



An acronym-free primer on mobile payments

Nicolai Schaettgen and Karim Taga

Mobile payments are the next big thing. But for outsiders the multitude of abbreviations and acronyms makes them difficult to understand. Our acronym-free primer explains what m-payment is and how it works. It also sheds light on the business potential of the industry and sets out the most promising approaches to take to see whether your business could profit from mobile payments.

Most people would be hard pressed to name the business that is expected to grow 80 % annually worldwide between 2010 and 2014, and in which Japan and Kenya are today's most advanced markets. But they may get nearer when given the hint that, in this business, insiders' chatter tends to be infested with acronyms such as MNO, TSM, OTA, SEPA, PSD, POS, NFC and API. You guessed right: we're talking about the mobile payment business, which in this article – please forgive us – we will abbreviate to m-payment.

M-payment refers to the use of mobile phones to make payments between consumers, businesses and governments. While mobile network operators and banks are obviously the most closely involved in m-payment, the topic should be of great interest to many other parties, for several reasons. Firstly, m-payment is a potentially valid alternative payment method for any company that is selling goods or services to consumers, particularly low-value goods and services. The Starbucks coffeehouse chain, for example, has started an experiment in which customers can pay for coffee and earn loyalty points at the same time via a barcode displayed on their iPhone. Some observers expect the mobile phone to replace plastic cards in the not-too-distant future.

The second reason why m-payment could be of interest to you is that your company may somehow become part of the growing business ecosystem in which m-payment is developing. Besides mobile network operators and banks, that ecosystem includes credit card companies such as MasterCard and Visa, standardization bodies, financial regulators, consumer associations and manufacturers of point-of-sale terminals and other hardware and software systems, such as vending machines. If you are one of these, or are supplying to them, m-payment is going to affect you, and you had better stay abreast of its speed of uptake, opportunities and risks.

Generally speaking, payments occur between consumers, businesses and governments. Various instruments are available to make these payments: paper instruments and electronic payments.

The third reason is that m-payment makes for a fascinating story. Even if you are entirely outside the m-payment ecosystem, its story provides unique insights about how a multitude of interacting forces play out and shape the evolution of an ecosystem on a global scale. These forces include consumer conservatism, erratic technological and regulatory change, incumbents' ingenious barricading, newcomers' surreptitious entry, opportunistic partnerships, the unforgiving economics of scalable networks, and the jockeying for highest-profit-at-lowest-risk. Many of these insights are transferable to other budding ecosystems, such as that related to electric mobility.

In this article, we will first explain what m-payment is and how it works. Then we will go into the size and growth prospects of the m-payment phenomenon, both in developed and emerging markets. We will then explore emerging business models in the m-payment sphere. We will conclude with some recommendations about how to benefit from m-payment opportunities, while managing the associated risks.

How m-payment works

Generally speaking, payments occur between consumers, businesses and governments (see Table 1). Various instruments are available to make these payments: paper instruments (such as cash, cheque and voucher) and electronic payments (such as wire transfers and cards). M-payment belongs to the latter category, along with the credit card, debit card and pre-paid card.

The credit card trumps m-payment as far as liquidity (reserve purchasing power) and acceptance are concerned. However, m-payment has the great advantage that it can be easily acquired, carried and used, as does the pre-paid card. M-payment has the added advantage over the pre-paid card that it allows easy tracking of expenditures, storing of multiple payment cards and the inclusion of loyalty schemes. Taking into account equipment investment, transaction fees and communications cost, m-payment scores more or less equally with credit and debit cards in terms of total cost. The main current hurdle for m-payment

Table 1 **Payment landscape, with typical examples**

		TO		
		Consumer	Business	Government
FROM	Consumer	Remittance	Point-of-sale	Fine
	Business	Interest	Trade	Permit
	Government	Entitlement	Tax refund	Wire transfer

