ACCEPTANCE AND DEVELOPMENT OF MOBILE PAYMENTS

THE IMPORTANCE OF VALUE NETWORKS AND VALUE ADDED SERVICES

STEFAN ASCHERL
Title:

ACCEPTANCE AND DEVELOPMENT OF MOBILE PAYMENTS
The importance of value networks and value added services

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ABSTRACT

Many new mobile payments services have launched especially within Europe since 2012. Mass adaption of those new ways of payment is still far away though. Former research papers focused already on business models in forms of value networks to increase success and popularity of such services. However, the highly fragmented markets concerning consumer behaviour and the technological conditions were very often neglected. Therefore the thesis is directed to mobile payment services to improve their current service offering as well as potential partners in a possible value network.

To highlight the importance of human behaviour in regards to consumer needs, a six months research period has been undertaken during and before the launch of a mobile payment service. The key outcomes of that research have been aligned with available literature on this field, to draw conclusions on how to shape and further extend a mobile payment service.

As a final result, mobile payment services have to follow two strategies. First they have to maintain their flexibility by adjusting their service to different consumer needs and offering value added services. Second, by forming alliances in forms of value networks, as partnerships with long-established companies like banks, they will contribute to further popularity and further growth of mobile payment services. Due to the complexity of the subject, a list of further research can be found at the end for more investigations related to the latest topics influencing mobile payments.
ACKNOWLEDGEMENTS

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Second last, a big thank you to my friend Alexandra. She always sent some motivation during the writing process by E-Mails and text messages to get the work done, which should not always be taken for granted from a student perspective …

At the very end, I want to dedicate this paper to my father who died unexpectedly right before I started my master education at KTH. Unfortunately he will not see me graduating anymore, but as he always said – “the main thing is to make it”. Done.
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ABBREVIATIONS

The following list includes some abbreviations, for an easier understanding when reading the paper. Simple word abbreviations as for instance mobile payment (m-payment) are introduced during the main text.

**API (Application programming interface)**
An electronic interface to connect different applications with each other (e.g. an online/Internet store can be connected with a payment interface to handle the transaction)

**EMV (Europay, MasterCard, VISA)**
In contrast to the magnetic strip on a payment card, EMV stands for the technical capability of reading the chip (e.g. by ATMs), which is safer as the magnetic strip.

**Android, iOS, RIM, Windows mobile**
Those are the names of software, which is installed on mobile devices, depending on the manufacturer of the mobile device (further explanation in the paper).)

**KYC (Know Your Customer)**
This is the name for a process that identifies the user before he or she can register for a financial service

**MNO (Mobile network operator)**
Those are telecommunication companies (e.g. Telekom, Orange, Vodafone)

**NFC (Near field communication)**
Near field communication, used to connect different devices wireless on a short distance to exchange data, e.g. to conduct a payment from a mobile device to a terminal. Similar to Bluetooth, however the distance counts only centimetres for NFC.

**PIN (Personal identification number)**
The most important number for individuals to confirm their identity (e.g. at ATMs); this number is the key opener to get access to personal details for credit cards.

**POS (Point Of Sale)**
A description for the place where an action takes place, (e.g. in a store)

**P2P (Person to Person)**
A description of an action (e.g. a purchase) that takes place between two individuals and not between a business owner and an individual

**QR-Code (Quick Response Code)**
Those are square dots on a white background that can hide information, which a consumer can access by capturing this square with its Internet capable mobile device and the information becomes visible.

**TAN (Transaction authentication number)**
Those are numbers, used for online banking for instance, to confirm a transaction. For every transaction the user needs a new unique number (TAN).
INTRODUCTION

Background

A mobile payment (m-payment) service can simplify trading business for companies and private persons, too. Many of such services are especially present in the United States, but also in Europe launched dozen of such services during the year 2012. The overall aim is to democratise m-payments respectively cashless payments and enabling everyone to process this new way of transactions for exchanging money, services and goods.

In the beginning of this thesis, the aim was to design a global, unique payment service. However, soon the situation made obvious that this approach will not work. This is because used technologies are different within different countries, and upcoming services try different concepts and approaches to gain most customers for their distinct offering. This development makes it difficult to spread one unique service across different territories, as it will be further explained below.

Problem

An m-payment provider depends on different administrative bodies and regulators. Even though the EU is a union, requirements for operating as a financial service differ within the countries, for instance regarding the customer registration process. M-payment services have to get adjusted to the present situation of the territory where they operate, especially regarding available technological infrastructure and social behaviours as well as the needs of the people settled there. Therefore several opportunities for an m-payment service are feasible.

In developed countries is m-payment already possible. Although not in the most convenient way and mainly needed to process cashless payments for selling goods and services. In undeveloped countries, m-payments are not available or only to a low degree, but mainly needed for person-to-person (P2P) transfers, not necessarily for selling goods or services. This example describes one problem to be considered when launching an m-payment service.

Objective and purpose

The objective for this thesis is from the perspective of an m-payment service provider based on the different demands of its forthcoming consumer. The purpose of the thesis is first of all to modify, innovate and increase the efficiency and working procedure of m-payment services. Second, it is to expand their future offerings to consumers by partnerships in forms of a value network.

Available research on this subject has been most often focused on step c (constructing value networks) where as step b (official launch of the service) has not been taken yet. Metaphorically speaking, builders and architects discuss the interior design of a house, however the house has not even been built yet, nor has been decided where the house would be built and who is going to live in there. This is similar with the present situation of m-payments; many of them were still in the fledging stages before 2012. By now we can look back to how several services
developed, how such services succeeded and failed as well as the needs to redefine the future of m-payments.

Research question

Two research questions are the focus of the thesis:
RQ1: How has an m-payment service adjust and develop its current service offerings?
RQ2: Who are advantageous partners in an eco-network of m-payments to capture and dominate the market?

Delimitation

As there are many different m-payment systems operating, my biggest focus is on POS m-payment services. Excluded are pure E-commerce services (e.g. eBay, Amazon), even though those belong to some extent to m-payments, too. Barcode and QR-Code services will be mentioned, but will not become a major part in this research. Instead the main part will concentrate on payments, processed mainly with cards that can be inserted in an adapter attached to a common mobile device. SMS and NFC payments will be discussed, too. As mobile devices are needed for m-payments, hardware devices driven by android and iOS will be explained, but all other kinds of mobile platforms, such as windows mobile and blackberry, are excluded.
The paper will not define a worldwide-standardized way of m-payment. Instead the thesis will show how to exploit the most recent changes in technology to extend new possibilities for processing and integrating m-payments with other services. The thesis will neither make predictions about economics regarding transaction volumes, as there are many different numbers circulating. All such statistics present different figures, however all statistics agree that there will be a huge increase regarding the transaction volume for m-payments over the next couple of years.

Thesis outline

The thesis is structured into three chapters: the theoretical framework, the investigation approach (methodology) and the discussion with the final conclusion and further research recommendation in the end.
The first part of the theoretical framework defines the subject m-payments and explains the potential of mobile devices. Thereafter, the focus is on developed and undeveloped markets as well as social behaviour. Subsequently different technologies and methods on how m-payments can be conducted are discussed. Two case studies of failed approaches are specified before the final part of suggested value networks will be presented.
The investigation approach is split in two parts, the results of the research and the discussion of those. The results are summarized in tables and briefly described. The following discussion elaborates such results and their consequences.
The discussion matches the two former chapters with each other. The new findings complement the literature outcomes and both research questions will be answered. A special focus is on suggestions for value added services and the roles of different
players within the value network. The conclusion summarizes the key findings including an outlook for the development of m-payment services. Due to the difficulty of delimiting and the fast development of m-payments, the additional page of further research will point out interesting fields for the future that will be worth looking at. The appendix part includes all investigation results in detail, which were clustered and summarized for the main text. Further, additional very small interviews were conducted in regards to questions that came up during the evaluation of the actual investigation. However, those are just briefly listed due to the adhocracy way in which they were carried out; there are no names of interviewed persons stated, due to missing publication rights.

Research approach

The research approach for this paper is split in two parts. First, on the theoretical framework, which is solely based on the literature review. Second, on a mixed methodology approach that was conducted over six months (June-November) in 2012. The mixed method is roughly divided in 80% quantitative and 20% qualitative way. In the beginning of the writing process there was no qualitative research intended; however, to gain further insights regarding some specific issues more details were necessary for profound knowledge.

Theoretical Framework

While researching value networks for m-payments, articles and journals provided only future predictions. However, just a very few m-payment services in Europe had launched at that time, meaning that existing research was heavily based on theories without applied relevance. This situation has changed since summer 2012 when four POS m-payment companies started their service in Germany and extended successively to further countries across Europe. As territories offer different opportunities, the first part in the literature review will show an overview of differences between developed and undeveloped countries. This is necessary to see if m-payment concepts can simply copied from one country into another. After this the paper will concentrate on social behaviour at different places, different cultures and different people. Followed by the different technologies available for m-payments. Two case studies about well-known companies pointing out failed m-payments approaches. The last point to be covered discusses propositions for value networks. Different roles of partners are explained and the possible interplay between those is shown. Most of the selected sources are not older than the year 2010. The majority of sources can be found on scientific journals, which can be downloaded from different library networks. However, due to the actuality of the topic and the time needed until research gets published, well-respected magazines as well as renowned news publishers were considered.

Mixed methodology approach

The quantitative part was conducted before and during the German market launch of the Swedish m-payment provider iZettle in 2012. The first half was necessary for a
market analysis by running a testing phase and to reflect on the findings from the previous theoretical part. The second half was spent on customer support to see which problems are still present after the service officially launched. Referring to the first part, close to 200 merchants were contacted to test the service. Results and explanations for the motivation of those people will be given. Regarding the second part, customer support was conducted via E-mail on a basis of around 50 E-Mails per day. That time contributed to gain further feedback for highlighting problems occurring during the common processes (e.g. customer registrations). All quantitative research that was conducted is solely based on the German market. However, conclusions and arguments from the results can be drawn- at least for the European market- due to similar situations among those countries.

Combination of the research methods

The aim of the combination between the theoretical and methodological part is to draw conclusions about the different requirements which m-payment has to face to expand on a global perspective. Difficulties have to be solved to consolidate in one country first before to move on into further countries. In other words, m-payment companies have to reshape and adjust their own service as well as finding possibilities via partnerships on motivating as many customers as possible to use their service.
THEORETICAL FRAMEWORK

Mobile payment – a definition

The definition of m-payment is very ambiguous. Zhou (2011, p.290) sets as a first characteristic for m-payments “that users adopt mobile terminals to conduct payment at anytime from anywhere”. Then, mobile terminals are described as mobile devices “such as mobile phones, PDAs and Tablets” (Amidian et al., 2010, p.376). The payment itself “is the process of two parties exchanging financial value using mobile device in return for goods and services” (Makkad et al., 2012, p.10). According to the scope of this thesis, I will also add the mobile sending of money without an exchange for goods or services to the definition of m-payments. Eventually, the m-payment process is split up into two main categories, named “proximity-based” and remote or respectively “remote-triggered” (Chuah et al., 2010, p.356). Examples for both payments can be found at table 1 (p.14).

Remote payment

Remote payment is defined for users that ‘need to connect to remote payment servers in order to conduct payment’ (Zhou, 2012, p.1086). Remote mobile payments enable purchases of online offerings as for instance news articles, ring tones and location-dependent services as public transport tickets (Mallat et al., 2004, p.43). This way of payment is simple to manipulate because signature or PIN is often not needed (Bingel and Massoth, 2009, p.2). Credit card details or stolen mobile phones are already enough to process a transaction. Databases storing the needed information to authorize transactions are therefore of high risk to be misused.

Proximity payment

Proximity payment is defined for users that ‘conduct a payment via their mobile phones on the spot’, so to say at the POS (Zhou, 2012, p.1086). Proximity payments can be for instance processed by support with NFC technology, barcodes or dongles that are attached to a mobile device to insert a payment card. E-commerce is excluded from proximity payments. Proximity payment is said to be safer than remote payment, because the buyer has to be physically present at the time when the payment takes place (Bingel and Massoth, 2009, p.2). This enables the seller to identify the buyer by checking the ID-card for instance.

