

Mobile Payments

Delivering Compelling Customer and Shareholder Value through a Complete, Coherent Approach

A White Paper
by Microsoft and M-Com

Microsoft[®]



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Introduction and Key Themes

A mobile payment (m-payment) can be defined as any payment transaction, whether in-store or remote, executed on a mobile device, usually a mobile telephone. The growth and viability of mobile commerce (m-commerce) relies heavily on the existence of a payment utility that is convenient, easy to use, trackable and secure. Proponents of m-payments argue there are inherent advantages that lead to optimism.

The presumed value proposition at point of sale (POS) rests on the convenience and speed of contactless payments enabled by mobile phones with embedded NFC (Near Field Communication) chips and other similar technologies. For on-line markets, the value proposition is the inherent connectivity, ubiquity, and near real-time verification capability of mobile devices (via SMS, WAP, or IVR).

However early market adoption has been stunted by technological challenges, a lack of standardisation, fragmented exploratory efforts, and a lack of provable ROI model.

Despite this, Informa Telecoms & Media forecasts that in 2013 almost 300 billion transactions, worth more than US\$860 billion, will be conducted using a mobile phone – a twelve-fold increase in gross global transaction values in just five years.

The implication of this prediction is that the average transaction will be less than US\$3 in actual value (bear in mind that this figure is globally derived). The business case for a financial institution, therefore, would focus on the relative cost of handling an m-payment as opposed to low-value payments executed over the traditional credit or debit card networks. The underlying assumption is that the mobile phone will replace the leather wallet and push cards, and cash away from centre stage.

In this white paper the reader will learn about the following concepts:

- Understand the landscape and taxonomy of mobile payments, and the different processing models
- Learn about the economic benefit of mobile payments through direct and indirect revenue generation
- Understand real and perceived risks, and how they can be mitigated
- Understand the value of an open loop, interoperable ecosystem for consumers, payment processors, banks and software partners.

Mobile Payments Landscape

The Range of Issues

Currently, there is little uniformity among the major players and few signs of meaningful collaboration. Banks, Cards Issuers, Merchants, Payment Processors, Alternate Payment Providers and Mobile Operators are each striving to build revenue models that meet their needs.

In the credit card/debit card universe, the various players in the value chain typically take a percentage of the payment transaction that ranges between one and three per cent. These interchange fees accrue to the merchant acquirer, the card issuer, and the network (Visa and Master Card, for example) that routes the payment transactions and provides other services, such as promoting the use of the mechanism. These fees are considered a major cost factor for merchants and have been a source of lawsuits and regulatory actions that have affected merchants, card networks and financial services firms in recent years. Any new payment model for mobile payments must attempt to reduce or match these fees to appeal to the merchant community or risk another round of contention.

Any valid return on investment model will rely on the flow of interchange to offset the costs of development, installation and maintenance of a viable m-payment facility, whether the revenue arises from a fee charged by a financial institution or a data charge applied by a mobile carrier.

Financial institutions, facing declining revenue growth from traditional credit cards, are looking to use m-payments to replace cash-dominated lower value payments to generate new revenue streams. This is important for banks and retailers as cash handling is both expensive but also poses a security risk. In 2004, these lower value payments, originated through credit and debit cards, accounted for US\$13.5 billion out of over US\$1 trillion total spent on lower value payments. Although the average mobile payment can be historically measured at being less than US\$5, consider that this is the result of an emerging technology that is destined to become mainstream and that includes emerging markets where the purchasing power of US\$5 is far higher than in the US or Europe.

Mobile operators also are under pressure to find new revenue sources. Voice services have declined and subscriber saturation has been reached in many jurisdictions. Mobile operators in the US have introduced features like mobile data content and applications; and the m-payment market presents them with an opportunity to further expand non-voice revenues.

On the demand side, the growing ubiquity of mobile phones and their increasing multi-functional capabilities make mobile phones a compelling candidate for replacing the physical wallet.

In the United States, mobile device penetration has passed 75 per cent, with 235 million mobile phone users, compared to 176 million people who actively use credit/debit cards. However, as with other technology-driven innovations, it is not clear at what point price resistance will be met.

Another growth area garnering bank and media attention is international remittances. It is estimated that some 150 million people send over US\$450 billion overseas each year. The Federal Reserve has

estimated that remittances from the US to Mexico alone total over US\$23 billion. But perhaps more important is the domestic remittances market, particularly in rapidly expanding nations. For example, in China, over 200 million people have moved from rural locations to the major cities. Those people also have the need to remit funds back to families in their home towns.