Area of highest interest for m-payment, with a payment example

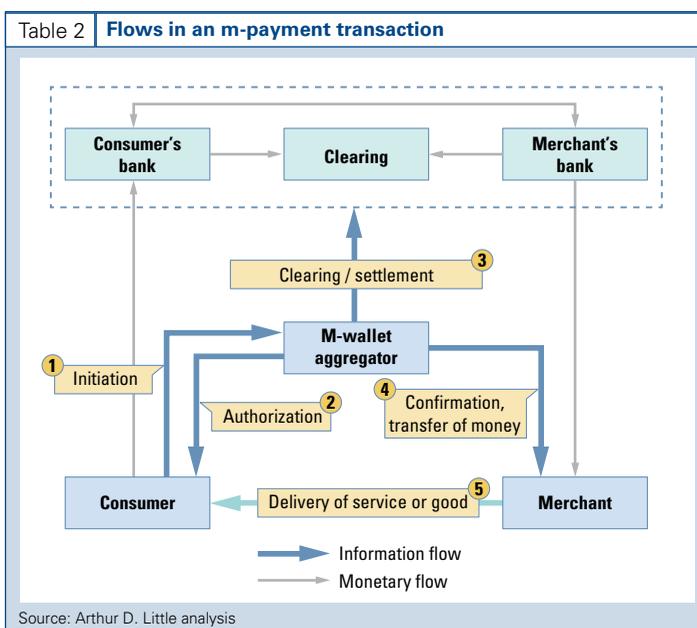
Source: Arthur D. Little analysis

compared to credit and debit cards is the almost universal acceptance of cards by merchants.

As a consequence, m-payment so far is generally seen as most suitable for micro-payments. The limit for micro-transactions varies between countries and industry players, but US\$25 is a common limit. Any application with frequent low-value payments and where queuing and/or convenience are major issues is a likely candidate for early adoption of m-payment, including public transport, retail kiosks, vending machines, events and movie theatres. Most current m-payment applications in developed markets are focused on m-ticketing and m-parking.

Whatever the amount of money involved in an m-payment, a number of players get involved to ensure a secure, easy and fast transaction (see Table 2). The so-called m-wallet aggregator (sometimes called trusted service manager) is an additional stakeholder not present among those involved in traditional payment schemes. Its role as an intermediary is to manage the secure element and supply over-the-air multiple bank accounts, cards and other data. When consumers want to buy a service or good and make a payment, they use their mobile phone to initiate the

transaction and receive authorization from the m-wallet aggregator. The latter then ensures that the proper monetary flows take place between the consumer's and merchant's bank, either instantly (as with a debit card) or deferred (e.g. by adding the amount to the consumer's monthly mobile bill). Once the m-wallet aggregator has confirmed the payment to the merchant, delivery of the service or good occurs.



Size and growth prospects of the m-payment phenomenon

Globally the m-payment market is still in its infancy, albeit with important country differences. Japan, Singapore, Korea and Kenya are the most advanced markets. Japan's NTT DoCoMo, for example, has established a highly successful m-payment solution with more than 37 million active users and 60 million phones equipped with the contactless chip FeliCa. The chip and associated secure memory can support a range of applications such as payment, ticketing and identity management. Today close to half a million payment terminals are installed, covering 90

% of all convenience stores in Japan. The number of transactions reached 16 million in June 2010.

We expect the worldwide m-payment transactions market to grow by about 80 % annually, from roughly US\$30 billion in 2010 to more than US\$300 billion in 2014.

Kenya is a success story from an emerging market. The M-PESA m-payment solution offers a wide range of services, including grocery shopping, remittances and airtime top-ups, that make everyday life easier for all family members in an under-banked country (with only one branch per 100,000 inhabitants and only 23 % holding bank accounts) with a large non-urban population (with only 22 % living in urban regions), yet with a high mobile penetration rate (80 % of the population have access to mobile phones). Thanks to its trustworthy brand and M-PESA's simplicity, Safaricom, a leading mobile network operator, has managed to convert more than 40 % of Kenya's adult population to M-PESA and announced plans to reach 10 million users by the end of 2010. According to Safaricom's CEO, Michael Joseph, M-PESA already transfers close to €50 million per day, which puts M-PESA ahead of the global transfer business run by Western Union.

We expect the worldwide m-payment transactions market to grow by about 80 % annually, from roughly US\$30 billion in 2010 to more than US\$300 billion in 2014. Money transfers and remittances and retail purchases are the fastest-growing services, expected to account for respectively 43 % and 23 % of the total by 2014. In terms of geographic spread, we expect the US and Western Europe to account for about 40 % of the total by 2014, outgrowing the other markets.

Various factors are combining to drive this growth:

- In developed markets the rise of mobile internet and the use of smartphones stimulate the demand for m-payment. New digital content (games, newspapers and many other applications) increases the need for online and mobile micro-payments. Amazon, for example, is responding to that need by providing merchants with tools to include payment options on their mobile websites.