Twitter co-founder Jack Dorsey has already ventured into m-payments with his start-up named Square that enables people to accept credit cards with their mobile device.

Mobile devices - potential, progress and prospects

The use of mobile devices has been increased over the last couple of years. Since 2007, the percentage of smartphone users worldwide has topped 20% and the usage itself had an ‘average of 108% annual growth’, which shows that users do not only want to possess their devices, but also use and merge from laptop and desktop units
to mobile devices (Markos et al., 2012, p.226). This gives especially smartphones the best opportunity to serve as a ‘fully-enabled digital wallet’ (Crowe et al., 2010, p.35). Very recent rumors reported about a high-tech version of the traditional arm watch as a new Apple product. Pebble, another IT-company, already offers their model of an online connected watch for pre-order worth 150US$ (Etherington and Velazco, 2013). Such a device could become convenient, too, regarding m-payment, as they are only a fraction compared to the size of smart phones and tablets. The same is for the Google glasses, which will also belong to the future of mobile devices.

Opportunities

Gibbs (2012) and Brian (2010) defined in their research lists of items and behaviour that shows how much influence a smartphone already has on our daily life. Car keys, USB-sticks, cash, cards – some even take their mobile phones to bed, which shows the intimacy people share with such devices compared to a traditional watch for instance that most people take off before sleeping. However not only the private use of smartphones will increase. Researchers assume that swiping mobile phones over a responding reader (i.e. contactless payment) could replace cash and credit cards in stores ‘within the next decade’ (Murphy, 2012, p.1). There is an obvious movement towards a strong convergence of always increasing different daily used instruments and tools into a single mobile device. Such devices include not only smartphones or tablets, but also iPods, PDAs and other devices that are portable and at best - not always necessarily though - be connected to the Internet.

Limitations

North Americans exploit the opportunities of mobile devices much more than other developed countries. They use apps to search for special offers in store, finding their ways in unfamiliar cities, track their fitness or manage their finances (Gibbs, 2012, p.2). This shows the impact of mobile devices for a very huge nation, providing a giant market to be explored. However as we will see later on, differences regarding the technological level and standards between countries and especially continents are tremendous. Not everywhere can the latest achievements for mobile devices be used due to restrictions and limitations in the infrastructure, e.g. bandwidth, which is essential to exploit all possibilities of a mobile device anytime and anywhere. On one hand people carry the Internet with their smart phone in their trouser pockets, on the other hand, there are places where an online connection is not available at all. Even if online coverage is offered a corresponding handset will still be needed.

Replacement cycle

Mobile handsets are limited in their capabilities. Operating systems and accompanying software running on mobile devices can only be updated up to a certain standard (Mostafa, 2011, p.1). However, contracts by MNOs ‘including handset subsidies and early termination fees that are used to protect the operator’s investment are accelerating the handset replacement cycle rather than inhibiting it’
In other words, dropping prices of handsets help to increase their replacement, which automatically gives consumers faster access to newer models and encourages companies to exploit the benefits of new devices. Via apps different user data can be stored and analysed, to personalize and customize the user experience. GPS location tracking services have been available on mobile devices for only a few years. As television and related hardware have already implemented IP functionality and wireless technologies, we can expect that more apps being made available to mimic devices’ such as remote controls for instance (Brian, 2010, p.2). Lights and heating are items that are already possible to be controlled by a mobile device. Such progress always opens up new opportunities for developers and manufacturers. The success of mobile has not only encouraged organizations to continue investing in technology, but also convinced them to hire more employees with mobile skills to build on existing programs for finding new ways to engage and inspire connected consumers (Oracle, 2012). This exploration certainly has a positive effect on m-payment by increasing its popularity and acceptance, too.

Data protection

On the contrary side, not all owners and users of mobile devices are great supporters of the technological progress. Manipulation and hacker attacks are present and simultaneously raising with the number of mobile devices and respectively the software installed on them. In fact, according to Intel, ‘cyberattacks on mobile phones rose by a factor of six’ in 2012 (Goldman, 2012, p.1). ‘I'm happy to buy my $2 Starbucks using my Android but I don't know that we will ever feel secure enough to make much larger purchases that way’ was a user comment on an article about m-payments replacing cash and credit cards by 2020 (Murphy, 2012). However, in another similar article about replacing different items of daily life with the mobile phone (Brian, 2010), users commented that they want their iPhone to store their life because it will ‘make things easier and less bulky’. Another posting on the same article, however, concludes if the phone is lost then life is lost. Data protection is a very controversial issue to define how much data gathering should be allowed and especially being forwarded to third parties. This discussion is also highly dependent on territories, cultures and governments there, which we will look into later on.

Summary

In this chapter the definition and the needed hardware of m-payments was explained. M-payments are divided in proximity and remote payments (s. table 1 below); where as different requirements apply for using and corresponding to such methods. M-payments are conducted with mobile devices. Such devices offer many opportunities to get personal and close access to the people using them. However limitations are given due to different progress of technology and current models in use that need to be replaced successively. Also data protection is a controversial subject where a broader consensus across the country boarders still has to be found.
Table 1: Examples for remote and proximity payments

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<td>Bars and restaurants</td>
</tr>
<tr>
<td>Send money to others</td>
<td>Vending machines</td>
</tr>
<tr>
<td>Pay bills</td>
<td>Taxi rides</td>
</tr>
<tr>
<td>Purchase airtime</td>
<td>In store payments</td>
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</table>

 Territories - developed and undeveloped markets

Tom Standage (2011) describes in his experiences that using a mobile phone in Nairobi to pay for a taxi is a lot easier than in New York. The reason for this is both cities belong to large countries that provide a totally different technological infrastructure to serve different needs of consumers that have different mobile devices in use. This brings us to a variety of platforms applicable for m-payments to choose from that makes the right choice of an appropriate platform for specific applications a challenging task (Amidian et al., 2010, p.376). In the following I will focus on developed and undeveloped markets as well as on the social cultures and behaviours within those markets.

Economics

One of the biggest differences between developed and undeveloped countries is the economical situation. By some estimates, more of the 475 million adults in sub-Saharan Africa ‘earning less than $10 a day’, are unbanked, which adds up to ‘$59 billion in new deposits’ (Heinrich, 2012, p.1). Due to the bank failure of approaching them, those people discovered the advantages of mobile banking for sending money by cell phones instead of bank branches (Heinrich, 2012).

The question has to be asked why do banks not get hold of that enormous amount? Answer: Simply because the high number of small amount transactions of the people are not worth the operation costs of building and running a decent physical infrastructure of bank branches across the country. Later, case studies will show where projects to harvest those deposits failed.

In Kenya, almost every fifth household depends ‘on remittances as their primary income source’ (Mas and Radcliffe, 2011, p.173). Younger family generations often have to support older generations with financial aid, independent from the geographical situation, which can cause travel distances of 1000km and more. The challenge to fit the needs for those people is as simple as to transfer money from point A to point B as cheap and fast as possible.

Mobile phone penetration

The economical situation makes everyone think that first of all people in undeveloped countries need water, food and sanitation. However, seen from a global perspective, ‘more people have access to a mobile phone than to a decent toilet or running water’ (Gibbs, 2012, p.1). Statistics show that four out of five people possessed a mobile phone in the developing world in 2011 (Acharya and Kshetri, 2012, p.9). Therefore,
despite the unhealthy economical situation, the people are keen for mobile devices even though they do not function everywhere, due to leaking coverage of technological infrastructure. Estimates show that by 2015, in sub-Saharan Africa, more people will have mobile phones than access to electricity. This increase turns such undeveloped markets into an enormous population of mobile subscribers, as MNOs are handling m-payment services there (Acharya and Kshetri, 2012, p.9). As a next step, ‘the introduction of third generation (3G) communication technologies will trigger mobile Internet development’ (Zhou, 2011, p.290), which offers additional possibilities for such territories.

Banked and unbanked people

As person-to-person transactions (P2P) are very important for unbanked people, m-payment service have to find ways to settle such transactions and not only selling goods. Acharya and Kshetri (2012, p.9) defined a short list of the drivers for m-payment services to fit the unbanked people in developing countries: First on this list is the existing lack of an alternative to cash. Especially transferring the money is not only time consuming, due to poorly developed transport systems, but also expensive in terms of cash couriers or money transfer services like Western Union. Second, places with higher crime rates bring the risk of being robbed and suffering from personal harm, a security reason so to say. Last, waiting in line at the bank office can take hours, also because branches are rare and not available everywhere. A comparison by Mas and Radcliffe (2011, p.174) shows that Kenya’s biggest m-payment service M-Pesa, which I will focus on later, offers 28.000 cash-in/cash-out outlets, where as the bank branch infrastructure consists only of 840 branches - merely 3% in comparison. Nevertheless, not only unbanked people live in undeveloped countries. Banked people are a good point to start with when introducing an m-payment service, because that group is already acquainted with banking. Later, if services become more popular on the market, unbanked users will likely need to drive the service expansion, which is one reason why Africa, with its high population of unbanked people, is seen as a market with a huge potential for mobile money deployments (Mas and Radcliffe, 2011, p.174).

Social behaviour

The understanding of the consumer’s perceptions and expectations of m-payments is according to Chuah and Lai (2010, p.358) a ‘pre-requisite’ for designing a successful solution. Adreev et al. (2012, p.239) came to the finding that the ‘consumers’ lack of willingness to make m-payments is the greatest barrier to the future growth of M-Commerce. Especially new companies who want to jump in between the traditional system of payment transaction that is tied to credit card companies, as VISA for instance, have to be careful with their developed solution as those companies rely very much on additional funding in the beginning. Regarding the investments for the development of such m-payment systems, it is of inevitable importance to ensure ‘that mobile users not only sign up, but will actually use m-payment’ (Kim et al., 2009, p.320). M-payment companies have to find a solution to ‘design and communicate their service
in a useful, secure and controllable’ way for the consumer (Shin, 2010, p.919). In the next paragraph I will describe the details of such attributes regarding social behaviours and social culture.

Trust, risk and security

Cyber fraud has been present for ages. Zhou (2011, p.290) states in his report that compared to E-commerce, m-payment ‘involves greater risk’, as non-wireless networks are less vulnerable for cyber attacks. As monetary issues matter, the roles of trust, risk and security are of high importance. Well-known brands and organisations (e.g. Wal-Mart, public transport) receive according to their size and age a lot of trust by their consumers. According to Andreev et al. (2012, p.240) communicating trust to accept m-payments with smart phones is one of the most important requirements for success. As long as the payment device belongs to the buyer the trust is of less importance, according to Murphy (2012), as most people trust their own personal hardware and software for transactions. As soon as those payment devices do not belong to the buyer, ‘vendors need to clearly communicate to consumers how their data is secured and privacy protected’ (Andreev et al., 2012, p.229). Bamasak (2011, p.184) points out two almost equally split main concerns for the acceptance of m-payments: the security of the circuit and the risk of ‘unauthorised use of mobile phones’ for purchasing. Therefore investments for improving security standards and also the communication of such are significant. Approaching early adaptors who already got in touch with virtual shopping experiences (e.g. E-commerce user) is a first step to establish m-payment services. ‘Services are perceived as useful as long as they are trustworthy’ (Markos et al., 2012, p.242). Therefore forthcoming m-payment hardware must include highly developed systems for ‘authentication and confidentiality to protect the owners of payment devices’ of fraud (Shin, 2010, pp.935).

