A Slow Start

Past m-payment market predictions, which estimated that the global m-payment market (in terms of total transaction volume) could be as much as US$15 billion in 2003, proved to be overly optimistic. In fact, global m-payment revenue in 2003 was only US$3.2 billion.

Why has the m-payment segment not seen the explosive growth many industry experts and analysts expected? Clearly, the difficult economic and financial climate since the year 2000 did not help, given the large investment necessary to develop an m-payment network. The industry was also hindered by insufficient marketing to clearly communicate added value to the customer, the lack of standardisation of payment systems and the failure of the various stakeholders to understand the importance of partnerships to deliver end-to-end solutions.

Many players with plenty to gain

The m-payment value chain involves a complex array of players, such as mobile network operators, banks, credit card companies, independent payment service providers, platform and handset vendors, etc., which can each benefit from entering into the m-payment market.

Mobile operators are well positioned to benefit from m-payments. They have strong customer relationships, possess the necessary billing infrastructure and control the customer handset. As the voice market matures, mobile operators are moving into data services in order to increase margins and ARPU. An obvious first step into m-payments for the mobile operators is to offer top-up of pre-paid cards through m-payments, bypassing the need for producing and distributing scratch cards. Operators with more innovative m-payment services, such as m-parking and m-ticketing, achieve higher margins through additional service fees. The advantages of m-payments for mobile operators are more than just financial; in our survey, mobile operators saw differentiating themselves from the competition as a key benefit of m-payments.

Financial institutions and credit card companies have key

relationships with merchants and customers, as well as extensive experience in payments and risk management and the necessary infrastructure. M-payments enable the banks to capture margins from transactions in which they would not otherwise be involved by accessing new customer segments such as the youth segment, which does not normally have a high usage of banking services. Many banks were initially reluctant to move into m-payments, deterred by the initial investment and a fear of cannibalisation of their core business.

Merchants have the opportunity to increase their turnover by providing their customers with the m-payment option. They should also benefit from faster payment authorisation and potentially a lower level of fraud compared to credit card payments, within a well organised m-payment system.

M-payment offers most players attractive monetary incentives. Still, some are very cautious.

Suppliers, such as platform and terminal vendors and handset manufacturers, operate the systems and develop the applications for m-payments and can benefit from the increased revenue potential from the new and possibly lucrative m-payment market. The leading mobile handset supplier, Nokia, is even looking to take a more prominent role in the process, and has begun co-operation with banks, VISA and Mastercard to design a new m-wallet application.

Finally, customers of m-payments benefit from the convenience of m-payment solutions. The main differentiator for m-payments is that it provides greater flexibility in time and location of usage.

How it works - the transactions

There are five categories of m-payment transactions, based on payment channel used for the transaction. A majority of m-payments are now based on the first three categories:

- Telecom and mobile portal - transactions between the mobile or telecom operator and the customer, such as the already large market for handset customisation, which includes ring tones, logos, wallpapers, games

and also top-up of prepaid phone subscriptions. A parent with a contract mobile subscription can use an m-payment solution to top up his children's prepaid mobile subscriptions. The parent's mobile bill is charged the total amount and the mobile operator avoids further distribution costs. In 2003, telecom and mobile portal-based transactions accounted for approximately 65 percent of total m-payment revenue.

Five categories of transaction forms are dominant: telecom and mobile portal, phone to machine, face to face, online, and phone to phone.

- Phone to Machine (P2M) - m-payments to vending machines, for purchases of goods from soft drinks to train tickets. For example, a consumer wants to buy cigarettes out of a vending machine and sends an SMS with the code corresponding to the cigarette brand he wants to purchase. The m-payment system signals to the vending machine to hand over the cigarette package. In most countries there is a minimum age limit to purchase tobacco; in this example, the m-payment solution can check the age of the customer prior to confirming the sale. P2M m-payment transactions equalled approximately 16 percent of the total in revenue in 2003.

- Face to Face (F2F) - m-payments at point-of-sale (POS) in retail stores, gas stations and taxis. In 2003, F2F transactions accounted for an estimated 12 percent of total m-payment revenue.

- Online - purchases over the fixed or mobile internet. Examples include purchases of books, CDs, DVDs, event ticketing or response to mobile phone push advertising. M-parking, one of the most popular initial services to be launched, is also in this category. For example, the customer sends an SMS with the desired parking time to the m-payment server. The server replies instantly with a parking ticket; 10 minutes before the parking time expires, the m-payment server sends a reminder and the customer has the possibility to prolong his ticket without having to walk back to his car. Online transactions accounted for only an estimated 6 percent of total m-payment revenue in 2003.