The situation is further complicated by the development of newer payment systems. Providers like PayPal are positioned to facilitate payment methods for on-line commerce between individuals and on-line merchants, allowing them to control the relationship with both merchants and consumers, thereby disintermediating financial institutions. In addition, their movement to provide person-to-person (P2P) facilities makes them a major element in the emerging taxonomy. It can be assumed that PayPal and its competitors will strive to build mobile capabilities into its proprietary systems so as to maintain the relationships they have built up over the years.

As we survey the surrounding strategic issues, each of the potential players has several considerations to contend with. The success of the m-payment structure relies heavily on the outcome of these strategic evaluations.

For financial institutions, the fundamental question is determining the extent of incremental revenues to be generated by their investment in enabling technology. A key question is whether the fees thus generated will be incremental to the interchange they already enjoy. Related to this are the twin questions of how effective an m-payment offering will be in getting and keeping customers or new segments. Finally, they will have to examine the possibility of collaboration with other players, mainly the network providers where, within geographic markets, competition for 'shelf space' may be intense.

Mobile network providers will be looking at the average revenue per user statistic for the strongest indication of the value to them. They are also likely to be the most active in trying to recruit collaboration partners to assist with the clearing of m-payments. Some observers think that the natural collaboration is between the financial institution and the mobile network. At issue will be defining a revenue and customer-sharing formulation that satisfies both collaboration partners.

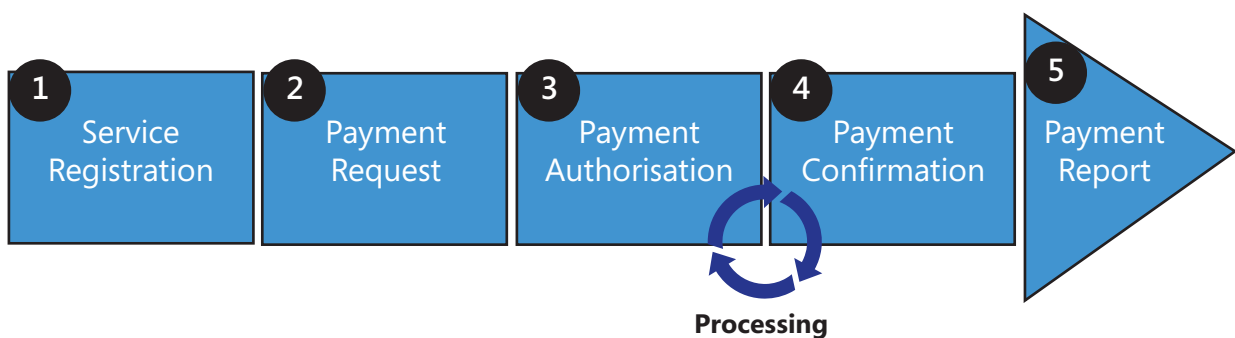
Retailers and merchants have to make a similar ROI determination. They have to be convinced that there can be any return on the investment in upgrading POS terminals to make them NFC reader capable, or to justify enhancing their electronic payment solutions. Some retailers and merchants will doubtless study the ability to charge a fee for the presumed customer convenience. And, for the largest big box/large space merchants, there may be associated cost to wiring their buildings to ensure connectivity.

The linchpin is of course, the consumer community. Two outstanding questions remain to be resolved. First, will the consumer see added value in replacing the existing cash/card paradigm with a mobile phone solution? Second, will the value proposition be sufficiently compelling so that the community will accept either fees from the financial services provider or data charges from their mobile provider?

Mobile Payment Taxonomy

There is a general acceptance that the mobile device represents a unique opportunity to innovate and deliver customer value in the payment realm. Like most service-based products, a payment is a process typically comprising of most or all of the following process steps:

