

innOPAY

Mobile payments 2012

My mobile, my wallet?



“ ‘Mobile payments 2012 – My mobile, my wallet?’ is an overall report on the evolution of mobile payment in various parts of the world. It concisely illustrates the diversity of market drivers, technologies and stakeholders and is a source of trusted information of the status of the markets. Recommended reading for those aiming to understand more on the status of the market. ”

Sirpa Nordlund, Executive Director of Mobey Forum.



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Preface

You are reading the report 'Mobile payments 2012 – My mobile, my wallet?' that provides an overview of the current affairs in mobile payment, both on a global and regional level.

While the earlier editions 'Mobile payments 2008' and 'Mobile payments 2010' included an extensive list of regional mobile payment initiatives, this year's version is based on a new approach. 'Mobile payments 2012' follows the structure of our latest 'Online payments 2011' report and consists of both general developments and specific regional developments. The list of initiatives will be included in a separate, new publication by The Paypers to be published next year.

This report consists of two parts. Part 1 presents the general, global developments in mobile payments, including the rise of smartphones and apps as a driver for mobile payments and the high attention given to NFC. Part 2 elaborates on the developments in various regions of the world. This part also includes case studies on the Cityzi NFC initiative in Nice, France, on mobile PoS solution Square, on Telefónica & MasterCard in Latin America, and on the activities of Orange in Africa.

The report is intended for everyone active in the 'transaction services industry', including merchants, banks, payment service providers, risk service providers, scheme organisations and policy makers. With this report we hope to provide a clear insight into the global mobile payments industry.

All details concerning mobile payment methods, specific payment products and payment service providers are based on information that was publicly available at the moment this report was written. Although we do not claim to provide a complete description of the market, we do feel that we present an overview of the main and relevant developments.

Finally, this report has been written with the utmost care. If you feel that, despite our efforts, it contains information that is unclear or find certain information to be missing, we appreciate it if you could let us know. Please mail us at info@innopay.com.

Amsterdam, September 2011

Chiel Liezenberg – Founding Partner Innopay

Douwe Lycklama – Founding Partner Innopay

Innopay on mobile payments

Innopay is an independent full service consultancy firm specialised in payments and related transaction services. It is our vision that:

- Globalisation increasingly leads to a network economy and electronic infrastructures enable industries to cooperate in networks, in real-time.
- (Mobile) Internet is developing into true transaction channel, creating new transaction contexts. New contexts require new transaction services and new options emerge in existing contexts.
- Transaction services are part of two-sided markets, with sophisticated network effects. Development of successful transaction services requires thorough understanding of the context. Development is complex and costly and asks for specialist expertise and a specific approach.

Innopay has been active in mobile payment since 1999. Several of our senior consultants have experienced the rise and fall of the first wave of mobile payment initiatives and the current upcoming second wave first hand.

We have come to recognise that mobile payments are greatly dependent on the economic, regulatory and cultural context. The European marketplace is very different from that in developing countries. Where in the EU there is a strong focus on NFC technology and key issues include the business case, interoperability and positioning, in developing countries the focus is on remittance and money transfer solutions and associated regulation, funding and risks.

Based on our experience we have created the 'Innopay Transaction Context Model' to better understand the success factors for mobile payment services development. Our services address three domains:

- Help you as a professional or regulator to 'structure & understand' the mobile payment services industry.
- Help you as a provider to 'develop & manage' mobile payment business, services and products.
- Help you as a corporation to 'choose & use' mobile payment solutions.

Some of our references cases include:

- Market analysis on introducing mobile payments in a developing nation for a leading bank.
- Business development in using NFC stickers as contactless payment method.
- Development and piloting of a mobile micro payments solution for a large multinational bank.
- Product development of an SMS payment solution for a large international bank.
- Product development and prototyping of a voice recognition mobile payment method for a large international bank.

Innopay is a member of the European Payments Consulting Association (EPCA) and an associate member of the Euro Banking Association (EBA). Innopay was also a member of the former Payment Systems Market Expert Group (PSMEG) of the European Commission.

Innopay's other key practices include: online payments, e-invoicing, e-identity, cards and related regulation. On most of these topics we regularly publish leading industry reports which can be downloaded for free.

For more information visit www.innopay.com or contact us directly at info@innopay.com or +31 20 6580651.

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Management summary – My mobile, my wallet?

A tipping point is the moment of which a previously rare phenomenon rapidly and dramatically becomes more common. Recent developments warrant the questions whether we are now at a tipping point – a revolution, rapidly changing the mobile payment landscape – or rather an evolution with mobile payments growing at a much slower, more gradual rate.

The attention for mobile payments has been rising steadily over the past years. Undeniably, mobile payments continue to be hot – perhaps hotter than ever. With the rise of smartphones ever more people have access to highly advanced handsets. The advent of mobile applications, or apps, has paved the way to more extensive and specific functionalities providing better user experience to the user. As consumers become more engaged to their mobile phones, mobile payments draw ever more attention.

This all makes analysts highly optimistic, predicting mobile payments to grow with double-digit figures on an annual basis. Gartner, for example, predicts that the number of mobile payment users worldwide will surpass 140 million in 2011, an increase of almost 40% compared to 2010. Together they are expected to account for a global transaction value of over USD 1 billion in 2014. In addition, the mobile payment users would represent merely 2.1% of all mobile phone users, which suggests there is still ample room for growth.

In developing countries, companies are tapping into the opportunities provided by the large unbanked populations that have no access to alternative methods of financial services. Building on the success stories like M-PESA in Kenya, Africa, similar initiatives that provide basic financial service through low-tech phones have come to life in many other African- and Asian countries.

India, the world's second most populous country and the 12th largest economy, is a good example to that end. India has a poor existing financial infrastructure resulting in a large population of unbanked people. Establishing a network of brick-and-mortar branches would be a daunting task, bordering on the impossible if we also consider the remoteness of many small communities people live in. Meanwhile mobile phones have penetrated in a fast-pace and function largely independent of brick-and-mortar networks. Within this context, mobile banking has emerged as a very cost-effective means of reaching a large number of Indian consumers, irrespective of their remoteness.

In developed countries, most attention is given to near field communication (NFC). This technology to communicate in proximity offers an easy, quick way to perform (typically) low value transactions. In addition, it offers the possibility for additional features, such as loyalty programs, couponing and targeted marketing. In some countries, such as Japan, NFC has already marked its place in people's daily life.

As NFC is predicted to be booming numerous new initiatives are born in countries all over the world. In the US, Google launched the Google Wallet as an answer to the Isis initiative. In Europe, in the UK, multiple parties such as Orange, Barclaycard and Visa are involved in

multiple initiatives. In France, there are pilots in multiple cities like Nice and Caen. In the Netherlands the three main banks and the three main mobile network operators are united in the Travik initiative. And there are many more not mentioned here.

Overall, the increased attraction and gained momentum of mobile payments are undeniable. With an increasing number of smartphones having ever more capabilities, with many new players entering the market and consumers that are more engaged to their mobile phones, we are definitely seeing a change in the market place.

To reach the next step towards being the standard rather than the exception, one cannot ignore context in mobile payments are carried out. In general, adoption of mobile financial services is context-driven; this means that a “one size fits all” approach does not work. In order to develop successful mobile payment services, one must have a clear understanding of its context and find a service that best suits its context. Differentiation between markets must occur in terms of the overall proposition behind mobile financial services. Consumer needs and perceived obstacles and drivers that shape the mobile ecosystem, along with technological developments all need to be taken into account.

In developed markets, such as Europe or North America, mobile payments are not a novelty. Here the tipping point should be in consumer behaviour: consumers adopting mobile payments on a much larger scale. In order to achieve this, mobile payments must offer added value to make their use more attractive, compared to other payment methods, for both consumers and merchants: they must be easier, cheaper, safer, and commonly accepted.

In developing markets, such as Africa or parts of Asia, mobile financial services have strong potential as they do not face competition from established traditional services. They thus have the potential to create a completely new market. Therefore the tipping should be in capitalization on the opportunity of the large number of unbanked and underbanked consumers. Keeping it simple is key: most devices in developing markets are basic, without advanced features.

In order to spark the tipping point now, providers need to focus on the context described above and develop mobile payment services that best suit the user needs. Otherwise, mobile payments are still happening, but at a more gradual pace than most predictions suggest. It seems like it will still take quite a while before our mobile actually becomes our wallet.

Part 1

General trends and developments



1 The mobile payments ecosystem explained

The mobile payments landscape is a complex one. There are several types of mobile payment services, such as remittance or contactless point of sale payments. To enable mobile payment services there are various technologies, for example Near Field Communication (NFC) or SMS. Combinations of technologies and business models add up to a large variety of mobile payment services. In addition, the world of mobile payments is populated by all sorts of different players and stakeholders, such as financial institutions, mobile network operators (MNOs), technology providers, regulators and many others.

A lack of clear definitions of mobile payments adds to the confusion and hinders better the understanding of the issues. Therefore, this chapter aims to clarify the various aspects of mobile payments and classify the services, methods and stakeholders. This will help the reader to get a better understanding of the mobile payments ecosystem, and enable the reader to put the developments described in the rest of this report into perspective.

1.1 Defining mobile payments

In the context of a financial transaction the mobile phone can be used for multiple processes, which are all closely related to each other. There is often confusion and overlap between a mobile payment, mobile banking, and the use of the mobile phone to simply order goods or receive delivery while paying by other means.

In this report we distinguish between five processes:

- **Mobile payment:** a payment, defined as a transfer of funds in return for a good or service, where the mobile phone is involved in both the initiation and confirmation of the payment. The location of the payer and supporting infrastructure is not important: he may or may not be ‘mobile’ or ‘on the move’ or at a Point of Sale (PoS); the payment may be processed by credit cards or by a prepaid wallet. Example: funds are transferred and deducted from the prepaid amount or billed by the MNO.
- **Mobile order:** transactions where the mobile phone is used to initiate the order but not to make the payment. Example: food ordered online via the mobile phone and paid at delivery.
- **Mobile delivery:** transactions where the mobile phone is used to receive delivery of goods or services without making the payment. Example: an event ticket is issued on the mobile phone.
- **Mobile authentication:** use of the mobile device to authenticate the user either as part of a payment transaction or to give access to some information or functionality. Example: a code is sent to a mobile phone which the user types in online to verify his identity.

- **Mobile banking:** access to banking functionality via the mobile phone. This includes the provision of part or all of the banking functionality already provided by banks over the internet in the form of online banking but also other methods of telephone banking. Example: view account balance and transaction history via the mobile browser or app. Note that a mobile payment can also be executed within the mobile banking environment.

Of the current applications of the mobile phone involved in a transaction, only a subset includes actual payment with the mobile. The large majority of applications simply use the mobile phone to initiate the order, receive delivery or authenticate the consumer.

The current overlap in the industry of such diverse functions as banking, order, delivery and authentication under the common label of mobile payments has some negative consequences for the development of mobile payment solutions. By confusing and using the term mobile payments the industry is diluting or blurring the specific needs of each function and in the process not adequately identifying and meeting these needs.

1.2 Mobile payment categories

Transactional services are subject to the context in which they are operated. Mobile payments can be performed in your local grocery store, to your friend to share the bill or online to buy a new DVD, just to name a few contexts. Given the large variety of contexts in which a payment can be carried out, there are various mobile payment services that fulfil the specific needs of each context.

In this part we aim to categorise the various methods. We base the categorisation of services on the criteria of the actors involved (relation) and location. Payments can be done between consumers (P2P or C2C) or between consumers and companies (C2B). In addition, payments can either be executed in proximity, for example at the counter in a shop, or remotely, for example paying online via a mobile phone. As a result we can distinguish 4 categories of mobile payments, which are depicted in Figure 1.

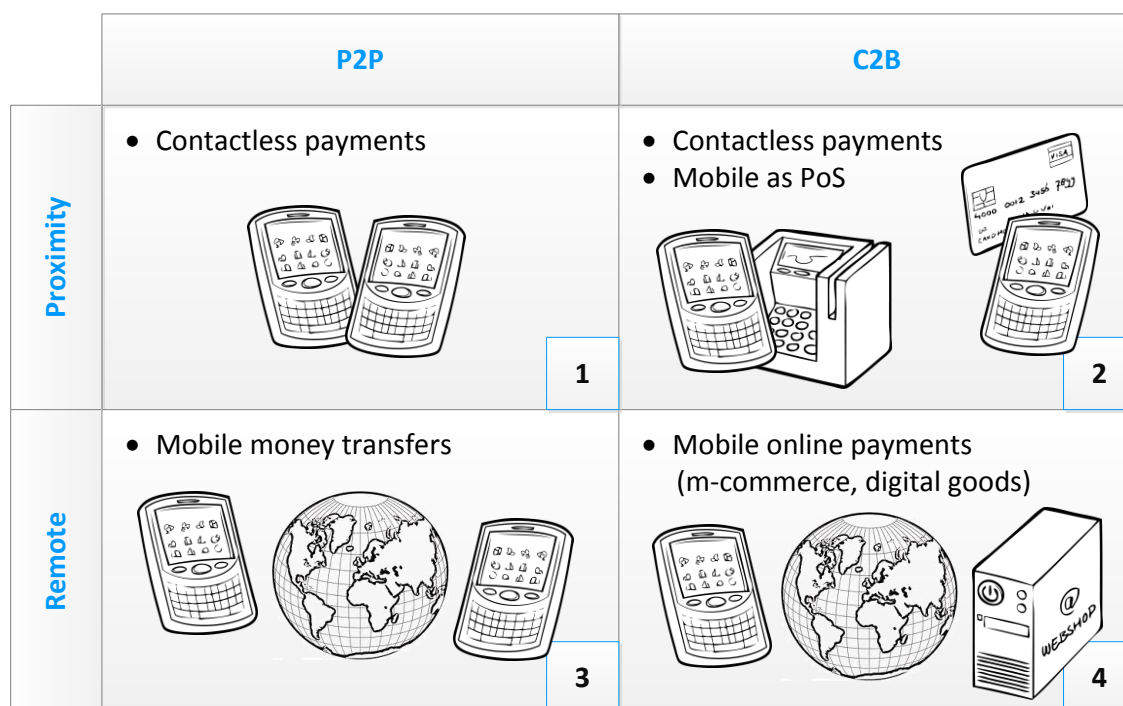


Figure 1: Mobile payment categories. Source: Innopay analysis.

1.2.1 Proximity payments

1. Contactless payments

Contactless payments are payments done in proximity without making contact. Some examples are paying at PoS by holding your mobile phone in proximity, transfer money to your friend by moving the phones towards each other or by paying your metro ride by holding your phone at the reader. As the examples show, contactless payments can be done both between consumers (P2P) and between consumers and merchants (C2B).

Contactless technology can be divided into two categories:

- **Vicinity:** this technology offers a maximum read distance of 1 to 1.5 meters (3 to 5 feet).
- **Proximity:** this technology has a much smaller read distance, usually about 7.5 centimeters (3 inches) in most instances.

There are multiple ways to perform contactless communication. Nowadays Near Field Communication (NFC), a contactless communication technology that will be explained later in this and the next chapter, gets most of the attention in the field of contactless payments, and in general in the field of mobile payments. Still there are many other, similar methods to perform contactless payments; they can be done via the mobile internet, Bluetooth or radio frequency waves of the mobile speakers.

2. Mobile phone used as PoS device

A recent phenomenon is the use of the mobile phone as a point of sale (PoS) to accept (typically) card payments. Some examples are paying the merchant at your local food market or at your favourite Italian restaurant.

With the help of an extra device and an application for the hardware the mobile phone can be used to accept (typically) card payments. The external card readers typically support payments between consumers and small enterprises. They are specifically targeted for enterprises not large enough for traditional PoS devices, thereby providing access to those otherwise excluded due to high lump sum investments.

More example and initiatives of mobile PoS devices will be provided in chapter 6 on North America.

1.2.2 Remote payments

3. Mobile money transfers

A mobile money transfer is a transfer of funds from one consumer to another over long distance. There are two contexts in which mobile money transfers are executed. The first context is payments that are carried out between consumers within the same country. In developing countries this could be in between people in a major city and their relatives on the country side. However, also in a country such as the US there is a large market for P2P mobile money transfers, supported for instance by the PayPal services.

The second, that includes the majority of the mobile money transfers, is the context of consumers sending money overseas. This area is dominated by remittances. A remittance is a transfer of funds from a foreign worker to his home country. This typically constitutes migrant workers from Africa or Asia Pacific that work in Europe and North America, but also happen within the same regions. Among the largest recipient countries are India, China, Mexico and the Philippines.

Remittances form a huge market. According to a recent report of The World Bank¹ remittance amounted USD 325 billion in 2010, and is expected to reach USD 404 billion by 2013. Driven by the lack of banking infrastructure and available alternatives, mobile remittances form an ever larger share of this market.

More information on remittances can be found in chapter 7 on Asia.

¹ World Bank – ‘Outlook for Remittance Flows 2011-13’, 2011

4. Mobile online payments

Mobile online payments are payments via the mobile browser or via an app on the mobile phone. There can be distinguished between two use cases of mobile online payments that both are executed in the B2C- environment: m-commerce and digital goods.

The first is the case of online shopping for goods or services on the mobile phone, called m-commerce. Online business models are incorporated into mobile devices in order to maximize revenue opportunities. Mobile devices are thereby becoming an ecosystem for m-commerce, allowing developers to build their own m-commerce applications on the mobile device.

The second is the case of purchasing digital goods on the mobile phone through mobile platforms. Often ignored in the field of mobile payments, buying apps, games and music is the fastest growing area in mobile payments. Depending on the platform, mobile payments are typically done by either having stored card payment details linked to the user account on the mobile phone, or prepaid cards credited to the user account.

1.3 Mobile payment enabling technologies

In the last section, we distinguished between four mobile payment categories, based on distance and relation between buyers. For each of these categories, numerous enabling technologies are available to apply in solutions. In this paragraph, we provide an overview of the main enabling technologies for mobile payment services.

1.3.1 Interactive Voice Response (IVR)

Interactive Voice Response (IVR) is a technology that allows people to communicate with computers via a telephone call. The technology allows companies to interact with pre-recorded or dynamically generated audio and register speech or telephone keypad input. IVR typically comes in the form of a dialogue and menu, allowing for a series of simple interactions.

By applying IVR to banking and payments, everybody with a cell phone can obtain access to mobile payments. Nevertheless, due to its limited user interface the user experience is not optimal.

1.3.2 Text messaging via SMS & USSD

Short Message Service (SMS) is a communication protocol allowing for the interchange of short text messages between mobile telephony devices. SMS is available on almost all modern mobile phones. Most SMS messages are mobile-to-mobile text messages, though the standard also supports other types of broadcast messaging as well, for instance mobile to landline or mobile to computer.

Short Message Service is a popular data service offered by mobile network operators and most widely used for mobile payments. It is relatively cheap and easy to use. The SMS capabilities can be used for basic functionalities like bank account enquiries or SMS based payments or ticketing. By offering SMS-based mobile payment services most users can be reached as SMS is the most accepted technology in mobile phones. On the other hand, the user experience of SMS banking could be improved.

A similar method to SMS is Unstructured Supplementary Service Data (USSD). USSD is a capability of all modern GSM phones. It is generally associated with real-time or instant messaging type phone services. USSD is a standard for transmitting information over GSM signaling channels. It is mostly used as a method to query the available balance and other similar information in pre-paid GSM services. The function that is triggered when sending USSD is network dependent and depends on what kind of services the operator has made available. Some operators have not activated this possibility.

The USSD bearer is accessed by calling a number that starts with the asterisk or gate (or hash) characters '*' or '#' and then a combination of numerals, asterisks and finally the gate or hash character '#', for instance #09001234#. There is no store-and-forward capability that is typical of 'normal' short messages. Response times for interactive USSD based services are generally quicker than those used for SMS. Also, the sender of a message can be absolutely sure that they are talking to their own operator. As a consequence, communication via USSD is in sessions instead of in discrete intervals.

1.3.3 Mobile internet

High speed broadband internet is increasingly available on mobile devices. In parallel, mobile devices are becoming increasingly like laptop computers in terms of the functionality they offer. The continuation of these two trends implies that in the near future, at least in terms of functionality, there will be little difference between our mobile devices and our laptop computers. The only yet critically important differences will continue to be the size of input (by definition small for a mobile device) and the size of the display (again smaller for a mobile device).

It is widely believed that the emerging convergence among the internet and mobile technologies will lead to the emergence of a wireless broadband internet platform that will allow ubiquitous access and a wide range of new value-added services, many of which would be settled via payment systems based on the platform. Future developments could lead to real time online banking with your mobile phone, which would be an enabler for point of sale payments.

1.3.4 Near Field Communication

Near Field Communication (NFC) has its origin in the Radio Frequency Identification (RFID), which is an application of contactless technology for both proximity and vicinity communication. RFID is used extensively in areas such as product tracking, passports, animal identification, libraries, etc. However, the restriction of RFID has always been that it is a one-way communication standard; from the code to the reader.

This restriction was resolved in the 1990's by Philips and Sony. The two companies jointly developed a standard for two-way contactless communication. The standard was called Near Field Communication or NFC and while this standard was available throughout the 1990's it was only acknowledged by the ISO organization in 2003 and from that moment became an open standard for two way contactless communications.

Along with the development of two-way contactless communication there have also been recent advances in the speed with which the data is transferred and the security of the transferred data through encryption.

The critical developments of two-way communications, faster data transfer speed and increased data security have made contactless technology ripe for use in payments. These developments have been the catalyst for an explosive growth in the use of contactless technology for payments with the volume of contactless cards growing to hundreds of millions helped in part by strong marketing pushes from the major card schemes.

However, because of the interactive communication opportunities offered by the two-way capabilities of NFC, this technology only offers its full potential when used with an interactive device such as a mobile phone. The recent developments in contactless technology culminating in the registration of NFC as an open ISO standard have been the catalyst for the recent renewed interest in NFC based point of sale payments using a mobile device.

1.4 Key stakeholders

1.4.1 Providers of mobile payment services

Mobile network operators (MNO's)

For mobile network operators mobile payments are an attractive proposition for achieving a return on the investments made in infrastructure over the last two decades through reduction of churn, extra payment related revenues and through associated increases in air time and data use. For mobile network operators mobile payments also hold the possibilities of allowing for diversification into other areas of the consumer's needs and lifestyle.

Financial institutions

For financial institutions mobile payments are first and foremost a defensive play. From a retail banking point of view, financial institutions are primarily focused on protecting the current account and surrounding loan products. Retail payments including mobile payments are more often than not a loss leader for these more profitable products. From a wholesale banking point of view financial institutions have already been disintermediated to some degree from their wholesale customers by third parties in the area of online payments. Financial institutions are keen to avoid the further worsening of this situation through third party mobile payments. Mobile payments also hold the allure for financial institutions of assisting in the ongoing battle to reduce the use of cash and its associated costs. Furthermore in developing geographies mobile payments offer financial institutions the opportunity to cost-effectively capture and service unbanked and underbanked communities.

Handset manufacturers (OEMs)

Handset manufacturers (or Original Equipment Manufacturers, shortly OEMs) produce the mobile devices and thereby determine their capabilities and usability. The success of the use of the mobile device for payments has the potential for resulting in a substantial increase in both sales to new customers but also for the renewal of existing devices in the market to ones that are payment capable.

Technology providers

As with any technology led development, mobile payments hold the most promise for technology vendors and systems integrators: chip manufacturers create the smart card chip on which the mobile payment application or secure element can reside; the secure element issuer personalizes the chip with the secure element; the service provider offers specific services for end users such as authentication; while the Trusted Services Manager (TSM) enable the service provider to use the secure element.

All these organisations are positioning themselves to provide the infrastructure and messaging for mobile payments and in the process offering to act as a trusted intermediary between the banks and the mobile network operators.

It should be noted that in the market today both financial institutions and mobile network operators play the roles of Secure Element issuers, service providers and trusted services manager.

1.4.2 Demand side

Merchants

For merchants, Point of Sale mobile payments could provide faster throughput at the checkout and the ability to send real time marketing messages to the consumer. However, faster throughput could also be achieved through contactless cards and it is yet unclear whether consumers would actually want or appreciate real time marketing messages from the merchant on their phone. However un-manned or remote Point of Sale locations could benefit from mobile payment by allowing a reduction in servicing costs. Remote mobile payments provide another channel for merchants and as such are an attractive proposition if the use of the channel can gain wide scale adoption at lower costs than existing channels.