- Phone to Phone (P2P) - payments for purchases over auctioning platforms like eBay, payments where cus-

tomers pay their share of a restaurant bill to a friend who then pays the restaurant, transmission of pocket or emergency money to children, etc. In these cases, the customer sends an SMS with the amount to transfer and the mobile phone number of the recipient. The m-payment server calls back and requires a PIN to authorise the payment. The money is then transferred to the recipient's phone account. In 2003, P2P transactions accounted for less than 1 percent of total m-payment revenue.

Regional differences

The progress of development in m-payments markets differs widely from region to region. Asia is leading in m-payments and Europe follows close behind, while Latin America and the United States are currently embryonic markets, as shown in Exhibit 1.

M-payments took off early in Asia, where consumers tend to be very technology-friendly, and mobile users enjoy doing more than talking on their mobile phones.

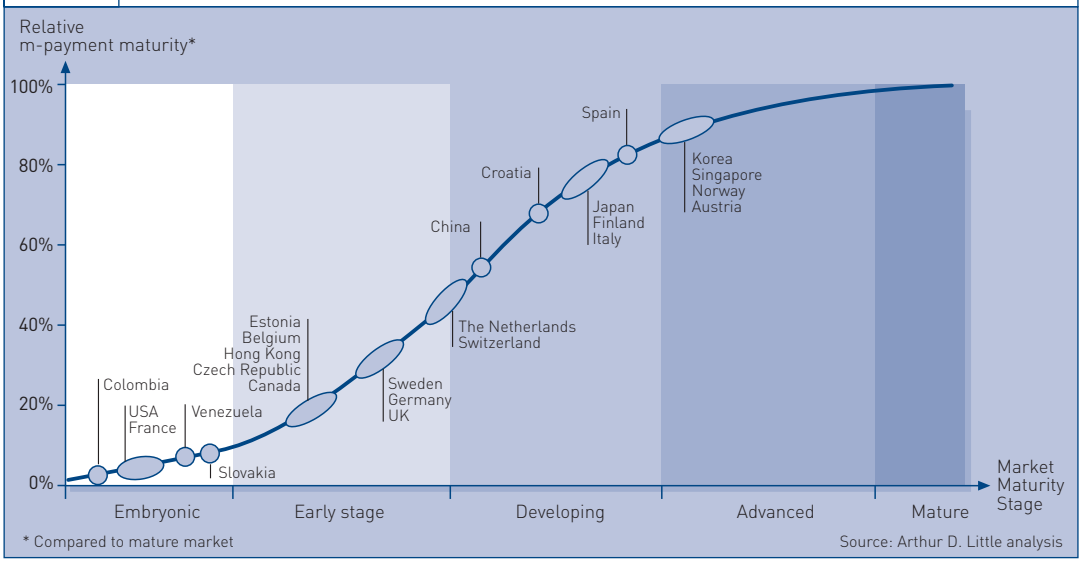
Asia is currently leading the pack in terms of m-payment developments.

While slower to get started, mobile operators in Europe, specifically in Austria, Norway and Spain, have been successful in launching not only traditional applications to raise data ARPU, but also innovative retail m-commerce solutions, such as m-ticketing and m-parking.

In the United States, the m-payment sector is still embryonic, due to the relative fragmentation of the banking and mobile phone industries and the extensive availability of widely accepted and convenient (including online) payment mechanisms. However, given that the US has the highest proportion of personal computer users and credit card holders in the world, coupled with a high mobile growth potential, it may prove to be a very attractive m-payment market once POS-terminals are m-enabled.

While low bank account penetration in Latin America limits the m-payment potential, some mobile operators are already developing new business models in order to serve "non-banked" users. In Venezuela, a country with medium mobile penetration and a large pre-paid base, a

Exhibit 1 **Maturity of M-Payment on a Global Scale**



top-up service from the mobile phone with access to the user's bank account is already available.

Based on our research, we have identified several factors that have contributed to the growth of m-payments initially in embryonic markets:

- A well established financial sector;
- High mobile penetration, including a high share of post-paid customers;
- A developed internet market;
- A regulatory environment that, at the very least, did not discourage the development of m-payments, such as by requiring mobile operators to have banking licences in order to process payments

The driver determines the market

We have identified five models for how markets have developed depending on which participant in the value chain has driven the process: mobile operator-driven, bank-driven, government-driven, independent payment service provider-driven and industry-driven.

