TSYS® People-Centered Payments

White Paper

What's Missing? Creating a Comprehensive Mobile Wallet Solution

By Chris Colson

The mobile phone can act as a mobile entertainment center that is able to play music, videos, and games. For many individuals, the phone has become the default device with which to search the Internet, access mobile banking services, make reservations, send and receive text messages, provide social network updates, and more.[1]

– Smart Card Alliance

Identification Credentials That Could Securely Integrate into Mobile Devices

Credentials mobile devices can store:

- Very simple software tokens
- One-time passwords
- Personal identification numbers (PINs) and passwords
- Public key infrastructure (PKI) certificates
- Biometric data

Functionality that can be enabled by greater credentialing:

- Storage of benefits and entitlement information (e.g., health care services)
- Electronic signatures for online transactions
- Loyalty program applications
- Protection of data on the device
- Financial services such as electronic banking, mobile payments, and online payments

EXECUTIVE SUMMARY:
The Great Potential for Mobile Wallets

Paying for a latte at Starbucks is now as simple as tapping a smartphone over a payment terminal. "Mobile wallet" technologies have made it easier than ever for U.S. consumers to make cashless purchases, and the opportunity for mobile payment solutions is growing rapidly. About 145 million people in the United States owned smartphones as of August 2013, translating to a 60.8 percent mobile market penetration.[2] Add to that our growing addiction to smartphones as a society: It takes the average person 26 hours to report a lost wallet, while it only takes 68 minutes to report a lost phone.[3]

This report highlights critical factors that will determine the mobile wallet's future adoption in the U.S. market and its acceptance among merchants, as well as explores how a more robust wallet solution can solve consumers' needs.

While the use of mobile payment technology has seen slow but steady growth in the U.S., we continue to lag behind other regions of the world. In Southeast Asia and Africa, for example, consumers have quickly transitioned from traditional cash-based transactions to mobile-based payments, bypassing the need for plastic credit cards altogether. The high adoption rate of mobile in those regions is due partly to the lack of a robust card-based payment infrastructure that exists in the U.S. market, making mobile payments a welcome alternative.

But U.S. mobile wallet providers also have struggled to win over consumers, many of whom are leery about the security of mobile transactions. According to Datamonitor, one in five U.S. smartphone users — or about 29 million people — has installed a mobile wallet application.[4] On the surface, these installation numbers are encouraging. But dig deeper, and it's clear that the actual usage of mobile wallets remains anemic: Only 1.2 percent of the $1.6 trillion in total credit card transactions made by U.S. consumers in 2012 were facilitated by a mobile payments solution.[5]

Mobile-based payments have not gained traction as broadly in the U.S. as they have in other parts of the world due to various factors that contribute to the complexity of delivering a comprehensive mobile wallet solution. These include the sheer number of Mobile Network Operators (MNOs), a large and diverse U.S. population, merchants' reluctance to accept mobile payments and the role of banks and government.

TSYS conducted a study in January 2014[6] to address some key issues that will affect the evolution of the mobile wallet and to reveal consumers' wants and needs from a mobile wallet solution. Questions addressed in *The TSYS Mobile Wallet Study* include: What will compel the U.S. market to enthusiastically adopt mobile wallet applications? And what must a solution include to gain widespread appeal?

For example, the study found that consumers desire a comprehensive mobile wallet that provides not just payment capabilities, but also the ability to replace the physical wallet, such as storing their driver's license information and other personal identification. Additionally, the study revealed that the key driver to making the wallet truly functional for consumers would be the integration of their identification.

Federal government entities issue various personal identification documents, such as green cards, voter registration, and licenses. This suggests that mobile wallet developers would likely want to partner with government agencies, particularly states' departments of motor vehicles (DMVs), when building their solutions.