Consumers

From the perspective of the end consumer, the mobile phone has achieved 'permanent share of pocket', i.e. next to the wallet and keys it is the object that is most likely to be constantly with the consumer. Furthermore, consumers are increasingly more comfortable with the mobile phone fulfilling more than one function, with mobile devices slowly morphing into multi-media and multi-application devices. However, does this mean that end consumers are ready to abandon the wallet and rely primarily on the phone, which is more a lifestyle or leisure tool, for the important task of handling their payments?

2 Mobile payments at a tipping point?

A tipping point is defined as the moment of which a previously rare phenomenon rapidly and dramatically becomes more common.

The attention for mobile payments has been rising steadily over the past years. Undeniably, mobile payments continue to be hot – perhaps hotter than ever. Advances in handset technology have also allowed m-payments to be carried out in new ways, while predictions for m-payments growth have continued to be aggressively optimistic.

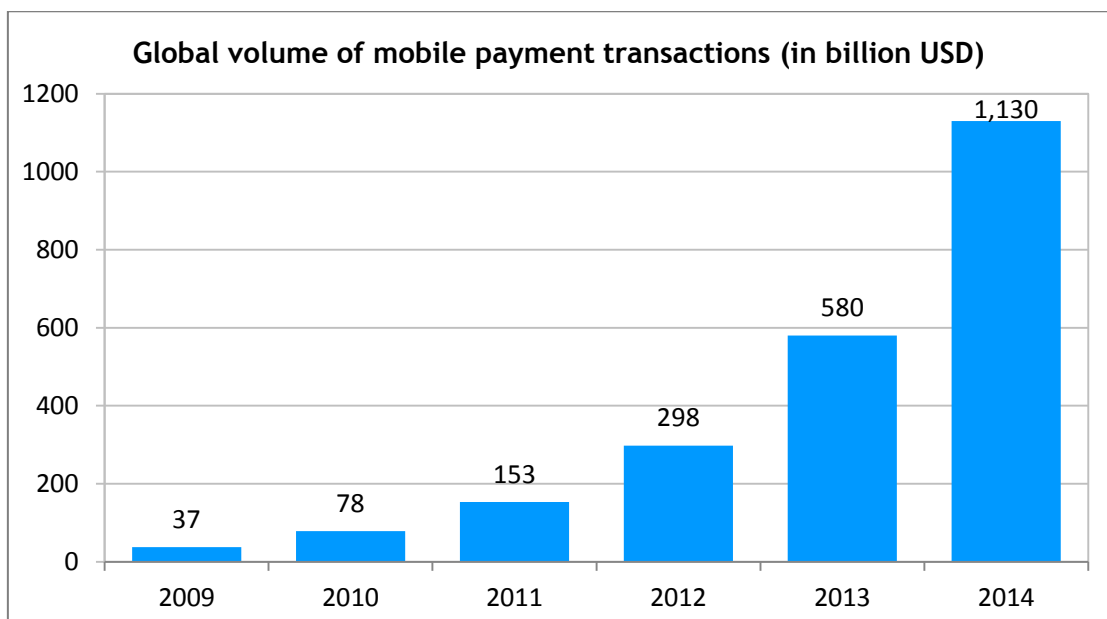


Figure 2: Global volume of mobile payment transactions. Source: IE Market Research, 'Q3.2010 United States Mobile Payment Market Forecast, 2010-2014', 2010.

According to IE Market Research², the global volume of mobile payment transactions is expected to grow from USD 37.4 billion in 2009 to over US 1.13 trillion in 2014, which means a CAGR of 94.8%. In addition, the number of mobile payment users worldwide is predicted by Gartner³ to surpass 141 million in 2011, a 38.2% increase from 2010. This number of mobile payment users would represent merely 2.1% of all mobile users worldwide, which suggests there is still much room for growth. Especially regions where there is a lack of alternative payment methods are seen to have strong potential.

² IE Market Research – 'Q3.2010 United States Mobile Payment Market Forecast, 2010-2014', 2010

³ Gartner - 'Market Trends: Mobile Payments Worldwide 2011', 2011

However, in developing markets, despite favourable conditions for mobile payment, growth is not as strong as was anticipated. Many service providers have yet to adapt their strategies to local requirements, and successful business models from Kenya and the Philippines have proven difficult to translate to other markets. While developing markets have favourable conditions for mobile payments, such as high penetration of mobile devices and low banking penetration, this is no guarantee of success, unless service providers adapt their strategies to local market requirements.

If mobile payments are finally set to become the norm rather than the exception, the current global m-payments ecosystem needs to evolve towards a state of consistent development. To arrive there, certain development areas must be given significant attention. Most urgently, these are regulatory compliance and a reduction of fragmentation and complexity through standardization (to be addressed in chapter 3). On top of this, success will take a thorough understanding of existing payment infrastructures, consumers' payment behaviour and the diversity of existing channels at the moment of payment.

This chapter aims to provide an overview of the main drivers for mobile payments describing the rise of smartphones, the advent of new technology and the changing customer needs. The chapter concludes with a discussion whether we now face a tipping point in mobile payments.

2.1 The rise of smartphones

The rise of smartphones is unquestionable, and smartphones are touted to have the potential to completely transform the mobile payments space.

Smartphone sales showed strong growth worldwide in 2010. According to IDC⁴ (February 2011), total shipments in 2010 were 302.6 million units up 74.4% from 2009. This makes smartphones 21.8% of all handsets shipped. The top mobile smartphone manufacturers, by 2010 global sales, are Nokia, RIM (Blackberry), Apple, Samsung and HTC. A similar study by Strategy Analytics (conducted in February 2011) found that shipments in 2010 were 292.9 million units up 67.6% from 2009. This would make smartphones 21.5% of all handsets shipped.

Gartner⁵ (April 2011) forecasts that Android is set to become the number one smartphone operating system in 2011. Gartner estimates that 468 million smartphones will be sold in 2011, a 57.7% increase from 2010. Of those phones, 38.5% will be powered by the Android operating system. By 2015, 631 million smartphones will be sold annually, nearly half of those will be based on Android.

⁴ International Data Corporation - 'Worldwide Quarterly Mobile Phone Tracker', 2011

⁵ Gartner - 'Forecast: Mobile Communications Devices by Open Operating System, Worldwide, 2008-2015', 2011

In a study carried out in March 2011 by IDC⁶ it is estimated that 450 million handsets will be sold by the end of 2011, a 49.2% increase from 2010. Of those phones, 39.5% will be powered by the Android operating system. Gartner (March 2010) predicts that in 2011, over 85% of handsets shipped globally will include some form of browser. In mature markets (for example Western Europe or Japan), approximately 60% of handsets shipped will be smartphones with sophisticated browsing capabilities, according to the same IDC study.

In addition, non-smartphones could be able to access the internet. Research carried out by dotMobi⁷ (mobiThinking's parent company) estimates that there are 6,500 distinct web-capable mobile devices models in use globally (not including handsets that have been renamed/relabelled by operators). The majority of these are not smartphones. The specifications/features of these devices vary massively, in particular in screen sizes. Also, the majority of web-enabled phones are not smartphones (and have much smaller screens), causing large images to load slowly. Moreover, many technologies commonly used on websites, such as Flash, do not work on many handsets, including Apple's iPhone.

All in all, the growth of smartphones is unquestionable. This recent proliferation of web-enabled smartphones is expected to drive mobile payment transaction volume. In-Stat⁸ predicts that the number of annual mobile payment transactions is likely to increase to 45 billion in 2015 globally as consumers become more familiar with mobile payments and the number of retailers supporting this technology constantly increases.

2.2 Mobile apps adding functionality

The advent of smartphones and the emergence of app stores, such as Apple's App Store or Google's Android Marketplace, has proven to be a complete game-changer for the mobile ecosystem and for consumer perception of m-payments, particularly in developed markets. Mobile phone applications (apps) are built on top of existing infrastructure by both the companies themselves but also by independent, third-party developers. The result is more extensive and specific functionalities for the smartphone with greater user experience.

This also has its effects on the payment industry: many financial service providers have opened up, offering application programming interfaces (APIs) for developers to create new, innovative mobile payment apps.

One of the frontrunners in this area has been PayPal which launched a developer library for mobile payments in February 2010⁹. The library, which is part of the PayPal X Payments

⁶ International Data Corporation - 'Worldwide Quarterly Mobile Phone Tracker', 2011

⁷ dotMobi - Interview with Ronan Cremin, VP of Engineering, 2011

⁸ In-Stat- ' Mobile Payments Worldwide: Is the Market Ready? ', 2011

⁹ The PayPal Blog - 'PayPal to Open Mobile Payments Library to Developers', 2010

Platform, enables app developers to accept in-app purchases directly via PayPal without having to store customers' personal financial information. Customers will be able to make a payment from a merchant's or developer's app without ever leaving the application.

In the months following the introduction of PayPal X, other payment networks launched innovation labs and open platforms. MasterCard Worldwide launched its proprietary payment and data services as an API and allowed third-party developers to build new payment applications in May 2010¹⁰. Visa followed in October 2010¹¹.

Apps are increasingly being used for mobile payments, developed both by the owners of the infrastructure and by third-party developers. Nowadays payment services are developed for social platforms such as Twitter (for example Twitpay or Twippr, notably both linked to PayPal). Most banks are developing apps for mobile banking and some also allow mobile payments through the same app. There are many other functionalities enabled by apps, such as mobile cheque deposit (Spanish bank Banco Sabadell has developed Instant Check), Bump (implemented by ING Direct USA), 2D barcode scanning (by Starbucks) or through hardware attached to smartphones such as Intuit and Square. These are just a few examples, there are many more that are not mentioned here.

Apps have truly altered the landscape for mobile payments in a positive way. With the added functionalities and enhanced user experience mobile apps are a serious driver for mobile payments.

2.3 Changing consumer needs

As smartphone adoption grows and mobile apps give them ever more functionalities, consumer behaviour changes. Modern consumers are interested in accessible financial services that are easy to use and allow them to exercise control without difficulty over their finances on a regular basis. The growing ubiquity of mobile phones and their multifunctional capabilities fit the bill nicely, making mobile payment a solid alternative for on-the-go consumers. As mobile and payment technologies mature and become widely available, mobile payments are expected to gain significant traction in the coming years.

Due to its high degree of usability, the high number of available applications and its association with the iTunes mobile store, the iPhone has become the leader of the smartphone world and by itself a driver for mobile payments.

¹⁰ MasterCard - 'MasterCard to Unleash Payment Innovation by Launching New Open API Developer Portal', 2010

¹¹ Visa- 'Visa Opens World's Leading Payment Network to Independent Developers', 2010

For example, research by The Yankee Group¹² shows that 41% of iPhone users have expressed an interest in mobile payments, and also that iPhone users have carried out more mobile purchases and have completed a higher number of mobile transactions than any other smartphone user segment. Moreover, the research has shown that 18% of iPhone owners have carried out m-banking activities from their devices; the same holds true for 10% of non-iPhone smartphone users, while only 5% of all mobile users have engaged in mobile banking. Likewise, 16% of iPhone users were shown to have carried out mobile payment transactions, compared to 6% of smartphone users and 3% of all mobile users. Additionally, the study has indicated that 9% of iPhone users have employed mobile coupons, compared to 4% of users who own smartphone devices other than the iPhone and 2% of all mobile users.

The public's fascination with Apple's iPhone has the potential to actually generate momentum for the entire mobile commerce segment – be it mobile purchases, mobile banking or other services such as mobile ticketing, location-based and information services, mobile marketing and advertising. Consumer confidence and brand loyalty make for a very strong capital, one which can be exploited for the benefit of mobile payments in general by capitalizing on users' willingness to follow wherever their trusted brands lead. Moreover, the iPhone does not stand alone: there are other brands of smartphones with millions more dedicated smartphone users who can easily become early adopters of mobile commerce.

On the other hand, according to research conducted online by market research company Tealeaf¹³, as smartphone adoption grows, UK consumers for instance are increasingly expecting a faultless experience across all online channels. Although 10 million UK online consumers have made at least one transaction in 2010 using a mobile device, 83% of them have also experienced problems when carrying out mobile transactions, a recent survey has revealed.

In addition, 74% of UK consumers in the survey have claimed not to see any reasons for a mobile transaction to fail on the first try and 66% of UK respondents have said that upon experiencing a problem conducting a mobile transaction, they would be less likely to buy from the same company via other purchase channels. The survey has also highlighted that 51% of the respondents who have conducted a mobile transaction in 2010 claim to expect a better shopping experience on their mobile device, compared to purchasing in-store. When questioned about any problems experienced, 34% of UK interviewees pointed out error messages and 24% of them mentioned experiencing navigation difficulties.

Moreover, when asked about their reaction upon experiencing a mobile transaction problem, 30% of British respondents who have experienced m-commerce problems in 2010 stated they would abandon the transaction on their mobile device and try again later on a computer, while 13% claimed they would switch to a competitor's app or website. 9% claimed not to conduct a

¹² Yankee Group- 'Why iPhones Matter', 2010

¹³ Tealeaf - 'Improving the Customer Experience for Mobile Consumers (U.K. Report)', 2011

mobile transaction again due to their dissatisfaction. Nevertheless, when faced with m-commerce problems, 23% of UK respondents said they would call customer service to solve the issue.

The growth of smartphones alongside the enhancements of their capabilities makes people more open towards mobile payments. In this context the Apple iPhone has shown to be a market leader and an important driver by itself. Nevertheless, as the research above shows, there are still hurdles to overcome in terms of security and user experience to convince consumers about the true benefits of mobile payments.

2.4 The tipping point: not quite there yet

As defined at the beginning of this chapter, a tipping point is the moment of which a previously rare phenomenon becomes rapidly and dramatically more common. Recent developments warrant the questions whether we are now at a tipping point – a revolution, rapidly changing the mobile payments landscape – or rather an evolution with mobile payments growing at a much slower, more gradual rate.

Despite the hype created, despite overly optimistic studies that proclaim that m-payments are expected to reach the 1 billion users or USD 1 trillion transaction mark by 2014, the truth is m-payments are not doing as well as previously anticipated. Better said, m-payments have not failed per se, but have failed to live up to the wildly positive reviews and market estimates they have generated.

So far, we have perceived the very nature of mobile devices as being in a way self-explanatory. This means that the main motivational factor to drive the long-awaited mobile payments revolution should be the very fact that many mobile devices are versatile, seemingly ubiquitous and thus perfectly suited for the provision for and access to financial services.

However, more is needed to create a mobile payments revolution. While the attraction of mobile payments continues to be amply acknowledged, the struggle to balance out rapid technological advances, regulatory and infrastructure demands, consumer marketing strategies and security issues continues to be no mean feat for all players on the m-payments market.

In general, adoption of mobile payment is context-driven; this means that a 'one size fits all' approach does not work. In order to develop successful mobile payment services, one must have a good understanding of its context and find a service that best suits this context. Differentiation must occur between developed and developing markets in terms of the overall proposition behind mobile financial services. Consumer needs and perceived obstacles and drivers that shape the mobile ecosystem, along with technological developments all need to be taken into account.

In developed markets, such as Europe or North America, mobile payments are not a novelty. Here the tipping point should be in consumer behaviour: consumers adopting mobile

payments on a much larger scale. In order to achieve this, mobile payments must offer added value to make their use more attractive, compared to other payment methods, for both consumers and merchants: they must be easier, cheaper, safer, and commonly accepted.

In developing markets, such as Africa or parts of Asia, mobile financial services have strong potential as they do not face competition from established traditional services. They thus have the potential to create a completely new market. Therefore the tipping should be in capitalization on the opportunity of the large number of unbanked and underbanked consumers. Keeping it simple is key: most devices in developing markets are basic, without advanced features.

Overall, the increased attraction and gained momentum of mobile payments are undeniable. With an increasing number of smartphones having ever more capabilities, with many new players entering the market and consumers that are more engaged to their mobile phones, we are definitely seeing a change in the market place.

Last year we have seen the birth of many new mobile payment initiatives. In developing markets the new initiatives are building on the foundations of the success of earlier ones, such as M-PESA in Kenya, Africa. The key feature is to provide financial inclusion to the unbanked with simple services. In developed markets new initiatives are mainly built around NFC, a truly new payment method in most countries. The latter strongly suggests an important mark in time.

In order to spark the tipping point now, providers need to focus on the context of the mobile payment and develop mobile payment services that best suit the user needs. Otherwise, mobile payments will still happen, but at a more gradual pace than most predictions suggest.

3 The hype -or hope- of NFC

Near Field Communication, or NFC, refers to a set of short-range wireless technologies that allow for simplified transactions, data exchange and connections to take place between two parties with a touch, typically at a distance of 4 cm or less. While by no means the sole applicability for contactless technology, making payments has emerged as one of the main foci for NFC. The appeal of using contactless-enabled devices in a commercial environment is undeniable. NFC-based transactions take place quickly and in a user-friendly manner. Moreover, NFC devices are versatile: they can be used for actual payments, as well as for ticketing and couponing, they can function as boarding passes and serve as a medium for advertising and loyalty programs at the PoS.

In this context, adding NFC capabilities to mobile phones seems like a recipe for success. The combination between the global popularity of mobile devices and the speed and ease of NFC applications (whether they are used for payments, transit or access control) has the potential to significantly expand the already wide range handsets' capabilities. Mobile phones are the hallmark of systems and services integration: they already carry email, daily planners, music, photos, maps, applications for banking and mobile money transfers, even books. This all makes predictions on NFC and NFC-enabled phones highly optimistic.

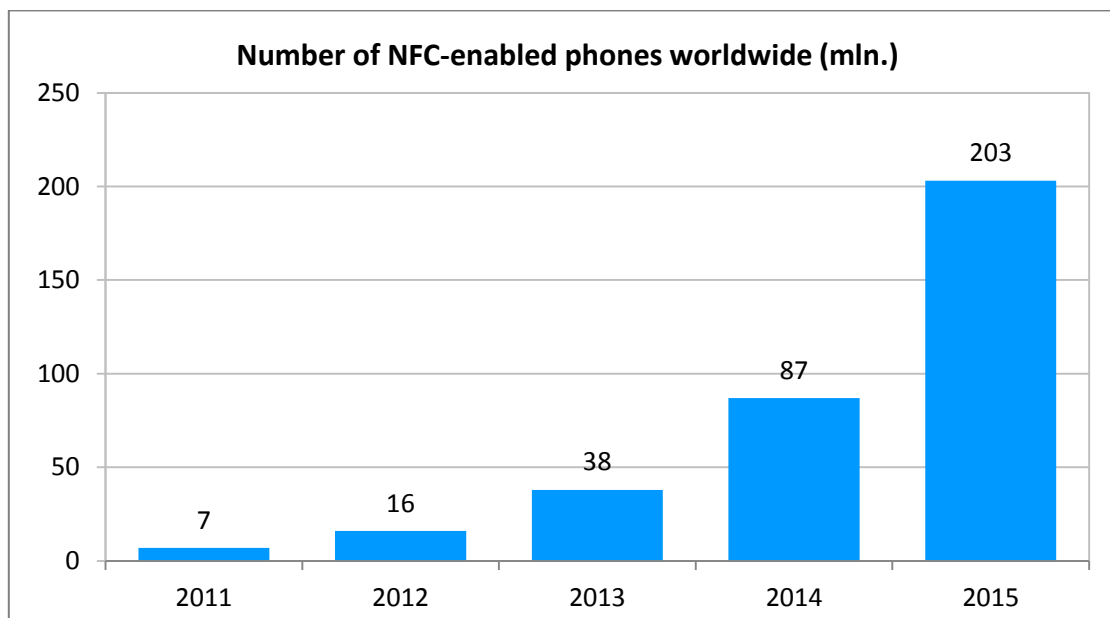


Figure 3: Number of NFC-enabled phones worldwide. Source: Yankee Group, 2011.

Stepping outside this wonderful vision of a global NFC-powered mobile ecosystem, the reality of the situation is that mobile contactless payments are nowhere near reaching mass-market adoption. Despite the buzz surrounding them and the wildly optimistic analyst predictions,

NFC still has a long way to go and many hurdles to overcome before it lives up to the glowing industry expectations formulated so far.

This chapter aims to take a closer look at the current state of the global mobile contactless ecosystem, its main drivers and the main challenges it still has to face before fulfilling its substantial yet elusive promise.

3.1 Drivers for NFC adoption

3.1.1 A better user experience

Despite their slower-than-expected rate of adoption in both developed and developing markets and the hurdles still to overcome, NFC-powered mobile payments adoption is still happening.

One contributing factor is the fact that mobile contactless payments are no longer a novelty in the mobile financial services ecosystem. The first mobile contactless payment pilot dates back to 2003. A survey carried out by Edgar, Dunn & Company (EDC) in collaboration with the GSM Association¹⁴ (GSMA) revealed that even as far back as 2007, 57% of interviewed stakeholders in developed markets regarded mobile contactless payments as being “extremely important” within the wider context of their future strategic directions.

There is a reason for which NFC has acquired so many loyal supporters: if the proper infrastructure and standards are deployed contactless mobile payments have huge potential. They allow customers to quickly purchase products and transfer secure information by touching devices, a very valuable proposition particularly in high-volume payment environments such as restaurants and large retailers. Consider that in the US alone, in 2010 there were around 300 billion¹⁵ small-value payments (worth USD 25 and less) carried out in retail locations, accounting for a total combined value of more than USD 1 trillion. Contactless payment technology would allow consumers to do away with cash, the payment method of choice for small-value transactions, while also providing the added benefits of user-friendliness and transaction speed.

Moreover, consumers with NFC phones can not only carry out payments, but use their devices to read NFC tags in an engaging and creative format. These tags can be host to a variety of content, including vouchers, competitions, videos, travel information, social media pages, etc. As the number of contactless products continues to grow, NFC adoption is likely to be embraced by not only the payments industry but by the world of marketing as well. NFC allows users to engage with traditional marketing campaigns in a new and exciting way; and what

¹⁴ Edgar, Dunn & Company (EDC), the GSM Association (GSMA) – ‘EDC – GSMA Joint Research Survey’, 2008

¹⁵ mobiThinking - 'Global mobile statistics 2011', 2011

makes this even more attractive is that promotions and offers downloaded by users from SmartPosters can be redeemed in-store using the same technology, a technology that is already in place. Payments Cards and Mobile reported in its March – April 2011 issue that there are over 60,000 contactless terminals in the UK alone and around 130,000 across Europe, a figure that has climbed enormously since the start of 2011. And with NFC marketing entering the picture, contactless looks set to get even bigger.

3.1.2 Players entering the arena

Despite its lower-than-expected degree of consumer adoption so far, the many virtues of mobile NFC have convinced at least two global market leaders to enter the game. Banking on the potential of NFC-powered mobile payments in the western hemisphere, giants Google and PayPal both have shown strong confidence with regard to the development of the contactless mobile ecosystem in the near future.

Google's Executive Chairman Eric Schmidt has even gone as far as to express his strong belief that within the next 12 months, a third of checkout terminals in restaurants and in retail locations will be NFC equipped¹⁶. The explanation for his confidence is simple: at the end of May 2011, Google has launched Google Wallet¹⁷, a mobile payments service that allows owners of Samsung's Android-powered Nexus S 4G NFC-equipped smartphone handset to trial using their phone for payments at 20 retailers in New York and San Francisco. Google Wallet is set to be NFC-powered, enabling consumers to make payments by tapping their phone on an NFC-enabled terminal at checkout. The wallet requires an app-specific PIN and in the first release, all payment card credentials will be encrypted and stored on a chip (the secure element), that is separate from the Android device memory and is only accessible by authorized programs.

At commercial launch, Google Wallet will support payments with two payment solutions: a PayPass eligible Citi MasterCard and a virtual Google Prepaid card. Consumers who already own a PayPass eligible Citi MasterCard can add it to Google Wallet over the air, using First Data's trusted service manager (TSM) service. Alternatively, they can fund the Google Prepaid card with any payment card. As a result, Google Wallet is expected to be accepted at around 124,000 PayPass-enabled merchants in the US and over 311,000 globally.

