There is no question that mobile will become a critical transaction channel for financial institutions, retailers and their customers, or that mobile banking, mobile payments and mobile commerce offer significant advantages and opportunities to early adopters.
But among considerable hype and a plethora of industry initiatives, the challenge of meeting ever-more demanding customer service expectations remains, and organizations are under even greater pressure to ensure the right infrastructure is in place to handle a future of accelerating change.

This paper explores the many ways that forward-thinking banks, processors and retailers are creating new and innovative mobile services for their customers, using existing back-end services and systems.

The number of people using mobile payments is expected to reach 2.5 billion by 2015\(^1\). Mobile money transactions are expected to reach \$670\ billion by the same date\(^2\), and more than 85 percent of point-of-sale (POS) systems are expected to accept mobile payments by the following year\(^3\). Mobile technology is set to transform the way banking, payments and commerce are conducted for a significant proportion of the market.

Although the advent of mobile introduces many new ways to initiate payments and to interact with customers, the back-end services that process transactions thereafter remain largely unchanged. The introduction of mobile-enabled services need not entail the introduction of new infrastructure, particularly where the move towards more agile payments processing has already been made. Equally, as the competitive arena moves to the mobile space, it may prove to be the trigger to adopt a more agile approach, and the technology to support it, for those organizations hindered by inflexible legacy payment infrastructures.

### Mobile banking
Retail and corporate banking have by and large taken two distinct paths when delivering mobile solutions to their customers. Differences in typical transaction volumes and values, security requirements and liabilities have necessitated a different approach. However, as the technology evolves and services develop, those differences are narrowing.

### Mobile retail banking
Being able to access account information from anywhere, at any time, is of great value to customers. Initially offered as a competitive differentiator, in some parts of the world mobile banking applications have become a commodity service, with most consumers today turning to mobile banking for one of the following services:
- Checking balances
- Reviewing transaction history
- Transferring funds between accounts
- Locating an ATM or branch

This first wave of mobile banking applications is focused on presenting information rather than enabling transactions from a mobile device. However, as mobile devices develop and the tablet form lends itself to more accurate data entry, the next logical step is to offer transaction banking initiated from a mobile device. This can include services such as:
- Person-to-person (P2P) transfers
- Mobile bill payments
- Mobile top-up
- Remote deposit capture
- Mobile fraud alerts

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\(^1\) Juniper research, July 1, 2011  
\(^2\) Juniper research, July 1, 2011  
\(^3\) ABI Research, August 2011
In an increasingly mobile society, the ability to pay individuals, settle bills, top up prepaid cards and accounts, and deposit checks without having to visit an ATM or branch is of obvious value to consumers. What’s more, mobile banking can be a significant cost-saving activity for financial institutions by reducing dependence on in-branch and call center interactions.

Once transactions are enabled from the phone, the traditional distinction between mobile banking and mobile payments breaks down. Customers are provided with an integrated set of mobile financial services, which can be viewed as an extension of online banking via a new set of devices.

However, there are additional opportunities that are specific to mobile functionality: the combination of real-time communications, location-based services and banking functionality on one device is a powerful one, which offers plenty of scope to create new value-added services.

At a basic level, a typical smartphone platform can add interactive GPS mapping to existing ATM locator services. More advanced offerings give customers the ability to manage their money in real time according to needs and circumstances: for example, consumers can transfer funds from another account or arrange an overdraft if a transaction is denied at the POS and then proceed with the original purchase. Alternatively, mobile banking applications can provide selected opportunities for contextualized advertising based on recent activity and current location.

### OTP Bank

OTP Bank, the largest bank in Hungary, has incorporated SMS alerts into its fraud management program. Working with ACI Worldwide and its mobile partners, OTP has extended its existing ACI Proactive Risk Manager™ fraud detection solution to trigger SMS alerts to customers in near-real time when it identifies a suspicious transaction. Customers can then approve or deny the transaction. Banks often underestimate consumers’ readiness to engage with new channels such as SMS alerting. But OTP Bank has found that more than 30 percent of consumers are willing to pay for the service. Its fraud level is under one basis point, which is significantly lower than the industry average for the region. The number of users has constantly grown and the bank has virtually no customer attrition. Instead the retention rate has increased and the subscription rate continues to grow by 30,000 paying customers a month.

### Pacific and EMEA

Many banks in Asia Pacific and EMEA have enhanced BASE24® to provide a mobile top-up service. Customers with prepaid mobile phone accounts can purchase additional minutes 24 hours a day by using the bank’s ATM network. The customer uses a bank card at the ATM in the normal way and selects the mobile top-up service. They then choose their mobile network and enter their mobile phone number and the amount they wish to add to their account. The airtime is then instantly credited to the phone. Airtime can also be added to any other prepaid account as long as the mobile number is provided.
Mobile corporate banking

Business banking is, by its very nature, much more complex and has seen a slower uptake of mobile solutions than retail banking. However, the benefits of banking on the move apply as much to corporations as to individuals, and demand is growing for time-sensitive wire or even ACH batch payments that require authorization by nomadic executives. These payments, which are often high value, are rarely initiated through a mobile device for security reasons. Instead, the mobile device is the means through which a secondary user can authorize payments that have already been set up.