Cost

Operating costs when using an m-payment service is another determinant of frequent usage intention. The installation of an m-payment service is often free of charge, as fees, depending on the amount of the transaction, generate the revenue of such services. Therefore the churning risk is very high, as there are either none, or very low switching costs for the consumer. Compared to the trust and security factor mentioned before, running costs are very simple to calculate for people using such services to make their own judgement. In order to willingly switch from an old traditional payment system to innovative m-payment, merchants and their customers must consider the mobile solution as more convenient, useful, and easy to adopt. In the end though, m-payment services are not always competitive for everyone ‘when compared to traditional payment methods’ in regards to their fees (Balocco et al., 2010, p.16). This will be explained further in the methodology part. The success of m-payment systems however does not only depend on the costs for running the service itself, but also on the needed device that possibly has to be bought. Especially the different generation of devices, being capable of Internet functionality, LTE, NFC and so forth.
Convenience and perceived usefulness

Even if costs are low and trust is given, the application for a new payment method still depends on the user friendliness and usefulness of the designed service. Crowe et al. (2010, p.11) describes that earlier, people had ‘to swap the SIM card’ of their mobile devices depending on the service they want to use – calling or paying. This example makes a service not very convenient for the user. On one hand decides design and workflow of the application, on the other hand m-payment services have to follow the rules of regulators and sometimes card issuing companies when accepting credit cards.

The ‘complexity of m-payment services is considered as a barrier’ to adapt the new technology (Bamasak, 2011, p.184). Therefore simple ways of using such services are needed. Consumers need comprehensible interfaces, ‘which can adequately guide them’ through the transaction process by providing logical instructions (Markos et al., 2012, p.243). In the case of iZettle, processing Mastercards has been a different process as processing VISA-cards for instance. Different security expectations interrupt a consistent payment process. Briefly speaking, MasterCard is satisfied with a signature as proof of the cardholder identity and VISA demands the PIN. To solve that problem, either an extra device is needed that offers Chip & PIN, or another way of additional identification via SMS has to be introduced. Either way, the process is not unified and therefore less user friendly. ‘The number of steps involved in the process should be minimized’ as much as possible ‘to avoid any confusion’ (Shin, 2010, p.935).

However simplifying the process is not only the duty of m-payment providers, but also of other companies involved in the new network to make sure that the innovative service gets adapted. Zhou (2012, p.1086) concludes in his analysis that perceived security, ‘perceived usefulness and perceived ease of use’ as well as mobility affects user attitude, which in turn affects usage intention.

Individual behaviour

Peoples own willingness of accepting new ways of payments has to be considered, too. Markos et al. (2012, p.242) confirms ‘that people primarily need to be motivated and intrigued by their own nature in order to adopt new technologies’. Hence, neither user friendliness nor costs and trust can sometimes convince cultures to be open for innovations. Quite often this can also be observed as a generation conflict that older generations are more reserved than younger generations.

‘Behavioral intention can be viewed as an individual’s underlying attitude’ (Shin, 2010, p.935). This attitude however has to be entertained by innovation to maintain the user’s interest. However, as the life period of an innovation is usually short, keeping a high level of the existing users’ satisfaction, ‘new functions or services need to be introduced continually’ (Cao et al., 2011, p.139).

Introducing banking services in new countries require a comprehensive knowledge of consumer behaviour and a thorough understanding of local cultures. It’s clearly an advantage of being a native of the market where the service operates. As this knowledge will make the situation easier to understand regarding the differences of each territory, which ‘results in better responses’ to the individual needs (Heinrich, 2012, p.1).
Summary

Even though undeveloped markets have a weak economy, alternatives to cash couriers are demanded. SMS payment is often already possible as a semi-developed infrastructure is present and compatible devices with such are in use. Banked people are familiar with financial services and should be taken as representatives to introduce the unbanked to m-payment.

The social behaviour is interplay of different factors, where as all have to be considered to a certain extent. Trust, risk, security, cost, convenience and usefulness are arguments that are perceived differently by individual behaviour. Therefore clear analyses of the different markets are necessary to see which of those aspects are of higher and which are of lower importance.

Mobile payments – different approaches

Different technology offers different ways for m-payments. In the following, three possibilities will be shown to get a clearer picture of the various ways for processing m-payments.

Applications that enable users to withdraw money from ATMs with their mobile phone (Sposito, 2012) are possible but will not be considered in the following, m-payments based on barcodes and QR-codes (Makkad et al., 2012, p.10) will be strived.

Technology

For conducting an m-payment, mobile technology is needed. However different sophisticated technology is available depending on the territorial area. The biggest gaps range from non-technological to mobile infrastructure (capable of texting and calling) to the latest sophisticated infrastructure as LTE (extremely fast Internet connection). The latest technology can be seen as the future driver of m-payment.

Being able to access the mobile ‘Internet from anywhere at anytime’ is essential to use m-payment applications in combination with other services (Bamasak, 2011, p.183). Nevertheless catching up to the latest standards to exploit the developed technology is blocked by different dependencies as heard. Those are ‘privacy fears, desire for anonymous payments, a lack of infrastructure’ preventing mass adaption as well as resistance of enterprises with investments in the current payment system (Murphy, 2012, p.1). However, also the most successful service for m-payments, named M-Pesa, can benefit from the current situation. The service works by providing simple money transfers with low developed technological infrastructure via SMS (see figure 1, p.19).

SMS payments

SMS can be considered as the simplest way of m-payments. In Iran is SMS payment considered as the best solution, however as Amidian et al. (2010, p.380) point out that this is a ‘country specific’ solution. Amidian et al. findings are strongly supported by Soni (2010, p.905), who also confirms SMS-payment as very sustainable, because ‘advanced mobile phones are not needed, and no extra charges are imposed by third-party payment gateways’.
‘The most successful mobile payment system in the world is M-Pesa (...) in Kenya and Tanzania’ (Ghag and Hedge, 2012, p.40). The service is a very basic and limited money transfer systems, good enough to serve the needs for the people in Africa. Those needs are sending money from phone to phone and either leave the money on the phone or receive the amount in cash at a huge number of different stores (e.g. integrated in supermarkets). However as Mas and Radcliffe (2011, p.171) describe, M-Pesa provides a ‘basic form of financial savings for a large number of users by creating a network for instant, “on demand” payments’. In other words, an online piggy bank that is stored in the cloud and people knowing the key can access the stored money. By doing so, M-Pesa enables unbanked people access to P2P transactions. Hence, accounting and APIs for integrating an m-payment system in a third party app are not possible.

Figure 1: How to make a payment with M-Pesa
With M-Pesa money can be send to any mobile phone user, even if the receiving person is not registered for M-Pesa, or if they are on different mobile networks.

E-Wallet

A more advanced approach of m-payments is E-Wallets. Most of them rely on NFC, which works contactless. NFC is a similar technology as Bluetooth, however with less bandwidth and a shorter operating distance of a few centimeters, which is said to make the connection safer than Bluetooth. Further, NFC is able to identify and proof the validity of a registered card (e.g. credit card) over the network with a PIN as well as add value to the card when needed. In other words, NFC technology enhances ‘the usability of mobile commerce applications and services’ (Salonen, 2012, p.2). A simple example for value added service is the used online data limit compared to the chosen tariff. By exceeding the data limit three times in a row, the MNO might call up the user, asking for a tariff upgrade. By a positive answer, the company gets on a regular basis a higher monthly payment by the user, which gives them a security to plan future investments. The user has an advantage with the new tariff as well, as no extras will be charged to him anymore at the end of the month. However such an analysis is only possible, because the customer is directly bound to the MNO via a subscription. Such a dependency will be taken over in the current “offline” business by the support of NFC, which is able to deliver the collected data to other companies. As in undeveloped countries, m-payments are to a great majority only needed for
P2P-transfers; NFC technology is simply not needed there, yet. But the potential of contactless payments should not be ignored, as the whole economy of the country can have positive benefits of it by raising the overall traded volume. Technologies based on the E-Wallet ‘will be able to permanently replace cash and card as a means of payment’ (Ghag and Hedge, 2012, p.41). Buses of the public transportation system in London recently upgraded their card reader with NFC compatibility for instance (Shead, 2012). The functionality of contactless payments is shown with figure 2 below.

Figure 2: How to make a payment with an E-Wallet
There is an additional PIN request if the amount exceeds more than 10-25€ (depending on the wallet service).

Even though the new technology sounds promising, Weiss (2011, p.9) explains that ‘fraud, and exploitation are possible’ by the secret use of receivers to access ‘the sensitive information now radiated from the NFC chips’. He continues by saying that if the radiation, in any form, of an individual’s account number, PIN, or any other sensitive, private, or exploitable information becomes common then there will be a breeding ground for abuse. In fact, it seems like that a high software fragmentation prevents from a high degree of fraud.

In comparison to SMS-payments, a more sophisticated technological infrastructure is needed for the introduction of NFC-technology. Handsets could be upgraded with chips, but high investments are necessary for readers in form of terminals. A third possibility of m-payments is the use of additional hardware, so called Dongles.

Dongles

A dongle is a card reader, attached to a mobile device that enables such devices to read the chip or magnetic stripe on a credit card. The dongle works in combination with an app to conduct the payment. Companies who offer such dongles can exploit the mobile device itself and overcome the traditional terminal. Therefore everyone having a compatible mobile device can use such, as a replacement for a card terminal. Taking a picture with the camera including the location of the bargain can be shown on the electronic receipt as well that is send via E-Mail. If a card is broken,
the card details can be entered manually with the app and the transaction can still be processed.

Dongles tend more in the direction of wallets than SMS payments, due to their integration possibilities. The overall target group of those dongles are micro merchants and for some services also individuals. Wolfe (2012, p.1) explains that such a target group is the strength of dongle-companies as those typically behave like consumers do. Consistent improving its offerings helps the American dongle service Square to maintain its appeal to those customers while trying to build recognition with the small-business sector as well. Over the time, more people and bigger companies than micro merchants will be attracted by the system, as it is technically possible to enable a data exchange for both sides by providing customers behaviour as a value added service. The functionality of a dongle payment is shown in figure 3 below.

Figure 3: How to make a payment with a dongle payment service
If the card reader is not present (e.g. broken card reader), then the details have to be entered manually instead of read automatically.

Recently more of the dongle m-payment services (e.g. Square in the US, SumUp in Europe) have started to offer a wallet option in addition to their service. Customers use the app to virtually check-in at a store enabling the shop owner to see their picture on its mobile device. By doing so, the duration of the transaction is reduced, as the shop owner only has to tap the picture on its screen, done. As this service is pretty new, we will not further look into combination benefits of dongles compared with wallets. Attracting consumers with the dongle service now and abandoning the dongle later by seeing users switching to the app-only alternative is certainly not wrong, as no additional and cost-intensive hardware will be needed anymore.
Summary

Different approaches for m-payments are possible. The approaches mentioned are clustered in table 2 below. These rely on the available infrastructure, including handsets on the consumer side but also mobile coverage in the country. Technical solutions are different for each service. SMS, Wallets and dongles are three ways to conduct mobile payments. Where as wallets are the most sophisticated service, as they do not fully rely on cards and can be easily combined with other services. However as wallets are the most sophisticated, cost intensive investments are necessary to launch this service. SMS and dongles do not rely on such heavy investments and can be used to a great extent already by now.

Table 2: Different approaches of m-payments compared with each other.

<table>
<thead>
<tr>
<th>SMS</th>
<th>NFC</th>
<th>Dongle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low investments for:</td>
<td>High investments for:</td>
<td>High investments for:</td>
</tr>
<tr>
<td>• Mobile service provider</td>
<td>• Merchants (terminal)</td>
<td>• Merchants (Operating fees)</td>
</tr>
<tr>
<td></td>
<td>• Customer (handset)</td>
<td>• Payment provider (hardware)</td>
</tr>
<tr>
<td></td>
<td>• Mobile service provider (infrastructure)</td>
<td></td>
</tr>
<tr>
<td>• Limited value added services</td>
<td>• Unlimited value added services</td>
<td>• Unlimited value added services</td>
</tr>
<tr>
<td>• Fast processing of transactions</td>
<td>• Fast processing of transactions</td>
<td>• Slow processing of transactions</td>
</tr>
<tr>
<td>• Independent of card issuing companies</td>
<td>• Independent of card issuing companies</td>
<td>• Very card dependent</td>
</tr>
</tbody>
</table>

Case studies – mobile payment failures

Even though more and more m-payment companies enter the market, some incumbents already resigned with their approach. The two following case studies describe failed approaches of entering the market of m-payments.