Google is also said to be working with several PoS system companies to create a new SingleTap shopping option. Some of the companies involved in the project include US-based electronic payment service provider VeriFone Systems, payment technology company Hypercom, French-

¹⁶ Google Executive Chairman Eric Schmidt - Interview at the Cannes Lions Advertising Festival, 2011

¹⁷ MasterCard Newsroom - 'Google, Citi, MasterCard, First Data and Sprint Team Up to Make Your Phone Your Wallet', 2011

based payment service provider Ingenico and US-based provider of NFC-enabled mobile payments VIVOTech.

An interesting point must be added here. As highlighted in the previous section, NFC also allows for other functionality as reading tags which opens the way for marketing and couponing. French PoS terminal manufacturer Ingenico¹⁸ has confirmed it will provide retailer check-outs with NFC hardware capable of redeeming coupons. Earlier reports suggested that Google was mostly interested in simply expanding to the offline world. However, the latter move shows that Google has a larger focus on marketing and couponing.

The other giant PayPal is no stranger to NFC. In 2010, PayPal had teamed up with NFC start-up Bling Nation¹⁹ to launch a so-called “tap-and-pay” payments program in the US designed for PayPal employees and early adopters in Palo Alto, CA. The trial allowed more than 2,000 PayPal employees and other users to pay for their purchases in a way similar to debit payments. To do so, consumers had to link Bling Nation’s BlingTag NFC chip, attached to the back of their mobile device, to a PayPal or other bank account.

Unfortunately, despite its promising start, all did not end well for the PayPal – Bling Nation partnership. In June 2011, Bling Nation announced that it would temporarily shut down its service in a bid to revamp its offering and re-launch it later in 2011. And while Bling Nation insisted that the interruption was merely a “pause” designed to provide time to upgrade its offering and business model, the company was rumoured to be facing a much deeper crisis than it was letting on.

The lesson taught by Bling Nation’s demise is one valuable to all the players in the NFC ecosystem. Slower-than-expected market traction translated into low acceptance rates among merchants and consumers alike turned out to be one (important) side of the company’s problem. The other major issue was that this so-called interruption would most likely have a potentially disastrous negative impact on consumer and merchant perception of the company’s services, while also leaving Bling Nation light-years behind other major competitors in the fast-evolving NFC landscape, Google prominent among them.

Across Europe, too, many mobile NFC trials have been carried out to date and some full-scale service deployments have also taken place. The Netherlands and the UK are interesting examples.

In the Netherlands, financial service providers ABN AMRO, Rabobank and ING have teamed up with telecommunications and ICT services providers T-Mobile, KPN and Vodafone to set up a joint venture that aims to promote and facilitate the use of m-payments in the country via NFC

¹⁸ Ingenico - ' Ingenico: First contactless NFC payment solutions certified in France by GIE Cartes Bancaires ', 2011

¹⁹ Bling Nation Press Room - ' Bling Nation launches mobile payments program powered by PayPal ', 2011

technology²⁰. By affiliating themselves all to the same system, all banks, mobile providers and other service providers will ultimately be able to provide their mobile payment services. The so-called “six pack” Dutch alliance is expected to go live with its services in 2012. In the UK, Orange and Barclaycard rolled out Quick Tap, a contactless mobile payments service which allows UK customers to make purchases worth GBP 15 or less by tapping their Quick Tap mobile handset against a contactless reader at over 50,000 stores in the UK²¹. The service allows UK shoppers to load up to GBP 100 on their phones from their Orange or Barclays cards. MasterCard provides the payment capability for the contactless mobile transactions of the Orange and Barclaycard mobile payment service. Gemalto provides Barclays with TSM services which enable the secure deployment and management of mobile contactless payment. Gemalto’s NFC services also include the UICC Cards supplied to Orange.

NFC trials are currently being conducted all over Europe in countries as diverse as Austria, Belgium, the Czech Republic, France, Germany, Hungary, Ireland, Italy, Lithuania, Poland, Russia, Slovenia, Spain, Sweden and Turkey.

3.2 Obstacles to overcome

NFC-powered mobile payments still face significant challenges when it comes to mass-market deployment and adoption. While many market players –phone manufacturers, banks and MNOs - are enthusiastic about its undeniable potential, mobile NFC adoption has been lagging behind expectations. Some of the main causes for this are the lack of a supporting infrastructure, the existence of a complex ecosystem of stakeholders and the lack of unified standards.

3.2.1 The ‘chicken & egg’ dilemma

Contactless payments require a pre-existing infrastructure at both merchant level and bank level. Also, as far as adoption and usage of contactless payments is concerned, we may be dealing with a variation of the classical chicken/egg dilemma. In order for consumers to start using this technology, the proper infrastructure must be put in place, both at merchant and at consumer level; on the other hand, merchants will not invest in the proper infrastructure unless contactless payments reach critical mass and start gathering momentum.

Enterprises are also wary of rolling out NFC applications and infrastructure due to the fact that NFC-enabled handsets, while not completely absent, represent a small percentage of the total

²⁰ The Paypers – ‘European premiere: Dutch banks, mobile operators join forces for contactless m-payments initiative’, 2011

²¹ Barclays Newsroom - ' Orange and Barclaycard launch of the UK’s first contactless mobile payments service', 2011

number of mobile phones in use. Consumers in turn are not drawn to NFC-powered handsets as there is simply not enough infrastructure deployed to justify buying such a device. Some device manufacturers – Apple and Nokia among them - have grown rather reluctant to the idea that NFC will become commercially viable in a mass market context anytime soon. As such, Apple – who in January 2011 was reportedly considering launching a NFC-based mobile payment service for the iPhone and the iPad – will most likely not include NFC technology in its much-anticipated iPhone 5²². Finnish giant Nokia is also said to have decided not to include NFC technology (an embedded secure element or an NFC SIM) in its latest phones, dubbed C7 and N9. Unlike Apple, though, Nokia is not completely excluding the contactless technology: Nokia already has a few models equipped with NFC and the company is said to be focusing on the use of NFC technology for other purposes except mobile-powered payments, such as file sharing, device pairing and tag reading²³.

As an alternative that would allow consumers to still use their (non-NFC powered) handsets for contactless payments, a new line of complementary devices and services have emerged. Mobile technology provider DeviceFidelity is such an example²⁴. In 2010, the company rolled out its In2Pay microSD technology, which essentially aims to bridge the gap between mobiles and NFC payments by providing payment network-compliant contactless payment capabilities for any handset that features an SD slot - whether micro, mini or full-sized. In2Pay supports devices irrespective of the location of the slot and includes a security feature that disables the integrated antenna when the product is not in use to avoid unintended contactless transmission.

DeviceFidelity also provides a platform targeted at banks, aiming to allow financial service providers to tap into all the functionalities of a mobile phone (the user interface and wireless connectivity for example). In2Pay features an open architecture and a Secure Element with integrated antenna, allowing third-party developers to create and market value-added applications such as couponing, loyalty programs, dynamic security, one-time password, virtual credit card numbers and two-factor authentication.

DeviceFidelity moves fast: not only has it decided to launch a full-scale assault of the contactless mobile payments market, but it has also set its eye on a significant market segment – US iPhone users. Given the iPhone currently does not feature a microSD slot, DeviceFidelity has designed a protective case that adds mobile contactless capability and works with iPhone 3GS and iPhone 3G.

²² The Paypers - 'Apple's next iPhone not to be NFC-equipped ', 2011

²³ NFC World – Interview with Rupert Englander, Head of services, sales and marketing for Nokia UK and Ireland, 2011

²⁴ The Paypers - ' DeviceFidelity rolls out mobile contactless payment solution for iPhone ', 2010

3.2.2 Security issues

Another cause for the slower-than-expected take-up of mobile applications such as banking, ticketing and payments solutions has to do with security issues in what concerns the mobile devices as well as the background systems involved, particularly when it comes to mobile web (online) payments. These concerns affect the consumer segment, making would-be buyers reluctant to carry out mobile payments via the internet. Acceptance of mobile applications in the merchant sector is also impacted negatively by security concerns, which come to strengthen merchants' existing doubts as the profitability of replacing a card with a phone for PoS transactions. Such issues drive online retailers to avoid providing the infrastructure which would allow their goods or services to be purchased online via mobile devices, for fear of seeing themselves exposed to fraud liability and assorted risks.

The trouble is, NFC has been repeatedly proven to be vulnerable to a variety of possible attack scenarios, and security remains one of the most serious threats to large-scale contactless mobile payments adoption. To avoid man-in-the-middle attacks (by which an illicit third-party intercepts and potentially modifies the data exchanged between the NFC device and the reader), higher-layer cryptographic protocols (such as SSL) need to be used to ensure that a secure channel is established. Securing NFC data demands that a number of parties cooperate. They include device manufacturers (who must deploy strong cryptography and authentication protocols into contactless phones), consumers (who should protect their devices with passwords, PINs, etc.), application providers and transaction parties (who must protect their systems against infection with malware).

3.2.3 Stakeholder cooperation & standardization

While stakeholders in the mobile contactless payment market may whole-heartedly agree with the fact that a bright future is in store for NFC-powered mobile payments, there is little consensus anywhere else. In fact, one of the main factors that prevented mobile contactless payments from achieving critical mass over the past years has been the lingering uncertainty surrounding the appropriate business model in this field. Additionally, by their very nature, mobile contactless payments require the existence of a secure ecosystem supported by a sound technology infrastructure (including NFC-enabled handsets and contactless PoS terminals) which adheres to uniform standards and pricing structures – again, an area where industry players usually agree to disagree.

It is therefore becoming clear that in order for the mass-market adoption of mobile proximity payments to become a reality, a consensus ought to be reached – if not yet with regard to technology standardization and business models, then at least in the area of mobile payments security and protecting customer account information. To that end, the Mobey Forum, a not for profit organization which looks to develop the global mobile financial services ecosystem has defined a list of alternatives available for banks to secure contactless mobile payments. This initiative looks to define and clarify the role and business implications of a number of

technical alternatives available to financial institution for the delivery of secure mobile contactless payments.

In other words, while not trying to impose a unique technology route for the delivery of mobile payments via a secure contactless infrastructure, a 2010 Mobey Forum white paper²⁵ looks to analyse the current mobile financial ecosystem, its stakeholders and the value chain positions that can be achieved by banks through different business models. According to the paper, at the core of the development of a secure mobile contactless payments ecosystem lies the so-called “secure element”, a hardware element within all mobile devices which is employed for the specific purpose of securely facilitating mobile financial services.

The secure element is regarded by Mobey Forum members as being the key to reducing the complexity of the global contactless payments ecosystem. This is achieved by defining a number of clear alternatives (in this case, five types of secure elements) as well as by outlining precise value chain positions banks can adopt and a clear range of secure element technologies currently available to financial institutions. Put simply, it is easier to select one type of mobile payments technology when there are a limited number of alternatives, each with its own particular strengths, requirements and implementation model.

The Mobey Forum white paper argues that by clearly defining existing solutions to the mobile contactless payments equation, the way is paved towards achieving at least some level of much-needed technology standardization. While a narrowed-down list of technology alternatives may be regarded by some as restrictive, the five secure element solutions described above provide sufficient variety of open business models to accommodate the provision of all mobile financial services, be it mobile contactless payments, mobile banking or remote mobile payments.

Another issue connected to the standardization of the contactless mobile payments ecosystem is the fact that the latter is unusually complex. If NFC m-payments are to become a reality, a wide variety of stakeholders must be involved in the process. They include phone manufacturers, MNOs, card issuers, public transportation companies, merchants, retailers, third-party payment processors— and of course, consumers. Any NFC mobile service user must have an agreement with the service provider of an NFC mobile service. In addition, the user must subscribe to the MNO provisioning service and have an NFC-enabled handset in order to access NFC mobile services – if the latter are available. It is easy therefore to see that all aspects of NFC adoption are quite complicated.

Moreover, cooperation in the area of NFC also requires the establishment of a business model in which all stakeholders involved are sufficiently compensated and where responsibilities (such as for example consumer support issues) are equally distributed among the ecosystem. The NFC value chain includes a number of players, each of which has its own interests and business model to follow. Ensuring cooperation between all these parties may prove to be the most difficult part of mobile contactless payment mass-market deployment.

²⁵ Mobey Forum - 'Alternatives for Banks to Offer Secure Mobile Payments', 2010

3.3 Putting the hype into perspective

As NFC continues to face significant challenges some analysts are starting to tone down their estimates - or at least inject higher doses of pragmatism into them. A July 2011 study by Gartner²⁶ highlights the fact that mobile payments are happening, with worldwide m-payment users expected to surpass 141.1 million by the end of 2011. However, Gartner warns that adoption rates are climbing at a slower pace than initially anticipated.

The same research warns that the service model associated with the development of a large-scale mobile contactless ecosystem is more complex than market players may have anticipated. Mass-market adoption of NFC payments is at least four years away in developed markets, Gartner says. The biggest obstacle mobile contactless payments are facing is not connected with infrastructure costs, security or standardization issues - although of course, each of these elements serves to slow down NFC adoption. But according to Gartner, the biggest issue has to do with consumer behaviour. In other words, it is proving difficult to convince consumers to change their payment habits and chose to pay via NFC-enabled handsets (that they mostly still need to acquire) rather than via the bank cards already tucked safely in their wallets.

The problem then becomes – do mobile contactless payments have enough added value to undermine and eventually overturn decades-old consumer perceptions? To answer this question, we must establish where the inherent value of mobile contactless payments lies. In developed economies, where consumers have a wide array of payment instruments at their disposal, the mobile NFC ecosystem cannot possibly be marketed as a novelty, but rather as an expansion of the existing payments landscape. To be considered attractive, mobile contactless payments cannot simply offer the same thing as card payments: they must be quicker, more secure and richer in functionalities than “ordinary” card transactions. While in theory, mobile NFC can offer all this and more, in practice the answer would be that raising awareness among consumers with regard to the value of mobile contactless transactions is an uphill struggle – one that is likely to continue for a long time.

It emerges therefore that the make-up of individual markets around the globe and the added value provided for consumers in each such separate environment both determine the degree of success for mobile NFC. This explains the fact that whereas in Europe, NFC adoption has been an uphill struggle, in Asia – particularly Japan and South Korea, where NFC vendors are closely related to mass-transit networks – NFC deployment and take-up has been massive, reaching close to 75% consumer penetration.

²⁶ Gartner – ‘Market Trends: Mobile Payments Worldwide, 2011’, 2011

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Mobey Forum

Mobey Forum is a global non-profit financial industry-driven forum whose mission is to encourage the use of mobile technology in financial services. It was established in 2000 by several of the world's leading financial institutions and mobile terminal manufacturers.

www.mobeyforum.org



Part 2

Trends and developments per region



4 Europe: working together on mobile payments

The European mobile ecosystem is diverse, fragmented, filled with potential and home to a wide array of coexisting mobile solutions, ranging from the very basic to the very complex. The European mobile financial landscape is unique in the sense that it shares some of its characteristics both with developed, sophisticated markets such as the US as well as with developing regions such as those in Asia and LATAM.

Geographically, Europe is home to nearly 50 different countries and territories and therefore naturally fragmented, making it a complex ecosystem for the development and deployment of mobile solutions, be they for banking, money transfers or proximity payments. On the other hand, Europe, despite being the world's second-smallest continent by surface area, is also the biggest global economy, the richest region in the world as measured by assets under management and home to about 11% of the world's population (around 733 million inhabitants)²⁷.

Europe's geographical fragmentation is aggravated by the historical divide between Western and Northern Europe on the one side and the Central and Eastern European bloc on the other side. This division, the result of the post-WW-II Iron Curtain, is reflected in the current state of both e-commerce and mobile commerce across Europe. The countries which were part of the Eastern communist dominion are, with few exceptions, de facto developing markets, while the Western half of Europe includes developed markets with solid financial infrastructures and successful commercial implementations of m-payments services.

An additional layer of complexity is created by the existence of the European Union (an economic and political union of 27 European states) and its Single Euro Payments Area (SEPA) initiative for the European financial infrastructure, which is looking to phase out differences between national and intra-European cross border payments (inevitably, mobile money transfers will be affected by this as well). Analysing Europe's progress regarding mobile-powered financial services is bound to take into account both the West / East divide and the current and future impact of SEPA.

This chapter aims to sketch an outline of the market and provide an overview of the main developments.

4.1 The European mobile payments landscape divided in two

Since Europe harbours both developed and developing economies, a special situation is created in which the same restricted geographic area plays host to diverse markets in which

²⁷ Wikipedia – Europe entry, 2011

the circumstances for providers and users of mobile financial services are very different. Both emerging and established markets coexist here. At the same time, Europe - the world's second-smallest continent – is also a rather “compact” ecosystem. Moreover, in Europe the majority of payment solutions are targeted at specific countries and driven by local requirements.

It thus emerges that the key to understanding Europe’s mobile landscape and tapping the considerable European revenue stream lies in understanding how adoption drivers vary between developed and developing regions.

Essentially, two trends can be identified in both types of markets, but the dynamic between the parties involved – both on the consumer and on the mobile services supply side (banks, merchants, MNOs) – is different. The first trend refers to existing financial services and their movement from the offline / online channel to the mobile channel. The second trend involves developing mobile financial services that promote a new type of value, a technology or business model that is so disruptive it has the potential to alter existing revenue models. This trend requires the development of large-scale m-payments ecosystems in which all participants (banks, MNOs, third-parties) are compensated satisfactorily.

4.1.1 Developed economies: seeking an alternative for existing payment methods

Transferring the traditional European financial value chain to the mobile domain is something that is happening in developed economies, where mobile-savvy users are prompted to start using their handsets for banking and shopping.

However, adoption drivers need to be carefully mapped out before addressing mobile financial services propositions in developed European markets such as the UK, France or the Netherlands. If end-users are not given a valid proposition to stop paying with a card – already a well-established method - and start paying with their phones they will not do so. Rather, m-payments would have to create a new type of value, primarily in terms of user experience, in order to attract seasoned consumers. Otherwise, providers looking to push m-payment propositions onto the market will appear to be promoting useless technologies that have no real-life applicability. Similarly, IBM²⁸ has highlighted the fact that in developed markets there are two drivers for mobile adoption, namely direct savings and improved user experience.

The North -Western European mobile financial services market has seen some successful m-payment trials and implementations, mostly NFC-based but not exclusively so. However, despite markets in this region being remarkably active, mass-market adoption of mobile financial services has not yet taken off. Forrester Research²⁹ values the mobile opportunity in

²⁸ IBM - 'Go Mobile, Grow', 2008

²⁹ Forrester Research - 'Mobile Commerce Forecast, 2011 To 2016', 2011

Western Europe at EUR 6 billion by 2013, and estimates that this market is likely to grow at an average of 25% annually by 2013. However, given the current state of affairs, this optimistic outlook does not appear justified.

One reason for the slower-than-expected uptake of mobile applications such as banking, ticketing and payments solutions in Europe's North - Western markets has to do with security issues concerning both the mobile devices as such as well as the back-end systems involved, particularly when it comes to mobile web (online) payments. These concerns affect the consumer segment, making would-be buyers reluctant to carry out mobile payments via the internet. Acceptance of mobile applications in the merchant sector is also impacted negatively by security concerns, which come to strengthen merchants' existing doubts about the profitability of replacing a card with a phone for PoS transactions. Such issues also drive online retailers to avoid providing the infrastructure which would allow their goods or services to be purchased online via mobile devices, for fear of seeing themselves exposed to fraud liability and assorted risks.

However, Europe's developed economies have made considerable progress over the past year in making mobile financial services a reality for consumers and many new initiatives came to life. The UK is an example of a market where mobile payment initiatives have already been implemented. In May 2011, UK-based mobile network operator Orange teamed up with Barclaycard to launch Quick Tap³⁰, a contactless mobile payments service. Quick Tap allows customers to make purchases up to GBP 15 in a single transaction by tapping their Quick Tap mobile handset against a contactless reader at over 50,000 stores in the UK. The service is also designed to allow UK shoppers to load up to GBP 100 on their phones from their Orange or Barclays cards.

In order to use the service, UK customers have to be holders of a Barclaycard, a Barclays debit card or an Orange credit card, as well as a Samsung Tocco Lite device, with other handsets from other manufacturers to follow as part of future developments. By using Barclaycard's contactless payment technology, customers are expected to be able to pay for items in places they see the contactless payments symbol, including shops and cafes such as Pret A Manger, EAT. and Subway. The payment capability for the contactless mobile transactions is provided by MasterCard, while the Dutch digital security provider Gemalto provides Barclays with Trusted Service Management (TSM) operated services which enable the secure deployment and management of mobile contactless payments. Gemalto's NFC services also include the UICC Cards supplied to Orange.

This one example of the considerable progress made in recent years. Nevertheless, mass-market adoption of mobile financial services is still waiting.

³⁰ Barclays Newsroom- 'Orange and Barclaycard launch of the UK's first contactless mobile payments service', 2011

4.1.2 Developing markets: mobile payments enabling financial inclusion

On the other side of the former iron curtain, Europe's Central and Eastern Europe (CEE) developing markets have a different story to tell. While CEE is a step behind the more developed nations of Western Europe, its lower-income countries and consumers constitute a fertile ground for the proliferation of mobile financial services. What needs to be made clear here is the context in which mobile financial services can be deployed. In developing markets m-payments need to solve problems and ease pain points, such as helping unbanked / underbanked consumers gain financial inclusion and access to basic financial services. However, the CEE space is by no means lacking in dynamism on other fronts including the commercial, regulatory and political arenas. Over the past year, mobile financial services trials have been initiated in countries as diverse as Slovakia, Poland and The Czech Republic.

In Slovakia, Gemalto³¹ has been selected by local financial services provider UniCredit Slovakia to provide the Optelio contactless stickers for the first commercial mobile payments deployment. The Slovakian bank is part of UniCredit Group, a European bank present in 22 countries and an overall global network serving approximately 50 markets through over 9,600 branches. By attaching the Optelio contactless sticker to their mobile phones, UniCredit customers are expected to be able to use the contactless feature on payments under EUR 20, with larger transaction amounts requiring a PIN code. Payments via the service can be made in fast food restaurants, cinemas, supermarkets and other retail outlets across Slovakia, with a contactless payment market of over 3,000 acceptance points in place.

Gemalto has also made its presence felt in Poland³², where it partnered with mobile network PTK Centertel, an Orange group affiliate, to deploy an NFC mobile payments program. The latter would enable PTK Centertel's customers to use their mobile phone to pay for goods and services with a wave of their handset. Poland has a contactless infrastructure of approximately 35,000 acceptance points, including fast food restaurants, cinemas, supermarkets and a number of retailers. As part of the partnership, Gemalto has provided an offering that includes NFC software and user interface applications embedded on an NFC SIM, as well as Trusted Service Management (TSM) services. The Polish initiative shows Gemalto's role in Orange Group's NFC expansion strategy which is already deployed in the UK and France.

In the Czech Republic, telecom and ICT service providers Telefónica O2, T-Mobile and Vodafone partnered to develop a joint platform in a bid to drive mobile payment adoption in the Czech Republic, according to online news outlet cellular-news.com³³.

³¹ The Paypers - 'Slovakia: UniCredit selects Gemalto Optelio service for mobile payments', 2011

³² Gemalto Media Room - 'Gemalto and Orange Group Extend Collaboration on NFC with Rollout of Poland's Largest Mobile Contactless Program', 2011

³³ The Paypers - 'Mobile contactless trial program starts in the Czech Republic', 2011

Dubbed "Plat mobilem" ("Pay by Mobile"), the platform will enable customers to pay for their purchases at checkout points using their mobile devices, either by sending a Premium SMS or via the jointly-developed payment gateway. In addition, customers using pre-paid SIM cards will have the amount deducted from the loaded credit, whereas customers with a tariff plan will have the amount charged on their monthly Statement of Services. No need for previous registration is required as the service will be activated as part of existing contracts.

4.2 Multi-stakeholder collaboration on implementing NFC

NFC (Near Field Communication) mobile payments are mostly used in Asia, for instance in Japan and South Korea, where paying with a NFC-enabled mobile phone or an NFC-smartcard is already part of everyday life. In Europe however, NFC mobile payment business models have yet to materialise.