When an m-payment market is in its initial stages or is trying to grow in a large, very liberalised business environment, anarchy tends to reign. Anarchy exists when different stakeholders push their own payment platforms with little co-operation, closed interfaces and proprietary solutions. Examples of countries that can be described as in m-payment anarchy are Italy, UK and Germany, where the roles of the value chain players are unclear (as far as customer ownership is concerned), and a lack of strong business models limits the co-operation among the different players. In the UK and Germany, we have seen content aggregators moving in to fill the void, as currently the largest market for m-payments is related to digital content. Bango in the UK and Jamba in Germany are examples of content aggregators, which have launched their own m-payment services.

Five models for market development were identified: mobile operator-driven, bank-driven, government-driven, independent payment service provider-driven and industry-driven.

1. In the mobile operator-driven model, the mobile operator controls a majority of the transactions and contracts directly with merchants. Examples of mobile operator-driven m-payment markets include Austria, Japan, Australia, Sri Lanka, China, Norway, Finland, Venezuela and New Zealand.

   mobilkom austria, the incumbent mobile operator in Austria, launched an m-ticketing application together with the Austrian national railway ÖBB in 1998, and has since continued to develop its m-commerce portfolio with a strong mass-market focus. From its subsidiary paybox, mobilkom offers all mobile users a complete range of m-commerce services, including direct and online mobile shopping, m-ticketing, m-parking, vending machines, and two kinds of travel insurance. Additionally, paybox offers the service of sending money directly to another phone, as well as POS payments. In order to be able to act as a full service provider, mobilkom acquired a banking licence, and today all three mobile operators in Austria have banking licences.

2. In the bank-driven model, financial institutions form a joint venture to develop, maintain and run a payment platform, more or less forcing mobile operators to open up their systems for mobile payment. Banksys in

Belgium is an example of a bank-driven model.

In Belgium, Banksys, the inter-bank clearing house, was given a mandate by the banks to develop m-payment activities and has developed an m-payment platform that is already successfully used for prepaid recharging by the second-largest mobile operator. Partnerships with the two other operators are also foreseen and we believe that the platform has the best chance to become the common m-payment standard in Belgium.

3. Singapore and South Korea, two of the most advanced m-payment markets in the world, are excellent examples of markets driven by the government. An m-payment platform was created in Singapore via a licence bid initiated by the government. All stakeholders were required to support the full value chain and interconnect with each other. A series of m-payment pilot projects are in the advanced stages. YW8, a joint project between banks, transaction service providers, mobile operators and retail, has been successful due to the emerging m-lifestyle in the country.

A majority of markets are currently mobile operator-driven as, in general, mobile operators are moving most aggressively into m-payment as it is an extension of their core business. However, the most developed m-payment markets in the world, Singapore and South Korea, have been government-driven.

4. In some markets, independent service providers, often funded by venture capital funds or with banks as shareholders, obtain a licence and are able to process and clear transactions.

   Contopronto is a Norwegian m-payment provider with an independent payment solution that was launched in 2002. The company has also received a licence from the Norwegian Royal Ministry of Finance to become Europe's first e-bank. Contopronto's platform allows cellular phone users to make payments and money transfers to any bank, credit card, business or individual through their phone. After opening an office in London, Contopronto expects to open e-money banks across Europe, giving Europeans access to a secure and rapid cellular payment option.

5. In some cases, such as in the United States and Hong Kong, m-payment development has been industry-driven. Key players in most initiatives are Nokia as handset

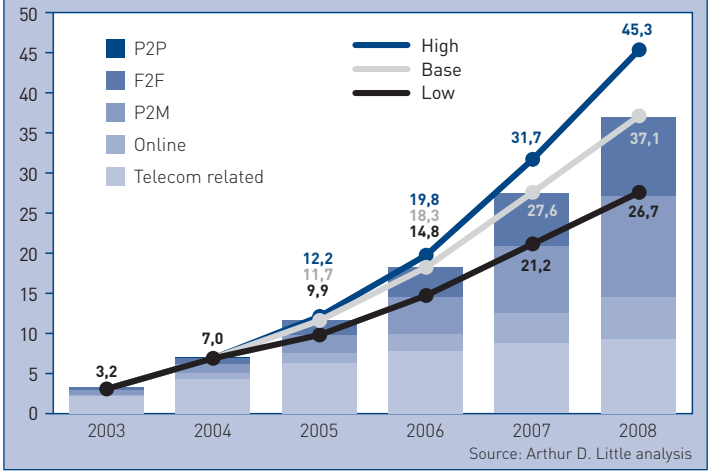
vendor, plus local banks, and settlement companies like VISA in Europe and Asia and Mastercard in the US. The co-operation is centred on the new wallet application in Nokia handsets and Verified by VISA service.