A Few of the Mobile Wallet Applications Available Today

The Starbucks Card Mobile App[7]

- Leverages a consumer-funded prepaid account
- Generates more than 10 percent of the company's U.S. transactions
- Processes more than 4.5 million mobile payment transactions per week (as of May 2013)[7]

Visa's V.me

- Uses cloud technology to enable payments using NFC-based technology for in-store payments
- Allows for placement of any card type in the wallet

MasterCard's PayPass[9]

- Enables Tap & Go at PayPass-accepting merchants with a PayPass-enabled phone, card, key fob, or mobile payment tag

Google Wallet

- Stores credit card information for any card type in the cloud that can be accessed when a purchase is made

Apple's Passbook

- Stores coupons, boarding passes, movie tickets, gift cards and other non-payment information (does not store payment card information)

Isis

- Founded by AT&T Mobility, T-Mobile, and Verizon Wireless
- Stores many physical wallet elements, including payment cards, loyalty cards, and coupons
- Offers PIN protection; the wallet can be turned on and off remotely if lost or stolen

Until the mobile wallet can fully replace the physical wallet, U.S. consumers are far less likely to use them broadly. Moreover, success depends on a virtuous cycle of adoption and proliferation with merchant acceptance of mobile payment mechanisms — feeding consumer interest and usage of the technology.

The current degree of perceived convenience of using a physical plastic payment card is quite high. In other words, today's iteration of mobile wallets may be trying to solve a problem that does not actually exist. From a consumer perspective, the added convenience of using a mobile wallet for payments is absent if they still need to carry a physical

wallet for other items they are reluctant to leave behind at home — particularly their driver's license. If consumers have to carry both a mobile and physical wallet, adoption and usage rates of the mobile wallet are likely to remain low. For the purpose of this report, "mobile wallet" is defined as any mobile-based application that serves to replace a physical wallet, including storing identification, payment cards, and loyalty reward program information. This report first looks at what consumers currently keep in their physical wallets and why that matters in the development of successful mobile wallet solutions. It then highlights critical factors that will determine the mobile wallet's future consumer adoption and merchant acceptance in the U.S. market, particularly what must happen to solve consumers' needs.

The TSYS Mobile Wallet Study found that the most important item in the physical wallet is the driver's license, with 73 percent of survey respondents rating it as "important," and 53 percent ranking it as the most important item in their wallet.

This report then explores the increasing momentum of wallets, changing market factors, lessons learned from international experiences with mobile payments, and how government needs of a better identification system align with consumer needs. The purpose is to explain how the development of so-called mobile identity in the U.S., along with an aggressive cross-industry partnership, could lead to the emergence of an effective mobile wallet solution with the potential to gain widespread adoption.

What's in a Wallet Anyway?

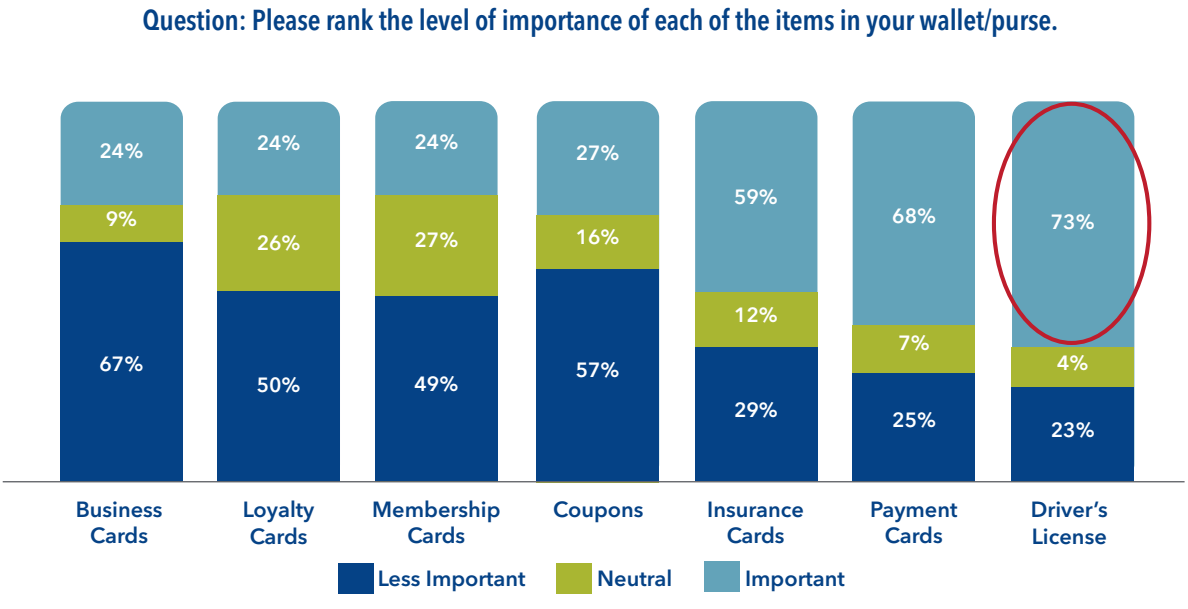
Before exploring what an ideal mobile wallet solution should include, it's helpful to understand what people already carry in their physical wallets — because that explains what a mobile technology will need to provide in order to truly replace it. A peek inside the typical U.S. consumer's wallet today reveals cash, coins, credit cards, debit cards, a driver's license, pictures, loyalty cards, receipts, coupons, event tickets, health care and auto insurance identification cards, and perhaps even a train ticket or airline boarding pass.