Most predictions on the future size of the NFC mobile payments market are encouraging and positive. Indeed, in recent years there have been many developments in NFC technology and some contactless technology development institutions have created specifications and protocols for NFC to incorporate their solutions into the NFC ecosystem. Juniper Research³⁴, for example, believed that the gross transaction value of payments made via NFC contactless technology, for relatively low value purchases (including refreshments, tickets and food), will exceed USD 75 billion worldwide by 2013. In a more recent report, Juniper forecasts that mobile payments for digital and physical goods, money transfers and NFC transactions will quadruple by 2014, reaching USD 630 billion in value. However, in areas such as NFC for greater collaboration is required to establish a widely accepted business model that translates easily into tangible services.

Some of the fears about security of NFC enabled mobile payments centre around the short communication distance between the sender and the receiver. Other threats come from skimming, eavesdropping (where a third party intercepts the signal and becomes the receiver of the payment) and tracking (where the unique identification number used to establish communication between phone and terminal can be tracked). The lack of available phones has also been mentioned as an impediment by several companies (like MasterCard) that launched trials which use NFC stickers or tags.

In regard to multi-stakeholder collaboration the Netherlands is home to a remarkable initiative. The Dutch financial services providers ABN AMRO, Rabobank and ING have joined forces with telecommunications and ICT service providers T-Mobile, KPN and Vodafone to sign a letter of intent to jointly introduce mobile payments at the point of sale in the Netherlands³⁵.

³⁴ Juniper Research – 'Mobile Payments: Strategies & Markets 2007-2011', 2008

³⁵ The Paypers - 'European premiere: Dutch banks, mobile operators join forces for contactless m-payments initiative', 2010

The companies believe it is technically and commercially feasible to introduce mobile payments in the Netherlands with multiple parties involved.

The six companies plan to set up a joint venture to promote and facilitate the use of m-payments in the Netherlands. The mobile phone will communicate by NFC while the payment software itself will be located in a secure part of the SIM-card. To enhance the ease of use and safety, a single uniform system for mobile transactions in the Netherlands is envisioned, based on international standards. By affiliating themselves to the same system, all banks, mobile providers and other service providers will ultimately be able to provide their mobile payment services. It is expected Travik (formerly known as Sixpack) will go live in 2012.

4.3 CASE STUDY: CITYZI ACHIEVING NFC IN NICE, FRANCE

NFC has strong potential but developing and implementing it may not be easy. Interconnecting and interfacing multiple operating platforms to create an open environment which enables the secure, over-the-air activation of multiple applications in UICC cards is challenging, to say the least. It requires the cooperation of mobile operators, financial services providers, transport operators as well as the active involvement of the retail sector. Under the heading of “Cityzi: Nice, mobile contactless city”, Nice is host to a successful cooperation³⁶.

The Cityzi project aims to pioneer a wide-scale commercial deployment of contactless mobile services. With the support of the French government, the project was developed in partnership with mobile and transport operators, banks and merchants. Its end goal was to develop, trial and ultimately deploy a secure infrastructure that would allow Nice residents and tourists to employ their NFC-enabled mobile handsets to pay at restaurants, supermarkets and local stores, as well as ride the city's buses and tramways.

The Cityzi initiative was jump-started in 2009 by the members of the AFSCM (Association Française du Sans Contact Mobile) which include banks such as BNP Paribas, Crédit Agricole and Société Générale as well as mobile phone operators like Bouygues Telecom, NRJ Mobile, Orange and SFR. In addition to the three telecoms operators, Orange, Bouygues Telecom and SFR, the project is also being backed by the Communauté urbaine Nice Côte d'Azur, the Université Nice-Sophia Antipolis, a number of banks among which the Crédit Agricole and Véolia Transport.

It followed the publication in 2009 of a series of functional and technical specifications developed by the AFSCM and the field trials carried out in 2008 in Caen and Strasbourg, which allowed for the validation of some the basic concepts regarding customer

³⁶ AFSCM – Survey of the Association Française du Sans Contact Mobile, 2010

acceptance for NFC-enabled mobile payments.

Launched in May 2010³⁷, the initiative has aimed to roll out interoperable NFC-powered services across Nice (the Communauté urbaine Nice Côte d'Azur more exactly). The deployed services include access to local and cultural information (via Cityzi tag reading), purchase and validation of urban transport tickets, access to real-time traffic information and timetables (BPASS Lignes d'Azur service) and contactless shopping with local retailers (payment, couponing, digital loyalty programs). Initially, the services were made available to consumers who owned Samsung Player One NFC-enabled mobile phones. The contactless offering made use of the SIM card as secure element. When consumers acquired the NFC-powered handset, they found some applications (such as the Visa / MasterCard payment applications) already loaded on the SIM card.

As far as the business model developed and employed by trial participants, it was based on close cooperation between all players involved, in particular between MNOs, banks and technology service providers. MNOs would host the applications needed to power the various NFC services on the SIM card. Moreover, all MNOs and banks involved in the project would have to agree on a common interoperability model, with no national or previously existing, proprietary solutions accepted. A common, interoperable data transmission system was based on common technical specifications, allowing for multiple business models and deployment strategies within the same environment.

The Nice initiative has seen members of the AFSCM join forces with international networks such as MasterCard and Visa, market bodies and standardizing bodies (such as the EPC, ETSI and EMVCo) in order to ensure that the infrastructure deployed in Nice meets internationally-recognized specifications and standards. Such standards mainly aim to guarantee an appropriate level of security for all NFC-enabled transactions, as well as ensuring interoperability between banks and mobile operators, enabling consumers to carry out payments in any and all stores equipped with mobile payment terminals, irrespective of their bank or the retailer's bank.

The project has also become an umbrella under which a number of new partnerships have emerged to support the deployment of wide-scale contactless mobile services for consumers. For example, Gemalto and Orange France have joined forces³⁸, with Orange selecting Gemalto as partner for its NFC solution, enabling interconnection with any service provider, such as banks and transport operators. Additionally, BNP Paribas and smart card solutions provider Oberthur Technologies have also entered a partnership³⁹, under the terms of which Oberthur would supply the NFC Services Management Solution

³⁷ NFC World - NFC city pilot to go live in Nice on 21 May under 'Cityzi' banner, 2010

³⁸ The Paypers – 'Orange France selects Gemalto for commercial mobile NFC roll-out', 2010

³⁹ Oberthur Media Room – 'BNP Paribas and Oberthur Technologies partner to offer NFC mobile payment solution', 2010

for the Nice initiative. Oberthur Technologies manages the mobile payment service on behalf of BNP Paribas via an OTA (Over the Air) Platform.

This serves as proof that major industry players have taken a keen interest in the Nice contactless trials, thus acknowledging the significant potential that mobile NFC technology has to meet consumer expectations for simplicity and convenience, enrich the overall mobile payments ecosystem and facilitate the collaboration between mobile network operators and other service providers.

4.4 M-SEPA: collaboration on a European level

It is not only on a regional or national level that parties are collaborating. On a European level there have also been attempts to standardise mobile contactless transactions. In order to standardise payments the European Union has created the Single Euro Payments Area (SEPA). The vision of the European banking initiative is to make all electronic payments across the euro area, for example by credit card, debit card, bank transfer or direct debit, as easy as domestic payments are now.

An expanded market in Europe is expected to boost technological innovation in terms of cards and other payment businesses. We are already seeing product developments in contactless or 'tap-and-go' cards, as well as in convergence with mobile telephone technology. In Europe, more banks and mobile network operators are initiating trials of mobile and contactless payments via NFC. The GSM Association (GSMA), which brings together major mobile operators around the world, and the European Payment Council (EPC) have published a paper that could speed up the adoption of NFC-based mobile phone payments in Europe⁴⁰.

EPC and GSMA have released the paper 'TSM Service Management Requirements and Specifications' in the Single Euro Payments Area for public consultation. This document focuses on various processes involved in the provision and lifecycle management of banks' mobile contactless payment applications incorporated into a mobile device.

The document describes the Mobile Contactless Payment (MCP) as any SEPA card based payment executed by a customer using a Mobile Contactless Payment Application provided by an issuer and loaded onto the Universal Integrated Circuit Card (UICC – also known as a SIM card and provided by a mobile network operator) of a customer's NFC enabled mobile phone.

According to the paper, using mobile devices for contactless payments in a secure manner is the next step in the development of mobile applications and payment systems. The document contains specifications meant to enable Universal Integrated Circuit Card-based NFC-enabled Mobile Contactless Payment Application deployment and interoperability between issuers and

⁴⁰ EPC, GSMA - 'TSM Service Management Requirements and Specifications', 2010

mobile network operators. The collaboration between mobile network operators and payment providers would enable more than 500 million consumers to make SEPA payments on their phones. The two organizations plan for the new services to be managed by a trusted service manager, an intermediary between banks and mobile operators, which would provide a single point of contact for mobile service providers and manage the activation of mobile services on NFC-enabled handsets.

5 North America: betting on NFC

When it comes to the North American (NA) mobile financial services landscape, there are a few preconceptions to be dispelled, or at least brought down to more reasonable proportions.

Despite wildly optimistic predictions, North America is not a mobile payments paradise where consumers use their handsets to carry out all types of mobile financial transaction with little hesitation. Overall NA is a developed market, with high mobile phone penetration, diverse mobile services offerings, a higher proportion of upper-market consumers and sophisticated market dynamics between banks, MNOs and third-party payment processors. In addition, while in NA the mobile channel faces serious competition from payment instruments such as bank cards payment cards and the online (banking) channel, there is still a long way to go before all opportunities offered by true financial mobility are exhausted.

When it comes to the relatively low uptake of mobile commerce in NA keep in mind the following: unlike Africa or Latin America, where consumers use handsets as a lifeline to previously inaccessible (basic) financial services, NA is a much more layered, developed market. The mobile opportunity in a developed market stems from the fact that in such a challenge-rich context, mobile phones can give fill a variety of roles. Revenue from mobile financial services can come in a variety of ways and mobile payments can be packaged to fit a wide array of consumer, merchant and corporate needs. This versatility can only occur in a developed mobile ecosystem.

This chapter aims to provide an overview of the North American mobile financial landscape, as well as explore the various types of services in use and have a look at what the future holds for this highly dynamic market.

5.1 Overview of the North American mobile payments landscape

5.1.1 USA: low uptake of mobile financial services

As far as mobile financial services are concerned, NA is predicted to account for 35% of all mobile transactions worldwide by the end of the year, ranking second after EMEA, which is expected to account for 41% of the global mobile transactions value in 2011⁴¹.

In 2010, the US had a total of 293 million mobile subscribers out of a total population of around 310 million. According to Morgan Stanley⁴² (via mobiThinking), in 2010 37% of all handsets owned by US consumers were 3G-enabled, ranking the US at number 7 in the top 10

⁴¹ Yankee Group - 'Mobile Money Forecast', 2011

⁴² Morgan Stanley- 'Internet Trends', 2011

countries worldwide as far as penetration of 3G handsets is concerned. More widespread availability of unlimited data plans has helped the US overtake and extend its lead in mobile media use, such as mobile web, apps and content downloads, compared to Western Europe. comScore⁴³ for instance found that 29% of US subscribers have unlimited plans, compared to 8% in Western Europe (which includes the UK, France, Germany, Italy and Spain). Also, a different comScore study⁴⁴ monitoring the US mobile consumer market for Q4 2010 found that 234 million Americans ages 13 and older used mobile phones and that 63 million consumers used smartphones, up 60% from Q4 2009. At the end of 2010, smartphone users represented 27% of the total number of mobile phone users in the US.

The ability to pay via mobile is seen as a major differentiator for US consumers when it comes to staying loyal to their banks. Mobile payment services are an important factor influencing consumers' decision to stay with or to change banks, according to research carried out for US mobile payments company Obopay⁴⁵. 70% of respondents interviewed by Obopay in Q4 2010 have stated that an option that allows them to get paid, send or receive money by mobile phone is a valid reason to stay loyal to their banks. Furthermore, when questioned about getting paid by mobile phone, 64% of respondents indicated that they would be interested in accepting either personal payments or payments for their businesses from a credit card, debit card, or electronic cheque via a mobile phone.

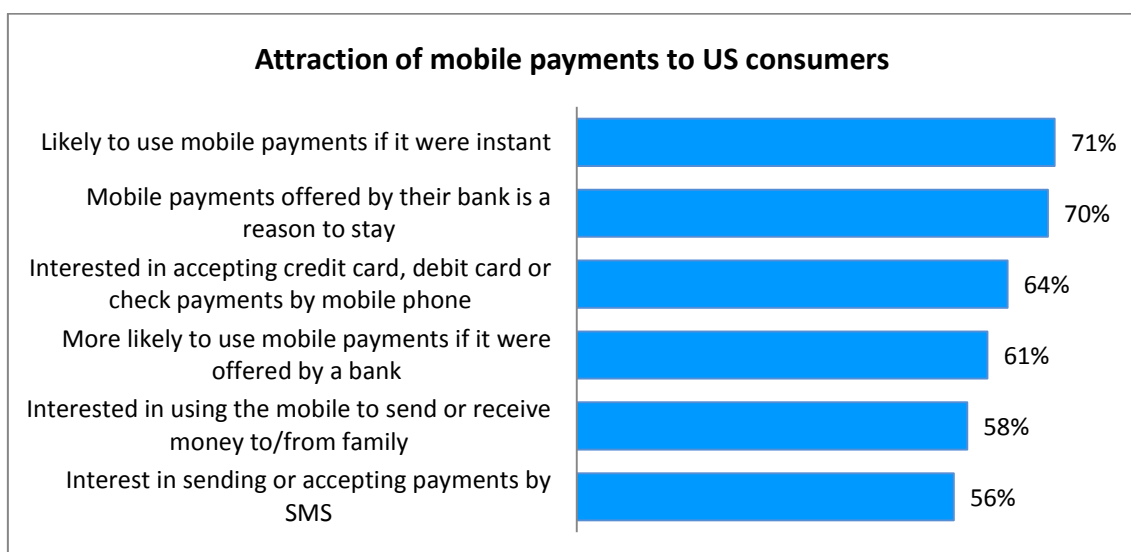


Figure 4: Attraction of mobile payments to US consumers. Source: Toluna Survey and Poll Services – Research commissioned by Obopay, 2011.

⁴³ comScore - 'The 2010 Mobile Year in Review', 2010

⁴⁴ comScore - 'comScore MobiLens ', 2011

⁴⁵ Toluna Survey and Poll Services – Research commissioned by Obopay, 2011

However, while in the US mobile phone penetration is close to 100% and a wide variety of mobile-based financial services are available, consumer mobile behaviour statistics⁴⁶ indicate that in Q4 2010 financial activities do not rank among US consumers' top things to do with their mobile phones, irrespective of their handset's sophistication. In other words, owning a mobile phone (even a smartphone) is not synonymous to using it to access mobile financial services. comScore thus reports that in Q4 2010, only 11.4% of US consumers used their mobiles to access their bank accounts, while a little over 10% of them employed their handsets to access financial news or stock quotes. Still, even this seemingly low percentage marks a significant increase compared to the situation at the end of 2009.

Despite a rather mixed overall picture of consumer mobile behaviour, age is found to be a distinguishing factor, as studied by Kelton Research on behalf of MasterCard⁴⁷. The study showed that mobile payments are of particular interest to consumers aged 18 to 34: 63% of them would feel at ease using mobile phones to make purchases, compared to 37% in the case of consumers aged 35 or older. Moreover, the research discovered that 65% of US consumers aged 18 to 34 felt more exposed without their phones than their wallets, compared to 34% of those in the 35+ category. A separate 2010 survey conducted by MasterCard Advisors also found that a strong demand for m-payments has been building among US respondents under 30 years of age over the past few years: between 2009 and 2010, the number of purchases made with mobile phones by US consumers under 30 has jumped by 67% year-over-year.

Despite the low uptake of mobile financial service, retailers remain optimistic. According to a study by Forrester Research together with Shop.org, m-commerce revenues are expected to hit USD 6 billion by the end of 2011, growing to USD 31 billion by 2016⁴⁸. This despite the fact that globally, m-commerce is only expected to account for 2% of e-commerce in 2011, and 7% of e-commerce by 2016. The data also indicates that 91% of online retailers in the US have a mobile strategy in place or in development. Moreover, 48% of US retailers surveyed by Shop.org and Forrester had a mobile-optimized website, 35% of them had deployed an iPhone app, 15% had deployed an Android app and 15% had deployed an iPad app.

The data show that even a developed mobile market such as the one in the US still holds significant revenue opportunities, as long as the mobile payment channel is properly adapted to the context in which payment is expected to take place. Whether the US mobile ecosystem can sustain long-term growth in m-commerce is a different discussion. Arguably, long-term m-commerce growth is more likely to originate in developing economies, where the mobile channel is virtually the only way to access the internet. However, a sophisticated market like

⁴⁶ comScore – 'The 2010 Mobile Year in Review', 2011

⁴⁷ Reuters- 'MasterCard Survey finds Consumers, Particularly Trend-Setting 18-34 Year Olds, Have Sights Set on Mobile Phone Payments', 2011

⁴⁸ Shop.org - Retailers Increasing Mobile and Social Efforts According to Shop.org/Forrester Survey, 2011

the US has both the potential and the resources to develop and support innovation in mobile payments.

5.1.2 Canada: diverse offering, still lacking widespread drive

The Canadian mobile financial services ecosystem is varied. It includes mobile payments and mobile banking offerings, m-wallets and carrier billing options. Smartphones in particular are growing in popularity among Canadians, as indicated by July 2011 estimates from Toronto-based Solutions Research Group⁴⁹. The latter indicate that over 2.5 million Canadians currently carry out purchases via their smartphones. A similar survey carried out on behalf of PayPal Canada⁵⁰ provides additional data with regard to the main drivers behind consumers' increased adoption of smartphone-enabled mobile payments. In Canada, convenience seems to be a significant argument prompting users to value the mobile channel, which allows them to shop, share expenses, send money or get paid back via one single device – their handset. NFC and other smartphone-based e-wallet solutions are thus expected to become major competitors to cash and bank cards on the Canadian market. But Canada's mobile financial services ecosystem is more comprehensive even than that.

The Canadian situation is also marked by an inevitable convergence with the US. Of course, Canada and the US do share some compelling market characteristics, given their proximity both in terms of geography and demographic make-up. A good example to that end is Visa, whose eye is decidedly turning to the mobile commerce market. In early 2011, Visa chose to target both the US and the Canadian markets with a digital wallet and services platform offering with added mobile capabilities⁵¹. The digital wallet is expected to store both Visa and non-Visa payments accounts and have added NFC functionality. The wallet allows Visa cardholders to pay online or via their internet-enabled mobile phones by entering their user names and passwords, without having to key in shipping and billing addresses.

For this, Visa has partnered North American payments card issuers, community banks, credit unions, acquirers, payment processors and merchants and is expected roll out the newly-announced services in the US and Canada in H2 2011. Visa and its partners – which include Barclaycard US, the Royal Bank of Canada, Scotiabank and US Bank (among others) will develop a range of transaction services focusing on both online and mobile commerce, micropayments, social networks and person-to-person (P2P) payments.

The question that emerges at this point is – will Canadian consumers take to Visa's new mobile digital wallet offering? Of course, Visa has a number of elements working for it, starting with

⁴⁹ Solutions Research group – '2011 Mobile Money & Banking', 2011

⁵⁰ Leger Marketing on behalf of PayPal Canada – 'PayPal Canada Mobile Wallet Survey', 2011

⁵¹ Visa Media Room - 'Visa Unveils Next Generation Electronic Payments and Services', 2011

its high brand recognition and existing relationships with merchants in the region (merchants need to sign up with Visa in order to offer the digital wallet as a payment alternative at checkout).

However, digital wallets have so far failed to achieve significant traction in the online commerce space, which is still for all intents and purposes an emerging market. Since Visa’s digital wallet is essentially conceived as a consumer-facing product, the company will have to prove itself remarkably quick on its feet, reacting to Canadian consumer and merchant feedback and being willing to adapt its product to emerging consumer demands.

5.2 Smartphones changing people’s behaviour

5.2.1 People more connected to their smartphone

The advent of smartphones and the emergence of app stores have truly altered the way people use their mobile phones. The creation of apps has led to more extensive and specific functionalities for the smartphone with a better user experience. Consumer behaviour is increasingly influenced by this growing convergence of multiple technologies on single devices that are available on an “anytime, anywhere” basis, allowing the internet to evolve and grow its reach even further. This is where the value of the mobile channel becomes more evident, because as far as convergence is concerned, smartphones are well-placed to allow consumers to carry out multiple types of activities: pay online in social networking / gaming environments, receive mobile transaction alerts and opt-in promotional information, carry out mobile money transfers, access funds, pay bills or top-up wireless airtime as well as carry out mobile NFC-enabled transactions (provided the right infrastructure is in place).

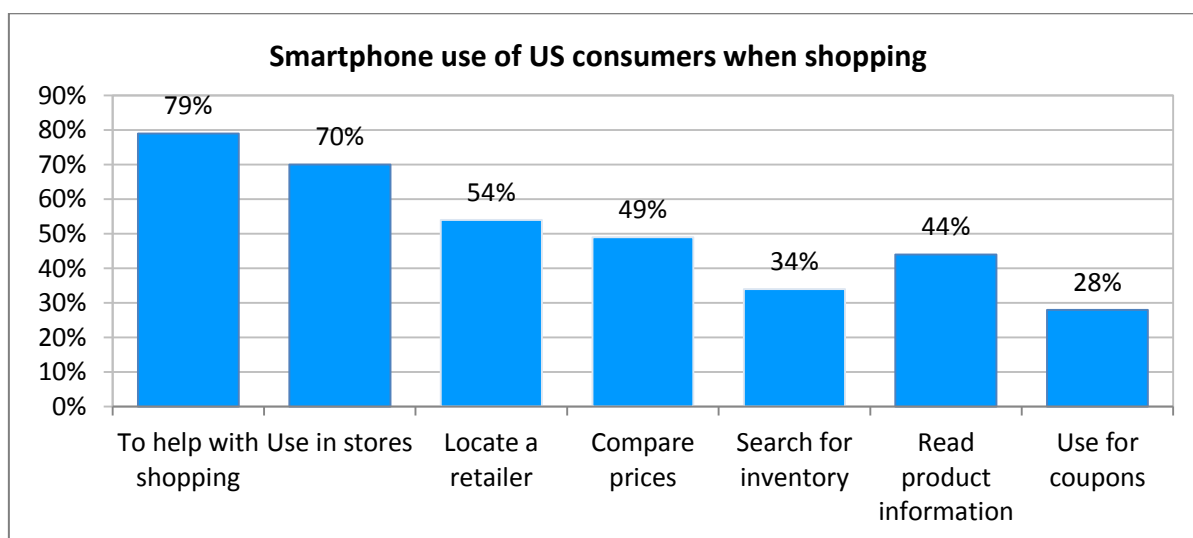


Figure 5: Smartphone use of US consumers when shopping. Source: Google / IPSOS OTX – ‘The Mobile Movement: Understanding Smartphone Users’, 2011.

According to an April 2011 Google/Ipsos survey⁵², 79% of US smartphone owners employ their handsets to help with shopping, while 70% of them use their phones in stores. Of those, 54% use their phone to locate a retailer; 49% compare prices to help decide; 34% use their handset to search in-store inventory; 44% read reviews and product info and 28% use discount coupons on their phone. Overall, 74% of smartphone shoppers have made purchases following research on their phone; in 2010, the average annual spend on mobile purchases was USD 300.

As far as the divide between mobile web and mobile app usage is concerned, a comScore⁵³ study found that the mobile web currently trumps mobile app usage, but mobile app popularity is growing at a faster rate. According to the research, in Q4 2010 30 million US customers accessed their accounts via mobile devices, marking a 54% increase compared to Q4 2009. The research found that in the interval under review, 18.6 million users accessed their accounts via mobile browsers (a 58% growth compared to Q4 2009), while 10.8 million consumers accessed their accounts via mobile applications, up 120% compared to the same interval in 2009. The report points out that SMS represented the smallest access point for financial service audiences with 8.1 million US users in Q4 2010, up 35% from Q4 2009.