VeriFone

At the end of 2012 – VeriFone, specialized on payment equipment at the POS, withdrew their dongle from the market. Their phase-out was their failed strategy for entering this market. VeriFone officially said about the reason of its backtracking that ‘the market offers only "razor thin margins" and profits that are “fundamentally unprofitable”’ (Eaton, 2012). As learning of the withdrawal and to regain some technology development costs, the company will provide ‘third-parties with dongle hardware and payment gateway access, but will discontinue any efforts around acquiring customers’ (Etherington, 2012). Further speculations are that the company was already ‘late to enter’ the market and that VeriFone was not good to find adopters for the new service and therefore did not ‘see the kinds of margins it hoped for’ (Gohring, 2012).
Nokia

Nokia, the handset manufacturer and long time market leader for mobile phones has started their service called “Nokia money” in India in 2011. After a one-year pilot program Nokia officially launched there, together with two banks. However, a few months later Nokia decided to pull the plug on the new service and to focus on its core products instead (Virki, 2012). The service itself was pre-installed on Nokia devices, designed for banked and unbanked customers, to send money but also enabling them to pay their bills. At more than 200,000 locations, customers were able to top up their account. The media wrote not enough customers signed to equal the costs for maintaining the service (Kakkar, 2012).

Handset manufacturers have not been able to enter successfully the business of m-payments, but MNOs are the winners instead, as it can be seen in the M-Pesa service run by a division of Vodafone (Thomas, 2012). Handset manufacturers simply lack the experience on how to handle financial services, which is different to telecommunication companies that have running contracts and monthly bills with their customers. Velasco-Castillo (2012) concludes, therefore, in his investigation that the ‘payment processors and mobile network operators establish watershed strategy alliances’ to build up m-payment services, as their fit works better to engage customer in the way the cyclic nature of these services demands. However, I strongly suggest including an additional company – the m-payment service itself, which will be explained as follows.

Value Networks

As shown in the two case studies before, there are several influencing factors, which are assigned to different players working together as an alliance - the value network. The most important ones are in my point MNOs, banks, agents and retailers. In addition, which I will explain in more in detail, are also mobile app developers, as such services that can be melted together by implementing an m-payment interface. The consumers can be seen in the centre as the driving force of the network. In other words, the needed players are defined by the needs of and values of and for the consumers.

Motivation for innovation

A clear business model is therefore important, as an ‘unclear business model’ can become a “roadblock” for a successful introduction of a new m-payment system (Andersson et al., 2011, p.3). As such a global m-payment system is not present yet, a final and clearly defined business model has not been found so far, as the negotiations about the split of the give and take by each part are not set. Some see a MNOs as the key player (Tobbin, 2011, p.185), others suggest that co-operation among each other is the best way to ‘implement an overall strategy’ (Markendahl, 2012, p.198).

As seen before, strong companies like VeriFone and Nokia can fail, which is because old strategy ‘models are not suitable for the new era of mobile business’ (Holmquist et al., 2010, p.1). The outdated thinking of only increasing the revenue as the main target has to be directed into a new thinking with the objective to provide a ‘better service’ to the customer and thereby improving the relationship with those (Balocco
et al., 2010, p.18). By doing though, each service gains value, the benefit will raise up, which has to make the service offering for the customer indispensible in the end. A problem with the service offering is also a ‘sufficient population size to allow technological competition’ (Haas et al., 2011, p.469). This competition on the other hand has reached a point where it has become unclear which technology should be standardized. The consequences are leaking coverage of the NFC infrastructure, which becomes in the end counter intuitive to fit the satisfaction of consumer needs. However, as soon as a compromise for a standard is found, innovation i.e. ‘the business is slowing down’ results in delayed agreements among collaborations (Haas et al., 2011, p.478). The motivation for innovation is a crucial point in an eco-system and the chance for smaller players to enter the market by filling the time gap of negotiations.

Definition of a eco-system

The question is, how does the mechanism of an eco-system works successfully? In his book “The death of Competition”, James F Moore defines an eco-system as an “economic community supported by a foundation of interacting organizations and individuals - the organisms of the business world”. Moore emphasizes that the leadership roles within such a system may change over time. However, everyone will have a benefit resulting from the strength of such a community. This will enable its members to move their own innovation forward which consequently results in support for each other (Andersson et al., 2011, p.21).

The problem of a working eco-system is according to Andersson et al. (2011, p.18) that often, such systems are defined as how the situation could be, however every participant in such a system should find an agreement on ‘how to implement the standard or “policy”’. However, negotiating this agreement is ‘more complex’ within an m-payment system as there are more roles to be assigned as within a network of traditional card transactions (Burreau and Verdier, 2010, p.6).

Focusing on M-Pesa, initiated by Vodafone that saw a potential in giving people access to financial services via their mobile phone. As the Central Bank of Kenya felt overstrained with the idea for such a new service, they allowed Vodafone to launch its service. However, as Kenya can be considered as a very poor country, the UK’s Department for International Development took the role of an investor and funded the beginning (Mas and Radcliffe, 2011, p.173). A license from the bank was needed, an investor had to be found and an MNO provided the technology for launching the service; it eventually became a well-defined business model.

Chicken & Egg

The challenge for founding an m-payment value network can be compared with the introduction of electronic cars as a replacement for petrol-driven cars. As long as there are no charging stations, nobody will buy such a car. Not to mention agreements between the car and the petrol manufacturing industry. Chuah and Lai (2010, p.358) describe such situations as ‘interdependent’ between consumers and merchants ‘to adopt new technology’. This interdependency is not everywhere present though, because neither the industry nor the consumers see necessarily a need for additional payments as long as cash is around (Crowe et al., 2010, p.35).
However, as seen before, individuals can introduce a new way of payment on their own by the support of start-ups using dongles or SMS-payments instead of waiting until terminals at bigger trading chains are replaced. Regarding NFC-payment and its expected mass adaptation however it is the classic ‘chicken and egg’ situation of who comes first – merchants and the industry verses the consumer.

To push the m-payment innovation, ‘network effects’ and “economics of scale” are driving factors (Bourreau and Verdier, 2010, p.12). And again, arguments to be taken into consideration are high investments for the industry, a guarantee for secure payments and resulting benefits of data that can be utilised (Bourreau & Verdier, 2010, p.15). Those benefits will be explained in the following.

Roles in a mobile payment value network

Mobile payment companies

M-payment services are the innovators. Publicly traded companies like Google, PayPal or Amazon are still in the preparations, searching and negotiating with partners with the aim of mass adaptation and introduction in the market. Smaller companies like Square, Payleven and iZettle benefit of the slowdown by creating their own m-payment ecosystem (e.g. with banks and credit card companies) when they launched their service. Earlier, Apple benefitted from the same situation when the company entered the mobile phone market with its AppStore, as they filled the innovation-hole with a new value added service for the consumer by creating a ‘mobile Apps industry’ (Haas et al., 2011, p.478).

Cooperating with m-payment companies, investments and high maintenance costs can become redundant for vendors, as in the case for purchasing SMS tickets when using the public transport. Currently, public transport companies still have ticket vending machines at each subway stop in use that have to be regularly updated or replaced. By using an electronic service, updates for price changes are done by the flip of a switch, which is a win-win-situation for both partners (Markendahl, 2012, p.199).

M-payment services have to achieve within a very short time, a high number of customers. Credit card companies like MasterCard, VISA and American Express see their potentials and invest in M-payment companies (Lunden, 2012). In contrast to E-Wallets, current POS m-payment services offer a huge potential for credit card enterprises, because the market of individuals and small companies is finally able to process card payments with their own devices. Even though m-payment companies will have a long way to go, researchers expect that ‘the volume of transactions will add up to a good amount’ to make a profit in the end (Tobbin, 2011, pp.187).

For m-payment companies are people that trust their service the most important target group in the beginning. Almost all active POS m-payment services in Germany show on their homepages not only their service but also people and merchants already using the service. Those ‘early adopters’ are very crucial for a ‘broad diffusion’ in the future because they act as a “trusted reference” for an innovative system (Schierz et al., 2009, p.215). Localizing new groups for each country also records and reflects the needs of the people living there. iZettle for instance adopts its homepage with locals from each country, which brings the service closer to the potential adopter living in that country. Even though Balocco et al. (2010, p.10) argument that m-payment services ‘are not interested in defining partnerships with
financial institutions’, those institutions are still important as they can serve as a “trust company” for a new service and have an enormous experience of handling financial issues. In Germany, iZettle launched together with the VR-Bank, serving as a distribution channel for the dongle, and embodies also a financial institution that people trust more than a small foreign start-up company.

**Banks**

Banks are the simpleminded advocates of an old-fashioned payment market and ‘lack proper tools to deal with m-payments’ (Acharya and Kshetri, 2012, p.12). Even online banking is still not fully online working as there are transaction numbers (TAN) needed that cannot always be send to the customer neither online nor via a mobile TAN-Generator, but by traditional paper mail instead. Therefore banks have the technological transition from offline to online either not really managed yet or they have become too big and complex to adjust to new models - as Bill Gates said more than ten years ago: ‘banking is necessary, banks are not’ (Brost, 2000).

The traditional infrastructure of banks consists of branch offices and such offices function purely as a bank only. This structure has parallels with the German mail service “Deutsche Post”. Until a couple of years ago, Deutsche Post also functioned with mere post branches, these days such branches have been integrated (e.g. in food stores and supermarkets) that people can still send a parcel when doing their shopping there. So called “packing stations” also serve as a self-service machine for customers to send or receive packages there, making the service available 24/7 (see figure 4 on the right side). More than 2 billion people in undeveloped countries wait for a financial service that is currently not provided by banks, because the handling of ‘low-value cash deposits’ is not worth the investment costs for the infrastructure (Mas and Radcliffe, 2011, p.181). Therefore cash trading with notes and coins stops banks from extending their service. M-payment is capable of cutting the costs for handling transactions, extinguishing geographical barriers and motivate banks for further investments to support such technology for gaining additional customers (Heinrich, 2012).

If m-payment companies manage to introduce their service that responds to the values demanded by the people’s needs, they will succeed. Even though ‘consumers would prefer to receive mobile payment offers from banks’ rather than an additional payment provider (e.g. regarding trust) (Bourreau and Verdier, 2010, p.14). Further benefits of having a partnership with a bank are for some countries a banking license as a permission to handle financial issues and their financial experience. In the case of iZettle as we have heard, banks also serve as a delivery and information channel. As by handling payments online instead of depositing cash on location reduces ‘the cost of financial services to consumers’ (Tobbin, 2011, p.187).
Retailers

Retailers are the cash cow as they are first in the value chain. They are closest to the consumer because they are selling the good or service. Companies as Wal-Mart, Target and BestBuy have started to work on an own m-payment service ‘that would allow consumers to pay with their mobile phones’ (Townsend, 2012). This smart move clearly aims on the strategy to ‘cut-out-the-middle-man’ (Levick, 2012) on one hand, but also to get hold of the consumer data and ‘loyalty management’ on the other hand (Chuah and Lai, 2010, p.357).

Another current limitation is the exclusion of different branches such as lottery, casino and erotic services. By building up an own payment service, retailers can administrate their own risk management and do not depend on third parties anymore. Some m-payment providers exclude such services as failure of performance or unpaid contributions, which can result in refunds and charge backs. However by offering an own service, this outlaw could be bridged by taking over the responsibility. M-payment white label solutions are already offered. The start-up company “Orderbird” cooperates with the financial service WireCard. Orderbird is an electronic order system for iOS based devices in restaurants that service personal can use for taking orders in restaurant. Their missing piece was the payment interface in the end so restaurants having Orderbird in use, still needed an extra contract with a payment terminal provider. Though, via the API, WireCard was integrated in their system and handles all the card transaction in the future with the same device and application as the orders are taken.