The TSYS Mobile Wallet Study revealed that the most important item in the physical wallet is the driver's license, with 73 percent of survey respondents rating it as "important," and 53 percent ranking it as the most important item in their wallet. The driver's license even ranked above payment and insurance cards (see Graph 1).

Today's existing mobile wallets, however, tend to focus on a far more limited set of services than what can be found in most people's physical wallet. Some wallet technologies focus purely on payment transactions, such as storing credit and debit card information, while others focus on nonpayment transactions such as storing tickets, loyalty reward program information, receipts, coupons or boarding passes.

For example, Google Wallet allows account value from any credit, debit, or loyalty card to be stored on the cloud and enables sending and receiving cash. The Isis mobile wallet, a joint venture between Verizon Wireless, AT&T Mobility, and

Graph 1: Importance of Items in the Wallet/Purse



Source: The TSYS Mobile Wallet Study. 2014.

T-Mobile, includes the storage of payment card information, loyalty cards, and even coupons and other promotional offers. Recently, they launched a promotion to incent usage of the wallet. Specifically, they are offering "Wells Fargo credit card holders the potential for 20 percent back and a $20 statement credit the first time they tap to pay using the Isis mobile wallet at hundreds of thousands of retail locations nationwide."[10]

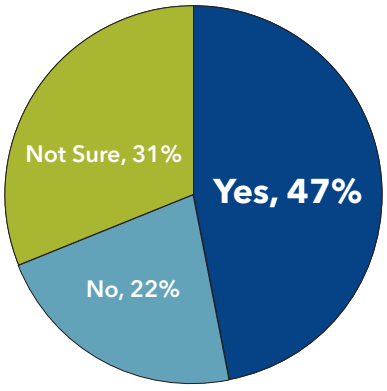
47 percent of consumers would consider using a mobile wallet if all of the components of one's current wallet were integrated.

Apple's Passbook excludes payment cards, but "keeps your boarding passes, movie tickets, retail coupons and loyalty cards all in one place."[11] Starbucks' closed-loop mobile payments application limits usage to purchases at the chain.

None of these current mobile offerings alone can fully replace the U.S. consumer's typical wallet, and merchant acceptance of mobile payment applications like Google Wallet and Isis depends on the store being equipped with NFC-based point-of-sale (POS) terminals, which, while increasing in usage, are still quite rare. That appears to be changing, though. Berg Insight, a telecom research firm, estimates the number of NFC-ready POS terminals installed globally will grow at a compound annual growth rate of 46.1 percent between 2012 and 2017, rising from 6.7 million units to 44.6 million units. In North America alone, Berg forecasts that 82 percent of POS terminals will accept NFC-facilitated payments by 2017.[12]

Graph 2: Mobile Wallet Use Consideration: If Inclusive of all Physical Wallet Elements

Question: Would you consider using a mobile wallet more if you could have all the components of your current wallet/purse in your mobile device?



