payment service provider, which is implemented either by a MNO or a bank. The MNO-centric business models provide their customers with a virtual money account (m-wallet), while Bank-centric business models acquire a real bank account to the customer. Although each of the approaches has its advantages and disadvantages, both do improve their customers' living conditions because they increase security, help to save time, and make people more independent. Chapter 6.4 provides the risks associated with M-Payment in the narrower sense, i.e. the personal risks anticipated by the user, and in the broader sense, i.e. the risks of money laundering and terrorist financing.

Chapter 7 provides the author's own primary research on two different research questions in the form of expert surveys. The first research question arises from the different approaches to M-Payment identified in chapters 5 and 6 of this thesis paper, with a due consideration of the actor implementing the role of a mobile payment service provider. Chapter 7.1 analyzes the relationships between financial institutions, namely banks, and mobile network operators by means of an expert survey. The goal of the survey is at first to assess the current relations and to predict their future development. Additionally, the survey analyzes the impact of M-Payment on the economical development of a country and provides prospects for the future adoption of M-Payment. Sixteen experts from seven countries participated in the survey and expressed their opinions on the formulated research question. Even though the experts have heterogeneous viewpoints on the questions raised, it becomes manifest in the analysis that MNOs will play a more comprehensive role in developing countries than in industrialized ones, where financial institutions will continue to have strong positions in the payment infrastructure. None of the experts expects the banks to disappear in the future; however, experts are confident that the roles and the tasks of the banks will evolve in the future. Some experts predict a competition between the banks and MNOs, but the majority believes in strong cooperation between the two in the future. The risk of a MNO becoming a monopolist is considered as low, as long as there is a market economy in the country. Experts have an unanimous view concerning the impact of M-Payment on the economic development of a country; the latter can promote the development through financial inclusion of the poor. The majority of the experts predict M-Payment to play an important role in the future. Nevertheless, alternative payment methods such as iris scan and finger payment have been mentioned as well. Chapter 7.2 represents the second expert survey which arises from the favorable conditions for the introduction of M-Payment in Kyrgyzstan as observed in chapter 6.1. The survey finds out that the experts' opinions are consistent with that of the author; hence there is indeed fruitful ground for the introduction of M-Payment services in Kyrgyzstan. However, the experts do not predict a cooperation of banks and MNOs for the implementation of this service, they expect rather a competition, which is disappointing since only tide cooperation is capable to substantially improve the living conditions of the poor through financial inclusion, microcredits and possible insurance services.

8.2 Recommendations

This chapter delivers subjective recommendations which are based on the presented analysis and on the results of expert surveys conducted in this thesis. In order to provide the recommendations, it is essential to distinguish between industrialized and developing countries.

In **industrialized countries** M-Payment will takeoff only if it provides substantial additional benefits compared to other cash-less payment methods. These benefits are expected to be introduced by the NFC technology. Hence, MNOs, financial institutions, merchants, and suppliers should concentrate their attention on NFC. It is important to continue investing in this technology and implementing trials and pilot projects, but much more important is to expand the cooperation network and establish collaboration business models, where all involved parties can benefit. Interoperability should be the main goal of the cooperation, as NFC M-Payment will succeed only if it will be supported by all MNOs, and accepted by all merchants. This is the point where the standard setting organizations are needed. Banks should become more active, they should realize the potential behind NFC and search ways for cooperation with MNOs without any fears of competition. Also the merchants should be aware of the new technology, when renewing their cash registers they should make sure that new POS terminals are compatible with the NFC technology.

The **developing countries** do not need to wait for the NCF technology to takeoff; they may benefit from the M-Payment already today. M-Payment can be used for the financial inclusion of the unbanked people, who otherwise would not have a possibility to open a savings account, apply for a credit or purchase an insurance. This can be realized, however, only by tide cooperation of MNOs and financial institutions. The developing organizations such as the United Nations Organization, the World Bank, the Asian Development Bank etc. should promote this cooperation since not all players are aware of the benefits of such cooperation to date. Last but not least, the national governments of developing countries should promote M-Payment and adjust the regulations when needed.

As for the **Kyrgyz Republic**, the author recommends introducing M-Payment service, especially the mobile money transfer service. As there are not only positive economic conditions but also a huge unmet demand for such services. Ideally, such service should be interoperable, i.e. supported by all the national MNOs. Therefore government intervention could be essential, it could be conducted with the assistance of foreign investors and developing agencies. Nevertheless M-Payment is not supposed to be an aid project, it is much more an investment which will repay and generate profit for the involved parties. The next steps for the introduc-

tion of M-Payment in Kyrgyzstan should be a representative survey of potential users, in order to find out how the money is currently transferred and what conditions are important for the user to send/receive remittances via mobile phone. The regulatory framework should be assessed and adjusted when needed. Vertical and horizontal cooperation should be promoted in order to illustrate that M-Payment is a welfare gain for all.

8.3 Looking ahead – just a simple day in 2020

"Prediction is very difficult, especially if it's about the future."[286]

Nils Bohr, Nobel laureate in Physics

"The best way to predict the future is to invent it."[287]

Alan Curtis Kay, Futurologist

The last chapter of the thesis provides the author's perspectives on the future development of mobile payment and its impact on people's lives. This chapter describes just a simple day of a person living in 2020 according to author's imagination, which is based on the illustrated technologies.

"Hello people and welcome to the future! My name is Mike, today is my birthday, the 12th July of 2020. I have to organize a party and you will follow me the whole day along. Are you with me?