Mobile network operator

In the early times, MNOs only had to cope with enabling their customers telephone calls, then additionally SMS-messages and now it’s services offered online that become successively important for revenues. More and more companies contribute to this new feature with their own service, e.g. competing with Apple’s App-store has been a new challenge for MNOs to defend their market position (Holmquist et al., 2010, p.3). For instance available Apps (free of charge) offer online instant messaging and will successively cut off the revenues from SMS-messaging. I claim that MNOs act similarly to a bank by clinging to their current model instead of being open for innovation. Why cannibalising the still high profit revenues of SMS by offering a less profit revenue with a data-stream (Haas et al., 2011, p.476)?

The increased usage of m-payment challenges also the further coverage of mobile connections and on-going investments in such. ‘Bad coverage in shopping malls (...) or conferences may lead to decreased customer satisfaction and bad reputation’ for the MNO (Markendahl, 2012, p.198) ‘as users want to be accessible at all times and places for both business and social purposes’ (Tobbin, 2011, p.185). As explained before, m-payment can reduce heavy investments for new ticket vending machines for public transport, but therefore the service has to function at every public transport station, making the network quite complex and demanding.

Similar to banks, MNOs also represent the trust they get from their customers. Trust does not have to be reflected in only a positive way, but more in a secure way. For instance, customers might not have a good relationship with their MNO as tariffs can be very high; however, they trust in them and feel confident when giving them their
banking details for a monthly direct debit authorisation. Therefore, by providing a new m-payment service via a MNO, costumers will feel more secure to work under this protection as to hand out their bank details to a third party provider. So even if the m-payment service is only indirectly offered by a MNO, as M-Pesa for instance, the trust is still very valuable for m-payment companies in the beginning (Zhou, 2012, p.1086). Also the exclusive use of providing such a service only for one MNO is conceivable and applies for instance for Google’s Wallet. There, people are confronted with ‘the US wireless carrier barrier that prevents users from using Google Wallet on every carrier, but Sprint’ (Ghag and Hedge, 2012, p.38).

The question rising is: who owns the customers data? Lots of such can be accessed by companies cooperating within an m-payment eco-system, which allows ‘for diversification into other areas of the consumer’s needs and lifestyle’ (Tobbin, 2011, p.187). Therefore the vertical integration in the value chain of MNOs ‘needs to be opened up’ to integrate further services that contribute with their offering to an overall benefit for the single user (Markendahl, 2012, p.199). Instead of cutting off innovative services to secure the higher profit margins (e.g. SMS messaging), MNOs should offer a service in co-operation.

However, clearly stated: MNOs still have high amounts of investments for erecting an infrastructure and also maintaining an existing infrastructure, especially in unexplored territories like undeveloped markets. ‘This often makes mobile services less affordable and may discourage operators to innovate and migrate to new technologies in emerging markets’, as the ROI cannot be guaranteed (Gourhant et al., 2011, p.1576).

**Handset manufacturer and apps**

Handset manufacturers are essential for m-payments as they produce the devices that are needed to execute the service. This can be compared with a film production whose film cannot be aired because proper TV-sets are not compatible with the video format. However, not only the device, even more important is the software installed on the device that has to be considered for app developers. Android and iOS are the most common software standards, followed by Windows mobile and RIM. Android is open source software. However even within such software are strong limitations set between different hardware devices and its API integration, which cannot always be guaranteed, due to fragmentation (see diagram 1 below). The service has to be compatible for at least ten different Android versions in 2012, therefore even a new service has to be down compatible to run on older mobile devices, too. This is different with Apple, which has closed source software that is solely run on all their devices and developer can easily adopt it, as it is to a great extend only one standard compared to already more than ten different in the Android market. This standard can be set directly from the manufacturers site, which is a prerequisite for a successful roll-out (Chuah and Lai, 2010, p.358), however ‘it is necessary to standardize m-payment protocols, schemes, and services’ (Shin, 2010, p.918) that might be regulated by administrative bodies, too.
Diagram 1: Android fragmentation

The fragmented android market development for API levels in 2011 and 2012. Having six different versions available in 2011, raised to ten versions in 2012. (Source: opensignal.com)

The other part of the manufacturers role is the security of the device. This is often an underrated issue, however most of the data is still stored on the device itself, mitigating slowly towards the cloud storage. Therefore the question is, how easily can the phone be hacked from outside and how is the data protected if the phone gets stolen. On a global study, the software company McAfee (2011) found out that the average value of saved data on a mobile phone is 37.000US$. That is why manufacturers as for instance Apple (Osborne, 2012) have started acquiring security specialised companies to protect the data that can be accessed via their devices. However, instead of designing and embedding solutions for a broad range of mobile devices, the feature will be brand specific (Chaykowski and Satariano, 2012), which blocks a fast integration for different brands and stops a faster adoption of m-payment.

Administrative bodies

Regulators by the state or other organisations like the European Union take the role of the supervisor about ‘all the other members of the mobile money ecosystem’ (Tobbin, 2011, p.188). As trust is a very important point, ‘regulatory bodies have sufficient powers to take actions against mobile service providers who do not adhere to such frameworks’ (Andreev et al., 2012, p.240). There are also benefits of controlling authorities that can retrieve sensitive data that MNOs ‘create with their users’ (Markos et al., 2012, p.243). As risk checks and credit ratings are for some countries required to enable people to use the service, this data could be exchanged among each other. This is also the case in Germany with social networks that are able provide sensible data and user habits to official bodies (Meyer, 2012). For instance, users tend to post about their lifestyle on social networks, which involves also monetary information about holidays and luxury goods for instance.

The role of administrative bodies has to be to ‘encourage innovation’ by minimizing risk, maximizing the trust and securing a safe process within a legal framework (Merritt, 2010). By giving more people access to m-payments, the overall trading
volume in especially undeveloped countries will increase and upgrade the economic situation there (Roh, n.d.).

Former research about concept models

Several m-payment value networks are conceivable; however, quite often those have to be adapted for special needs as in the case with M-Pesa. This provider started up in Kenya where are different conditions and basically no competitors to be considered that is different to Europe. Mas and Radcliffe (2011, p.169) point out three factors for a successful rollout: First, the ‘preexisting country conditions’, second ‘a clever service design’ that fits to the needs of the consumer and last ‘a business execution strategy’ to reach very quickly the break even point regarding a positive number of customers to turn into profitable operation. What simplified the situation for M-Pesa is that there was no m-payment or cashless payment alternative available when the service launched. The danger in countries with high competition could be that they extinguish each other due to insufficient customers, resulting in not enough or none profits.

Andersson et al. (2011, p.21) suggested ‘four main types of business scenarios’ for the adaption of contactless m-payments. Some are with, some without global standards and also with dominators in the network like VISA or MasterCard as well as joint ventures from the industry. However in regards to technology, VISA already faced some problems during a trial stage for NFC at the Olympic games in London (s. fig.: 05). Regarding the research for this study, I do not suggest the lead by a traditional company as VISA, as those are still too much interested in the current solutions out there. Why should a company like VISA cut down their own profit margins as they are in the current models of card payments present? First of all there is some pressure needed to show such companies that there is a need for innovation and that the old model is out dated, however giving such a company the lead is in my point of view not the right direction. They need to balance their current model and open it up for smaller revenue streams, too.

I agree with Bourreau and Verdier (2010, p.16) who suggest a more balanced and cooperation model among different actors. However they emphasize the importance of MNOs and mobile handset manufacturers as well as the m-payment service itself, where as the m-payment service makes the ignition, as it was the case with Square. Further arguments were also a separation between niche and mass market models as a cooperation is considered to be more cost and time-intensive compared to a light model, which can be ‘established between banks and MNOs’ for instance (Bourreau and Verdier, 2010, p.22). According to Gynwali and Park (2011, p.658) m-payment services have to communicate the bigger value for potential partners, making ‘a larger share of the benefits’ crystal clear. Further co-opetition among the giants in the industry will speed up the process of innovation and adaption of the technological development. Markendahl (2012, p.200) explained that it is essential ‘to have financial institutions as partners’, however there are also MNOs as NTT Docomo in Japan that have started their own credit card brand for instance. Also the cross-border possibility is currently still limited. Therefore the
integration of regulators in a broader sense will be needed to share the consumer data ‘as money transfer businesses are established in multiple geographic and legal jurisdictions’ (Merritt, 2010, p.27).

Summary

In this chapter about value networks, the roles of different companies that contribute to the success were explained; summarized in table 3 below. With a motivation for innovation, everyone in the network should be encouraged to take a benefit out of the new service. There are some approaches especially with NFC, where a mass adoption is needed and the chicken and egg problems needs to be solved.

Table 3: Parties of a mobile payment ecosystem
In the following table are the offerings and demands of the different participants summarized. This shows who depends on whom.

<table>
<thead>
<tr>
<th>Offering</th>
<th>Demands</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M-Payment service</strong></td>
<td>Customers</td>
</tr>
<tr>
<td>Value added service</td>
<td>Trust</td>
</tr>
<tr>
<td>Innovation</td>
<td>Delivery channel</td>
</tr>
<tr>
<td>Personal Data</td>
<td></td>
</tr>
<tr>
<td>Investment Benefits</td>
<td></td>
</tr>
<tr>
<td><strong>Handset manufacturer</strong></td>
<td>Customer loyalty</td>
</tr>
<tr>
<td>Delivery Channel</td>
<td>Value added service</td>
</tr>
<tr>
<td>Software standards</td>
<td></td>
</tr>
<tr>
<td>Mobile device</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
</tr>
<tr>
<td><strong>MNO</strong></td>
<td>Value added service</td>
</tr>
<tr>
<td>Customers</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td></td>
</tr>
<tr>
<td>Technological infrastructure</td>
<td></td>
</tr>
<tr>
<td>Delivery channel</td>
<td></td>
</tr>
<tr>
<td><strong>Banks</strong></td>
<td>Convenient banking/transactions</td>
</tr>
<tr>
<td>Customers</td>
<td>Mobility</td>
</tr>
<tr>
<td>Trust</td>
<td>Value added service</td>
</tr>
<tr>
<td>Financial experience</td>
<td></td>
</tr>
<tr>
<td>Delivery channel</td>
<td></td>
</tr>
<tr>
<td><strong>Retailer</strong></td>
<td>More customer loyalty</td>
</tr>
<tr>
<td>Closest to customer</td>
<td>Universal use</td>
</tr>
<tr>
<td>Delivery channel</td>
<td></td>
</tr>
<tr>
<td><strong>Administrative bodies</strong></td>
<td>Sensitive information</td>
</tr>
<tr>
<td>Licences</td>
<td>Economic country benefits</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
</tr>
<tr>
<td>Registered data</td>
<td></td>
</tr>
</tbody>
</table>

The m-payment provider takes the role of the innovator within the network that develops and adjusts the new service of payment in a way that it fits to the needs of the consumer. Banks are the once that have a lot of experience on how to handle money that is circulating. However most of the banks are not very efficient by operating with physical structures in form of bank branches, therefore m-payment solutions can help them to extent their service, attract new customers and reduce the costs. Retailers are the cash cow as they are closest to the customer. Some of them have already started to develop their own m-payment service; the smaller ones however will need to catch on with alternatives. MNOs are the providers of the infrastructure; they should see this service as an addition to calling and texting and serve as a delivery channel by offering the product. Handset manufacturers will have to move closer together to avoid a too high fragmentation of the market, which would cost too much time and money to adjust m-payment software to every platform they
run on their models. In the following investigation approach, the matching points between customer and m-payment provider will be explained.
INVESTIGATION APPROACH

I did an analysis during the German market launch for the Swedish m-payment service iZettle in 2012 (June-November). iZettle works with a dongle that can be attached to a mobile device for reading the chip and not the magnetic stripe of various credit and debit cards. However even without the dongle, payments can be processed in a manual way via the app).

In the beginning of 2013 while the research was already done, iZettle offered an additional Chip & Pin device (see figure 6, on the right side), to raise the security and especially for accepting VISA cards in a more convenient way. This card reader is an external pin pad and gets connected via Bluetooth with the mobile device of the seller. Due to the late introduction the Chip & PIN device was not considered for this investigation.