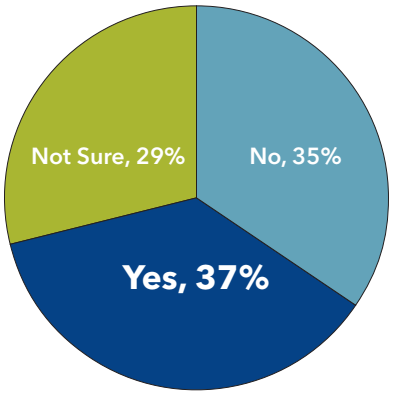
Source: The TSYS Mobile Wallet Study. 2014.

Market Challenges: Merchant Reluctance

Despite forecasts for mobile wallet technologies' increasing adoption, challenges remain in the U.S. market. For one, two-fifths of U.S. small and mid-sized businesses[13] today use attachable card reader terminals, such as Square, to swipe traditional plastic cards. That may suggest that merchants — at least smaller ones — are more comfortable investing in card readers rather than NFC contactless terminals that are compatible with mobile wallets.

Graph 3: Willingness to Replace Mobile Wallet with Physical Wallet

Question: If you had the ability to copy the contents of your wallet/purse (e.g. Credit/Debit Cards, Driver's License, Insurance Cards, etc.) to your mobile device, would you be comfortable leaving your physical wallet/purse at home for a day?



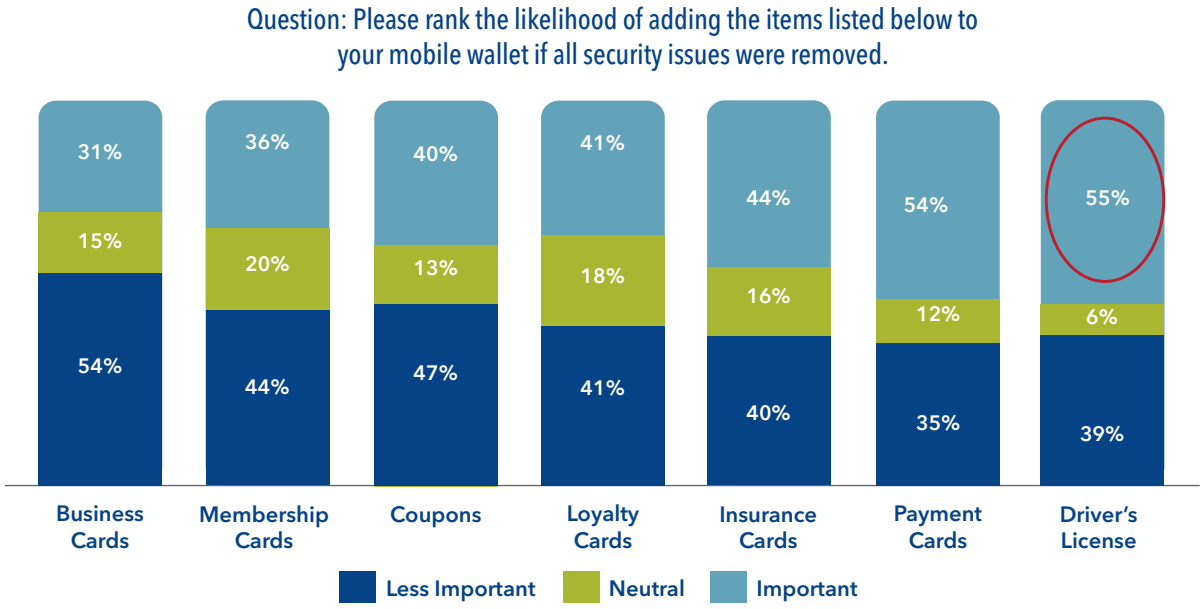
Source: The TSYS Mobile Wallet Study. 2014.