- In emerging markets the low penetration of banks and payment cards leaves the field open to alternative financial services. Given the high penetration of mobile phones, m-payment is an obvious candidate. Furthermore, gadgets are much cheaper than branches as a means for banks to expand their reach.
- So-called Near Field Communication (NFC) technology promises a big leap forward in terms of convenience by allowing consumers to pay by waving a smartphone at an NFC reader. Several hurdles related to standardization, the availability of NFC-enabled handsets and the costs of rolling out the new NFC readers still need to be overcome. But recent trial activity and decisions by major handset manufacturers show a clear upward direction. In France, for example, the Payez Mobile trial run by a consortium of six banks and four mobile network operators was successful. Nokia's new C7 smartphone also has an embedded NFC chip. Overall, we expect shipments of NFC-enabled handsets to take off in 2012 and 2013, from an insignificant base today to about 700 million units in 2014.
- Legislative changes, particularly in the European Union (which has introduced directives on payment services, e-money, e-commerce and distance selling), are creating opportunities for a variety of players, for example through the harmonization of payment markets.
- Both consumers and merchants welcome alternatives to card transactions, as both are paying high transaction fees. In the US, retailers are looking for an alternative to the dominance of MasterCard and Visa. To that end, AT&T, Verizon and T-Mobile, in partnership with Barclays, have set up a trial with contactless handsets that could lead to the replacement of more than 1 billion plastic cards in US wallets, with a total investment estimated at more than US\$1 billion.
- Many players, and mobile network operators in particular, are suffering from stagnating or even declining revenues in their core business. Providing a complete payment solution offers significant upside potential. No one wants to be last to join the race.

A clear power hierarchy in the m-payment ecosystem has not yet been established. Neither banks nor mobile network operators are emerging as the dominant players.

There are a number of factors holding back the faster take-off of m-payment. Firstly, it is difficult to change consumer payment behavior, especially in developed markets with a legacy of credit cards. Secondly, the cost of implementing an ecosystem around contactless NFC technology is still high. For example, a merchant may have to spend US\$200 per reader and the cost of the extra electronics may add US\$10-15 to a handset. Thirdly, competing standards hinder the realization of critical mass, credibility and scalability. This points to the fourth hurdle: there is not yet an appropriate business model that will allow a fair share of the pie to each of the parties that need to co-operate to make m-payment happen.

As a consequence, many players, including merchants and consumers, are adopting a wait-and-see attitude, while the traditional players in the payment sphere, i.e. banks and credit card companies, are wary about the impact of m-payment and mobile network operators' moves on their revenue streams.

Emerging business models for m-payment

A clear power hierarchy in the m-payment ecosystem has not yet been established. Neither banks nor mobile network operators are emerging as the dominant players. Put differently, it is still undecided which player – mobile network operator, bank or independent third party – will assume the role of m-wallet aggregator, as referred to in Table 2. Players are vying for that role because it decides the ownership of two crucial assets: the customer relationship, which gives access to customer information such as mobile number and bank account, and the m-payment product, which opens the door to lucrative applications related to loyalty programs and mobile advertising. As a consequence, four business models could take hold: operator-dominated, bank-dominated, hybrid, or one involving an independent third party.

In the operator-dominated model, the mobile network operator owns both the customer relationship and the m-payment solution, with most of the benefits and risks accruing to the operator. A typical example is NTT DoCoMo in Japan. Its contactless m-payment solution serves as the

It is hard to predict which of these models will prevail. Several may co-exist, depending on the targeted payment application. In any case, co-operation by the various players in the ecosystem will be necessary to provide an offering to both consumers and merchants that is sufficiently attractive.

most successful benchmark worldwide. Another example is the Mobilkom-owned Paybox, which is the leading m-payment solution in Austria.

In the bank-dominated model, the existing payment value chain consisting of the consumer's bank (called the "issuer"), the merchant's bank (called the "acquirer") and a clearing house is used. In addition, a financial institution owns the m-payment solution. MasterCard, for example, is involved in several m-payment trials in countries as diverse as the US, Brazil, Romania and Singapore, thereby benefiting from its experience with its contactless PayPass cards. Clearly credit card companies are keen to protect and expand their merchant franchise.

In the hybrid model, mobile network operators and banks share the benefits and risks. The operator owns the customer relationship and m-payment solution, but the existing payment value chain is used by integrating existing card products in the mobile phone. For example, South Korea's SK Telecom has launched the Moneta service, which enables payment with a handset from credit card accounts.