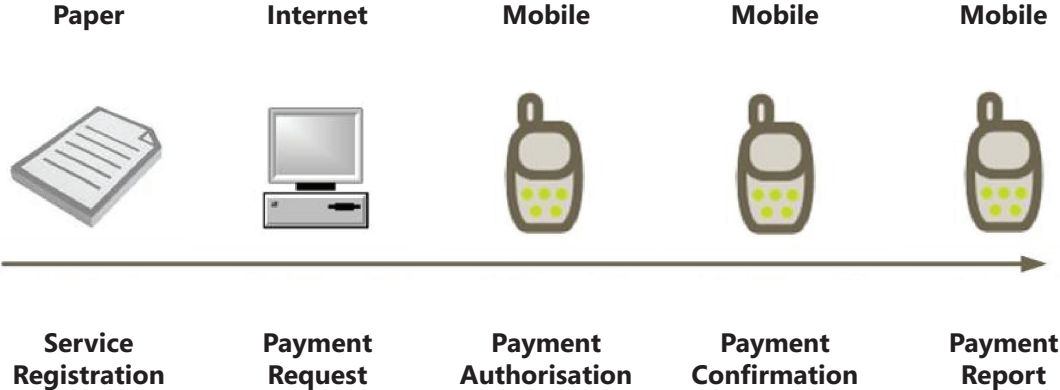
1. **Service Registration.** The consumer commences a payment service relationship with the financial institution or payment provider. This includes the enrolment and activation of the payment instrument.
2. **Payment Request.** The consumer initiates a payment to a third party (person, biller or merchant) and typically includes transaction value and timing as parameters. In some payment models the payment request is initiated by that third party.
3. **Payment Authorisation.** The consumer authorises the payment (including authentication) before it is processed.
4. **Payment Confirmation.** Confirmation of the payment outcome is provided to the consumer.
5. **Payment Report.** The consumer can review the payment that took place, at some point in the future.



Another attribute of the payments process, and one which further confuses market participants trying to assess the mobile payment landscape, is that some of the process elements may be carried out through one banking channel, whilst other process steps may leverage an alternative channel.

Consider the scenario where:

1. A consumer registers for mobile payment service with a bank via a physical form (for example as part of the signature-required account set up process)
2. Upon making a purchase online, the consumer decides to use his/her mobile phone to effect the payment (for example choosing 'mobile pay' during the check out process at Amazon.com)
3. Payment request is made to the consumer's mobile phone, which s/he authorises through the device
4. Payment outcome is confirmed – successful or otherwise – within the consumer's mobile phone
5. Consumer can review payment information, as a receipt or transaction history event, within the mobile phone.



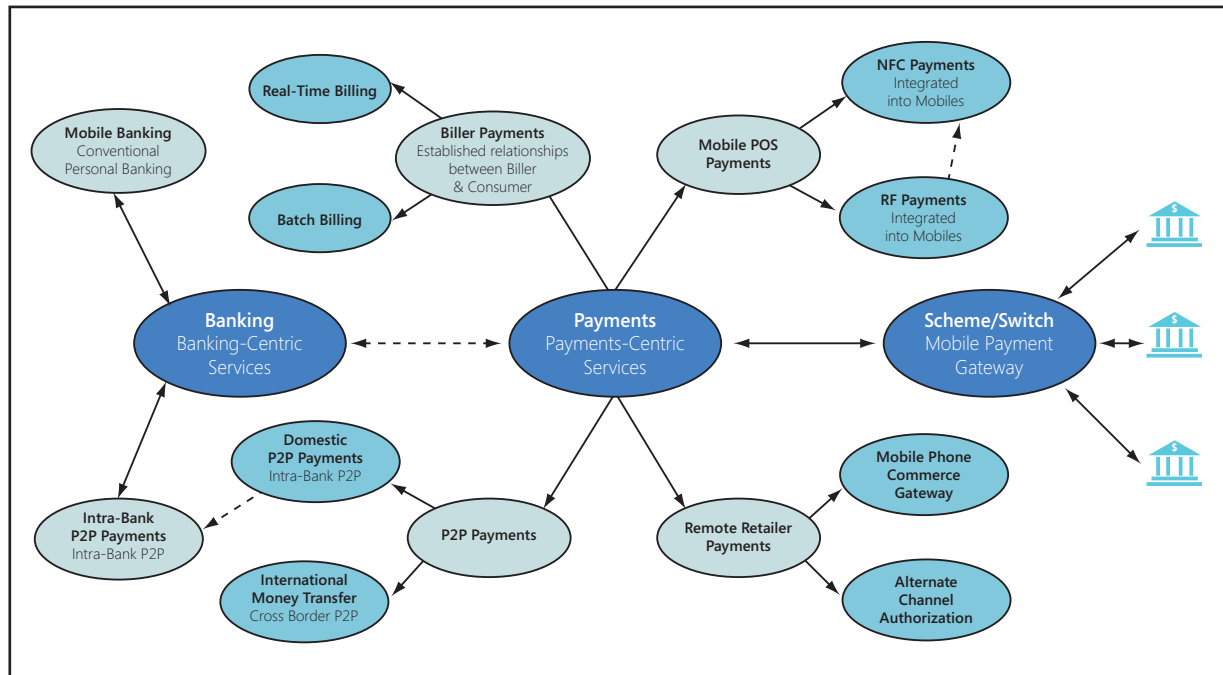
In this context, part of the payment process is carried out through the mobile channel, whilst other parts of it depend on existing and well understood purchasing and payment channels.