A majority of markets are currently mobile operator-driven as, in general, mobile operators are moving most aggressively into m-payment as it is an extension of their core business. However, the most developed m-payment markets in the world, Singapore and South Korea, have been government-driven, which illustrates the important role the telecommunication and financial regulators play. Spain is a good example of a market in which, after a strong push by the regulators, banks and mobile operators have worked together to launch an m-payment solution to the benefit to both the players and the market as a whole.

A Future of Growth

Predictions for the development of the m-payments market have been wildly optimistic in the past. In the last couple years, there has been progress made on developing payment standards, at least within individual markets; market players have begun to develop partnerships to better serve the market; and m-payment services have been successfully launched in several countries.

Exhibit 2 | M-Payment Revenues (in US$ bn)



Source: Arthur D. Little analysis

Based on our global survey, we estimate that m-payment transaction revenues will increase from $3.2 billion in 2003 to $11.7 billion in 2005 and $37.1 billion in 2008. Exhibit 2 illustrates Arthur D. Little's forecast for m-payment revenues by type of transaction.

We expect vast differences in the development of the m-payment sector to continue between individual markets. How quickly m-payments take hold will depend largely on market specifics, key players and relevant regulators.

Overall, we believe that the market will continue to be driven primarily by mobile operators, but with an increasing role played by banks and credit card companies, to the benefit of the m-payment sector in general. Regulators will also play a key role as, without their support, m-payments will not take hold in any market.

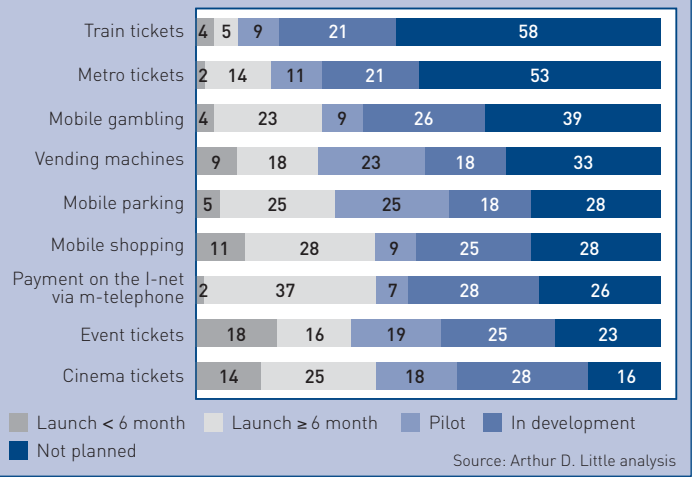
Mobile operators will continue to drive the market. But the role of banks will become more important.

The initial capital expenditure necessary to develop an m-payment platform can be considerable. An m-ticketing platform could cost an approximate US$250,000 to develop. However, there are distinct advantages to being the driver of an m-payment market, and significant risks in not developing an m-payment strategy. In addition to being perceived as being innovative and more dynamic in the market, a company that leads m-payment development will be able to design a system that is advantageous to its market position and strengths. To a certain extent, the market driver will also be able to dictate the terms to companies entering the market late, and at the very least be in a strong negotiating position.

Conversely, companies that do not keep up with their market in m-payment development could find that they are missing out on a dynamic, fast-growing market. Entering late could leave a player with few remaining potential partners and only more expensive options for accessing m-payment platforms.

In the course of our survey, we asked industry experts about the stage of development of various m-payment services in their markets. The services currently under development or being prepared for launch are shown in Exhibit 3.