Today I woke up a bit later because I set an alarm clock on my vSmart phone for 9 am. Usually the vSmart phone wakes me up at 7:30 am, and it is impossible to oversleep, because the vSmart phone is connected to all the home appliances and it will do anything to wake me up. For example, it will turn on the light or a radio station; it can even turn on my air-conditioner, as it knows that I hate cold. In order to turn the alarm clock off, the vSmart phone demands me to do a new thing every day. Today, for example, I had to solve a simple sudoku; yesterday I had to sing my favorite song, the vSmart phone is very creative and therefore it is completely impossible to oversleep. But if I become sick and will not be able to do the required actions to turn the alarm clock off, the vSmart phone will recognize that, as it constantly receives information such as blood pressure or body temperature from the censors integrated in my bed. In the case of the critical body temperature, for example, the vSmart phone will call a doctor instead of asking me to do some silly things. As you can see, my

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[286] Cited in: Vishwanath, S. R. (2009), p. 497
[287] Cited in: Sherron, G. T., Boettcher, J. V. (1997), p. 14

vSmart phone is a very helpful device, by the way "vSmart phone" stands for very smart phone. In 2020 we do not have those bulky computers or notebooks anymore; all we need is a vSmart phone. The vSmart phone is used as communicational device not only by people, but also for coordination of electronic devices. In 2020 all technical devices are smart devices, which means that they can communicate through wireless networks and therefore make peoples' life more comfortable and safer. We will see how it works, as we proceed through the day.

It is breakfast time. While I was taking a shower, the coffee machine has done its job, and the toasts are crispy already. The display of my fridge suggests me different balanced meals; it also tells me that I have to buy some milk, eggs and orange juice. This information is automatically saved on the vSmart phone, which will remind me to buy the food.

Before we go out, I want to make sure that I look appropriate. My smart wardrobe will help me with it as it receives the information of my datebook and weather forecast from the vSmart phone and suggests me proper clothes, which are virtually displayed in the mirror. Today I will put on my blue jeans and my favorite t-shirt. I guess I should buy a new t-shirt because this one looks a bit old. My vSmart phone will help me to find another one. It suggests that we should go to the central shopping mall, there is a new arrival of t-shirts from the brand that I like and there is also a 20% discount for birthday boys. Of course, it is possible to choose and pay for a t-shirt by my vSmart phone without visiting the store, but today I have some free time, so let us go to the shopping mall. Would you mind if we go by bus? This is my favorite type of transportation, and the shopping center is only three stations away. My monthly bus ticket is saved on my vSmart, hence when entering the bus I just have to wave the phone against a special terminal. I will pay for your ticket by selecting an additional single travel ticket on the touch screen of my vSmart and by waving it against the terminal another time.

My customer profile for the shopping mall is saved on my vSmart phone; therefore the shopping center knows what kind of goods I usually buy and what is on my wish list. It also knows my sizes and offers me only those clothes which are available straightaway because it knows that I don't like to wait. As we enter the shopping mall, it welcomes me and suggests a list of clothes which I should have a look at. I trust the system because I have great experience with it. The suggestions are saved on my vSmart, which will navigate me through this huge shopping center. The suggested t-shirt actually looks very good, but I'm not sure if it will look good with my black jeans. My vSmart, helps me one more time. It downloads the image of the jeans from my smart wardrobe which are then virtually displayed in the store's mirror. I am

going to buy the t-shirt; in order to do that, I just have to shortly locate vSmart on a PayPad and confirm with my fingerprint. In the future, we do not have those plastic credit and debit cards any more, and you can hardly find any cash. The vSmart phone payment or as you called it in 2010 the mobile payment has substituted all other methods because it is much faster, safer and more convenient than any other approach. I believe you should know that my ID card and my keys are also saved on the vSmart. So, on leaving home I only need to have one thing with me – the vSmart phone.

As we follow the route through the shopping center, I can see a billboard announcing a concert of my favorite band "iCe giRls". I use my vSmart to establish a connection with the poster in order to get more detailed information about the concert, watch a demo of the new music video, and to buy the tickets.

Oh, look, I have automatically received a coupon from the Restaurant "Jasmine", which is only few meters away. I guess we should go in.

The lunch was good, now we have to buy some beer and some chips for my birthday party, so let's go to the supermarket. When I am taking a shopping cart, the vSmart reminds me of buying some milk, eggs and orange juice. The vSmart also helps me to find the products in the supermarket. Good that I do not have to put all the products on the conveyor belt, I just proceed through a scanner portal, which recognizes the purchased products, unique ID of my vSmart and charges my bank account automatically.

I am calling a taxi because it is hard to carry so much beer. Actually I need not call – I just need to press a button on my vSmart phone and the taxi company automatically sends a car because it can recognize my position. The driver calls me when he arrives. On the way home, I want to download some new songs for the party and for the disco club where we will go afterwards. Nowadays we don't pay any entrance fee for a disco club. Instead, we create a playlist with songs which we like; this playlist is then automatically sent to the DJ, who chooses music according to the wishes of the current visitors. For each song from the customers' playlist played, the visitor is charged a small amount. This ensures that people who like the music pay more, and those who dislike don't pay at all.

Well, we are there, and my friends are about to come in a minute. I would like to thank you for your company; I hope you enjoyed the future. It is time for you to travel back to the past."[288]

The described possibilities may seem to be incredible, but the most incredible feature of such technologies is that the majority of them are technically feasible in 2010. However people will have to wait 10 to 20 years until these technologies find a regular place in the everyday's life.

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[288] Inspired by the lectures of Prof. Dr. Michael H. Breitner and Dr. Nadine Hennigs.