From a strategic perspective, a mobile payment takes place when any payment process step is carried out through the mobile device of the payer. Furthermore, financial institutions should consider this view when defining their own approach to mobile payments or a broader payments architecture. Refer also to the Microsoft document entitled *Dealing with Strategic Choice: The Payment Services Factory* available at www.microsoft.com/financialservices.

Defining Mobile Payments

The principal challenge financial institutions and payment processors face in defining their mobile payments strategy is that mobile payments means different things to different people. The disparate payment ecosystems, taxonomies and commercial structures in each geography further increase this confusion.

Documented below is a defined market set for mobile payments. The intent is to clarify the nature of the mobile payment opportunities and the relationship and inter-dependencies between each. The optimal mobile payments strategy – and the rest of this white paper – is based upon this mobile payments taxonomy.



The key distinction made within the mobile payment taxonomy regards who is being paid through the mobile channel. This paper recommends that financial institutions ensure their mobile payments strategy, technology solution(s), and service design take these multiple mobile payment elements into account.

1 – Paying Billers

Payments to billers represent a very significant share of transaction value in all economies, particularly developed ones. Currently in the US, paper bill payments are more than twice as prevalent as electronic payment models, representing major efficiency opportunities for banks, payment processors and billers.

Bill payments can be broadly categorised into two areas:

- Batch-based billing processes for standard utilities and services.
- Real-time and expedited bill payments. The most common form of real-time payments to billers are topping up pre-paid mobile airtime and other prepaid services (such as utilities).

Attributes that are unique to bill payments and must be considered in the mobile context include; billing system integration, fraud relevance (for example to get value from paying my water bill, you need to be able to steal my water on an ongoing basis), 'pull' capabilities (enabling billers to initiate the payment request), and possible integration with billing related alerts (such as 'your payment is overdue').

2 – Paying People

Paying other people is an everyday occurrence and a universal human activity. Person-to-person (P2P) payments are typically divided into two types:

- Domestic Funds Transfers to friends and family or to enable inter-personal commerce.
- International Remittance, moving money across national borders, typically in different currencies.

The reasons for this distinction are that different risk management, compliance and switching (or 'rails') capabilities are required to effect such payments. Person-to-person payments in the mobile context must address, amongst others, the following specific considerations; regulatory obligations, proactive risk monitoring and management, 'pull' capabilities (enabling payees to initiate the payment request), and integration with payment outcome alerts (such as 'you have been paid').

3 – Paying Merchants (and other remote commercial entities)

Television 'infomercials', direct marketing and the Internet have enabled consumers to purchase and pay for goods and services remotely. The mobile device merely increases the 'anytime, anywhere' element of such activities. In this context, we distinguish between two fundamental merchant models for mobile payments:

- Purchasing and paying online, typically for digital content (or mobile payment gateway services). In essence, this is mobile equivalence of online payment methods such as credit card gateways, PayPal, or even the use of 'mobile wallets' to fund mobile purchases of digital products such as ringtones.
- Payment authorisation via the mobile device. In this context, payment requests can be initiated by any party – remote merchants, corporations or even the treasury function of the bank – and the payee uses the mobile device as an authenticated mechanism to safely and rapidly approve the payment. This is particularly relevant for corporate banking transactions such as payroll, foreign exchange, wire transfers and other authorisations that may be enabled via the mobile channel.