The fourth model involves an independent third party taking the power in the m-payment ecosystem. One example is MobileLime, a mobile relationship marketing company in the US that attempted to turn the mobile phone into a marketing, loyalty and payment device in 2006. Other examples are Monitise in the UK, VoiceCash in the Netherlands and mPay in Poland. More recent moves include Google's extension of its Google Checkout™ online payment service to mobile phones running on the Android platform, as well as its investment in the m-payment startup Corduro earlier this year. Apple is also pondering its moves.

It is hard to predict which of these models will prevail. Several may co-exist, depending on the targeted payment application. In any case, co-operation by the various players in the ecosystem will be necessary to provide an offering to both consumers and merchants that is sufficiently attractive to persuade them to adopt the m-payment solution. Several characteristics determine the attractiveness of a payment solution:

Collaboration should aim firstly at harmonization of standards and interoperability. This will pave the way for establishing scale and building the required infrastructure, thus starting the virtuous circle typical of a network.

- **Simplicity.** For both consumers and merchants, service simplicity comes first. The m-payment solution must be easy to use, intuitive and have no need for training. It should take no more than two clicks to access the service and three seconds to launch it.
- **Security.** The second key characteristic for both consumers and merchants is security. Experience of or hearsay about credit card fraud in developed markets or robbery in developing markets has turned trustworthiness into a key success factor.
- **Cost.** The m-payment solution should be low-cost. For merchants, total cost is determined by transaction fees, equipment (reader) investment, compatibility with existing systems and the volume of paperwork.
- **Universal access.** Access universality is an additional key characteristic for consumers. There must be widespread merchant acceptance of the solution, and the solution must work whatever network, phone or operating system is used.

A collaborative approach by mobile network operators, banks and other third parties is most likely to establish a successful m-payment offering with these characteristics. Collaboration should aim firstly at harmonization of standards and interoperability. This will pave the way for establishing scale and building the required infrastructure, thus starting the virtuous circle typical of a network: more volume leads to greater acceptance, which lowers cost, which in turns attracts more volume. Collaboration should also aim at giving every major player some piece of the pie. For example, bundling additional services (e.g. loyalty programs) into the payment solution broadens its appeal. Mass-market adoption will also be stimulated by enlisting large retailers, for example by providing subsidies for point-of-sale readers or covering part of their marketing costs. Automatic activation of the m-payment service in the mobile phones of all users will also help, as Vodafone and O2 are doing in Germany.

One example of a nascent collaborative approach is Zoompass in Canada. The country's three largest mobile

operators (Bell Canada, Rogers and Telus) launched a fast, easy and secure m-payment service in June 2009. A payment application can be downloaded onto a mobile phone. Zoompass funds are held in a stored value account that is linked to the consumer's personal bank account or credit card. Optionally a pre-paid MasterCard card with PayPass technology for contactless payments allows purchases in-store and online or the withdrawal of cash from an automated teller machine. The initiative shows that collaboration is possible, both between operators and between operators and clearing houses. Along with other successful solutions, it indicates that consumers' willingness to pay for an m-payment service may be relatively high for certain niche applications such as m-parking, m-vending or m-ticketing, but that larger segments such as money remittances are also highly promising.

Insights for the executive

Even if your company is neither a telecom operator, a bank nor a retailer, the unfolding m-payment story offers great insights into the dynamics of an ecosystem that should be of relevance to many companies. The great challenge for a new service substituting for another is to persuade the users – consumers and merchants in the case of m-payment – to adopt it quickly. A collaborative approach by the key players in the ecosystem can overcome the many hurdles – lack of standardization, the need for upfront investments in infrastructure, uncertainty about revenues and risks and the achievement of critical mass – that slow down the development of irresistible service features and thus user uptake.

One of the earliest and simplest m-payment success stories is that offered by Croatia's VIPnet. In 2001 it introduced an SMS-based m-parking service. Today it covers 75 % of all parking spaces in the country. Nationwide, half of all parking charges are paid by m-payment. In Dubrovnik the share is 75 %. Imagine what it would mean to achieve similar penetration rates for other applications.

Nicolai Schaettgen

... is a Consultant in Arthur D. Little's Vienna office, where he leads the firm's m-payment competence center.

E-mail: schaettgen.nicolai@adlittle.com

Karim Taga

... is the Managing Director of Arthur D. Little's Vienna office and member of the Telecommunications & Media Practice.

E-mail: taga.karim@adlittle.com