Functionality
During the time when the analysis was taken, there were some limitations. First of all the service could only be offered to people owning a company, but no private persons (private persons had to be registered manually). Second, the card acceptance was MasterCard only in the beginning; debit cards and American Express followed in the second half. The manual payment process without the reader is only possible with credit cards, not with debit cards. However, more than 90% in Germany pay with debit cards. Last limitation, the service was merely available for iOS-devices, Android was at that time not working, as this was the case later on.

Popularity
iZettle was during the research period very unknown in Germany, the investigation during the Beta testing and the soft launch took place without public notice. During this time was only an international homepage of iZettle in Germany accessible, saying that the service is not officially available yet in the country. However people were able to pre-register via the Internet site by sending their E-Mail address to get notified when the service is accessible.

Statistics
More than 178 contacts were established where as 167 of those were business contacts and 11 private accounts. Out of those 178 accepted 101 to join the Beta, 77 denied. A summary is provided in the following part.

Investigation results
The investigation is split in two periods. First the Beta stage, for identifying possible companies to test the service (June-October). Second, by answering E-Mails after the launch took place (November).
Beta stage

Most of the companies were contacted via E-Mail in the beginning. A second E-Mail was sent as a reminder and if the first approach remained unanswered. The third step was to approach them by phone. In the beginning I tried to focus on family and friends, however as soon as those were all contacted, potential customers were just picked by chance (mainly from pre-registered E-Mail-addresses). Due to uncertainty by the customers, I tried to find contacts that were close around me that I could see them in person, which should give them more confidence in the service.

Table 4: Adverse conditions (denied contacts)

<table>
<thead>
<tr>
<th>Answers</th>
<th>%</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>18</td>
<td>No reply</td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td>Satisfied with current solution</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>Various: out of season/no internet access/denied by credit rating/E-Commerce</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>Out-of-reach</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>Too expensive rates</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>No demand anymore/not interested (reason unknown)</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>No or not enough hardware devices available</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>Registered after official launch</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>Already signed competitor (WireCard/SumUp)</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>Sent out a group mailing to organisation members</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Interested, but no agreement yet (implementing complexity)</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Billing process to complicated</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Cash only</td>
</tr>
<tr>
<td>79</td>
<td>100</td>
<td>Summarizing the table brings us to the following situation (rounded numbers): 35% might be reachable, but denied due to missing or lack of value added attributes 10% were not reachable, neither by several mails, nor phone. 10% were of several reasons not accepted 10% considered the rates as too expensive 10% showed no interest 10% explained missing hardware as their reason 10% are not interested due to administrative bodies and cultural issues 5% registered after the free of charge Beta, which might be trust as the reason 5% served as an allocator to their members, the feedback was diverse</td>
</tr>
</tbody>
</table>
List of negative requirements:
- Too high single transactions (e.g. 1000€) for artists, bands
- Satisfied and trust in the current system, not willed to change
- Taking only debit cards, because of lower fees and credit cards not common
- Have a direct debit authorisation with their regular clients, no effort, no costs
- Bad connectivity, e.g. basements, deep inside building, no Wi-Fi
- Too slow compared to cash payments (10 sec)
- Billing, due to unknown final amount of payment (construction, medicine)
- No device available, investment not worth the value
- Too many devices would be needed, therefore only cash (tourist guides)
- Transactions higher than €4-5k/month, due to lower fees (terminal rent 30-45€, fees around 0.3% or minimum 8ct for debit cards)

Table 5: Favourable conditions (approved contacts)

<table>
<thead>
<tr>
<th>Answers</th>
<th>%</th>
<th>Business branch</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>17</td>
<td>Retail</td>
<td>Clothing, Bikes, Lights, Pharmacy, etc.</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>IT services</td>
<td>Web design, Programming, etc.</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>Private Account</td>
<td>Private persons</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>Business services (small companies)</td>
<td>App-Developer, Film production, Publisher, PR, Locksmith, Chambers, other</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>Business services (Freelancer)</td>
<td>Journalist, PC-Repair, Designer, Event, Rental</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Food stores</td>
<td>Bakers, Food delivery</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Bar</td>
<td>Restaurant</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>E-Commerce</td>
<td>Web shops</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Health care</td>
<td>Private sector</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Art Dealer</td>
<td>Gallery/Photography studio</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Finance</td>
<td>Banking</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Miscellaneous</td>
<td>Beauty, CoWorking Space,</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Hotel</td>
<td>Lodging, Apartments, etc.</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Transport</td>
<td>Taxi company</td>
</tr>
<tr>
<td>99</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarizing the table brings us to the following situation (rounded numbers):
15% pure merchants, mostly in the form of settled stores (no card acceptance yet)
15% Business services of different branches, similar to the point before
15% Different branches gathered
11% Food, Bars and delivery services
10% IT-services, either app developers or other Internet companies
10% added manually private accounts (can be ignored)
7% Freelance, smaller service sector
5% E-Commerce
5% Health care of the private sector, not the governmental sector
5% Art and creative industry

List of positive requirements:
• Non-card experience, curious and if for free (during Beta stage) worth a try
• Unhappy with current product, outrunning leasing contract
• Bikers or pedestrians (sleek product, easy to carry)
• Low debit, but high credit card traffic
• Non-regular customers with immediate payment
• “Replace” the traditional accounting with the included payment overview
• Speed of payment irrelevant (e.g. private teaching)

Customer support

After the official launch, users had the chance to get in contact via E-Mail for questions. An extensive list of frequently asked questions was provided online. When answering the E-Mails, customer requests got tagged with keywords.

The following list presents the main concerns:
• Failed and delayed registrations for identification and bank account approval
• Unknown delivery information of the reader
• Price battle regarding the kind (30Pin/Audio) and costs of a reader
• Functionality problems with software and hardware

Discussion of the results

As shown above, there were different reasons pro and con m-payment services. As follows the achieved results are explained.

Costs

The still biggest issue for the German market are the high transaction fees for debit cards. As the fee is less than 1% with traditional card terminals, 2,75% considered many interested users as too high. However, additionally to the low transaction fees of traditional terminals, there is also a monthly rental fee of the device itself (30-50€). Therefore most contacted people did a cost-benefit calculation and found out that a card payment transaction volume higher than 3500-5000€ a month, will result in a loss when switching to m-payment.

Among dongle-payment provider, some offer the card reader for free or charge. In the case of iZettle the purchase of the reader was 24,95€ including a 20€ voucher for transaction fees. While campaigns were running, the reader was offered for 14,95€ (incl. the 20€ voucher). Nevertheless, early adopters were asking if they can get the reader for free, if not they will join one of the competitors.
Overall, switching costs between m-payment providers are more or less the same. However not only a comparison of the operating costs between m-payment and cash payment is for user a deciding factor. Even the acquisition costs of less than 30€ for a dongle purchase have to be considered when m-payment services are compared with each other. Here I believe that intensive co-operations with MNOs help-to offer a card reader in combination with a mobile device for a subscription to potential customers. We will look further into this in the discussion part of the value network.

Immediate payment

It is very common that in the health care segment and craftsmen business that bills are send via the usual postal service after the work is done. This always takes a few days not only until the bill is sent but also until the bill gets paid, which can take according to my research a couple of months. Very often, while being on location the merchants do not know the final amount they have to charge to the customer. In health care for instance the sum total depends on the health insurance company of the customer. The split of these costs differs between every health insurance and the physician. On construction sites often only the head of the company is authorized for invoicing, but not employees. In other words, on one hand, there is an internal deficit regarding responsibilities for invoicing; on the other hand, bureaucratic and administrative problems by the state, the so-called regulatory bodies, have become a roadblock. Where m-payment at least in the crafts men section were feasible though are for instance repair services, if such work takes place within a few hours and ideally without any cost of material.

Compatibility

Mobile devices are often still expensive to purchase. In Germany, investments of about 400€ and more depending on the device are not uncommon. Accompanying 24months contracts binding customers to MNOs complicate this issue even more. Further, some people are still unfamiliar with smartphones. In my research, the interest strongly depended on generations. Younger ones – the digital natives - were not sceptical about purchasing a smartphone. For them were the obtaining costs of such a device the biggest obstacle. Where as older people use mobile phones mostly for calling and texting but not for any applications even though if their device is Internet capable.

One example of my investigation is a company with up to 100 tourist guides that denied using iZettle, because they cannot equip all their guides with compatible mobile devices. If they cannot supply all of their employees, they cannot announce the card acceptance at the POS on their homepage, they argued; therefore they continue taking cash-only. The situation improved after the service was also offered for Android devices. However, Android is compared to iOS an open source platform, which means different devices can run different versions of the software, which does not automatically guarantee that all Android devices are supported. This dissatisfied customers after the official launch. Some signed up for iZettle and could not use the service afterwards due to a lack of compatibility with their device which cannot always be tested in before hand.
Reliability and trust

Few people stated that they already changed the company providing their card terminals, because of dissatisfaction and therefore do not intend to change the service again. Despite that iZettle was totally free to use in the beginning. Here, the service-reliability of being able to accept card payments overtrumped the trust factor. Where trust was still important though was not the functionality of the system but the guarantee to receive the payment on the bank account in the end- meaning that the buyer cannot revert its card transaction (i.e. charge back) after the purchase. However, this is often still possible as there is only signature, but no PIN needed. Signature is according to EMV-standards enough to authorize a payment, but not enough to guarantee the pay out of the money; therefore fraud is still possible, after the purchase is done. As fraud considers most often only a very little fraction of accepted card payments, some m-payment provider take this risk and give a guarantee that the money will be paid out.

Convenience and design

Regarding the convenience factor most people desired a device that is very small and easy to take with them. However, the needed 3G-frequency reception is not always given (e.g. when being out on the countryside or in basements), therefore a desire for m-payment was not needed. While being available for iOS only, the dongle worked with a 30pin-connector that had to be plugged into the mobile device. As Apple replaced its popular 30pin-connector, the new dongles have to be connected via the audio jack and charged separately with a Mini-USB-cable. The charging step was not needed before and the Mini-USB-cable needed to be purchased extra for some users. Therefore iOS users demanded a dongle with the new lightning connector that can be plugged directly into the latest Apple devices. However due to economics of scale the audio-jack-reader is compatible with Android and iOS devices, the most significant downside of this new model is the convenience.

Another negative aspect is the duration of the payment. If users do all single steps for a successful payment, they will end up with 30-60 seconds duration (the span depends on an available Wi-Fi-connection as well as if the transaction is a card or a manual payment). This duration is unacceptable for food stores during rush hour and bars for instance. Cash payments take a few seconds, especially if there is no cash change back.

Last point regarding convenience is the competing popular automatic debit authorisation (ELV) where customers authorize the merchant with a periodic standing order. This does not cost anything and works automatically. Regular food deliveries (e.g. breakfast services) make these arrangements with people, ordering every day the same menu and pay once a month for all at once.

KYC – Know your customers

Providers of financial services have to know the financial history of their customers before they authorize them for using the service. If a user has a “bad history”, there
will be a negative decision and the user will not be accepted. Criteria for a positive decision are among others no payment reminder in the past and a registered living address.

In Sweden a personal number and a company registration number exist. Those numbers can be used by payment services to identify and either verify or decline the company or person. In India for instance, customers can be verified with a simple water bill where their address is stated to get a positive KYC acceptance (Velasco-Castillo, 2012). In Germany though is the so-called “Datenschutz”, protecting the privacy of people. To complete the identification process for the authorisation, payment services sometimes have to ask their user if they can hand in a copy of the company registration form or an officially proved address registration form. The data at the authorities might not be up to date as the process to update the address (e.g. moving to another city) still takes processing time. This is not only a problem for the m-payment provider, as it takes further human resources to re-check such data manually, but also for their potential customers. They cannot use the service until they are verified, which also causes dissatisfaction.

Delivery

Another point that caused a lot of E-Mail traffic in the support is the delivery of the card reader. In the case of iZettle, the reader could either be ordered via the homepage, or bought in a shop of a partnership company (e.g. Deutsche Telekom). However, the online order did not clearly say when the reader would be delivered. Users got via E-Mail the information send that the reader will be delivered in 5-10 days after their registration. Though, if a registration could not be completed immediately (e.g. pending bank account verification), the reader was not send out and the user could not track the sending information, because no tracking number was provided.