4 – Paying Retailers (at the point of sale)

The most common transaction of all is the payment to the retailer – traditionally carried out in cash or through card-based instruments. Contactless card standards are evolving and converging with mobile phone capabilities enabling mobile device-based payment at the point of sale through a contactless interaction (bringing the payment instrument within a few centimetres of the point of sale terminal reader). Given the immaturity of the market in mobile point of sale payments, we recommend financial institutions evaluate a two-pronged strategy:

- Near-Field Communications (NFC) is the leading standard for mobile contactless transactions within a hardware chip embedded into the mobile device. Its key challenges centre on the complexity of the payment eco-system, particularly regarding the issuing and management of customer credentials. The lack of mobile devices currently available further retards the speed within which NFC will be a sustainable mechanism for mobile payments.
- Contactless Stickers and Tags offer card issuers a simple way to migrate existing card holders to mobile payments. By simply changing the form factor to a mobile phone-friendly tag or sticker – such as First Data's GoTag or M-Com's Swiftpay – issuers can rapidly integrate payment and banking services whilst delivering universal device reach [this overcomes the constraints outlined in NFC above].

Assessing the Risks and Economics of Mobile Payments

While this document deals explicitly with mobile payments, access to account and other Financial information will influence how consumers adopt mobile payments and the manner in which they use them. Market research clearly indicates that consumers prefer to have a single product and technology source for banking and payments through the mobile channel – ideally through a single set of enrolment, customer care and preference management tools that deliver a seamless user experience.

Similarly, the research suggests that security concerns remain the single biggest barrier to the adoption of mobile financial services. As such, both banks and consumers prefer to start their mobile journey through access to risk-free mobile information services (such as account balances), and having gained trust in the channel, subsequently adopt mobile payment services. Adoption data from banks who have mobile solutions in market reinforces this insight – financial institutions delivering mobile banking services have higher adoption rates of mobile payment services than those that offer mobile payments on their own.

For financial institutions, banking, alerts and information services through the mobile channel will provide the best possible entry point into most mobile payment models. Furthermore, those that deliver an integrated user experience between payment and other banking services within the mobile channel will have the highest rate of customer satisfaction, adoption and usage for payment transactions.

Economic Drivers

New banking and payment technologies are often interesting from a market perspective, but the economic rationale for investing in mobile payments is also powerful.

Revenue Models

The most obvious source of value in this context is direct transactional fees from both end-users (consumers, small business and corporate) and merchants. Whilst the revenue and pricing models vary vastly across service types and jurisdictions, most financial institutions can make US\$3-5 per customer per month a reality across their retail customer base (whether that be from bill payments, top up or P2P transfer of funds).

Revenue models in payment systems are complex, and this document does not aim to articulate all possible options in this regard. The same complexities and opportunities exist within other payment channels. Revenue models can be based on fixed transactional fees, percentage of transaction value, subscription fees or a mix of these, and these can be charged to the payer and/or payee (in the latter case, particularly commercial entities).

A very broad range of revenue models are employed globally and there is no single model that delivers the highest yield to financial institutions and ecosystem participants. Pre-existing market conditions are likely to have a significant influence on the revenue model most likely to succeed for any given mobile payment service.

Customer Retention and Acquisition

Payment interactions also deliver increased customer intimacy, and as a result additional customer profitability. According to a study by Microsoft partner Fiserv carried out in conjunction with SunTrust (US\$179bn in assets), consumers who routinely pay their bills electronically through their financial institution have almost twice the number of products (5.34 as against 3.21) and deliver more than twice the annual profitability (US\$102.17 versus US\$54.87) of the average retail customer.

The same study also saw the average churn rate reduce dramatically (1.45 per cent versus 6.59 per cent) when consumers became regular electronic bill payers. In other words, beyond direct transactional revenues, electronic self-service payments deliver a compelling bottom line impact to financial institutions.

An alternative assessment by mobile payment solution provider M-Com with one of its customers saw the retention rates of Gen Y consumers transacting via the mobile channel improve from 85 per cent (or 15 per cent annualised baseline churn rate) to 93 per cent.

Cost Elimination and Mitigation

For most financial institutions, paper-based payment transactions are expensive to support and offer few opportunities for differentiation. These costs are not only transactional (for example labour and technology costs) but are augmented by manual interventions required under error, exception and fraudulent conditions. Whilst the cost metrics associated with processing checks and cash payments vary substantively across jurisdictions, financial institutions and payment types, it is well understood that electronic payments – including those carried out through mobile phones – have a direct positive impact on for the cost structures of payers, payees and financial institutions alike.

The cost savings to ecosystem participants are so significant that regulatory bodies in a broad range of countries – including Australia, Malaysia, UK and the USA – are choosing to intervene to ‘encourage’ migration to more electronic payments.