Exhibit 3 | M-Payment Functions



Based on our survey, we believe m-payments in the short and medium term will be primarily focused on micro payments, such as m-parking and m-ticketing. By 2008, as the market begins to take hold and consumers begin to be more familiar with the technology, we expect P2M to increase to 34 percent (from 16 percent in 2003), F2F to 27 percent (from 12 percent in 2003) and Online to 14 percent (from 6 percent). The share of telecom and mobile portal-based transactions, therefore, will decrease to 25 percent from 65 percent in 2003. P2P transactions are also expected to increase, but will remain less than 1 percent of the total m-payment revenue in 2008.

We do not expect m-payments, for example, to replace credit cards in the foreseeable future. However, in markets such as the US, where there is a very high use of credit and debit cards, m-payments may become another communication medium by which credit card transactions are carried out.

The Challenges

The m-payment market has a long way to go until it becomes established. To reach that point, several strategic challenges will need to be addressed by all players in the industry.

Challenge #1: Partnerships and incentives

The success of m-payments depends on establishing partnerships and defining clear roles and incentives along the value chain. The players in the value chain should agree on basic revenue-sharing principles between industries, to avoid having different industries create different standards, which would reduce the value of m-payments for consumers and slow down industry development. The ability to charge flexibly for different types of services and applications and to split revenues between different parties in the value chain is key to the creation of a successful environment for m-commerce.

The mobile operator is, in most cases, a logical choice to lead market development, as they already have a customer base and a billing infrastructure for small transactions, and m-payments is an extension of their core business. However, mobile operators will find it difficult to go it alone. They do not have a merchant network, the systems to process macro-payments or the necessary experience in risk management. For this reason, a partnership with a bank or credit card company may be necessary to ensure success.

Partnerships and cooperations offer mobile operators a new source for revenues.

As mobile operators have only limited capabilities to broadly acquire merchants in different vertical segments, they should also consider co-operation with traditional payment service providers (PSPs) and merchant acquirers. Through partnership with a PSP or merchants acquirer, a mobile operator can more quickly expand its merchant network, which is key to gaining a critical mass of customers and revenues to offset the investment into m-payments.

Banks and credit card companies are attracted to m-payments as a way to increase revenue, secure all virtual transactions and reduce fraud. However, many banks were initially reluctant to move into m-payments, deterred by the initial upfront investment and a fear of cannibalisation of their core business. While initially reluctant, there are an increasing number of financial institutions offering m-banking services, which enable their customers to

build their m-payments-related experience and become more familiar with the technology.

Banks that do not develop an m-payment strategy early will be under increasing pressure from mobile operators, which tend to act faster in m-payments. By not co-operating with operators, banks risk being dependent on costly SMS or voice channels for their future m-payment solutions.

VISA and Mastercard control a global network of more than 21 million merchant locations and have more than 450 million cards in circulation. They are thus well positioned to get their slice of the cake.

Credit card companies have an important role to play as they tend to be more innovative than banks, and understand the value of co-operation with mobile operators in the area of identification and authorisation of the payment process. VISA and Mastercard control a global network of more than 21 million merchant locations and have more than 450 million cards in circulation. Core competencies of both banks and credit cards companies are their strong brands, well established relationships with large customer bases, a network of merchant locations and long experience in risk management.

For merchants, beginning with m-payments requires an up-front investment, the size of which varies depending on the solution. For this reason, the merchant must be convinced about the value it will bring, through increased revenue, access to new customer segments, increased security, higher customer satisfaction and lower costs for distribution and collection. For example, for a concert organiser, having access to an m-payment solution would not only increase revenue, but also lower operating costs, as fewer people would be needed to man the ticket booths.

Suppliers, such as platform and terminal vendors and handset manufacturers, have a clear motivation to provide innovative solutions to the m-payment industry, and, if at all possible, to be involved in the creation of a broader solution that will open the market and increase their revenue potential.

Challenge #2: Developing Standards

The sooner the players are able to co-operate on developing m-payment standards, the faster m-payments will take hold and bring benefits to all involved in the value chain. Open standards, not specific to any operator or payment scheme, ensure interoperability across platforms and services, and are critical for ensuring widespread access to m-payment services. Without an m-payment standard, companies will not invest into m-payment platforms because they would not be able to reach a broad enough market to make it viable.

Technical standards are key to all players' success.