Getting merchants to adopt NFC-ready terminals, however, may soon get easier. The growth of EMV (which stands for Europay, MasterCard and Visa) — a globally recognized card chip technology — could help spur adoption of mobile wallets. Here's how: starting in October 2015, Visa plans to shift card-fraud liability from card issuers to merchants.

This shift may compel merchants to upgrade their POS systems to more-secure EMV-based terminals from today's card swipe terminals. Because many of today's mobile wallets rely on EMV-based techology, those terminal upgrades may benefit mobile wallet acceptance among merchants and help lessen consumer concerns about security.

Additionally, new mobile wallet technologies that allow for geofencing — the ability to sense a user's location within a particular radius of the terminal — may further compel merchant adoption. Apple's iBeacon technology uses Bluetooth LE (low energy) to allow merchants to sense a customer's presence and provide them on-the-spot deals and production information, while potentially offering them faster checkout from anywhere in the store.

Graph 4: Applications Making a Mobile Wallet More Valuable



Source: The TSYS Mobile Wallet Study. 2014.

Apple is using iBeacon in their stores, and iBeacon-enabled apps were recently showcased at the 2014 Consumer Electronics Show. There are also other companies joining the iBeacon push to merchants, including Estimote and Qualcomm's Gimbal. Merchants' use of iBeacon to engage customers in their stores provide a clear benefit of mobile wallet technology and could help spur consumer adoption and merchant acceptance.

Consumers Want a More Robust Mobile Wallet

There is good reason to believe that a more all-inclusive and widely accepted mobile wallet solution could win over U.S. merchants and even convince consumers to leave their physical wallets at home. For one thing, consumers increasingly use their smartphones more frequently than their physical wallets. According to findings from a Mercator focus group, "when asked which companies they would trust to deliver mobile payments in a safe and secure environment, consumers in the groups ranked financial institutions (FIs) first and card networks second."[8]

While consumers would likely trust a mobile wallet offered by their financial institution or card network, they also want a broad solution that encompasses all the contents of a physical wallet.

While consumers would likely trust a mobile wallet offered by their financial institution or card network, they also want a broad solution that encompasses all the contents of a physical wallet — storing payment cards, auto and healthcare cards, and identification cards such as driver's licenses. Furthermore, mobile wallets offer users a vast array of useful extra features and capabilities, such as comparing product prices while shopping, keeping tabs on loyalty reward points, and tracking personal spending habits.

These features and others sure to be introduced in the future should make mobile wallets a more attractive option than plastic cards for both consumers and small businesses. *TSYS Mobile Wallet Study* supports this notion: It found that 47 percent of consumers would consider using a mobile wallet if all of the components of a physical wallet were incorporated.

This percentage increased significantly — to 76 percent — among respondents under age 25. For those aged 25 to 44, it was 61 percent. These findings suggest that most consumers would prefer the convenience of having one mobile wallet for everything rather than having to switch between a mobile and physical wallet for different purposes, and that the Millennial generation will continue to propel the mobile wallet's growth.

Study participants were asked specifically to rank the importance of various functions beyond payment card storage that could be integrated into a mobile wallet. Fifty-five percent ranked the inclusion of the driver's license as important (See Graph 4). Similarly, 52 percent responded that they would like to store a copy of their driver's license on

their mobile device if electronically stored information was a legal and accepted proof of identification.

Among people under age 45, more than 62 percent said they would store their driver's license on a mobile device if such identification was acceptable. In fact, 37 percent of survey respondents said they would leave their physical wallet at home for a day if all of its contents — including credit and debit cards, a driver's license, and insurance cards — could be stored on their mobile device. The responses revealed a high variance by age, with younger segments responding more favorably to the idea of abandoning their physical wallet. The survey found that 65 percent of those under age 25 would do so, compared to 54 percent of those aged 25 to 34, and 48 percent of those aged 35 to 44.