Measuring Return on Investment

So what does all this mean? Where is the ROI? Calculating the ROI from mobile payments for a typical retail bank is relatively straight forward as shown by this example.

Let's assume Woodgrove Financial Bank has one million accounts, with 10 per cent mobile payment adoption and usage, charging US\$5 per user per month (with an average total channel cost of US\$1 per user per month). If its pre-existing metrics include 12 per cent customer churn, US\$500 average customer profitability, and US\$100 costs of customer acquisition, the bottom line impacts of operating mobile payments services will be US\$6-7m annually.

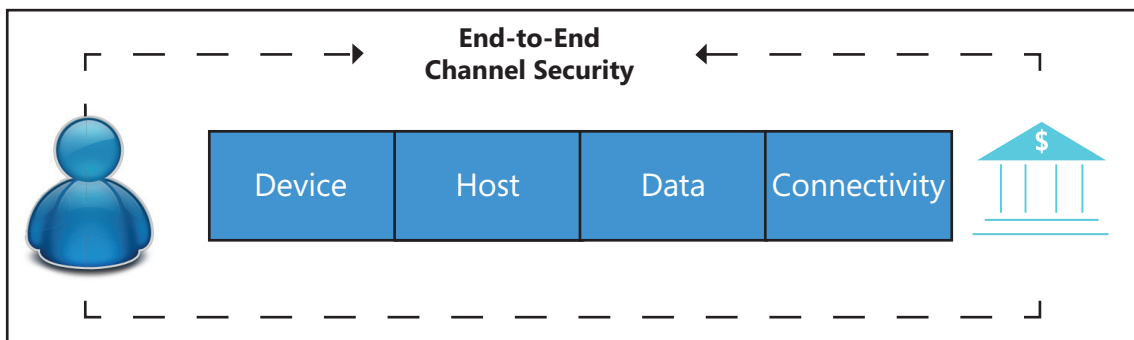
Risk and Regulatory Issues

When it comes to managing risk associated with electronic services, nowhere are the demands more intense than in payments. As a new and emerging channel, the mobile channel is and will continue to be severely scrutinised.

End-to-End Security

Delivering mobile payments safely end-to-end means addressing concerns throughout the process and technology chain. These include :

- a) **Authentication** of the consumer, bank and mobile device. The authentication requirements change in accordance with the access modes (SMS, Mobile Browser, USSD and Downloaded Application) being deployed by the financial institution and the payment type.
- b) **Transport Security** through all technical links in the value chain – from mobile device through payment processing infrastructure to the core systems of billers, retailers and other third parties.
- c) **Risk Management Tools** and capabilities to protect from topical infrastructure risks, such as security threats/attacks, natural disasters, staff/insider fraud, vast peak volumes and other similar risks.
- d) **Consumer Behaviour** to minimise the security risks brought about by social engineering threats and create consistent 'good habits' when it comes to mobile payments.
- e) **Regulatory and Compliance** to ensure all parties in the mobile payment transactions meet their legislative, industry and internal compliance obligations. This includes: Know Your Customer (KYC), Anti-Money Laundering (AML), Sarbanes Oxley (SOX), Basel II and a broad range of similar regulatory obligations.



Risk Management Tools

As is the case with other channels and payment instruments, financial institutions must incorporate risk management tools into their mobile payment solutions. Examples of best practice in this context include:

- End-to-end auditing and logging capabilities for both consumer and employee activities
- Real-time monitoring and alerting for exception conditions, such as velocity and value thresholds, failed logins and transactions and mobile device authenticity
- Business rule management for service enrolment, activation and credential changes
- Protection from typical security attacks, such as malicious code and buffer overflows
- Integration into existing risk and fraud systems to proactively monitor unusual cross-channel and channel-specific activities.

Consumer Concerns (and Behaviour)

The leading concern amongst consumers regarding mobile payments is insecurity. A number of technical and behavioural interventions are available to financial institutions who want to overcome this concern. These include:

- Delivering mobile alerts and information services to consumers in the first instance to develop channel trust.
- Provide and communicate service guarantees and real-time customer care processes (such as immediate remote service suspension).
- Reinforce safety and security within the aesthetics and syntax of the consumer's experience (such as centre brand messaging around security).
- Visibly deliver best practice payment technology elements, such as transaction identifiers and effective repudiation management.