All requests regarding the delivery of the reader had to be answered manually by the support in the end, which caused a lot of human workload and could be easily automatized as for instance with amazon and eBay. This is not only annoying for the customer but also for the m-payment service as every further day delayed is a day where no transactions can be made.

Summary

The analysis shows that the investigation results support the key outcomes of the literature review regarding the aspects of social behaviour for m-payment users.

As switching costs are very low and operation costs are similar or identical, m-payment services must try to convince their customers with value added services. Also additional security procedures for a secured pay out on their account is of importance. Compatibility problems arise as the market for mobile devices becomes more fragmented, which can cause dissatisfaction among the users. Customer satisfaction is in general an argument for loyalty to stay with one payment service and decrease the risk of churning. Therefore the functionality of the service of being available anywhere anytime has to be guaranteed. Also the ease of use on how services and hardware are connected and designed for the user plays a significant role. KYC-processes have to be optimized and analysed to give a potential customer
fast access to the service and deliveries status have to be changed in a more self-serving way for the user to avoid additional E-Mail traffic.
Discussion

The music streaming service Spotify managed to carry people to a new music experience and not simply to another way of consuming music. The secret recipe behind Spotify’s offering is the convenience. An enormous amount of all music available can be consumed online and offline, mobile and home, everywhere and anytime for in average 10€ a month. This value convinced the user and increased the subscriptions. Finally, studies have proven that this increases the consumption of music, which persuaded all players (e.g. labels, music artists) in the network to take part in that new business model as they saw many benefits in this innovative service. Exploiting the possibilities of the Internet, combined with already existing hardware (e.g. smart phones, laptops) where the service can be installed, created a disruptive product that makes casual stereo systems and new sound carriers redundant. The registration process is simple and fast and the promised value of consuming music non-stop pans out. Started really small in Sweden, established companies saw the potential and integrated the service offering in their company. Deutsche Telekom, for instance, offers Spotify for the usual price, but without additional charging for the data consumption when users listen to music – offering Spotify as an exclusive value added service in their portfolio compared to other MNOs. Coca-Cola also integrated Spotify in form of a loyalty program when a bottle of the beverage was bought. As a consequence, the popularity of former disruptive products (e.g. iTunes) decreases, by convincing the user to value access more than ownership. Also piracy pushed the service as it was found out that the cost-value can trump illegal piracy and carry even “the pirates” to the legal way of consuming music.

For this thesis - Spotify is the m-payment company. Labels and artists are MNOs, Banks and the partners in the network that have to try to respond to the consumer needs that changed with the increased media consumption via mobile devices. Reflecting the brief Spotify example refers back to the research questions from the beginning, about the maintenance of the superior position of start up companies compared to the long established companies in the market and their development by forming partnerships within a value network.

Before answering the research questions, some critical aspects of m-payments will be discussed. As m-payments are currently not used by as many people as it could be, there are some concerns regarding this innovative payment. Similar to printing false own money in the physical world, especially online hacker attacks are a threat for m-payments. As the service can be only used via mobile connections – no matter if SMS or Internet – there are possibilities to manipulate the system. This thread will rise with the popularity of people using m-payments in the future. Therefore, companies have to have a clear communication for the consumer explaining them how they guarantee the security of their service. Further they have to develop further possibilities on how to increase this security to avoid the loss of private PINs and other confidential details to third parties. Except the fraud of the infrastructure, the mobile device itself is a risky part, too. Especially the loss of such a device bears a high danger that the new “owner” can exploit secret passwords stored on them for financial transactions. Simple protections as a four digits pin to protect the device from being accessed as well as a simple signature for user identification will be not enough anymore in the future.
As secure m-payments are a combination of a protected online connection and a safe device, companies have to be able to diminish those risks in the future. This, again, will increase the trust in such services and will convince potential consumers to use this way of payment. The mobile phone penetration is very progressed and the infrastructure has to catch up with that progress. Currently there are even in developed countries still massive problems to have everywhere Internet or simple phone access. This again, will be a disadvantage compared to simple cash payments, which can be conducted everywhere.

In the following, answers will be given to the research questions posted in the beginning.

**RQ1: How has an m-payment service adjust and develop its current service offerings?**

The big advantage of m-payment services is their flexibility. They are of young age and can easily change and adjust their service to the needs of their customers. As long as this is possible they will be very valuable within a network compared with bigger and more complex companies as banks and MNOs. As some m-payment companies are publicly operating for shorter than a year, they have to try to keep their service as convenient as possible to spend more time on innovations. One step towards a more flat running service is to register customers as fast and simple as possible. The best way doing that is a fully online registration form. Currently there are obstacles preventing to run this process consistently. I suggest two options to improve this situation:
First – administrative bodies have to be convinced to make existing personal data easier accessible for third party services – as m-payment companies. If not, customers will need to spend too much time to get access to the service or get none access at all. Offline identification processes (e.g. PostIdent, where the consumer gets identified in a post office via his ID card) are very cost intensive, time consuming and therefore counter-intuitive. Second – among partnerships with banks and MNOs, sensitive consumer data between companies needs to be exchanged. Customers must not run the KYC-process again if they succeeded already before when opened a bank account or signed up for a subscription based contract for mobile phone.

A further important step towards more efficiency is the implementation of E-Mail feedback to reduce the E-Mail traffic between company and customer as much as possible. Less E-Mails result in less costs for staff and opens space for more innovation. The aim has to be that if something unexpected happened, the user has to be informed on what to do next, before asking the company on how to react. I suggest the following solutions for this goal:
Adjusting FAQs, to guide customers automatically further in a do-it-yourself way, if something unexpected happened (e.g. failed/denied registration). This is a repetitive request that should not point the user to the support via E-Mail, but give him direct advice on what to do next, e.g. by sending official documents. This measurement will reduce time intensive work tasks especially when the company has to hire additional support staff to manage such repetitive requests. Forwarding the communication effectively by involving several departments of the company and adjust the customer interaction accordingly should be off high priority. In figure XX an example is shown...
on how users should be conveniently supported instead of preparing their own answer.

Figure 7: Example on more efficiency towards the consumer

Article on iZettle’s FAQ for the UK regarding the return of broken card readers (source: iZettle FAQ, accessed, 15.03.2013):

You have the right to cancel your purchase of a card reader by getting in touch with us within fourteen (14) days from when the card reader was delivered to you.

If you return the card reader, it should be unused and in its original packaging (you have the right to examine the product so that it is not defect). You are responsible for the cost of returning the card reader to us. Also note that it is you who is responsible for the package when it is returned to us at iZettle.

Returns are made to:
iZettle | 111 Buckingham Palace Road | London SW1W 0SR | United Kingdom

Don’t forget to attach a note with your name, address, email address and receipt number. Please also enclose the reason for returning the card reader.

Suggestion for a clearer and time saving improvement:

You have the right to cancel your purchase of a card reader by getting in touch with us within 14 days from when the card reader was delivered to you.
You can check if your returning option is still available by entering your tracking number: XXXX

If so, then please print this pdf, where the sender address is already stated and don’t forget to check the box regarding the applicable error of the reader.

M-payment services should announce new product features in time ahead as a preparation for the next experience. Studies have shown that the pleasant anticipation outweighs the release of the event itself. In other words, looking forward to an event increases the emotion until the actual event takes place. A very simple example is the preparation for Christmas, especially for young children. The closer the 24th of December, the more excited children become and as soon as the gift giving is over, everything is set back to normal. Innovation is important and shows users, but also partner companies, an on-going further development of the service offerings. As there are no binding contracts between customer and service provider, churning can be very high. By entertaining the customers with forthcoming features, churning can be minimized.

Co-operations regarding the purchase of hardware among several m-payment service providers are also an option for faster m-payment adaption in the beginning. As economies of scale can lower the price for hardware (e.g. dongles, Chip and PIN reader) that is produced by the same manufacturers, the price reduction could be passed on to the customer. A lower price lowers the entrance barrier for signing up to use m-payments as described before in the cost section of the investigation.
Though, m-payment is in some countries still considered as an alternative way of payment, but not as a disruptive way of payment as most often the benefit is the same – no matter if paying cash or electronically. Hence, value added services can change this situation. Value added services are especially needed in highly developed countries where m-payment solutions are already widely available for the pure intention of payment, but not for any additional extras. Therefore a highly motivated scouting for partners of different services is important for partnerships to form alliances, increasing the motivation and raising benefits for the customers. In undeveloped countries, the value added services are defined differently as in developed countries. Extras that are already built into mobile devices are also of valuable interest. Illiterates as well as deaf and blind people could have a benefit of built-in cameras and microphones as instruments of communication, instead of tippinf and writing on the display. In the following five examples for value added services will be explained.

_Time saving_

Supermarkets with self-scanning tools could offer an app with an integrated payment option in the end. This would be an improvement to the current system where users have to register again for a further account with an involved bank to receive an additional payment plastic card. By changing this, the user will have a better and more convenient experience by operating all from one account via its own mobile device. The mobile device can be also used for scanning articles, taking us to the next example.

_Reducing investments_

Similar to ticket vending machines, fast food restaurants sometimes offer an express check out. Customers order their food themselves on machines, similar to check-in-machines at airports, then show the receipt and pick up the food at the counter. Again, the whole process could be processed with a simple single app that replaces the stationary machines. Such a machine sends the payment receipt via wireless printing options to the counter and customers can simply pick up their order there, without any other extra receipt showing. Bulky machines like paid entrance barriers for public toilets or newspaper boxes (see figure 8 below) that are stored inside of a vending machine could be connected via a wireless connection to the phone. Prices could be changed easily and robbery as well as destruction in regards to stored money in the machines will stop.

_Ratings_

In bars and restaurant, customers could order and pay for a drink with their phone. This saves time for the guest and time for the waitress. The guest can set up a list of formerly consumed drinks, rate those and avoid ordering next time a drink that does not fit his tasting. A trusted rating platform of customers that have actually
been to that place could be set up which becomes accessible after a payment has been made. Right now plenty of rating platforms are circulating, where everyone can write comments. Therefore platforms like HRS for hotels, where people are only able to make ratings after they stayed there could be connected with m-payment services.

Payment security
Due to the promised functionality of accepting payments anywhere and anytime, immediate payment is possible. If merchants offer their service on exhibitions, they could already bill a fraction of the price as a security for the purchase. For instance wine sellers have not always the space to take all their goods with them on exhibitions due to limited space availability, therefore they could negotiate a payment in advance instead of invoicing the full amount afterwards. Currently such merchants often offer their goods only for tasting and customers have to come to their vineyard to buy and pay everything there. By modifying this service, the customer could save time by receiving the goods as a delivery and the seller already received parts of the final amount.

Loyalty
Currently there are several bonus programs circulating. Those are offered in forms of bonus cards, bonus tokens or fully single service programs as payback for instance. All those could be integrated with m-payment gathered and directly credited on the users account when a transaction is processed. By doing so, the user will not miss any special deals anymore and does not have to search for paper advertisements but will get advised mobile on special deals. Implementing such a feature makes digital bonus programs also for small merchants available and not only for bigger chains.

M-payments could easily be distributed across one country as the service is provided as an app that can be downloaded by the user; no investments are for the consumer necessary. Bank branches however have to be erected physically which is not only much more cost intensive but takes more time, too. Creative and smart ideas for apps in cooperation with their developers are needed to integrate m-payment via an API. Among the examples above, other services like order-apps at restaurants, service finder for craftsman and tradesman, apartment rentals, taxi order and so forth are suited for such co-operations.

Integrating social and NGO organisations can raise the trust for m-payments. For instance “round up”, a social donation where the amount that has to be paid can be rounded up with a few cents can be easily implemented. Similarly to the environmental fare that can be added on top of flight tickets, for compensating against carbon dioxide emissions depending on the flight distance. Other social services as Greenpeace or the World Wildlife Fund would be also suited for gaining more trust into the service for the consumer.