The reality of the situation is that even in developed markets such as the US (where smartphone penetration is higher), more consumers use the mobile web than mobile apps, and very few consumers use either mobile apps or mobile web exclusively. In fact, US consumers prefer browsers to apps for most mobile activities, according to a Keynote/Adobe survey⁵⁴ of US smartphone users carried out in October 2010. Also, according to a Nielsen June 2010 survey, **the most used apps across all smartphones** in the US are Facebook, Google Maps and The Weather Channel (TWC). The most popular app categories are games, news, maps, social networking and music. Mobile financial services apps (whether for m-banking or P2P mobile-enabled payments) simply don't make the cut – yet.

The situation is unlikely to change considerably over the coming years; in fact, if we are to listen to ABI Research, app stores are likely to slowly decline by 2013, as subscribers migrate from downloaded apps to mobile websites. Also, phone manufacturers are increasingly preloading some of the more popular apps, such as social networking, onto mobile devices, making it redundant for consumers to download the apps themselves from an app store. Gartner however does not share this rather pessimistic view. In fact, the company's most recent statistics on mobile commerce indicate that the success of mobile-application stores, such as Apple's App Store is one factor which causes merchandise purchases to outweigh other use cases in developed markets such as North America, along with the efforts in driving mobile sales by major retailers, such as Amazon and eBay.

⁵² Google / IPSOS OTX – 'The Mobile Movement: Understanding Smartphone Users', 2011

⁵³ comScore - 'The comScore 2010 Mobile Year in Review', 2011

⁵⁴ Keynote / Adobe - 'Adobe Mobile Experience Survey', 2010

5.2.2 Growth of smartphones use increases risk of fraud

Mobile commerce and transaction execution are expected to increase at a rapid pace by the end of 2013, with the improvement of browser experiences on smartphones, a report by Gartner revealed⁵⁵ in late 2010. However, they also point out that the growth in m-commerce transactions will necessitate the development of fraud detection mechanisms capable of coping with fraud-related issues specific to the mobile world.

According to Gartner, 12.5% of all e-commerce transactions are expected to be carried out via mobile devices by the end of 2013, as a result of the rapid adoption of smartphones. This hasty adoption is forcing banks, social networks and other e-commerce providers to implement the types of fraud detection capabilities on mobile platform that have already become mainstream with fixed-line computing.

The main problem is that the fraud detection tools available today in fixed-line computing environments do not work well or at all in the mobile world. Although there are a number of methods that can be implemented to help enterprises detect fraud in the mobile environment, they are still in their early stages of development, and it will take until at least 2012 for them to reach the stage of technically mature systems that work easily and transparently across disparate mobile networks.

According to Gartner, fraud prevention methods available today to mobile applications include mobile device identification (enabled through a JavaScript on the server that the user logs in to, which captures whatever information it can get from the user's browser and phone) and location of device (based on the phone's location information independent of the browser).

The study has also predicted that location or profile information from mobile phones will be used to validate 90% of mobile transactions by year-end 2013. With such a forecast, the development of professional fraud detection tools is expected to play a significant role in the transformation of mobile commerce into location- and context-aware commerce, contributing to the increase in confidence on the part of businesses, financial institutions as well as end users.

5.3 Betting on NFC

NFC take-up in the United States (or rather the lack thereof) has long been a much debated topic among industry players as well as a constant source of frustration for those among them preaching the many virtues of NFC payments. There are many advantages that come with combining mobile payments technology and short-range high frequency wireless

⁵⁵ Gartner – 'Get Smart With Context-Aware Mobile Fraud Detection, 2010

communication, as previously outlined in the chapter dedicated to NFC. The crux of the matter has always been driving merchant and consumer adoption.

There are some inhibitors in driving user adoption. On the one hand, adding NFC capabilities to merchant's PoS devices is costly for merchants. They need assurances that once the technology is installed they will process high enough volumes of contactless transactions to actually make the hardware and software investments profitable (critical mass). Consumers on the other hand need specially equipped mobile phones, a sufficiently high number of NFC-enabled retail locations at their disposal and enough confidence in the NFC payment ecosystem to adopt mobile contactless payments.

Nevertheless there remains a continued, growing interest in NFC. This section describes the main commercial developments around NFC, showing multiple approaches to the matter.

5.3.1 NFC heating up

In the USA mobile payments are a hot topic, and NFC leads the way. As many companies try to obtain a piece of the NFC pie, last year marked the beginning of many new initiatives. One of the most important initiatives has been Isis. The joint-venture between AT&T, T-Mobile and Verizon, announced in November 2010, was formed to jointly develop an NFC based payment network⁵⁶. Transaction fees would be collected by the MNOs, while the customers would also have their payment account at the MNO instead of with a bank or credit card company.

Visa, MasterCard, US-based direct banking and payment services company Discover and US financial services company American Express are planning to team up for mobile commerce via Isis. Isis' relationship with all four payment networks is will allow consumers and merchants to make and receive payments via Isis-enabled phones and payment terminals in place.

The four biggest payment processors will create mobile payment applications compatible with the Isis infrastructure, which will conform to the GSMA-backed Trusted Service Manager standard.

When it was launched, Isis had plans to become a payment processor in its own right, but that didn't go down well with the existing players, and the consortium changed tack to welcome existing players with a standard infrastructure – a decision which has now paid off with broad industry support.

Meanwhile, Google has teamed up with MasterCard, global financial services provider Citi, US electronic commerce and payment processing company First Data and US provider of wireless and wired communication services Sprint to field test and toll out the NFC-powered initiative

⁵⁶ Reuters – 'Telcos, Discover plan mobile payment venture: sources', 2010

Google Wallet⁵⁷. The company also invited additional issuing banks, payment networks, mobile carriers, handset manufacturers, point of sale systems companies and merchants to join the initiative in the near future.

Google Wallet currently only has MasterCard's backing. When it launches to the public, later this year, the Google Wallet will only contain a Google pre-paid card and (potentially) one from Citi, while an Isis phone could potentially include any MasterCard, Visa, Discover or American Express payment card.

In June 2011⁵⁸, Isis indicated that it was planning to initially launch its mobile commerce program in Austin, Texas in the first half of 2012. Previously, in April 2011⁵⁹, Isis had announced plans to pilot its mobile commerce program in Salt Lake City, Utah by mid-2012.

Another major player in the US online and mobile payments industry is also making steps towards NFC. As described in chapter 3 on NFC, PayPal has teamed up with Bling Nation to launch NFC payments at merchant's PoS. Before being able to use it users would need to connect the BlingTag NFC chip to their PayPal wallet or a bank account. After an initial launch this initiative was temporarily shut down in June 2011 to improve the current product.

Meanwhile PayPal is also working on other initiatives in the field of NFC (in addition to a few mobile payment initiatives without NFC, such as the acquisition of Zong in July 2011). At the MobileBeat 2011 Conference⁶⁰ in July PayPal showcased a new P2P service (only limited to phone-to-phone transactions) using the NFC capabilities of Android phones. In order to use it one person needs to start a payment request or payment delivery via the PayPal app. Next, both users need to put their phones together until they vibrate. When the second person enters his pin number the money is transferred. Notably the new service is said to be free of charge if using a bank account or PayPal account with existing balance. The new PayPal app is said to become publicly available later this year.

5.3.2 A different approach to NFC with MicroSD

Despite the fact that NFC is far from reaching a critical mass on the US market, key (potential) players are still willing to give the technology a chance. Some take a slightly different approach, however.

⁵⁷ MasterCard Media Room – 'Google, Citi, MasterCard, First Data and Sprint Team Up to Make Your Phone Your Wallet', 2011

⁵⁸ The Paypers – 'Isis to introduce mobile commerce program in Austin, Texas, US', 2011

⁵⁹ The Paypers – 'Isis to pilot NFC m-commerce program in 2012', 2011

⁶⁰ Reuters – 'PayPal unveils NFC Android-to-Android payments', 2011

In late 2010 a number of major players in the US payments and mobile space – Barclays, Discover Financial Services, US Bank as well as mobile network operators AT&T, Verizon and T-Mobile - revealed initiatives all involving the significant expansion of the country's NFC infrastructure. Since one of the biggest issues with contactless technology adoption has been the need for both consumers and merchants to own NFC-enabled hardware (the vast majority of US consumers do not own NFC-enabled phones), large US mobile carriers have decided to switch tactics.

Instead of trying to sell the virtues of contactless merchant payment terminals and handsets they have now decided to focus on offering NFC-enabled m-payment services via contactless microSDs and other such accessories that can turn any phone (smartphones included) into a contactless payment device.

For example, in early August 2010⁶¹, mobile carriers AT&T, Verizon Wireless and T-Mobile USA have announced plans to establish a contactless mobile payments venture that would enable customers to use contactless technology in order to complete purchases in stores via smartphones. The three companies will be running mobile NFC payments trials in Atlanta and three other US cities. Discover Financial Services and the US arm of the UK's Barclays Bank have also announced their intention of taking part in the trials.

In September 2010, Wells Fargo Bank⁶² announced that together with Bank of America and US Bank (and in association with Visa) it will carry out a pilot enabling participants to pay for purchases with their smartphones at contactless payment terminals. Visa's microSD payment pilot is based on the In2Pay microSD technology developed by mobile contactless company DeviceFidelity.

DeviceFidelity also partnered with Monitise⁶³, a British mobile banking and payment service provider. Under the deal, DeviceFidelity will integrate its In2Pay technology with Monitise's mobile financial services and user interface design to allow financial institutions to provide their customers with contactless transaction capabilities. The Monitise-developed user interface can be integrated with various mobile banking applications, enabling financial institutions to offer their customers a suite of mobile services, including mobile payments, balance inquiries, mini-statements, bill payment as well as funds transfers.

DeviceFidelity's In2Pay is a microSD-based technology that transforms a mobile phone with an available memory card slot into an interactive contactless transaction device. The In2Pay "plug-and-play" technology provides an alternative for installing NFC contactless transaction functionality on mobile phones which are already in use. In2Pay is designed to be compatible

⁶¹ Bloomberg – 'AT&T, Verizon to Target Visa, MasterCard With Smartphones', 2010

⁶² Reuters – 'Wells Fargo, Visa to test phone payments', 2010

⁶³ The Paypers – 'Monitise, DeviceFidelity join forces to enable mobile contactless payments', 2010

with existing merchant, mass-transit and bank infrastructure, allowing one-click access to payments and other personal access control features.

For handsets without a microSD slot, DeviceFidelity has developed a protective case which accepts the In2Pay microSD card and allows smartphone applications to communicate through the phone's universal connector.

Also in September 2010, JP Morgan Chase⁶⁴ revealed that its banking arm was planning to test mobile payments, again using contactless microSD cards combined with a Visa payWave application. Visa itself had quite a busy end of 2010 on the contactless front, as it launched contactless payment trials for commuters in New York and Los Angeles, in a bid to extend its contactless payWave payments technology across the public transport services. The trial allows New York riders to pay for their journeys using the Visa payWave-enabled mobile phones, whereas commuters in Los Angeles can use a special Visa prepaid card to travel with the LA metro system.

5.4 Alternative contactless methods for proximity payments

5.4.1 Starbucks Card Mobile using 2D barcodes

Those who follow the developments in the mobile payment world cannot help but notice that the pace at which initiatives are launched is higher than ever before. Despite the fact that some of them fail to take off and meet expectations, it seems that companies do not show any signs of hesitation to launch new initiatives or extend trials.

Starbucks, a company which has been struggling with weak US sales growth due to declining demand in light of the economic slowdown, is such an example. The coffee retailer has recently announced that its Card Mobile iPhone application can now be used to pay for Starbucks purchases via barcode scan at over 1,000 Target locations across the US⁶⁵. The initiative follows a successful trial project at 16 company-operated stores in Seattle and Northern California, which started in September 2009, when Starbucks launched its two iPhone applications, namely Card Mobile and myStarbucks. Motivated by the success of the initial trial, mainly driven by the high usage rates of both Starbucks cards and Apple products in the two test markets, Starbucks decided to expand the pilot test of the mobile payment system to 1,000 coffee shops.

The potential of the large-scale project is considered sufficiently high, given the four powerful players behind it: Starbucks, Target (a Starbucks licensee for more than 10 years), Apple and mFoundry, a provider of mobile financial services that built the mobile payment application.

⁶⁴ NFC Times – ‘Chase Joins Other Big U.S. Banks in Plans to Test microSDs’, 2010

⁶⁵ Starbucks Blog – ‘Starbucks Card Mobile Payment Now in New York’, 2010

Starbucks Mobile Card is an application for Starbucks cardholders, which can be downloaded via the iTunes Application Store and which enables customers to manage the funds on their card. The application lets users check their card's balance, add additional funds, review their purchase history and even pay for purchases without using a physical card. When they first launch the application, customers have the possibility to sign in with their Starbucks account, or continue without an account. Starbucks cardholders can create an account online and register their card with their account. Once they sign in to their Starbucks account, the application opens to a main screen with several options to manage the card, as well as showing the current balance and an actual image of their card. The company has added a passcode protection that users can enable, using a 4-digit code.

In selected stores, customers can pay for goods using the Starbucks Card Mobile app with an iPhone or iPod Touch. After the customer selects the payment option within the application, the device will display a 2D barcode. The cashier can scan the special barcode image and the amount will be deducted from the customer's account.

The simplicity of the barcode technology could be one of the main factors that contributed to the rapid expansion of the project. The barcode system does not require additional hardware and can easily be installed on the current generation of smartphones. Smartphones such as the iPhone, Google's Android range and Nokia can now be automatically scanned on barcodes.

But analysts' opinions are divided as to whether 2D barcodes are a realistic technology for mobile commerce. Some observers consider this technology⁶⁶ as being more practical than hardware based solution such as NFC chips. For years, companies have been testing mobile payment systems based on NFC chips and in spite of their success, only a few commercially available phones have the necessary hardware. And although the advent of contactless payment has been heralded as one of the most promising payment breakthroughs in recent years, reports indicate that more needs to be done to drive adoption. This is why 2D barcodes have come to be regarded as a more viable solution for mobile payments until NFC chips become widely available.

On the other hand, analysts also claim⁶⁷ that NFC will help mobile payments and marketing technologies such as smart posters reach the mass market and in spite of their potential, 2D codes will never gain widespread adoption in the US mainly because of device limitations: users are required to download special software to their devices to utilize the technology, something which many might find discouraging. Indeed, this could be an impediment, because in order to make m-commerce a success and achieve a high degree of customer acceptance, mobile services must be designed to be as convenient as possible for the consumer.

⁶⁶ GS1 MobileCom – 'Mobile in Retail - Getting your retail environment ready for mobile', 2010

⁶⁷ GS1 MobileCom – 'Mobile in Retail - Getting your retail environment ready for mobile', 2010

Leaving aside debates on what kind of system for mobile payments will eventually take hold, which is less important for the present article, Starbucks' project will test US consumers' willingness to replace their cards with mobile phones. Given the increasing popularity of smartphones, other companies will definitely follow suit and market their products. And they seem to be heading in the right direction, as mobile payments may be the necessary instrument for them to build stronger relationships with customers, differentiate themselves from the competition and increase revenue. Mobile payments have the potential to be faster, safer and more widely acceptable in the years to come and Starbucks is already trying to mark its territory.

5.4.2 Geo-location-based payments by MobilePay USA

MobilePay USA is a smartphone app that uses geo-location technology to connect consumers with merchant locations⁶⁸. Once the app is downloaded on the user's phone, consumers can power it up by entering a four-digit PIN to unlock it and can proceed to pre-load all their credit, debit and even loyalty cards. The cards loaded onto the app are tokenized versions stored with the company's banking partner, so that no actual details are stored on the mobile device itself.

Once the consumer walks into a MobilePay-powered store and unlocks the app, the merchant in question is automatically displayed on his phone and the consumer can select it from a list displaying all other available merchants. To initiate a payment, the user taps the 'Pay Store' button; once the store is confirmed on the screen, the consumer chooses which of the preloaded cards he will use, enters the amount due and thus finalizes the transaction. Authorization is sent out for acceptance to the real-world merchant, with no specific hardware or software needed. A payment confirmation will then appear simultaneously on the consumer's phone and the merchant PoS terminal. Soon after, a receipt will be sent to the buyer's email; the receipt can also be viewed online at MobilePayUSA.com.

The good news about MobilePay USA is that it works without merchants being forced to buy and install any additional hardware and software to their existing point of sale technology. This is a massive advantage that comes to kick NFC where it hurts the most – in its need for consumers and merchants to own special, contactless-enabled hardware. On the other hand, MobilePay is a smartphone app, and as such it targets a limited (albeit financially privileged) pool of consumers. From this perspective, NFC-enabled m-payment services delivered via contactless microSDs (and other such accessories) have the potential to reach more consumers, particularly among non-smartphone users.

MobilePay uses the mobile phone to carry out payments at a merchant, while the actual transaction is carried out from the consumer's debit or credit card account. The phone is

⁶⁸ TechCrunch – 'MobilePay May Be The Death Of The Wallet. Yes, For Real This Time.', 2010

simply used as a channel to a centralized hub used to connect to the merchant PoS and from where the payment is initiated. In other words, MobilePay turns the consumer's smartphone into a mobile wallet rather than a payment instrument per se – same as with NFC-powered payments.

Its main advantages thus lie in the fact that it comes with zero adoption costs for the merchant and has the added convenience of being a payment app – therefore not a novelty, but rather an everyday reality in the technological landscape of smartphone users. It remains to be seen whether MobilePay actually takes off - but its future definitely looks promising.

5.4.3 ING Direct USA introducing P2P Bump payments

ING Direct USA, the American arm of ING Direct which has recently been acquired by Capital One, released an enhanced version of its mobile banking app in May 2011⁶⁹. The new app has been enhanced with the capability to perform contactless, proximity person-to-person (P2P) payments via Bump, which allows ING Direct customers to instantly transfer money to each other.

Bump, a small tech, Silicon Valley startup, has developed a technology to exchange information of many types between phones by 'bumping' two phones together. The application uses the phone's sensors to register the bump after which the selected information is sent to the Bump's cloud-based servers. (The user does not need to actually bump the phone, a shake is enough to activate the accelerometer.) By using an algorithm for the phone movements it is matched with the other phone in the same area, after which the data is streamed to the recipient. Via an API the technology can be integrated into other apps, which is what ING Direct has done.

To access the new feature one needs to download the latest mobile banking app of the bank. After signing in, one selects the P2P option and chooses Bump. Then, the user indicates whether he or she is sending or receiving and types in the amount. Note that the users do not need put in each other's account numbers. The users can now bump their mobile phones, after which the payment only needs to be confirmed. This will initiate an instant payment between the users.

ING Direct USA was not the first financial institution in the US that implemented Bump; PayPal already launched their app with Bump capabilities in March 2010. Nevertheless, by being one of the first banks to use this technology, ING Direct confirms its position as an innovative company changing the way banking is done.

⁶⁹ ING Direct Media Room – 'ING DIRECT Launches Bump For iPhone', 2011

5.5 Mobile phone used as PoS device

A recent phenomenon is the use of the mobile phone as a point of sale (PoS) to accept (typically) card payments. With the help of an extra device and an application for the hardware the mobile phone can be used to accept such payments. The external card readers typically support payments between consumers and small enterprises. They are specifically targeted for enterprises not large enough for traditional PoS devices, thereby providing access to those otherwise excluded due to high up-front investments.

There are a few initiatives in this field, each with a slightly different approach and different background. Most of these initiatives originate from the USA. Verifone, the US provider of PoS solutions and also mother of the PayWare solutions, provides a device surrounding the iPhone through which the card can be swiped⁷⁰. The Verifone solution also includes a stylus by which cardholders can sign for the transaction. Mophie, the US provider of iPhone hardware such as external battery cases, also developed an iPhone case that allows users to accept credit card payments⁷¹. Intuit, the US provider of financial services software and hardware that works with Mophie card readers has also developed its own card reader that can be mounted in the headphone plug on iPhones, Android phones and Blackberry smartphones⁷².

Outside the US, in Europe there is the initiative of Barclaycard. Barclaycard, the largest UK credit card issuer and provider of PoS solutions, announced in 2010 at Mobile World Congress that they were working on an iPhone PoS device to accept both conventional and contactless payments⁷³. This device would be mounted as a case around the smartphone. For conventional card transactions such as EMV the user would insert the card in the slot and type his PIN. For contactless payments the user would simply hold the card in the proximity of the device. Although at the moment of writing we are unaware whether it has already been launched in the market, the initiative looks promising. In Sweden there is also iZettle⁷⁴, a company that has developed a device that can be plugged into the dock connector of an iPhone to accept credit card payments.

And there are still more similar initiatives that we have not even mentioned. The most well-known example is Square, which is highlighted in the case study below.

⁷⁰ Verifone Media Room – ‘VeriFone’s PAYware Mobile Now Available on App Store as Credit Card Encryption Sleeve Begins Shipping’, 2010

⁷¹ mophie Media Room – ‘mophie Powers Mobile Credit Card Transactions for the iPhone’, 2010

⁷² Mophie Media Room – ‘Intuit GoPayment and mophie marketplace Offer Complete Credit Card Solution for iPhone’, 2010

⁷³ Barclaycard Media Room – ‘Barclaycard Announces New Smart Phone Enabled Terminal’, 2010

⁷⁴ The Paypers – ‘Swedish m-payments start-up iZettle launches mobile POS app for the iPhone’, 2011

5.5.1 CASE STUDY: THE RISE OF SQUARE

It was December 2009 when Jack Dorsey, former founder of Twitter, announced his mobile payment start-up Square⁷⁵. Its concept was simple: let people accept credit cards with their mobile phone. Square provides individuals and small business with the capabilities to accept and process credit card payments without the need of expensive hardware and merchant accounts.

Square works with an application (suitable for the Apple and Android platform) and a small dongle device that is plugged into headphone jack that acts as a card reader which allows the seller to swipe the payee's card to initiate a transaction. Before using the service the users need to have a Square account and have a Square card reader. After its set-up the user can accept USA issued credit cards from Visa, MasterCard, American Express and Discover. Users can sign-up for free and there are no monthly fees or contract.

In addition to the payment capabilities it supports several features. Individuals who buy items via Square can store and browse photos of items they have bought. Buyers and small sellers can access transaction history. Buyers can tip a sellers and sellers can set up virtual shelves of the items they sell.

The potential of the service that Square offers is huge. With small adjustments to already existing devices and payment infrastructure users are provided access to credit card acceptance, something which is not offered by most other payment methods. A small merchant is no longer forced to invest in costly hardware and can accept credit card payments even for lower value items.

Since Square delivers a great service, it has all the ingredients to prosper. However, during its start-up phase the company faced many problems. The hype surrounding Square had sky-rocketed merchant's demand for the free dongle device, which created some challenges for the company. The free Square plug-in device attracted many would-be users that only cost the company money. Moreover, the high demand made it harder to screen users and eliminate fraud risk. The creators of Square have been struggling to ensure the functionality and security of the payment processing infrastructure.

Of course, when you offer a cards payment service without a contract, monthly fee or minimum monthly transaction value you are bound to attract high-risk merchants that otherwise do not qualify for merchant accounts with credit card acquirers.

As Jack Dorsey stated in an email to users "parts of the Square services were released before they were fully baked"⁷⁶. After its initial launch Square had to rethink its strategy

⁷⁵ The Paypers – 'Twitter creator rolls out mobile payments start-up', 2009

⁷⁶ TechCrunch – 'Square Delays Mass Roll-Out, Admits They Began Before Things Were "Fully Baked"', 2010

and business operations, and focus on strengthening the underwriting infrastructure. To limit the fraud risk Square has set limits on transaction.

Time will tell if Square will be able to solve the security issues. Nevertheless, the Square service has great potential.

5.5.2 Mobile PoS added with NFC functionality

At the Google I/O developer conference which took place in San Francisco in May 2011, US business and financial management company Intuit showcased a concept demo adding NFC technology to its application⁷⁷. During the concept demo Intuit showcased various operations that small businesses could undertake using the GoPayment NFC application, such as completing a sale or adding inventory.

Intuit's GoPayment was initially launched to provide small businesses and individuals with a means of accepting credit card payments via their smartphones. To use the service, clients need to install the GoPayment application on their web-enabled mobiles as well as open an Intuit GoPayment merchant account. Afterwards the clients can accept all major credit cards, such as Visa, MasterCard, American Express, Discover, Diners Club and JCB, as well as signature debit cards.