Compliance

National, international and regulating industry bodies already have an interest in payment systems and services, and are becoming more engaged and prescriptive in the compliance requirements for providers of mobile payment services. International examples in this context include PCI Data Security Standard, Anti-Money Laundering (including Suspicious Activity Reporting (SAR)), Basel II (internal and external fraud provisions) and Know Your Customer legislation and guidelines.

The employment of 'industry best practice' and use of 'banking grade' architectural principles upfront in the design and deployment of mobile payment solutions will assist financial institutions to reduce the cost and time-to-market impact of their compliance requirements as they apply to mobile payments.

Mobile Payments Applications and Devices

As discussed, mobile payments is of strategic value in all geographies; in both developed financial markets, and also developing markets. However, it is also true that the nature of transactions, the customer experience demands, and usage models may not be developed to the same extent or in the same way in each market. But to gain true global acceptance for a mobile payments solution, and to offer bank and consumer choice, the following factors must be present:

1. Open loop payment processing
2. Interoperability across phone devices and mobile phone carriers.

'Open loop' processing is important if mobile payments are to become a mainstream means of initiating funds transfers to people or businesses with which the sender has no pre-established relationship (either personally or via a phone provider or bank). In other words, the payment must be capable of being processed via the open national or international payment networks, and not restricted to a 'closed loop' environment. Examples of closed loops are in-bank networks, or those requiring membership in a mobile payment network.

An open loop system should integrate to a bank's existing payments architecture for delivery of the transactions to the national payment infrastructures. An example of this trend is the 2009 announcement from the UK Payments Administration seeking a national mobile payments network that would connect into the national Faster Payments scheme.

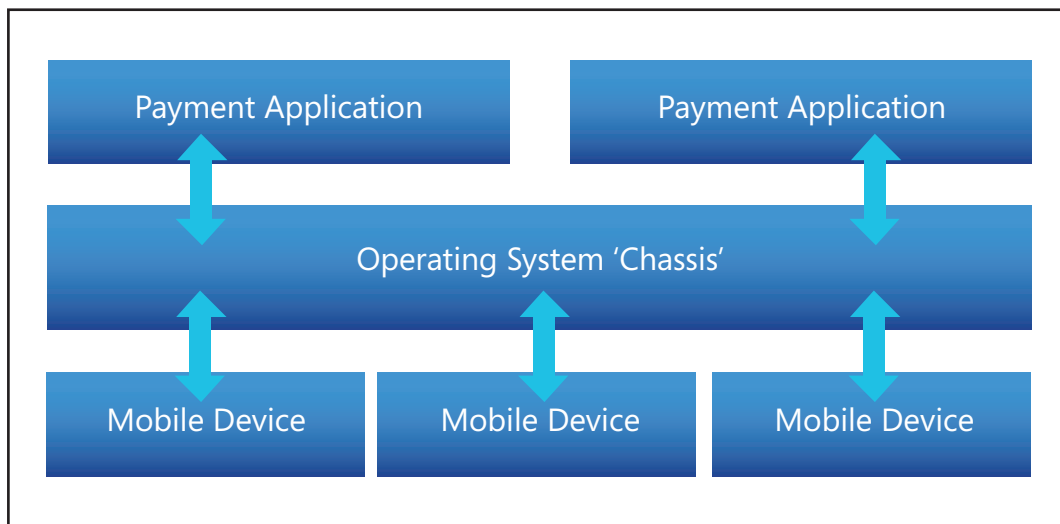
The Need for Interoperability

The mobile payment experience should be delivered across multiple mobile devices, manufacturers and cellular phone carriers to accommodate the personal preferences of the target audience: the consumer. This is the only way that choice can be extended across global markets. At the heart of interoperability is the layer between the hardware and the payment experience: and that is the mobile operating system.

The approach of treating the mobile device operating system as a 'chassis' creates two valuable characteristics:

1. Interoperability towards handset manufacturers with defined interfaces to firmware
2. Separation from the device to the payments application.

This means payments application providers can develop solutions for a single operating system than can run across all supported devices and networks. This is true interoperability and leads to a vast ecosystem of software and hardware partners linked through a common operating system; thereby delivering flexibility and choice – as dictated by regional usage models – across all markets.