However, the widespread adoption of tablet devices has removed some of the obvious downsides for mobile corporate banking applications. The new form factor enables banks to go beyond their slimmed down offering for mobile phones, and to extend the rich functionality of online banking to the mobile space, including the initiation of payments and creation of new payees. It can also offer an optimized combination of online features, mobile functionality and improved interface and usability.

ACI Enterprise Banker™

A regional bank in the U.S. has extended its existing implementation of ACI Enterprise Banker™ to deliver mobile corporate banking applications that are optimized for both smartphones and tablets. Traditional retail mobile solutions did not meet some of the more sophisticated needs required by the business community, including the need to review and approve wire payments before release. What’s more, users had to be at their PC or laptop to complete transactions, which was not always possible for traveling executives and business owners. ACI Mobile Enterprise Banker™ enables them to perform account transfers, access account data and approve transactions securely from any mobile device. As an early adopter of these business mobile solutions, the bank has been able to differentiate itself with a solution that surpasses the limited retail solutions offered elsewhere.
Mobile payments
The mobile payments landscape is a complex one: numerous distinct schemes co-exist and overlap. A user’s choice of scheme will depend on where they are in the world, who and where the recipient is, who their favorite retailers are and the services available from their bank or telecoms provider.

The bank applications and mobile browser-based services discussed above are perhaps the most obvious mobile payment methods, since they are an extension of using a standard browser to make an online purchase. But other options have emerged that are more closely related to the specific form and functionality of mobile devices. ACI Worldwide has identified an additional four broad categories of mobile payment types:
• P2P payments for unbanked customers
• P2P payments for banked customers
• Retailer payment applications
• NFC (near field communication) contactless payments

P2P payments for unbanked customers
For unbanked and under-banked populations, barriers to financial inclusion include the absence of a branch within reasonable distance, high transaction costs and fees, identification requirements, the need to have a minimum balance and, in many cases, the need to supply the bank with a physical address.

In addition, those at the bottom of the financial pyramid have specific financial needs that are often not met by formal financial institutions, such as accepting both international and domestic remittances, receiving payments for casual and seasonal employment, storing money for short amounts of time, and sending and receiving funds to and from individuals. The use of mobile phones, which frequently have much greater levels of penetration, enables these financial needs to be met largely through SMS-based services.

For people at the bottom of the financial pyramid, being able to accept remittances and use money immediately upon receipt is important, and the mobile channel represents a significant opportunity for financial providers to serve these financially excluded populations. Initially these schemes facilitated the movement of money only, but as they grow in transaction volumes and develop savings functions they become deposit-taking organizations. There is an opportunity therefore for banks to engage with this market through partnership with non-banking players and the provision of fund-holding facilities.

P2P payments for banked customers
Banks can add a feature to their mobile retail banking solution that enables customers to move money from their checking accounts to that of a customer at another bank using only an email address or a mobile phone number. Often considered to be a replacement for checks or bill payments, customers access this P2P payment feature from their mobile banking application on their smartphone, through online banking or from an ATM. They enter the name, mobile phone number or email address of their chosen recipient and the amount they want to transfer; the recipient receives an email or text message that alerts them of the payment with instructions on how to access the money.

Some of these services enable payments to be sent across country borders through links between banks or with payment service providers. To support these cross-border payments, several banks have developed ties with Safaricom’s M-Pesa in Kenya, for example, or with traditional remittance providers such as Western Union, and are thus expanding the scope of their traditional payment services.

Retailer payment applications
In addition to introducing mobile commerce solutions (see page 7), a number of retailers – notably fast-food outlets and coffee chains – have extended their mobile applications to include mobile payment functionality. These are funded by closed-loop systems, such as stored-value or store-issued virtual prepaid cards, which are also tied to their loyalty and rewards programs. As with any form of prepayment method, the mobile payment application offers the retailer a lower transaction cost than debit and credit cards and improves working capital through the advance float.
NFC contactless payments
Leveraging NFC technology enables mobile phones to be used in a way similar to contactless cards in order to make payments for goods or services at the POS.

NFC can be viewed as the next phase in the evolution of payment products from magnetic stripe technology through EMV payment (chip) cards to EMV contactless cards. In fact, NFC is widely recognized as a change in form factor for payment tokens, rather than a radical new payment technology. It is categorized as a mobile payment type because the relevant technology – the NFC-enabled chip and a supporting contactless payment application – is embedded in a mobile phone. Transactions are conducted over the same short-range network as the contactless card rather than a mobile phone network.