Now, using Google's Android mobile platform and integrating NFC technology via Google's Nexus S device, Intuit has effectively transformed its existing GoPayment mobile credit card processing app: the renewed GoPayment application no longer transfers credit card data via a dedicated card reader – rather, data transmission takes place via radio waves without any add-on card reader hardware.

With the upcoming service, small business owners are expected to tap their phones against a product with a smart tag in order to add an item to inventory. All information on that product is then set to appear in the mobile payment application. To complete the purchase, the customer and small business owner would touch their phones together, eliminating the need to swipe a card.

Customers could also pay for products using a virtual debit card residing on their phone. To complete the purchase, the customer and small business owner would also touch their phones together. Customers could use this same process to receive a receipt, or have a copy of the receipt sent automatically via e-mail or text message.

The advantages of adding NFC to a mobile credit card processing application such as Intuit's GoPayment are clear: not only would transactions be carried out faster, but users would also experience a higher degree of convenience, since they would no longer need to use a physical credit card or credit card reader. In addition, it provides access to NFC acceptance to a much larger public.

⁷⁷ Intuit Media Room – 'Intuit GoPayment Brings NFC Innovation to Life at Google I/O', 2011

6 Asia: a fragmented market

Looking at the developments and future potential of mobile payment services in Asia-Pacific, it is clearly a fragmented market.

The main sources of this fragmentation are not hard to deduce. On the one hand, Asia-Pacific is the most populous geographical region in the world, and also a region with very high rates of mobile penetration, coupled with fast mobile growth. According to research carried out by The International Telecommunication Union (ITU)⁷⁸, China and India alone added a cool 300 million new mobile subscribers in 2010, spearheading mobile growth in the developing world. China and India also boast the highest number of mobile subscriptions worldwide (also a direct result of being the most populous nations on the globe): at the end of 2009, China had around 750 million mobile subscribers while India had 525 million mobile subscribers.

On the other hand, Asia-Pacific consists of rather diverse set of markets with different payment ecosystems. This diversity manifests itself on a number of levels: Asia-Pacific includes both developed and developing markets; territories both large and small, some with an established and modern telecommunications, retail and transport infrastructure, other with high numbers of unbanked and underbanked consumers; some with a high urban population, other with a sprawling rural ecosystem marked by informal economic activities and lacking basic consumer access to financial services; finally, industry standards and levels of regulatory compliance differ wildly from one market to the next.

In the context of an overall huge number of mobile users counterbalanced by the presence of different types of economies and existing levels of mobile financial services implementations, fragmentation is to be expected. Also expected and easily justifiable is the presence of a large variety of active players currently looking to establish themselves in the promising mobile payments playing field.

However, just labeling the mobile payment ecosystem in Asia-Pacific as fragmented and leaving it at that is too simple. This all-encompassing label may in fact lead to the (wrong) conclusion that fragmentation is in itself a definition of the mobile payments ecosystem in the region, an unmovable reality that has to be taken as a given. In fact, the fragmentation of the Asia-Pacific market is no more than a premise for development. It is a fluid state of affairs that evolves from one year to the next, as new technologies emerge, as consumer behavior changes to accommodate change, as the mobile web evolves and as mobile payments develop along such coordinates as m-commerce, NFC and mobile banking.

Mapping the mobile payments value chain in the region is a complex undertaking, one that ought to depart not from what sets the countries in Asia-Pacific apart, but from what brings them together. What constitutes the main argument pro mobile payments all over Asia-Pacific

⁷⁸ ITU – ‘Access to mobile networks available to over 90% of world population 143 countries offer 3G services’, 2010

is the fact that m-payments are versatile enough to be feasible both in developed and in developing markets, to bridge the urban – rural divide, to bring access to financial services to millions of unbanked consumers, and to allow MNOs, banks and third party m-payments service providers to tap a fabulously diverse, rich and still largely unexplored consumer market.

Conversely, we cannot ignore the fact that the deep-rooted fragmentation of the mobile payments ecosystem across Asia-Pacific has the potential to be a barrier, making m-payments a challenging environment when it comes to the roll-out and consumer adoption of new mobile-based financial services.

This chapter aims to provide an overview of the Asian – Pacific mobile payments landscape. In this way the chapter helps to understand the sources of fragmentation, the differences per mobile payment service and per country.

6.1 Differentiation based on market segmentation

As mobile networks (MNOs) in the region developed and grew in size and coverage, rapid advances in mobile technologies also took place. However, the ever-present premise of market fragmentation has led to a certain degree of specialization among m-payment services providers. Put simply, different market players (be they banks, MNOs or else third-party service providers) have started targeting their offerings at specific payment areas and types, such as mobile wallets, mobile banking, contactless retail payments or the provision of mobile P2P (including mobile remittance) services. Furthermore, when developing their specialized offerings, these players adapt to the specificity and make-up of each market in the Asia-Pacific space.

A very good example of this is India, the world's second most populous country, the 12th largest economy on a global scale and also one of the world's top 20 fastest growing economies. The fast-pace penetration of mobile phones in India has become the main growth driver for the development of specific types of mobile financial services in the region, mobile banking prominent among them. This has happened while in India, existing financial infrastructures, particularly the ones available to the country's largely unbanked rural population, are poor-quality and not geared at reaching this large consumer segment. Mobile financial services come with the added advantage that they can largely function independently from the existence of a brick-and-mortar support network.

Also, some types of services such as mobile banking can be carried out very well (at a basic level) in the absence of sophisticated phones. This is good news for the Asia – Pacific region, as most handsets currently in use there are low-tech, allowing only access to relatively unsophisticated mobile-based financial services. Therefore, the proliferation of mobile banking services among India's underbanked and unbanked consumer segment has continued unhampered by technology barriers.

The relative simplicity of use has led to high levels of m-banking services adoption among India's rural consumers. This state of affairs also reflects a reality particular to the Indian financial ecosystem: the fact that in the country's rural areas mobile banking is essentially a means for consumers to achieve financial inclusion, as it allows users to gain access to basic financial services to which they would otherwise have little to no exposure. Indeed, with the country's rural population living in almost 600,000 villages, establishing brick-and-mortar bank branches would be a daunting task, bordering on the impossible if we also consider the remoteness of many such small communities.

Within this context, mobile banking emerges as a very cost-effective means of reaching a large number of Indian consumers, irrespective of their remoteness. At a more general level, the development and consumer take-up of m-banking services in India perfectly illustrate the differentiation of mobile financial services according to specific consumer realities and payment areas that is so characteristic of the Asia-Pacific mobile payments ecosystem.

Yet another major characteristic of Asia's m-payments market is the differentiation of the industry (or industries) which have developed particular types of mobile payment technologies, according to their specific needs. For example, NFC has been widely developed by players in the transportation industry, with stored-value cards either attached to the mobile phone or else embedded in the SIM like the Sony Mobile FeliCa ICs. In Japan, for example, the implementation of mobile NFC technology such as the Osaifu-Keitai system for fare collection on mass-transit transport networks has eventually led to NFC becoming the de-facto standard method for mobile payments in the country.

In conclusion, the Asia-Pacific mobile financial services ecosystem is characterized by fragmentation and differentiation brought about by specific needs, both on the consumer and the industry side.

6.2 Each service fulfills different needs

6.2.1 Mobile banking serves the unbanked

As described in the previous section, mobile banking has emerged as a way to serve the unbanked. In many countries, such as India, there is a lack of proper financial infrastructure and mobile banking has become a cost-effective method of reaching a majority of the population. As most mobile phones used are rather low-tech, the majority of the mobile banking initiatives so far have centered on the deployment of simple mobile banking services accessible by the unsophisticated mobile phones: funds transfers and account inquiries.

The biggest potential of mobile banking comes from tapping the large unbanked markets such as India or China. A study carried out by research and consulting company Celent⁷⁹ revealed that in 2010, around 25 million Indians were registered for mobile banking, with an active user base of 2.5 million, or just 10% of registered users. However, the report also indicated that financial services providers operating in India had grown into the mobile commerce space – comprising both mobile banking and the mobile payments sector – as a cost-effective means of expanding their reach and increasing their customer base.

According to a different study published by Celent in mid-April 2010⁸⁰, India's mobile banking sector is clearly divided into urban and rural segments, each with its own history, characteristics and prospects.

Celent expects the number of urban mobile banking subscribers in India to reach 65 million by 2012 and refers to mobile banking in an urban environment as an “enabling fifth channel”. This is a reasonable view, in line with the fact that mobile banking growth among urban consumers was quite low in 2009 as well, its continued development facing different barriers from those affecting India's rural population. Prominent among these barriers is competition from other alternative banking media such as ATMs and online banking, which are more readily available to urban consumers.

6.2.2 Mobile wallets are combined with NFC

Mobile wallets allow users to store credit and/or debit card details or stored value on their handsets, subsequently using the mobile phone to pay for goods and services in a variety of contexts. In Asia-Pacific, mobile wallet development, while still rather small-scale in terms of market share, is still higher than for example in Europe or the United States and markets such as Japan, South Korea and Hong Kong are pioneering the use of this particular m-payment option.

In Japan, the country's largest mobile phone operator NTT DoCoMo started to deploy devices featuring the FeliCa contactless IC chip developed by Sony in 2004. The FeliCa chip makes it possible for Japanese mobile devices to effectively function as mobile wallets and contain multiple forms of data including bank account numbers and credit account information. This allows mobile devices to be used as a substitute for cash and cards at vending machines and merchants' PoS.

Insofar as m-wallet usage, Japan once again emerges at the top of the list. According to statistics released by comScore⁸¹, in December 2010 9.8 million Japanese mobile users carried

⁷⁹ Celent – ‘Mobile Payments in China: Emergence of a Mega-Market’, 2010

⁸⁰ Celent – ‘Mobile Banking in India: Dual Strategy for Rural and Urban Segments’, 2010

⁸¹ comScore – ‘The 2010 Mobile Year in Review’, 2011

out a purchase using their mobile wallet. This accounts for nearly 10% of the country's base of nearly 100 million mobile subscribers. When it came to the most likely places consumers used their mobile wallets to make purchases, retail/convenience stores topped the list, with 7.6 million mobile subscribers using their mobile wallets at such locations in December 2010. Vending machines came next (3.2 million), followed by public transportation (2.7 million), grocery stores (2.6 million) and restaurants (1.5 million).

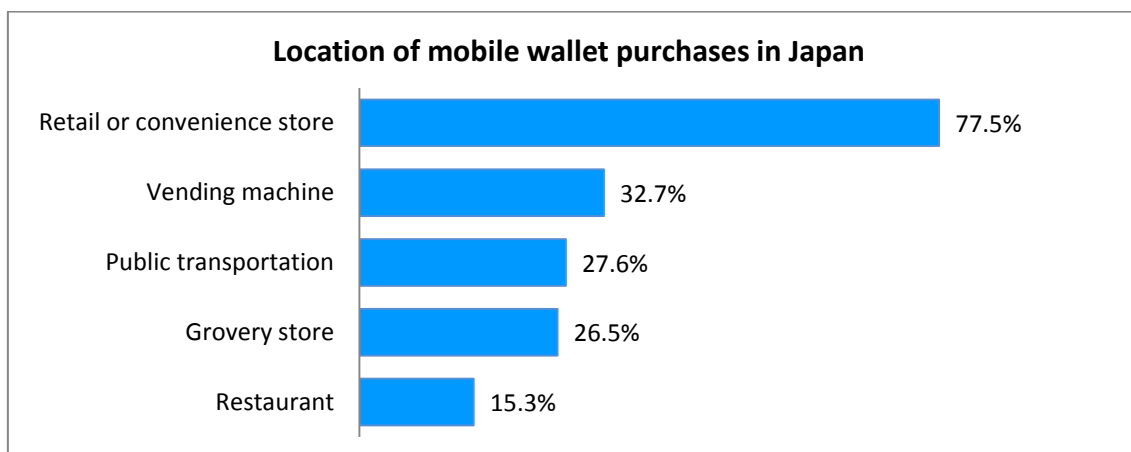


Figure 6: Location of mobile wallet purchases in Japan. Source: comScore – ‘The 2010 Mobile Year in Review’, 2011.

When it comes to the main sectors where m-wallet technology adoption has flourished, the retail sector is definitely on the list. M-wallets are particularly popular in high-volume outlets such as supermarket chains and fast food restaurants. The Asian telecommunication industry also features m-wallet-based value chain scenarios and services, as do the region's transportation, media and entertainment industries.

To date, various public transport agencies in Japan, South Korea and Singapore have piloted and implemented the use of NFC-enabled mobile phones. NFC is used in the context of transport ticketing in gateless systems to enable a simple start-up program. Other trials have added retail contactless payment cards to the ticketing options. Other applications, including online payment and over-the-air ticketing, have also been enabled by the phone.

6.2.3 Mobile remittances serve migrants to send money home

While mobile payment adoption is still in the early stages in Asia, the need to remit money is a driver for the growth of mobile money transfers in the region, particularly for cross-border transfers. Mobile payments, including in the form of remittance, have the potential to provide a viable alternative for traditional money transfer channels such as established agent locations. This potential derives mainly from the fact that mobile payments and mobile-powered

remittances can be more cost-effective for price-conscious migrants looking to send money home either as credit which can be immediately accessed and withdrawn or in the form of airtime top-ups.

In order for Asia's mobile remittance market to take off, a close partnership needs to be established between MNOs, banks and third-parties such as retailers. The latter are instrumental in the development of a solid mobile remittance infrastructure across Asia, as they operate widespread agent locations which could be used to transmit cash from mobile customers and then to credit / debit their mobile phone accounts.

So far, there have been few mobile-to-mobile remittance services in Asia, and they tend to focus on establishing a mobile money corridor between one developing country in the region and one developed country. One such initiative was launched in mid-July 2011 by Japanese mobile operator DoCoMo under the DoCoMo Money Transfer heading. It enables Filipinos residing in Japan to send cash directly to over 8.5 million Smart Money accounts of relatives and friends in the Philippines. Smart Money is a reloadable payment card linked to a Smart handset powered by the mobile commerce platform of Philippine-based mobile network operator Smart. NTT DoCoMo is a partner of Smart's mother company Philippine Long Distance Telephone Co.

To access of the service, the Japan-based sender must register for a DoCoMo Money Transfer account. Once registered, the sender then can remit cash to any Smart Money account in the Philippines by making an order from a mobile phone. The sender must indicate the designated recipient, the cash value and 16-digit Smart Money account number; the funds are then remitted to the recipient.

The mobile-to-mobile remittance service is also expected to enable remittances to Brazil, South Korea and China – three countries that alongside the Philippines account for almost 80% of all foreign residents in Japan. The DoCoMo Money Transfer service is also available to Japanese nationals, allowing them to send money to other Japanese nationals visiting or residing in the Philippines. In 2010, the record of Japanese visitor arrivals in the Philippines stood at over 350,000, as reported by the Department of Tourism.

Another means to transfer value from one consumer to another in the Asia-Pacific region using a mobile phone is cross-border mobile airtime remittance. TransferTo – a mobile airtime remittance provider, now an Ingenico company – allows Asian migrants working abroad to reload the prepaid mobile phones of their family members back home. Rather than focus on mobile remittance as such, TransferTo has chosen to focus on developing a system for cross border sending small-value amounts (typically worth between USD 1 and USD 10).

The TransferTo network is interconnecting mobile operators' prepaid users of the senders and receivers countries. By SMS or through a mobile client application, foreign workers can recharge the prepaid mobile phone of their relatives. Users need to indicate the recipient's phone number and the amount they want to recharge. The transfer is processed in real time. TransferTo is targeting the ethnic segment of the mobile operators' client base in countries with a large migrant population, like for example : the USA, the UK, France, Saudi Arabia, Hong

Kong, Australia to name a few. Local users of the airtime service would be originating from the Indian subcontinent, the Philippines, Indonesia and China.

With over 3 billion subscribers in developing countries, prepaid mobile phones have improved the life of all its users. They have become a tool of economic empowerment in compensating for inadequate infrastructures, allowing information to move more freely and unleashing entrepreneurship. Transferring airtime from a prepaid phone serves a different purpose when compared to transferring money. Airtime is sent as gift to family and friends on many occasions and its recipients have the potential to outnumber money transfer recipients.

6.3 Countries vary between sophisticated and simple services

6.3.1 Japan is one of the most sophisticated markets

Japan has one of the world's most sophisticated mobile phone markets. It boasts 100 million⁸² mobile subscribers (half of which have access to a 3G network) and a mobile-based payments infrastructure dating back to 2004, when the country's largest mobile phone operator NTT DoCoMo started to deploy devices featuring the FeliCa contactless IC chip developed by Sony.

Unlike Europe, where the uptake of mobile payments has been slow due to a number of factors, cost and regulatory concerns prominent among them, the Japanese market's response to mobile payments services has been extremely enthusiastic. Among the major contributing factors to Japan's positive uptake of m-payments are the high levels of mobile phone penetration, along with fact that Japan is the world's tenth most populated country; also relevant is the fact that Japan is an overwhelmingly urban society (just 5% of the population is employed in agriculture) and therefore has a large number of potential end-users.

Within this context, the continued expansion of Japan's smartphone market can be seen as a natural move away from the multiple-function mobile phone towards a more complex device. For the sophisticated Japanese user to have a smartphone, which is essentially a mini-computer and whose functionality can be extended with various applications, is the next logical step. According to 2009 estimates⁸³, in 2012 the number of smartphones shipped on the Japanese market is expected to grow to 2.6 million units for individual users, and 700,000 units for corporate/business users.

Currently, Japan's smartphone market is dominated by Apple. Data released in December 2009 by Tokyo-based research company Impress R&D⁸⁴ indicates that nearly half of all Japanese smartphone users rely on Apple's iPhone. According to the survey, 24.6% of Japanese

⁸² BuddeComm – 'Japan - Mobile Market - Overview, Statistics and Forecasts', 2011

⁸³ TCA, Japan Statistics Bureau, June 2011

⁸⁴ Impress R&D – 'Japan's smartphone market: The iPhone is huge, the BlackBerry and Android aren't', 2009

smartphone users own an iPhone 3G, while another 21.5% of them have opted for the iPhone 3GS, released in June 2009.

Despite its supremacy on the Japanese market, the Apple iPhone lacked embedded support for the FeliCa wireless payment system. This was a rather serious issue, given that the FeliCa chip makes it possible for Japanese mobile devices to contain multiple forms of data including bank account numbers and credit account information, allowing mobile devices to be used as a substitute for cash and cards at vending machines and merchants' PoS.

In early 2010, Mophie, a US case solutions provider for the iPhone and other Apple devices, announced a partnership with two Japanese companies to develop a mobile payment solution for FeliCa technology in Japan⁸⁵. The solution hit the market in spring 2010, allowing users to read and write electronic money card information using their iPhone device in conjunction with a marketplace FeliCa App.

Mophie's initiative came as a welcome addition both for individual and for corporate/business iPhone users in Japan, all of which have been clamoring to receive much-needed support for using the FeliCa wireless payment infrastructure. As a consumer-oriented service, the added FeliCa functionality allows iPhone users to record all their card activity history, confirm card account balances, report expenses, transfer deposits, provide secure payment and accumulate or deduct rewards points. For general business users, the added FeliCa functionality allows for easier management of employee's iPhone-based expenses and journals. As far as retail businesses are concerned, the added FeliCa compatibility serves to provide a low-cost solution for electronic payment processing, which will become available to smaller stores such as temporary retail shops or even open air markets.

6.3.2 China has the potential to be the 'mega-market' for mobile payments

China has a huge number of mobile subscribers (well over 700 million, nearing 750 million according to 2010 estimates⁸⁶), high rates of mobile phone penetration and a relatively limited number of top-tier players involved, all with very large customer bases (here we mainly refer to MNOs, banks and third-party m-payment services providers). Given its sheer size and huge revenue potential, China is also frequently depicted as a "mega-market" as far as mobile payments are concerned, with wildly optimistic predictions being made in terms of its development over the coming years.

⁸⁵ mophie Media Room – 'mophie Powers Mobile Credit Card Transactions for the iPhone', 2010

⁸⁶ National Bureau of Statistics of China, Statistical Communiqué of the People's Republic of China on the 2010 National Economic and Social Development, 2011

For example, in November 2010 Celent⁸⁷ estimated that by 2013, China was expected to become the leading mobile payments market globally, while within the same timeframe the Chinese m-payments ecosystem would be expected to reach 410 million users. Around the same time (October 2010), research by Frost & Sullivan claimed that mobile payments would witness a significant increase in the Asia-Pacific region, with mobile-based transactions set to reach USD 3.6 billion by 2015. According to the same source, the increasing adoption of mobile payments in the region would mainly be driven by technological innovations and operators' initiatives, particularly in the NFC (Near Field Communication) field, with China leading the way.

Once we go deeper beneath the (very optimistic) surface, however, a more complex picture emerges. No one can dispute the fact that China has an impressive mobile user base, and implicitly strong potential for the deployment and take-up of handset-initiated payments – particularly when we also take into account that credit card adoption in China is remarkably low, with considerable room for versatile alternative payment methods. Mobile financial services certainly fit the bill, in the sense that they have the potential to appeal both to China's young, tech-savvy urban population as well as to underbanked consumers living in remote rural areas. In China's rural segment, mobile banking in particular is of particular interest, being defined essentially as a means for consumers to achieve financial inclusion, as it allows users to gain access to basic financial services to which they would otherwise have little to no exposure.

Nevertheless, high mobile handset penetration does not, of course, equal high m-payments adoption. In fact, the majority of Chinese mobile phone users cannot access mobile payments services on their devices.

A 2010 study published by Beijing-based telecom consultancy Maverick China Research⁸⁸ found that at the time when the research was carried out, 75% of surveyed mobile phone users in China didn't have access to mobile payments, while of the 25% whose phones enabled them to access m-payments services, less than 2% actually made use of their mobiles to carry out transactions. In June 2011, ResearchInChina⁸⁹ published more optimistic estimates, concluding that the penetration rate of the Chinese mobile payment market had reached 18.5% for 2010 and would increase to 25.8% by the end of 2011.

⁸⁷ Celent – 'Mobile Payments in China: Emergence of a Mega-Market', 2010

⁸⁸ Maverick China Research – 'Mobile payment market hurt by weak demand', 2010

⁸⁹ ResearchInChina – 'China Mobile Payment Industry Report, 2010-2011', 2011

6.3.3 India shows the benefits of mobile banking for the unbanked

A combination of factors – mostly demographic, geographic and social in nature – has created a unique ecosystem, one specific to India alone, which renders the country’s economy increasingly appealing to mobile financial service providers. Overall, the market for mobile financial services seems a very attractive one as it is largely untapped by other means. Mobile financial service providers have taken a keen interest in India, mainly due to the fact that such services have dual potential, appealing both to India’s young, tech-savvy urban population as well as to underbanked consumers living in remote rural areas.

Nevertheless, India’s mobile banking ecosystem is rather complex with demographics leading to differentiation and a divide between urban and rural segments, each with its own history, characteristics and prospects.

Predictions on the Indian mobile banking market are rather optimistic. However, in 2009 the overall number of internet subscribers in India was estimated to be around 14 million⁹⁰, a low figure which signals that internet banking services will currently have a limited impact among consumers. In this case, mobile banking is bound to have a more immediate, wider appeal to urban consumers, with higher growth potential in the short to medium term.

As far as the rural environment is concerned, a Celent report⁹¹ regards it as “a huge opportunity to bank the unbanked population”. As explained earlier in this chapter, mobile banking can be a very cost-effective way of reaching a large number of consumers. Celent expects government-to-person (G2P) payments to be the main growth driver for rural mobile banking, followed by regulatory changes. The study predicts that by 2012, over 60 million rural users will be beneficiaries of mobile banking.

In both the urban and the rural segments, Celent points out that regulations and technology are the two fundamental factors that impact the growth potential of mobile banking, with non-transactional users expected to remain the majority in India due to their access to alternative payment mechanisms. “The rural mobile banking segment is a high growth area, due to the adoption of the business correspondent model and relaxed Know Your Customer norms, but financial literacy remains a big issue for retaining the rural adopters” comments Sreekrishna Sankar, Celent analyst and co-author of the research report.