A variety of standardisation bodies exist in the area of m-payments, which have been founded by different stakeholders, each with their own focus and approach. The Mobey Forum is dominated by financial institutions and focuses on the drafting of high-level requirements for m-payment transactions from a financial institution's point of view. The Open Mobile Alliance (OMA) has established the M-Commerce and Charging working group (MCC) that is also working on m-payment-related issues. MeT Ltd. focuses on the definition of a complete framework for m-payment environments on the basis of existing standards, cooperating with other organisations that are working in the same area. PayCircle is dominated by suppliers of payment infrastructure (with Siemens, HP, Sun, Oracle and Lucent as founding members) and focuses on the development of electronic payment standards. The goal of the Secure Mobile Payment Service (SEMOPS) is to create a universal electronic payment service, to be introduced in most European countries. Simpay was founded by the mobile operators Vodafone, T-Mobile, Telefonica and Orange, and is working towards interoperable mobile payment infrastructure and potentially a European clearing house.

Most experts we talked to during the course of our survey stated that they primarily participate in these organisations in order to keep updated on what other players are doing. The standardisation work proceeds slowly and many players are launching their own proprietary solutions. While these organisations are taking steps toward harmonisation of payment standards, more has to be

done in order to contribute to the growth of m-payments in the future.

Challenge #3: Finding a Trusted Brand

Building strong brands and giving customers the services they need are further milestones on the way to success.

A trusted brand is critical to generating confidence in m-payments and achieving critical mass of customers and merchants. While the actual level of security of m-payment solutions is very good, stakeholders also have to address the issue of perceived security and faith in the system. Our research has highlighted that perceptions of security (or lack thereof) are a major barrier to further penetration of m-commerce.

For this reason, the involvement of companies with strong brands in the development of the m-payment solution is critical to building up acceptance and trust by customers and merchants. Research shows that banks' and credit card companies' brands are most trusted by consumers.

It is interesting to note that in Europe, where mobile operators tend to have very strong brand recognition, mobile operators have been driving the process. In the United States, the market has been driven rather by banks and credit card companies, which have much stronger brands than the mobile operators.

Challenge #4: Customer Benefits

A key success factor for companies investing into m-payments is to achieve a critical mass of customers, and thus revenue, as soon as possible in order to offset the necessary investment in the solution. For that reason, the first services to be launched should focus on the primary benefit of m-payments to the customer - flexibility and convenience - supported by powerful marketing to communicate these messages.

Through m-parking, the customer can prolong his parking time without having to leave his meeting and go back to the parking machine. M-payments would mean no waiting in lines at the metro or train station, ski resort or movie theatre. Once the customer becomes familiar and

comfortable with this new payment option, more complex solutions such as m-payments over the internet, in taxis or at vending machines, or phone-to-phone money transfers will be easier and less risky to launch.

Consumer requirements for a new payment system are relatively straightforward. The system must work on any handset and on any network, it must be easy or even automatic to register and no change of bank account or different payment card should be necessary for using the solution. Additional costs to the consumer should be zero or very low and correspond to the value added. Finally, billing should be clear, with appropriate options (such as splitting business transactions from personal purchases). A company that meets these requirements will have a much better chance at successfully launching an m-payment solution.

Consumers are very straightforward in their needs: The system must work on any handset and on any network, it must be easy or even automatic to register and no change of bank account or different payment card should be necessary for using the solution.

Efforts to launch m-payments have often been hindered by a failure to educate the consumer about the benefits of m-payments. New players must communicate the additional value from their solutions, such as flexibility, convenience and security, and clearly communicate this message to their target markets.

Insights for the Executive

The future of m-payments is highly dependent on the ability of the players in the individual markets to address the four strategic challenges we have identified. Some countries are already in the process of meeting these challenges, while in others it will be some time before these challenges are solved.

Co-operation among the major players, especially mobile operators, banks and credit card companies, is critical to reach the mass market and achieve real growth. However, in many countries these players have been more focused on protecting their current business than on investing into a new payment system with relatively lower returns and additional risks. In this case, it is likely that one player will need to take the lead and drive the market.

While there are risks to investing into an m-payment solution, there are distinct advantages to being the driver of an m-payment market, and significant risks in not developing an m-payment strategy. In addition to being perceived as innovative and more dynamic in the market, a company that leads m-payment development will be able to design a system that is advantageous to its market position and strengths. The market driver will also be in a strong negotiating position vis-a-vis companies entering the market late.

On the other hand, companies that do not keep up with m-payment development could find that they are missing out on a dynamic, fast-growing market. Entering late could leave a player with few remaining potential partners and only more expensive options for accessing m-payment platforms. There may be a long way to go for m-payments in some markets, but this is one bus that the astute player cannot afford to miss.

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