To banking systems, therefore, the mobile device can be managed much like a card and the actual payment transaction goes through the processes already in place. The impact on the back-end infrastructure is minimal, especially where an agile payment platform is in place that can accept, manage, secure and operate multiple payment types from multiple channels.

As more NFC-enabled devices are shipped to consumers, and retailers begin deploying payment acceptance technologies that support contactless products, financial institutions that already issue physical cards will be in a good position to leverage their existing infrastructure to issue virtual cards on NFC-enabled phones for mobile contactless payments.

Absa Bank
Absa Bank in South Africa has extended its existing BASE24/BASE24-eps® system to develop a new P2P service for payments between banked and unbanked individuals. Absa’s CashSend™ service enables individual and business customers to transfer funds electronically, via an ATM or mobile phone. The recipient is then able to withdraw those funds from any of Absa’s ATMs, even if that recipient does not have a bank account. Rather than using an ATM card of their own to authorize the withdrawal, the recipient enters a code generated by the CashSend system and a corresponding access code is created and sent to their own mobile phone by the sender. Currently, Absa records an average of 78,000 CashSend transactions per month.

ACI Token Manager™
A number of ACI’s customers, including President’s Choice in Canada, use ACI Token Manager™ to support the lifecycle management of smart cards, including EMV, contactless, single and multi-application cards, and to provide the data preparation and personalization capability for both mass card and instant issuance. The solution has the functionality to support mobile contactless provisioning and manage applications and keys on NFC phones. This allows financial institutions to manage both smartcards and smartphones from a single solution.
How mainstream do you think the following payment types will have become in your market by 2020?

Please rate on a scale of 1 to 4, where 1 is nascent and 4 is a mainstream payment product

Research

Research conducted on behalf of ACI Worldwide shows that top-tier banks (those with $100 billion or more in assets) in particular believe that mobile-based contactless payments, mobile wallets and mobile P2P payments will be mainstream by 2020.

Mobile commerce

Despite significant investment in CRM applications, retailers still have immense difficulty connecting the 'last mile' - what the customer actually does in the store - except through proprietary loyalty programs. Advanced mobile functionality has exacerbated the problem, as consumers use smartphones to check reviews, compare pricing, and receive coupons and offers in stores.

As a result, brick-and-mortar retailers have been losing the battle for a real-time, relevant conversation with customers in their own stores. However, retailers are developing new ways to capitalize on the rapidly evolving use of mobile devices, through the development of mobile commerce solutions that offer a new way to interact with customers. These solutions bring together in a single application a number of elements that include:

- Receiving advertising and marketing
- Merchandising of individual products
- Incentive delivery via coupons
- Managing loyalty and rewards

Mobile commerce applications enable retailers to provide highly personalized communications with customers in a real-time fashion from the moment the consumer enters a store to the time they check out. They also provide retailers with a wide array of reports, based on analyses of consumers’ in-store behavior, which enable them to assess which offers translate into purchases and support more effective customer targeting.

A key element in a mobile commerce solution is the mobile wallet, a ‘virtual wallet’ that can be filled with various types of accounts, rewards, discounts and other services. Mobile wallets store these accounts either in a secure ‘vault’ in a cloud-based service or on the secure element of an NFC-enabled phone. In this way, consumers can pay with their phones and participate in loyalty or reward programs without having to carry multiple cards in their wallets.
The following scenario is an example of how a mobile commerce application would work:

1. The consumer 'checks in' at the store’s entrance and opts to receive real-time advertising and offers while they shop, either by scanning a QR (quick response) code with their phone's camera or tapping an NFC tag if their phone is suitably enabled. Offers can be simple universal discounts to everyone making purchases that day, or sophisticated personalized offers that are enabled through close integration of the mobile commerce application with existing CRM solutions.

2. At the payment stage, the consumer 'checks out' by scanning the second, unique QR code or tapping the tag on the NFC-enabled POS device.

3. The total amount due is sent to the phone’s mobile commerce application, which can then recommend a payment method. The customer can be informed of any outstanding value on a gift card or reward points available from using an in-store branded card. Certain mobile commerce solutions also enable tender steering by listing all the payment types available based on the amount of discount available from each one.

4. The consumer can tap on each account for additional information, such as the associated interest rates and terms; they can even split the total amount due among different payment types. Payment can be integrated with reward or loyalty programs and any rewards earned can be presented back to the smartphone application.

5. Having selected their preferred payment type, the consumer finally authenticates the transaction either by entering a PIN number or biometric identifier such as a thumbprint.