On the whole, the accelerated development of India’s mobile communications sector is expected to act as a significant trigger for the positive evolution of mobile financial services adoption in the country, despite the currently low number of actual mobile banking users. Banks are willing to contribute to this trend, India’s mobile financial services sector being a potential source of revenue which cannot be neglected. As proof, new consumer-oriented

⁹⁰ Telecom Regulatory Authority of India, 2009

⁹¹ Celent – ‘Mobile Banking in India: Dual Strategy for Rural and Urban Segments’, 2010

mobile banking initiatives are launched constantly. Foreign mobile service providers are also becoming aware of the vast potential presented by India's urban and rural mobile consumers. A number of limitations exist, such as the lack of unified technology standards for mobile banking, ensuring transaction security across wireless networks and boosting customer confidence in phone-based financial services.

However, both banks and independent mobile technology providers seem to have taken up the challenge, a feat which is likely to significantly benefit both Indian consumers and the country's economy as a whole.

7 Latin America: the next frontier

After Western Europe and the US, the general perception seems to be that the next most promising emerging market for mobile financial services is shaping up to be either India or China. The parameters that define a market's potential to sustain a profitable mobile payments ecosystem are varied and complex. In the case of emerging economies, they include population size and mobile phone penetration, regulatory frameworks, existing service providers and traditional financial infrastructures already in place. A solid business case for mobile financial services adoption is also needed, which in emerging markets is often connected to the existence of a large unbanked / underbanked consumer segment. India and China do score high on the previously mentioned parameters; however, the emerging mobile payments ecosystem in Latin America also has all the major ingredients in place to become a success story – albeit, of a different nature.

Latin America, which includes South and Central America along with the Caribbean region, has so far been subject to less scrutiny than other regions with similar growth potential. Attention has, understandably, been focused on Brazil, the country with the largest population and the highest rates of mobile phone usage in Latin America, not to mention a mobile penetration rate over 102%⁹². However, other countries and sub regions, such as Argentina, the Caribbean and Central America, also warrant attention: they display equally high or even higher mobile penetration rates than Brazil, having growing consumer purchasing power and are emerging as ecosystems ripe for the massive adoption of mobile financial services. For example, in 2010 Argentina had a mobile penetration rate of 130%, with 54.4 million mobile subscribers, while in the Dominican Republic mobile penetration has reached 96%, with 8.8 million active subscribers.

Like Asia-Pacific, Latin America is a patchwork of markets, each with its own dynamic and characteristics. Unlike Asia-Pacific, from a purely geographical perspective Latin America is quite simply less vast; with a population of 589 million, Latin America's size is closer to that of North America (350 million) and Europe (730 million), than to Africa (1 billion) and Asia (over 4 billion). Latin America is also less culturally divided than its Asia-Pacific counterpart, particularly in terms of language and divisions between social classes. This makes Latin America a fertile ground for expansion for American and Spanish companies that are looking to use the mobile channel to tap into Hispanic and Caribbean communities. Spanish telecom giant Telefónica and mobile agency Mobext are good examples of this.

This chapter provides an in-depth look at what Latin America has achieved so far on the mobile financial services front and where the region is headed next.

⁹² Fortumo – 'Mobile penetration in Latin America and the Caribbean', 2010

7.1 Gap between internet and mobile penetration

It becomes clear that there are a number of common characteristics shared by all Latin American sub regions as far as mobile financial services deployment and adoption is concerned. These common features currently shape the region’s mobile landscape and trace the main coordinates that are likely to impact its future development.

The first such common denominator is the fact that all across Latin America mobile phone penetration is very high, unlike fixed internet and fixed phone line adoption which is very low and will most likely remain low. Overall, Latin America has 89% mobile penetration. Argentina leads the way with 130% mobile penetration, followed by Venezuela (98%), Chile (97%), Colombia (92%) and Brazil (90%)⁹³. Another common characteristic shared by Latin American territories is the fact that prepaid usage trumps contacts as far as mobile phone ownership is concerned. This is partly responsible for the high rates of mobile penetration across the region, as consumers often own more than one prepaid mobile account.

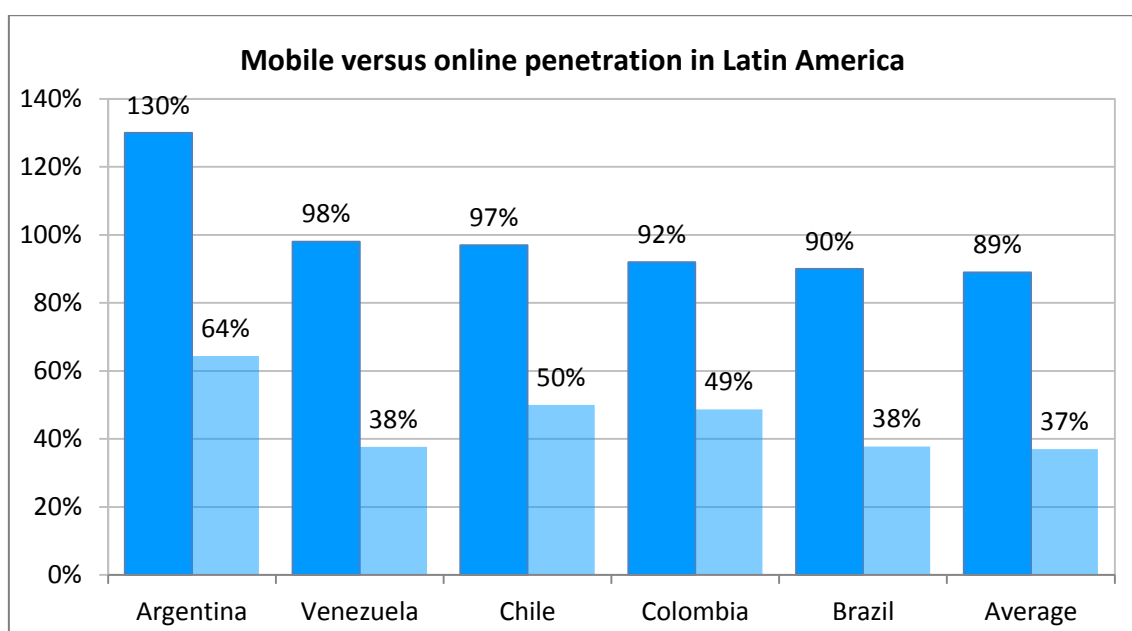


Figure 7: Mobile versus online penetration in Latin America. Source: mobiThinking – ‘State of mobile in Latin America’, 2010 (dark blue = mobile penetration, light blue = online penetration).

The prevalence of the mobile over fixed-line internet means that the mobile handset is likely to turn into consumers’ main access portal to the internet. Moreover, mobile is emerging as

⁹³ mobiThinking – ‘State of mobile in Latin America’, 2010

the main (sometimes the only) channel via which large numbers of consumers can be reached simultaneously. This state of affairs makes the mobile channel the only thing banks and third-party payment service providers will want exploit. Put simply, there is no other choice.

The big gap between internet penetration and mobile penetration also means that in Latin America, financial services offered via the mobile do not face serious competition from online financial services. Unlike developed markets, where the mobile channel is more often than not an alternative to established payment instruments such as credit or debit cards, in Latin America mobile financial services have the potential to be the only option, particularly for unbanked consumers. A 2010 study by the OECD⁹⁴ reveals that the penetration of traditional payment systems across the entire Latin America region averages around 10% in demographic terms (in the Caribbean sub-region, penetration rates are around 20%) and 40% in terms of actual territory where consumers have access to bank branches and ATMs. The conclusion is simple: the vast majority of consumers are unbanked / underbanked.

A 2009 study published by local mobile payment service provider Upaid showed that a major consequence of Latin America's long history of hyperinflation is widespread consumer mistrust in banks. This means that on the one hand, consumers in the region are prone to considering alternative payment channels, which gives mobile-based financial services a head start. On the other hand, given consumers' innate mistrust of the banking system, the struggle for customer ownership between operators and banks so often witnessed in developed economies is likely to have a much smaller impact on the evolution of Latin America's mobile financial services ecosystem.

7.2 Battle between banks and MNOs

This state of affairs, with a gap between internet and mobile penetration and mistrust of banks, allows mobile operators to lead the mobile transaction services revolution across the region, with consumer demand for reliable, fast and accessible banking services driving innovation. This situation is also likely to put MNOs at odds with the restrictive regulatory frameworks present in some Latin American countries, such as Colombia.

According to the Sybase Mobile Commerce Guide 2011⁹⁵, national regulators in Latin America have adopted a rather cautious view of mobile financial services. This cautious approach has been brought about by the instability of the Latin American economic climate, as well as by concerns that m-payments could be the starting point for the creation of a parallel currency, which could in turn be used for money laundering and other illicit activities. In Venezuela, while a regulatory framework for mobile payments has been sanctioned by the government,

⁹⁴ OECD – 'Latin American Economic Outlook 2010', 2010

⁹⁵ Sybase Mobile Commerce Guide 2011

no international mobile-based remittance services have been green-lit to date. This in itself is quite significant, given that cross-border mobile-powered remittance services are one of the most promising areas of mobile financial services in the region.

When it comes to regulation dealing specifically with mobile money schemes, with a few exceptions (such as the previously mentioned Colombia), the regulatory environment is not sufficiently developed. The payments regulator in most Latin American countries is typically the central bank, acting as a separate entity from the “superintendencia” (the banking supervisor). Regulators are currently studying mobile money schemes in order to create regulation that facilitates industry development. Consistent with most of the world, mobile network operators cannot operate as banks, meaning financial institutions own the product while MNOs market the product through pre-existing channels. Regulators are usually happy to assert that financial institutions are ultimately responsible within the mobile money ecosystem.

The substantial poor – rich divide accounts for the fact that a large percentage of Latin America’s economy is “informal”, meaning that it consists of activities not included in the official GDP. This also ties in with the large percentage of unbanked / underbanked consumers. For people making a living out of informal activities, and who on top of that have little access to traditional financial infrastructures (bank branches, ATMs), mobile phones often constitute a lifeline. The key here is keeping it simple. There is a huge number of mobile phones currently in use in Latin America, most of which are unsophisticated and can only be used to access a limited range of financial services. However, SMS works on virtually all handsets, which makes mobile phones ideal tools for receiving transaction alerts or accessing bank account information. Compared to this, the use of mobile phones for actual payments is likely to remain in an embryonic state for a long time.

The development and deployment of mobile financial services in Latin America has taken place on two well-defined (if disproportionate) fronts: one more sophisticated, targeting richer, more established consumers; the other less complex but targeting the region’s vast unbanked population. Due to money laundering concerns, Latin American regulators would rather see banks taking a leading role in the provision of mobile financial services both for established consumers and for the unbanked (via mobile wallets and mobile airtime top-up services). However, there are a number of strong MNOs in the region – Telefónica, America Movil, Digicel – that are likely to form alliances with the bigger banks and leverage their own brand recognition and established network of agent locations so as not to be outdistanced by the latter.

The prevalent social disparity between rich and poor consumers has also been an influencing factor with regards to the types of mobile financial services developed by banks. The development of more sophisticated mobile financial services has been prompted by considerable growth in 3G+ networks and broader use of smartphones in the region. Pyramid

Research⁹⁶ estimated that 8.6% of all new phones in Latin America in 2010 were smartphones, predicted to rise to 32% of the handhels in 2014. Mobile banking is also usually made available as an alternative channel to consumers who already have access to more sophisticated financial services (rich consumers). However, m-banking infrastructures are quite rudimentary, with banks reluctant to invest in mobile banking platforms because there are not enough users to actually make them profitable.

As banks seek to place themselves at the head of the mass deployment of m-payment solutions throughout Latin America, they are likely to pursue MNOs as their main partners. MNOs can offer low transaction costs for mobile financial services, because their distribution networks (like in Africa) are already in place. With more than 98% mobile penetration by the end of 2010 (according to Pyramid Research), the vast majority of which involves prepaid usage, Latin America's consumers are already well acquainted with their operators' correspondent agent networks.

Banks expect Latin America's unbanked and underbanked consumers to manifest an interest primarily in mobile wallet solutions. Some banks, such as Banco Agrario in Colombia and Caixa Economica Federal in Brazil, have significant physical presence in their respective countries. They have less of a need to leverage the MNOs' networks for mobile wallet registration and cash-in/cash-out procedures – however, these are the exceptions.

Telefónica, a Spanish MNO and leading operator in Latin America seems ambivalent about mobile money. In May 2008, the company announced plans to launch a new mobile money service targeting 175 million people in Latin America⁹⁷. The 2008 initiative never materialised, though. In 2010, Telefónica announced that technology provider Trivnet had won the contract to supply the MNO with mobile banking software in Latin America⁹⁸. Then, in early 2011, Telefónica announced a joint venture with MasterCard to roll out mobile financial services in twelve countries⁹⁹. But does this mean that Telefónica is finally serious about mobile money in the region? We can only wait and see.

The key factor in the rate of future growth of the m-payment market in Latin America is expected to be the degree to which collaboration increases between the key market stakeholders including mobile phone manufacturers, banks and MNOs. Without this, the Latin American m-payment mass market is much less likely to take off.

⁹⁶ Pyramid Research – 'Latin American Operators Take Mobile Banking to the Masses', 2010

⁹⁷ Cellular News – 'Telefonica to Launch Mobile Banking Across Latin America', 2008

⁹⁸ Trivenet Media Room – 'Telefonica Selects Trivnet to Provide Mobile Financial Services in Latin America', 2010

⁹⁹ The Paypers – 'MasterCard, Telefonica in joint venture for mobile financial services in Latin America', 2011

7.3 Mobile remittances fail to deliver on promise

Across Latin America, development in banking, telecommunications and technology has varied from one subregion to the next, but overall the infrastructure is sufficiently developed to sustain mobile-powered cross-border remittances throughout the region. Despite falling sharply by nearly 12% in 2009 and remaining flat in 2010, remittance flows to Latin America have started recovering in 2011 with an incipient economic and labour market recovery in the US and sectoral shifts in migrant employment, World Bank statistics¹⁰⁰ point out. The same source indicated that for Latin American countries with available remittance data for Q1 2011 – Mexico, Colombia, Guatemala, El Salvador, Honduras, and Nicaragua which together account for 70% of remittance flows to the continent (Caribbean included), remittance inflows grew 7.1% in the first quarter of 2011 on a year on year basis. Overall, the World Bank estimates that remittance flows to Latin America will total around USD 63 billion by the end of 2011, with the figure expected to grow to USD 74 billion in 2013.

Remittances play an important role in the economy of the region. In fact, we may go as far as to say that Latin America depends on family remittances to support local consumption, given that in some countries, remittance flows exceed 10% of the GDP. In a region where mobile phone penetration has reached almost 90% but only 35% of consumers have bank accounts and only 19% have bank cards (according to data provided by Telefónica¹⁰¹), the potential for mobile-powered remittances is very high.

However, there are a number of obstacles that have prevented the significant up-take of mobile remittances in Latin America, the first of which is mobile money regulation. Both Latin American and US regulators (around 75% of remittances in Latin America come from the US) are looking to exercise tight control over the mobile remittance channel, as its reach and popularity could potentially allow it to be used for illicit activities such as financing terrorism and money laundering. The second major obstacle is pricing – what Sybase¹⁰² refers to as “the development of a cost structure that reflects already competitively priced remittance corridors between the region and the US”. In other words, it has been difficult to come up with pricing models that are low enough to make cross-border mobile remittances attractive to low-income consumers while keeping prices high enough to make the m-remittance channel profitable for banks, MNOs and third parties.

Under these circumstances, a few market players enjoy a head start as far as cross-border m-remittances are concerned. Among them are established remittance providers such as Western Union, large companies such as Visa and MasterCard which already process international payments, and finally local (Latin American) banks which have also established a

¹⁰⁰ World Bank – ‘Outlook for Remittance Flows 2011-13 – World Bank Brief’, 2011

¹⁰¹ Telefónica quoted by the NYT – ‘Mobile Banking in the Emerging World’, 2010

¹⁰² Sybase Mobile Commerce Guide 2011

presence on the US market. However, Western Union – which currently controls around 26% of the traditional US-to-Latin America remittances corridor – does not seem overly concerned with developing a mobile-based remittance channel for its users. Since mobile money transfers are in fact an alternative to traditional remittance services, the mobile channel can actually be seen as a threat to Western Union’s core business, which relies on its agent network. Presently, the amount of money remitted to Latin America via mobile is very small.

Believing that the successful roll out of mobile financial services in Latin America hinges on migrating international remittances to the mobile channel goes a bit too far. While Western Union has forged some partnerships with mobile money providers, the market leader in remittances to Latin America does not seem to want to change its current business model. So, while the promise of mobile remittances in Latin America is great, it does not look like it will be fulfilled any time soon.

7.4 Brazil leading the continent

As the largest country and economy in the region, Brazil is a reliable indicator of what could become successful throughout Latin America in terms of mobile financial services. The rapid growth in access to mobile telecoms in Brazil has created new opportunities for MNOs and banks to provide financial services using the local mobile networks. At over 102%¹⁰³, Brazil has one of the highest penetration rates of cell phones in Latin America – however, the country’s mobile payment market is still small, with very few transactions actually carried out via mobile phones.

Nevertheless, due to the enormous potential of the mobile payment market in Brazil, all stakeholders involved in the payment landscape are currently focused on developing new mobile payment platforms and creating products utilizing cell phones as a means of payment.

The total number of mobile payment transactions in Brazil reached 3.9 million in 2010¹⁰⁴. This number is negligible in comparison to the total number of credit and debit card transactions which reached 5.8 billion in 2010. With growth rates over 30% in the short term, the number of transaction is likely to reach 5.1 million by the end of 2011.

A recent Nielsen Company report¹⁰⁵ suggested that in Brazil smartphones make up about 10% of mobile phones owned in Brazil. Brazil's leading mobile operators and banks currently offer recharge facilities to over 50 million consumers and process over 2 million transactions per month.

¹⁰³ Telefonica statistics 2010

¹⁰⁴ Frost & Sullivan – ‘Opportunities to offer payment services through cell phones are arising in Brazil’, 2011

¹⁰⁵ Nielsen – ‘Smartphone Sales Soar in Brazil as Affordable Devices Reach More Consumers’, 2010

7.5 CASE STUDY: TELEFONICA & MASTERCARD COMBINING FORCES

The Latin American market is marked by a significant gap between the take-up of established payment tools such as credit cards and the increasing popularity (and consumer penetration) of the mobile channel. While in the US credit cards may be one of the main tools for payments both online and offline, a set of circumstances have contributed to them being less popular in Latin America.

Credit has not traditionally been easily available to Latin American consumers, due to currency fluctuations as well as political instability in countries such as Argentina, Brazil or Colombia. Instead, consumers in the region have learned to rely on cash and checking accounts, and seem to have discovered early on the value of prepaid. Mobile revolution left aside, one fact is becoming clear: the change in consumer behaviour required by the wide-scale take-up of any new payment instrument (the mobile phone included) must factor in the prepaid component.

In this context, mobile wallet initiatives – that would allow consumers to link their mobile phones to a prepaid electronic wallet – are likely to be the way forward towards achieving mass-market adoption for mobile financial services. And with mobile penetration eclipsing banking penetration in Latin America, the revenue opportunity for market players that will prove quick to capitalize on this state of affairs is quite significant. Pyramid Research¹⁰⁶ estimates that around 18 million Latin American users currently use their handsets to access any form of financial services. The same company predicts that this number may rise to more than 140 million by 2015. According to MasterCard¹⁰⁷, by 2014 mobile financial transactions will reach approximately USD 63 billion in Latin America.

Two companies that seem to have realized that the mobile prepaid channel may be the key to tapping LATAM's large unbanked / underbanked consumer segment are credit card processing company MasterCard and Spanish telecommunication services provider Telefónica. The two companies have recently entered a joint venture to provide mobile financial services in 12 countries in Latin America where Telefónica is represented by the Movistar brand. The newly set-up company will have a 50/50 ownership participation and it is set to combine Telefónica's telecommunications assets and extensive presence on the LATAM market and MasterCard's payments expertise.

The partnership between Telefónica and MasterCard has all the makings of a highly profitable initiative. Quite adequately, the two companies intend to market their joint

¹⁰⁶ Pyramid Research – 'Latin American Operators Take Mobile Banking to the Masses', 2010

¹⁰⁷ MasterCard Media Room – 'MasterCard and Telefónica Create a Joint Venture to Offer Mobile Financial Solutions in Latin America', 2011

offering as aiming to promote the financial inclusion of a high percentage of the Latin American population with difficult or no access to traditional banking systems. Moreover, the mobile payment services to be developed by Telefónica and MasterCard will be centered on linking the mobile phone to a mobile wallet or prepaid account – again, a wise decision given LATAM consumers’ trust in prepaid financial tools. Consumers will be able to use their mobile wallets for money transfers (both locally and cross-border), mobile airtime reload, bill payment and retail purchases.

In a bid to further expand the reach of their joint mobile initiative, some of the new services to be developed by Telefónica and MasterCard (such as receiving remittances) will be targeted at 200 million Movistar and non-Movistar mobile subscribers in the 12 Latin America markets included in the joint venture. The two companies expect that as a result of this initiative, acceptance of electronic payments be expanded to cash-based merchant locations and micro-businesses such as taxis and street vendors, allowing the latter to accept mobile payments. On the whole, Telefónica and MasterCard expect to provide around 87 million current and potential Movistar customers with mobile payment services.

In Latin America, cultural demarcations are less obvious than in other regions of the globe, particularly in terms of language and divisions between social classes. This makes Latin America a fertile ground for expansion for American and Spanish companies that are looking to use the mobile channel to tap into Hispanic communities – both Telefónica and MasterCard fit the bill.

Moreover, by branching out into mobile financial services, Telefónica is responding to a market reality – namely, the high level of trust LATAM consumers place in their mobile phones. As a mobile operator, the company is well positioned to offer mobile money services by leveraging its customer relationships as well as its extensive prepaid agent networks. Additionally, Telefónica partnership with a company such as MasterCard, that enjoys its own high level of brand recognition, will most likely prove invaluable in overcoming the regulatory hurdles that are sure to accompany the launch of any type of mobile financial services. Finally, MasterCard’s expertise in the field of promoting financial inclusion will also prove critical in helping drive scale and high transaction volumes necessary for the initiative to be successful.

8 Africa: a success story in banking the unbanked

The extensive take-up of basic m-banking and m-payments services in emerging markets and among developing nations is real. To that end, Africa is one area which, along with India, is often brought up as a glowing success story for the mobile revolution currently sweeping the world.

It is certainly true that mobile phones have changed the lives of millions of unbanked or underbanked consumers around the world. However, it is also true that a little perspective and a lot of eye for details need to be applied in order to have a realistic discussion regarding the evolution of mobile financial services on the African market.

In Africa, the mobile phone has grown to become somewhat of a lifeline for consumers with limited access to financial services. In such a context, the development of (mostly rudimentary) mobile infrastructures has been swift but mainly needs-driven, lacking in sophistication, with almost none of the high-tech glamour that surrounds the mobile ecosystem in developed markets. There are, of course, a few notable exceptions – East Africa comes to mind, with Kenya and M-PESA at its epicentre - but even East Africa still has a long way to go down the road to becoming an established mobile market.

In the developed world, one of the main selling points of mobile financial services is their inherent convenience. M-payments allow busy consumers to keep track of their spending, shop and pay bills with a few keystrokes. However, in the developed world the mobile is merely an alternative or a substitute for any number of readily available payment instruments. In Africa, mobile financial services are often the only viable alternative to otherwise poor-quality financial service; they have developed to become accessible and affordable and have come to make the difference between access to banking and no access to banking, between existing and not existing from a financial point of view.

8.1 Still much potential to grow

When it comes to mobile financial services, Africa's ecosystem is paradoxical to say the least. A mobile industry that around the year 2000 was almost non-existent is today flourishing. Africa has grown to be one of the world's fastest-growing mobile phone markets, while its number of active mobile subscriptions has crossed the half-a-billion mark in Q3 2010¹⁰⁸. This is despite the fact that for many years, Africa has lagged behind the rest of the world insofar as mobile connectivity and m-commerce technology penetration were concerned, and is still the continent where 36% of the population lives on an income of under USD 1 per day.