Germany has very complex regulations in the highly profitable medical sector. There are several hundred health insurances available for customers to choose from. All those insurances have different billing regulations for treatments. Briefly speaking, if a physician does a home visit which includes a blood pressure check, this can’t be billed on location as the doctor does not know how much money the patient has to pay and how much money the insurance takes over, due to the always different cost split. Therefore regulators are necessary that provide such data digitally for
immediate access. This will reduce the time until the patient gets the bill, the doctor who gets the money and the overall process of how many hands are involved. However according to current privacy laws, such an immediate availability is still far away.

Another feature that has to be aimed for is cross border functionality (e.g. at exhibitions abroad). Currently however, most m-payment services are only available within the country the customer is registered, due to the risks of fraud. By overcoming such barriers, high cash exchanging rates for foreign currencies become redundant. In Africa some services already offer that option, which is still the exception though. Technically it would be even possible at least across Europe to open up the service, however due to fraud prevention and currency conversions, the option is not offered, yet.

For justifying the still high fees for transactions, m-payment providers have to assure merchants that they can increase their business volume. Similar to Google AdWords, where the advertisement can be tracked back to the original page via Cookies. The costs for that particular acquisition can be charged higher to the merchant compared to the usual fees. Such a feature can be used in conjunction with loyalty programmes for instance. Coupons could be printed with a unique code on the receipt that is sent via Email to the user when making a purchase. By identifying the redeemed code, the merchant could be charged with an extra fee, as the bargain would not have been possible to execute without the m-payment service. Therefore especially small merchants can use the service as a way of marketing their own offerings by getting directly in touch with the customer. This is definitely a way for m-payment services to prove that they can increase business volume and justifies high fees as provision for enabling those extra sales.

**RQ2: Who are advantageous partners in an eco-network of m-payments to capture and dominate the market?**

**Handset manufacturers**

Apps of m-payment services can be pre-installed on mobile devices when shipped. Nokia music, a streaming service for music is preinstalled on the hardware device. The strategy behind this decision is to direct the user straight to a distinct offering for listening to music, skipping the scanning of the market to search for alternatives. By partnering with mobile device manufacturers, unknown payments services could reach popularity by getting shipped as pre-installed app that users hear and get to know the service immediately.

Further, handset manufacturers should offer a common standard for hardware connectors as well as software that are used as their platform. Some dongles for instance have to be charged separately before they can be used and additional cables for mini-USB have to be bought. Therefore the solution via the audio connector is only semi professional, as some extra adjustments (e.g. volume fully up) have to be considered that can cause failures.

The role of the hardware manufacturers is also to design a device that is safe. By providing secure devices, users will be more eager to explore the possibilities of them, instead of only texting and messaging due to feeling of insecurity concerns.
Card issuing companies
A wide card acceptance for m-payment services is crucial as card fragmentation reduces the motivation for the merchants. Businesses that can only accept a limited choice of cards are not very professional. This option is in the interest of the merchant as well as for the m-payment service to increase the trading volume. As heard before, VISA acts different than other players regarding their security measurements. Therefore a constructive cooperation between m-payment companies and the card industry would be of advantage for both sides.
Cards are currently very useful as they have been established and accepted for quite a long time. For merchants, the chance of the availability of such a card for a purchase is very high. The buyer does not have to be registered for the m-payment service, which is different to PayPal for instance, where both sides have to be registered.

Banks
Creating a new customer experience by providing a complete financial overview in real time at one place would be an added value (see figure 9 below). Currently, users access their account and their credit card balance via their bank portal. However the m-payment balance is listed on another portal. In the future, all balances must be provided in real time as an overview that is accessible 24/7. The more financial information can be gathered at one place, the more information about that person can be accessed, the better banking products can be customized. Banks will not be able to extend their physical presence by setting up more and more ATMs, as most often those are only cash out, but not cash in machines. A proper transformation from the physical offline to the digital online presence is needed and m-payment services can contribute with their business as they can adapt very easily due to their flexibility.

Figure 9: Suggested financial overview for consumers by banks (including an account for m-payment).

<table>
<thead>
<tr>
<th>Item</th>
<th>Balance Date</th>
<th>Balance in EUR</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank giro account</td>
<td>29.02.2013</td>
<td>2.000,00 (cr.)</td>
<td>Money transferral</td>
</tr>
<tr>
<td>VISA Credit Card</td>
<td>29.02.2013</td>
<td>1.000,00 (dr.)</td>
<td>See details</td>
</tr>
<tr>
<td>Mobile payment</td>
<td>29.02.2013</td>
<td>1.500,00 (cr.)</td>
<td>See transactions</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2.500,00 (cr.)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Similar to the service of Spotify, many small customers contribute to a huge profit in the end, including the labels that own the rights of the songs. Before, only “big bargains” in form of CDs were considered as worthy, however due to logistical reasons, it would have been simply not possible that electronic chains sell instead of 10 Album CDs, a 100 single CDs, the analogue business would have collapsed due to costs of storage and staff. Banks should consider the additional possibility of being able to handle small transactions as a chance, to reach out for future customers and provide a more coherent service for current customers.
MNOs
The technological infrastructure for conducting m-payment is provided by MNOs. Speaking of now, they are essential to keep the service working. The opportunity for them is to offer their customers a new and additional service of accepting m-payments with their own device. This will increase the data volume and ties the customer to the provided network coverage. Instead of paying physically, supported by ATMs, online m-payments should be always possible, too. Hypothetically speaking it's a race between building up a decent online coverage by MNOs, or banks placing ATMs everywhere that physical cash never runs out. Nevertheless, especially in developing countries are MNOs of high importance, as there the need of sending money from one place to another is much more needed than conducting a payment in a store for instance.

For needed hardware like dongles, MNOs can function as delivery channels as well by cross-selling dongles with hardware devices in form of campaigns. This will speed up the replacement cycle of mobile devices, too. The German MNO E-Plus promoted a dongle service together with a tablet for a monthly subscription fee of 15€ (transaction fees were charged extra). By doing so, consumers do not only get the chance to become familiar with a new way of processing payments, also the entrance the entrance barrier for highly prized hardware products is this way lower. Also simple rentals for mobile devices are conceivable as a counterpart to traditional POS companies. Smart phones for fashion shows, music festivals or Christmas markets could be rented out for a couple of days or weeks, instead of tying consumer to long term contracts.

Low and little transaction users as small companies and individuals
All of such consumers get the benefit of being able to offer m-payments. Rental contracts for mobile terminals were not worth for many of them. However, the high transaction fees of m-payment frighten some. Therefore m-payment services have to find ways to increase the value as already mentioned in several examples before. By supporting their business with additional services (e.g. marketing via E-Mail coupons), such users can be convinced to use m-payment in the future. However social networks as facebook reach out for them, too, offering pages for free where potential clients can be informed about the company via the news feed.

Mobile payment services
M-payment services are the innovators that demand new customers. The old economy players as bank and MNOs should support this service innovation by handling the necessary tasks (e.g. network coverage) in the background. M-payment becomes more and more competitive, due to the huge population that is still disconnected to m-payment opportunities – no matter if banked or unbanked people. Therefore is the flexibility and integration in third party services the strength of m-payment providers.

By excluding designated m-payment services from an eco-network, innovation will slow down; users will reach the point of fatigue and become less interested to use the service in the future. Especially third party app-developers are of high interest for m-payment services, as for monetizing reasons plenty of such will need a payment interface as well, e.g. public transport tickets, taxi drivers and other business service provider. As KYC processes are stricter for financial as for casual registration processes, companies could save up time, focus more on the core of their services
and match them together in the end. This will encourage the growth of the m-payment acceptance, by using such synergies.

M-Payment services must try to enforce an increase of their popularity as much as possible to be able to conduct future payments without extra hardware and extra cards. This will contribute to the convenience and design, as well as the duration of a transaction. At the current situation however, most consumers feel unsure to store all their data on a mobile phone and pay with it for a service offered by companies that are new on the market. However as soon as the trust grows for such companies and as soon as mobile devices are able to protect data from manipulation or if they get lost or stolen, m-payment services will adapt to an online-only m-payment without any extras on the side as cards or dongles. By adapting to such a way of online-only m-payment, manufacturing costs and delivery times for dongles will also become redundant and make the service easier to handle, too.

**Administrative bodies**

Federal administrations are very hard to fit in a network as they act everywhere different. While licenses for operating as a financial service are transferable between the EU-countries, situations are totally different in Africa for instance. Therefore this aspect should be treated separately depending on the territory the company intends to enter.

Generally speaking, administrative bodies have to define how to handle very complex issues as data security. However getting access to data is very important to know the customer and to make sure that the service is not misused (e.g. money laundering). Therefore such regulators must improve online data access availability as much as possible. By now there is the possibility to get such access, however very often the data is not correct due to asynchrony or has to be accessed via third parties where as those also get the data via different external services.
CONCLUSION

The key findings of this thesis show that there is no generic method for the adoption and implementation of m-payments. A successful rollout has to consider not only the territories but also the social behaviour in those areas as well as the different needs of potential users settled there. Due to the heterogeneous progress and availability of the technological infrastructure, limitations for the instalment of m-payments that rely on the Internet are not everywhere feasible.

In undeveloped countries the most significant need is an alternative for sending money to family members across country borders. In developed countries is a need for value added services that m-payment companies have to offer to compete with currently existing payment solutions on the market. To increase further growth of m-payment services, value networks should be formed. Those networks consist of well-established companies to support the new entries in regards of primarily trust, security and delivery purposes.

From a consumer perspective, m-payments can increase the overall trading volume. People and not only companies finally get a chance to accept cashless payments by using a service without any long lasting contracts and only to be billed if transactions are made. This keeps them flexible. Those m-payment services are extremely fast to install and compatible with many consumer mobile devices available on the market. Especially the additional functions coming with online payment in regards to digital data storage are immense as for instance receipts can include additional marketing features as voucher codes. As a mobile device is accompanying users more than any other physical device like keys, wallets and cards, a convenient solution which is times saving and contactless has priority. Also the payment on the spot can become important in different situations as sending bills always delays such a process. If the different parties involved in mobile payments can collaborate together, a more convenient way of personal accounting could be offered where all personal expenses for the consumer are gathered online at one place, similar to a bank portal.

Regarding critical aspects of m-payments, the biggest concern is the mobile device and the mobile connection that can be attacked. Personal devices for conducting a payment are considered to be more trustful than entering personal details in devices owned by third parties. The thread of online software manipulation can still be considered as minor precarious right now, however as soon as m-payments become mainstream, this situation might change and software could be hacked much more often.

As technology develops very fast for the IT-sector, currently popular credit cards will be replaced over the next years by E-Wallets. This transformation strongly relates on how fast trust and security can be communicated to the customer to adapt to such services. The aim for m-payment services has to be to replace cash with cards first, and cards with wallets second, to offer a new payment experience to the user in the end.
FURTHER RESEARCH

In the following part, upcoming devices and developments are mentioned that will strongly influence the development of m-payment.

Since the launch of the tablets, no new mobile devices entered the market. Only successors with basically the same features followed. Recently however was announced that the traditional wristwatch will be re-launched equipped with Internet access. As such a device can be very small in comparison to current mobile devices, there might be also a huge hidden potential for m-payments. The same is for the already announced but not commercially launched Google glasses.

The further development and usage of payment cards in form of credit and debit cards should be observed. As this can become an indicator how much consumers trust already in mobile stored information.

Also the security of mobile devices plays a significant role for the adaption of m-payments. Different approaches for instance with biometrics should be monitored, combined with a chronological statistic of mobile virus attacks and fraud.

The suggested value added services in the discussion part are believed to be useful for m-payment services. However there has no research been conducted if the examples are enough to convince more consumers to use m-payment. Especially the justification of different fees depending on the increased transaction volume should be looked further into.

I suggested in the paper that m-payment should not be carried out by handset manufacturers. This was supported by the failed approach of Nokia and reasoned with little experience of handling circulating money deposits. However as especially Apple has not made a clear statement on how they will offer or implement m-payment, there might be indeed another possibility of carrying out m-payments. This is similar to the opportunities of social networks where more than 1billion people are already registered.
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APPENDIXES

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