6. Once the transaction is complete, an image of the receipt can be sent to the phone application. The consumer can also be given the option of receiving it by email.
Managing fraud in the mobile environment

One of the hurdles to mobile financial services is the perceived security threat. Customers instinctively feel that mobile banking and mobile payments are less secure than their online equivalents. This is not necessarily the case and the challenge that financial institutions face is thus twofold: protecting mobile payments and banking, and communicating the security issues to customers. Those that offer customers the greatest levels of safety and reassurance will gain a competitive advantage as mobile financial services become more mainstream.

NFC payments, when supported by EMV with local authentication, are relatively low-risk: they are typically used for low-value purchases of goods with little re-sale potential and often capped in value. The real risk occurs if consumers download insecure NFC applications (see page 10). However, at present these payment types are not sufficiently lucrative to justify a fraudster’s effort. Given the small size of the market share of mobile payments as a whole, they are not considered a viable source of income for fraudsters. This will inevitably change with wider adoption. Security measures that are commensurate with the increased level of risk will need to be developed and based on the experience of protecting online payments.

It must also be noted that mobile devices can improve financial security through features such as enhanced authentication transaction alerts and dynamic PINs. In addition, having access to real-time (or near-real-time) account information can aid fraud prevention. The very portability of mobile phones, and the typical way in which users keep them to hand at all times, makes them the ideal method for sending and receiving information about account activity. Given the depth of user information they contain - including the location, purchasing behaviors, interests, contacts and more - mobile devices can also serve as a fraud reduction tool for providers.
When it comes to banking, the general pattern is that typical online fraud types are extending into the mobile space, rather than card fraud types. The precautions taken for online banking apply equally to mobile banking, therefore: customers need to be reminded to be alert to phishing attempts, avoid downloads from an unknown source and adopt other basic online safety practices.

That means that the biggest current risk for mobile banking is the downloadable application. Apple’s ‘closed shop’ approach at iTunes ensures that all iPhone applications are rigorously tested for malicious code, Trojans or key loggers. Android’s open application policy is a greater and growing threat. Anti-virus programs for Android are available and will be essential for mobile payments to succeed on this platform. Banks may also find it necessary to bypass third-party application stores and make banking - and payment - applications available from their own secure source to ensure the integrity of the software their customers download.

Although securing the phone, the bank account and any data sent over mobile networks is critical, there is no way to guarantee success. Good fraud prevention practice therefore focuses on how to prevent losses in the event of a security breach. It is about knowing who the customer is, building an accurate profile of ‘normal behavior’ and activity across all channels, identifying

What are the top investment priorities in tackling fraud for your bank by channel?

Please rate on a scale of 1 to 4, where 1 is a low priority and 4 is a top priority
anomalies, and then flagging them up in the form of alerts either to customers or to internal analysts. In this way, activity in the mobile channel is considered both in isolation and in context of behavior across all other accounts and payment channels. The process is the same whether for online banking or mobile and the same solutions that check for fraud at the transaction level can also be used in the mobile environment.

As fraudsters move from card to online, one of the biggest threats is ‘man in the browser’ where fraudsters intercept the banking session itself, as discussed in ACI’s recent white paper, Securing Online Banking. Many banks are not as prepared as they could be and this lack of preparedness is transferred to the mobile banking operations and will need to be addressed to secure mobile banking in the future.

Where next?
Mobile devices continue to develop, with new hardware, operating systems and software coming regularly to market. With each new iteration comes the ability to carry out a wider set of transactional services. What is currently missing is a universal set of standards that enable interoperability, but as options are developed and the market determines its preferred services, these will emerge, initially in the domestic sphere before applying to cross-border international payments.

Given the level of unpredictability that currently prevails, the most successful schemes will be those that take advantage of existing payments processing infrastructure, particularly where the real-time capabilities that mobile demands have been deployed. Mobile will rightly be a trigger for organizations to implement a more flexible payments platform that enables them to adapt to changing conditions with agility. But where these platforms are in place, businesses can overcome the challenges and focus on the opportunities presented by mobile banking, mobile payments and mobile commerce.

→ The portability of mobile phones makes them the ideal method for sending and receiving information about account activity.
About ACI Worldwide
ACI Worldwide powers electronic payments for financial institutions, retailers and processors around the world with the broadest, most integrated suite of electronic payment software in the market. More than 90 billion times each year, ACI’s solutions process consumer payments. On an average day, ACI software manages more than US$12 trillion in wholesale payments. And for more than 160 payments organizations worldwide, ACI software ensures people and businesses don’t fall victim to financial crime. We are trusted globally based on our unrivaled understanding of payments and related processes. We have a definitive vision of how electronic payment systems will look in the future and we have the knowledge, scale and resources to deliver it. Since 1975, ACI has provided software solutions to the world’s innovators. We welcome the opportunity to do the same for you.