¹⁰⁸ International Telecommunications Union – 'Access to mobile networks available to over 90% of world population 143 countries offer 3G services', 2010

Also, despite still being torn by war and famine, despite extreme poverty and the lack of a uniform financial infrastructure, mobile financial services have bloomed in Africa, more often than not leapfrogging traditional financial services models and proving impervious to adverse factors. A second paradox came on the heels of the first one: while fixed telephone line penetration is still in single digit percentages and computers are absent from the majority of African households, a number of cities in Africa boast modern 3G mobile services. And while reliable electricity may be an occasional problem, a mobile payment landscape unique to Africa has developed despite (or rather, due to) these adverse elements, sailing past the obstacles hampering traditional financial infrastructure development and creating an ecosystem worth over USD 25 billion, according to Bharti Airtel estimates.

The mobile revolution that has gripped Africa has created a certain hype, with Africa's mobile market being described in very optimistic terms. Not only has Africa's mobile penetration rate jumped from merely 3% in 2002 to 48% in 2010, but mobile money transfer services in Africa are predicted to surpass USD 200 billion by 2015, as research carried out by Pyramid Research¹⁰⁹ suggests.

According to the Pyramid research report, Africa's mobile money transfer services market is expected to account for some 8% of the continent's GDP by 2015. The report also reinforces an aspect that has already been highlighted in previous analyses of the African market, but has not lost its relevance in the slightest. While the global mobile financial services market is reaching saturation, the African market constitutes fertile ground for the continued development of mobile money services.

Mobile penetration has skyrocketed, but there is still room for improvement. There are still substantial under-served regions in Africa - in some rural areas mobile penetration rates rarely exceed 10%, for example. And there are still deep divides between regions. Consumer take-up of mobile-powered basic P2P transfer services may have grown spectacularly, but there are millions more Africans still reluctant to put their (sometimes extremely low) incomes into a formal banking system. Once they have been persuaded to do so, these consumers will most likely grow into a profitable market segment, with increasingly sophisticated needs. As M-PESA has shown, the use of mobile technology to reach large, unbanked consumer segments not only holds great promise, but has already been tested and proven to be a recipe for success.

Looking beyond the hype, Africa's short but intense history with mobile money has its roots in a number of premises that have shaped the African mobile ecosystem into its present-day form. The first is Africa's large unbanked or underbanked population. Before mobile payment became a reality for everyday consumers, throughout most of the African continent the availability of formal financial services was limited to certain geographic and income ranges. Put simply, it was unprofitable for banks to serve poor consumers, as the revenues resulting from managing their small-value deposits could not offset the costs of servicing them. This left

¹⁰⁹ The Paypers – 'Africa: mobile payments to exceed USD 200 billion by 2015 – report', 2010

the majority of Africans to look for an alternative, which consisted largely of unreliable and costly informal channels.

The second premise has to do with the poor quality of the financial services serving as alternatives to mobile payments. In the absence of a widespread network of bank branches and of more established payment instruments, it is not difficult to understand why mobile money transfers - carried out from anywhere via a relatively cheap prepaid mobile phone, without the need to travel to the bank and manage a bank account - became very attractive.

This takes us to the third important premise behind the current African m-payments ecosystem: the continent's economy. There was an underlying need for a service that would allow migrant breadwinners working away from their homes in urban centres to send money back to their families and friends. This state of affairs also explains the fact that P2P money transfers – which allow consumers who do not own bank accounts to send money immediately and safely over the mobile phone – are the most common type of service carried out by African consumers.

The most successful revenue model in Africa has proven to be one that a 2010 report by the Bill & Melinda Gates Foundation's Financial Services for the Poor (FSP)¹¹⁰ division refers to as "usage-based rather than float-based". Traditionally, banks assess (and reward) their customers based on their account balances and the frequency with which they use their money. Mobile operators employing the usage-based model have chosen to develop their services based on the actual context in which most consumers are likely to use their hard-earned money and payments occur. It has thus become obvious that selling prepaid airtime to poor customers in small increments has the potential to make each transaction profitable on its own. In fact, on closer inspection, Africa's most successful initiatives to date rely on the development of low-value transactional platforms (again, M-PESA serves as the best example) that provide consumers with more than one type of service, based on their real needs. Additional services may include adding money to a savings account, paying bills or making and receiving P2P payments (domestically or cross-border).

One valuable lesson that Africa's rapid mobile financial services adoption has yielded is that while "banking for the unbanked" holds great promise, it is not particularly easy to make African consumers see the need for an electronic banking system or trust such a system. A Sybase 365 report¹¹¹ indicated that in 2010, fewer than 10% of African consumers were enrolled in formal banking, due to the poverty and the fact that brick-and-mortar bank branches were inaccessible. As far as trust was concerned, the same survey revealed that the easiest way for m-payments companies to bring consumers on board is to keep their offering simple and allow customers to carry out multiple types of transactions via locally established agents that can offer hands-on assistance.

¹¹⁰ World Bank – 'Mobile Payments go Viral: M-PESA in Kenya', 2010

¹¹¹ Sybase 365 – 'Mobile Banking in Africa', 2010

8.2 Key players are acting

The year 2010 has seen a number of shifts in the line-up of key players in the African mobile market, the most important of which being the acquisition by India's Bharti Airtel of local mobile telecom giant Zain¹¹². At the time of its June 2010 takeover by Airtel, Zain was serving over 40 million African customers (in such countries as Burkina Faso, Chad, the Democratic Republic of the Congo, Gabon, Ghana, Kenya, Madagascar, Malawi, Niger, Nigeria, Sierra Leone, Tanzania, Uganda and Zambia). A veteran of the African m-payments space, which it had entered in 2005 via the acquisition of Celtel International¹¹³, Zain not only had a strong established brand presence across Africa, but it had also invested heavily across the continent through network upgrades and acquiring two more country licenses. In the wake of the acquisition, Airtel is expected to boost Zain's already successful business by adding elements of its Indian operating model, including its use of outsourcing to maximize efficiency. Airtel also announced that it was likely to continue Zain's strategy of investing in the diversification of its services offering and the expansion of its network across more African territories.

True to its word, in early 2011 Airtel Africa teamed up with international financial institution Standard Chartered Bank and MasterCard to launch a virtual card set to operate as a mobile wallet¹¹⁴. Dubbed Airtel 1time Shopping Card, the service enables Kenyan customers to make online purchases from MasterCard merchants globally via their mobile phones. The Airtel 1time Shopping Card has been initially rolled out in Kenya (subject to regulatory approvals), with the provision that it would then be made available in markets across Africa. This initiative testifies to Airtel's decision to expand into the largely untapped space of web-enabled mobile payments - a decisive step forward in Africa's development into a fully developed m-commerce ecosystem.

Kenya is one of Africa's most active markets in terms of new m-payment offerings being trialed and rolled onto the market. This is a somewhat predictable state of affairs given that Kenya, home to the successful M-PESA initiative, has a definitive head start insofar as mobile financial services are concerned and is developing into a mature market for mobile payments. It comes as no surprise under these circumstances that Safaricom – the Kenyan affiliate of Vodafone – has expanded its M-PESA offering to Kenyan supermarkets in October 2010¹¹⁵. Dubbed Nunua na M-PESA, the service allows Kenyans to pay for goods in supermarkets using their mobile phone and was initially launched at Uchumi and Naivas Supermarket outlets across Kenya.

In further testament to Safaricom's commitment to extend M-PESA's reach among Kenyan unbanked and underbanked consumers, in April 2011 M-PESA closed a deal with money

¹¹² TheNigerianVoice – 'Bharti Airtel Completes Acquisition of Zain', 2010

¹¹³ Wikipedia – 'Zain entered Africa in May 2005 through the \$3.4 billion purchase of Celtel International', 2005

¹¹⁴ The Paypers – 'airtel Africa, MasterCard, Standard Chartered Bank in mobile service joint venture', 2011

¹¹⁵ Safaricom Media Room – 'Safaricom rolls out M-PESA service in Kenyan supermarkets', 2010

transfer giant Western Union¹¹⁶, with the latter making available its money transfer service via the m-wallets of the M-PESA service. The partnership allows users to send funds directly to M-PESA subscribers via Western Union's agent locations.

Capitalizing on its success in Kenya, Vodafone decided to bring the M-PESA mobile money transfer service to South Africa¹¹⁷. The service was deployed by Vodafone's division Vodacom South Africa together with a South African banking partner. The decision to expand M-PESA's reach to South African consumers was most probably prompted by the fact that while the mobile penetration rate among the adult population is over 94%, around 26 million South Africans have no official bank accounts. Vodafone's decision to tap the South African mobile opportunity was not risk-free: unlike other less developed African markets, the competition is heating up on the country's mobile financial market, with an ever-expanding array of mobile services being made available to consumers – NFC among them.

8.3 The success story of M-PESA

CGAP (Consultative Group to Assist the Poor) has published a brief¹¹⁸ on one of the first studies which researched the usage of mobile financial services offered by MPESA in two locations in Kenya, as well as the impact that usage has had on the lives of the users. There is much information being published on the various technologies of mobile financial services, as well as on the companies involved, but very rarely have the actual users been the focus of attention. M-PESA was chosen as it is one of the first successes in mobile financial service provisioning. It is a joint venture between Safaricom and Vodafone. Since its launch more than six million customers have registered with M-PESA. Although an average of 150 million Ksh (EUR 1.39 million) is transferred through M-PESA per day, most of this is done in small amounts of around 1,500 Ksh (EUR 13.93) per transaction.

The study also discovered a barrier to usage. For urban users the two most important barriers were failed transactions and problems getting help from Safaricom. For the rural users the biggest barrier by far was the lack of cash at agents. Agents have to maintain their cash float by making regular trips to the bank, where the money is stored. As banks are often located far away from the rural agent, these trips are costly and time-consuming.

During the period of the study the remittance patterns changed. As the urban users became more accustomed to the service, they started sending smaller amounts of money more often. The result of that increased frequency of remittances meant an increased income of the rural

¹¹⁶ The Paypers – 'Kenya: M-PESA, Western Union in mobile money transfers deal', 2011

¹¹⁷ The Paypers – 'Vodafone implements M-PESA in South Africa', 2010

¹¹⁸ CGAP – 'Poor People Using Mobile Financial Services: Observations on Customer Usage and Impact from M-PESA', 2009

recipients. An added advantage for the rural recipients is the fact that through the agent network they reduce their travelling costs by being able to withdraw their money locally, as compared to having to travel to go to the bank in the nearest town. The mobile phone has also empowered the rural women as they can simply make a call to their urban relatives to request a money transfer. As they can ask both their husbands and any other relatives, this has increased the financial autonomy of those women.

The fact that people started using M-PESA as a savings method is important for both their usage and the impact of the service on their lives. The M-PESA account allows customers to make regular deposits and so save up small amounts into a lump sum. However, for fear of their saving being wiped out, they also used informal savings clubs, storing money at home, and if possible a bank savings account. A possible negative impact on the lives of the rural recipients, especially the women, is that the mobile money transfers through M-PESA have decreased the number of visits the urban senders make to their family in the rural area. Rural wives worry that their husbands will find themselves a city wife and that this could result in either fewer remittances or the other wife moving to the rural community. In conclusion then it can be said that as hoped the services offered by M-PESA generally have a positive impact on the lives of customers.

8.4 West Africa on its way to becoming Africa's hottest market

When discussing the advent of mobile payments in Africa, most of the focus is captured by ecosystems such as those in Kenya, Tanzania or South Africa, whose momentum has already attracted a lot of attention internationally. And while the success of initiatives such as M-PESA cannot be denied, the Vodafone / Safaricom mobile money partnership is not the only such initiative worth analysing on the African continent. In fact, recent research quoted by media outlet businessdayonline.com¹¹⁹ has found that West African economies are fast catching up with Kenya and South Africa insofar as mobile financial services adoption is concerned. Nigeria is expected to become the largest mobile payment market in sub-Saharan Africa by the end of 2011.

According to same source, Nigeria currently has approximately 90 million mobile phone users (out of a total population of 150 million). Conversely, only around 22 million Nigerians own a bank account, signalling that – like in many other African regions – the mobile financial services opportunity cannot be denied. In Nigeria's mobile payment market, operators and the regulator are currently involved in the shift from card-based transaction to mobile-based transaction. As a result, the Central Bank of Nigeria (CBN) has issued additional seven approvals in principle (AiP) to prospective mobile payment service providers in the country.

¹¹⁹ BusinessDay – 'Nigeria may become largest mobile payment market in Africa', 2011

One company that has been very active in the Nigerian mobile market is UK-based mobile financial technology company Monitise, which as recently as August 2011 has been granted a Mobile Payment System Provider license by Nigeria's Central Bank. The license allows Monitise to develop and deploy a mobile financial services platform in the country. The Monitise technology platform is designed to be shared by various banks and payment providers, enabling them to offer mobile payment services under their own brands. Monitise, with its local partners, has set up a network of agents in Nigeria that can be employed by banks and payment service providers to offer branchless banking services.

Monitise received a provisional license in December 2010 and launched a mobile payments pilot in four cities and 11 rural locations in Nigeria earlier in 2011¹²⁰. Within the trial, the Monitise pilot attracted around 7,000 users and handled payments totalling over 25 million Naira (GBP 100,000). Using the service allows consumers to register via their handset, deposit money at a registered agent, send money to others (regardless whether the recipient is registered or not), as well as top up airtime for their prepaid mobile, withdraw funds at a registered agent and check transaction histories

The next step for Monitise is to enable Nigerian banks and other financial institutions to provide mass market mobile phone based financial services including loans, insurance, pension products and savings. The Monitise platform aims to increase access to financial services without needing to build and operate bank branches across the country.

8.5 CASE STUDY: ORANGE IN WEST-AFRICA

Mobile network operator Orange has been one of the most active players in the field of mobile payments in West Africa. Its Orange Money offering is a mobile phone-based payment system that allows customers to carry out basic banking operations and transactions¹²¹. The service is available for consumers whether or not they own a traditional bank account. The service allows mobile customers to deposit and withdraw money, to transfer money, buy call credit, pay for goods at retailers and pay bills.

Orange Money was initially rolled out in the Côte d'Ivoire in December 2008 after extensive trials¹²². In May 2010¹²³, Orange Money was also made available to consumers in Senegal and Mali. Orange's mobile-payment service is built around partnerships with

¹²⁰ Monitise Media Room – 'Monitise Pilot Brings Secure Mobile Money Into Nigeria', 2011

¹²¹ Orange Media Room – 'Orange accelerates deployment of its mobile payment service, Orange Money, in Africa', 2010

¹²² Orange Media Room, 2008

¹²³ Orange Media Room – 'Orange accelerates deployment of its mobile payment service, Orange Money, in Africa', 2010

banks, which are responsible for issuing and guaranteeing the electronic money. For countries in Western Africa Orange has been working in partnership with local subsidiaries of BNP Paribas (BICIS, BICIM). For its part, Orange is responsible for the service's IT platform and marketing, also leveraging its extensive distribution network in both countries. In November 2010, Orange also partnered Kenya's Equity Bank to launch Orange Money outside West Africa.

Orange expects to see the take-up of its mobile financial offering accelerate in West African territories over the coming years as the customer base reaches a critical mass and the service becomes part of everyday consumer habits. In a statement following the launch of Orange Money in Senegal and Mali, Orange's Executive Director for the Africa, Middle East and Asia Pacific Region Marc Rennard indicated that for Orange, the mobile money offering serves a dual purpose. "By providing our customers with the means to save money, pay bills and run their businesses", he stated, "we are not only reinforcing customer fidelity but we are also able to play an active role in the economic development of the country".

The fact is, MNOs in West Africa have every reason to develop their presence in the region and bring cost-effective, secure access to banking services to low-income consumers. The revenue opportunity is considerable, given the fact that a large percentage of the population lack access to traditional financial services. But there is another factor which makes West Africa a potentially ground-breaking region for mobile financial services: its high potential for interoperability at cross-border level.

Eight West African countries - Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, Togo and Guinea-Bissau – make up the West African Economic and Monetary Union (UEMOA). The latter is an organization established to promote economic integration among its members, all of which share the CFA franc as a common currency. All eight UEMOA countries are governed by the same central bank, giving Orange – a company with an established presence in the region – with the opportunity to expand its mobile money services by adding a cross-border dimension. In fact, Orange has already expressed its intention of developing additional, more advanced mobile payment services such as international money transfers – an intention which due to the favourable monetary conditions in West Africa has every chance of being successful.

Annexes



Annex 1: Glossary

App

Mobile phone applications (apps) are built on top of existing infrastructure by both the companies themselves but also by independent, third-party developers. They enable for more extensive and specific functionalities for the smartphone.

App store

App stores are the distribution channels for apps where users can browse and download both free and paid apps.

Consumer

A consumer is an individual or household that use goods and services generated within the economy. The consumer is the end-user of a product or service, and constitutes the last element in the production-consumption chain of goods and services.

Context or Transaction Context

The context or transaction context is the total of situational circumstances in which each of the three processes of the transaction – agreement, payment and delivery - take place.

Ecosystem

Term derived from biology; a natural unit consisting of different elements in an area functioning together with other factors of the environment.

European Commission

The European Commission – formally the Commission of the European Communities – is the executive branch of the European Union. The body is responsible for proposing legislation, implementing decisions, upholding Union’s treaties and the general day-to-day running of the Union.

European Payments Council

The European Payments Council (EPC) is the decision-making and coordination body of the European banking industry in relation to payments. Its primary responsibility in recent years has been the implementation of SEPA, the Single European Payments Area.

FI or Financial Institution

A financial institution acts as an agent that provides financial services for its clients or members. Financial institutions generally fall under financial regulation from a government authority. Common types of financial institutions include banks, building societies, credit unions, stock brokerages, asset management firms, and similar businesses. Financial institutions provide a service as intermediaries of the capital and debt markets. They are responsible for transferring funds from investors to companies, in need of those funds. The presence of financial institutions facilitates the flow of monies through the economy. To do so, savings accounts are pooled to mitigate the risk brought by individual account holders in order to provide funds for loans. Such is the primary means for depository institutions to develop revenue. Should the yield curve become inverse, firms in this arena will offer additional fee-generating services including securities underwriting, and prime brokerage.

GSMA

The GSM association (GSMA) is the global trade association representing 700 GSM mobile phone operators. In addition, 180 manufactures and suppliers support the association's initiatives as key partners. The primary goals of the GSMA are to ensure mobile phones and wireless services work globally and are easily accessible, enhancing their value to individual customers while creating new business opportunities for operators as their suppliers.

Innovation

An innovation is a good, service or idea that is perceived to be new by its adopters.

Merchant

Merchants function as professionals who deal with trade, dealing in commodities that they do not produce themselves, in order to produce profit.

MNO

Mobile Network Operator is a company that provides service and has its own frequency allocation of the radio spectrum, and it has the entire infrastructure required to provide mobile telephone service.

Mobile payment

A payment where the mobile phone is involved in the initiation and/or confirmation of the payment. The payer may or may not be 'mobile' or 'on the move'.

NFC

Near Field Communication (NFC) is a short-range high frequency wireless communication technology which enables the exchange of data between devices over about a ten centimetre (or four inches) distance. The technology is a simple extension of the ISO 14443 proximity-card standard that combines the interface of a smartcard and a reader into a single device.

Payment

A payment is a transfer of wealth from one party to another. A payment is usually made in exchange for the provision of goods, services or both, or to fulfil a legal obligation.

Payment Institution

A legal person that has been granted authorisation in accordance with the Payment Services Directive (PSD) to provide and execute payment services throughout the European Community. It is envisaged, but not a requirement, that a payments institution would be an entity providing as its core business payment services, as distinct from other banking services. However, the PSD does allow for hybrid institutions, such as telecoms providers, who in the course of their business may also provide some forms of payment service (and in turn are to be regarded as payment institutions).

Perceived Risk

Perceived risk is the subjective judgment that people make about the characteristics and severity of a risk.

PoS

PoS is short for Point of Sale. It refers to a location where a transaction occurs, which is oftentimes a retail shop or the checkout counter in that shop.

Risk

Risk is a concept that denotes a potential negative impact to some characteristic of value that may arise from a future event. Exposure to the consequences of uncertainty constitutes a risk.

SE or Secure Element

Also Security Element. Physical place used for user authentication, authorisation and stored credentials; it houses confidential information.

SEPA

SEPA is short for Single Euro Payments Area. This is the vision, directive and goal of the European Commission to let consumers and businesses within the EU pay with one set of payments instruments. This set includes bank transfers, direct debits and cards. SEPA marks the end of international payments within the EU.

SMS

Short Message Service is a communications protocol allowing the interchange of short text messages between mobile phone devices.

Standardisation

Standardisation is the process of developing and agreeing upon technical standards. A standard is a document that establishes uniform engineering or technical specifications, criteria, methods, processes or practices.

Transaction Context

See context.

Trusted Services Manager

Trusted third party who securely distributes and manages the service providers services to the mobile network operator customer base

UMTS

Universal Mobile Telecommunications System (UMTS) is one of the third generation (3G) cell phone technologies, which is also being developed into a 4G technology. Currently, the most common form of UMTS uses CDMA as the underlying air interface. It is standardized by the 3GPP, and is the European answer to the requirements for 3G cellular radio systems.

USSD

Unstructured Supplementary Service Data (USSD) is a capability of all GSM phones. It is generally associated with real-time or instant messaging type phone services. There is no store-and-forward capability that is typical of 'normal' short messages. Response times for interactive USSD based services are generally quicker than those used for SMS.

Annex 2: References

For news on the mobile payments industry we can recommend the following websites:

www.mobeyforum.org

www.mobilepaymentsworld.com

For news, feeds and research on the telecom industry:

www.telecompaper.com

For news and research on the payments industry:

www.thepaypers.com

www.finextra.com

www.paymentsnews.com

For more information on NFC:

www.contactlessnews.com

www.nfc-forum.org

www.nfc-research.at

Annex 3: About the editors and publishers

Chiel Liezenberg

Chiel Liezenberg is a founding partner of Innopay, an independent full service consulting firm specialised in payments and transactional services. Chiel is one of the thought leaders in online and mobile payments, e-invoicing and e-identity, shaping breakthrough business and market innovations, schemes and standards.

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Jeroen de Bel is a business analyst at Innopay. Prior to working for Innopay, Jeroen worked at several major financial institutions where he gained experience in the areas of corporate finance, treasury and e-brokerage.

Jeroen holds a Master of Science degree in Business Economics (Finance) from the University of Amsterdam. Jeroen graduated Cum Laude in 2009.

Monica Gâza

Monica Gâza is a news editor at The Paypers, the leading independent source of news and analysis for professionals in the global transaction services industry.

Monica has been actively involved in covering mobile payments-related topics for three years now. She enjoys the dynamics of the global mobile payments ecosystem and is keen on tracking and analysing the latest developments in the field

About Innopay

Innopay is an independent full service consultancy firm specialised in payments and related transaction services.

Our key practices include online payment, e-invoicing, e-identity, mobile payment, cards and related regulation.

Given our independent position, we work for all players in the industry. We devote research time and investments to help peer professionals 'structure & understand' these topics and actively facilitate industry knowledge transfer, which we consider crucial for the further development of global e-business. Our leading industry reports can be downloaded for free.

With our in-depth knowledge and experience gained on both the demand side and the supply side, we are ideally positioned to help our clients determine the direction of their growth. This

often results in new products and/or markets that we successively help to 'develop & manage' and bring to market in a controlled and effective way. We do this for single clients but also for groups of clients. Consequently, we have extensive experience in developing multi-party transaction schemes and accompanying messaging standards in diverse industries such as financial services, insurance and document exchange. On the other side, we help corporate users to 'choose & use' the transaction services that fit their specific business needs from the wide array of often industry tailored transaction services on offer. We use a multi-disciplinary approach covering commercial, operational and technical aspects.

Innopay is a member of the European Payments Consulting Association (EPCA) and an associate member of the Euro Banking Association (EBA). Innopay was also a member of the former Payment Systems Market Expert Group (PSMEG) of the European Commission.

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