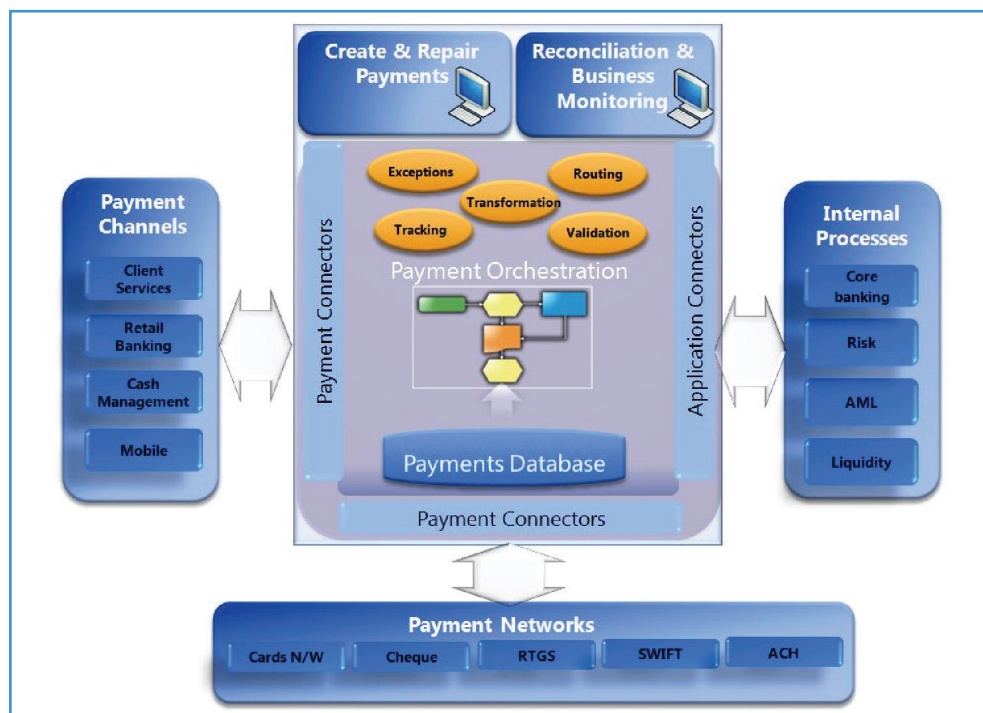
Integration with Enterprise Payments Strategy

Just as important as the mobile device platform is the integration to the bank's existing payments infrastructure. Banks have struggled for the past 30 years with a 'hodgepodge' of legacy and new applications and are now faced with streamlining this by implementing enterprise-wide payments architectures. In the rush to bring solutions to market care must be taken not to reinvent the old model by creating yet another silo for mobile payments!

Although the implementation of mobile payment processing is new for many institutions, the enterprise view must be preserved. The Microsoft view of this is called the Payments Services Factory and is centered around a standards-based, interoperable financial messaging framework.

An Enterprise Payments Framework

A framework approach can be taken to simplify back office operations by focusing on seamless integration to enable interoperability. New payment services and applications can be integrated to coexist with legacy payment, core banking and compliance systems.



Such a technology framework can be implemented and configured to meet the operational and product demands of any bank's payments group, and facilitates the integration and process management with legacy applications. This framework solution orchestrates the lifecycle of payments and provides business process management (BPM) and business activity monitoring (BAM) tools to monitor the state of operations. Data transformation, technology adapters and business rules are implemented to direct payments from the delivery channels through the back office of the bank, using payment applications and services as required, before being delivered to the appropriate clearing and settlement mechanisms.

Conclusion

Mobile payments are a complicated business. There are multiple models in play from banks and mobile operators across different global regions, but also within the same country. Clearly this aspect of the industry is in a constant state of flux, but it is undeniably a growth market and an opportunity for banks to win client loyalty and profit from new transactional fees

Despite the turmoil, the time to invest in mobile payments and broader enterprise payment infrastructure is now – mobile operators and third party brands are investing in this space, consumers are demanding better payments options and user experiences, and the value propositions for mobile payment models have been proven.

Banks must look at this opportunity strategically and pragmatically – the ROI and loyalty payback can be substantial.

Microsoft and its extensive range of partners such as M-Com, are here to help. We work with financial institutions and leading banking service providers to deliver solutions that enable a compelling user experience and coherent deployment models that are interoperable across mobile devices and operators. And by integrating this functionality to the core of the banks' payment applications, Microsoft lays a foundation for the growth of mobile banking and payments in any financial institution, anywhere.

For further information, visit:

www.microsoft.com/financialservices

www.mcom.co.nz