Though this is new research, the responses were surprising, and it would be interesting to track the impact over time as Millennials make up a greater share of the U.S. customer base (See Graphs 2 & 3).

Gaining Momentum: Charging Up Mobile Wallets

Mobile transactions have made greater inroads in international markets such as Japan, India, and Africa than in the U.S. market. Technology research firm Gartner estimated that mobile transaction value in the Asia-Pacific region would grow 38 percent in 2013, reaching $74 billion. "Deployments in developed markets such as South Korea and Singapore and in developing markets such as India are expected to drive healthy growth in this region," Gartner reports.[14]

Statistics suggest consumers in the Asia-Pacfic region are more likely to have a mobile wallet than their U.S. counterparts. Two significant reasons for the higher adoption rate in those regions are that some countries and regions lack a formal banking infrastructure — creating greater market demand for mobile transactions — and mobile device penetration in many of those markets is higher than in the U.S.

In general, U.S. consumers trust FIs with their money, thus putting FIs at an advantage to offer a reputable mobile wallet.

In general, U.S. consumers trust FIs with their money, thus putting FIs at an advantage to offer a reputable mobile wallet. In a joint survey completed by TSYS and American Banker, 39 percent of participating FIs expressed an interest in offering a mobile wallet solution.[15] Given that consumers trust FIs and card issuers with sensitive financial information — more than they trust retailers — more FIs and issuers should feel compelled to explore and test mobile wallet applications.

For one thing, retailers have shown themselves ready to pounce on market opportunities that FIs have left unfulfilled. Walmart, for example, now offers loans to the underbanked, while Starbucks built one of the first mobile wallet applications. FIs should act before retailers with strong brand recognition and loyal customers do.

Here are two other factors that should make mobile wallets a compelling offering for FIs:

Factor #1: Smartphones are ubiquitous.
Consumers rely on their smartphones for an expanding array of everyday tasks, whether emailing, texting, interacting on social media, writing shopping lists, reading a product review, comparing prices, or checking a bank balance. As mentioned earlier in this report, studies have found that consumers notice a lost phone before a lost wallet. Furthermore, consumers increasingly expect to be able to carry out their financial tasks via mobile and want a dependable solution.

Factor #2: Consumers are increasingly comfortable interacting with FIs via mobile.
Surveys show that Americans are using mobile banking more frequently for financial transactions. Among Millennials (those aged 18 to 34), 44 percent were active users of mobile banking in 2012, up from 36 percent a year earlier, according to a Mercator survey.[16] Research by Aite Group forecasts that the percentage of U.S. consumers who use smartphones to check financial account balances will increase from 36 percent today to 59 percent in 2016.[17]

Moreover, mobile transactions are growing quickly. U.S. mobile payments were expected to reach $30 billion for 2013, meaning that they grew an annualized 118 percent since 2008, according to research compiled by BI Intelligence.[13] Recently, mobile-based shopping (m-commerce) was growing 200 percent faster than standard ecommerce.[18] ComScore reported that in March 2013, 48 percent of the time U.S. consumers spent on online retail sites occurred on mobile devices.[19]

Of course, the adoption barriers for m-commerce are lower than the adoption barriers for mobile wallets, which must address POS-terminal compatibility, merchant acceptance, and consumers' perceived security concerns. In order for a mobile wallet to be a complete solution for consumers, it must be convenient and easy to use both online and at in-store POS terminals.

As consumers' comfort levels with mobile phone transactions increase, the lack of an identification component will prevent mobile wallet's widespread adoption.

Another Benefit: Mobile Wallet Offers Greater Security

Beyond the growth of smartphone usage, m-commerce, and mobile payments, there's another reason that should compel FIs to introduce mobile payment applications: They are more secure than other payment methods, including plastic cards. Mobile wallet users must enter a password in order to access their wallet — meaning that even if someone steals the smartphone, the mobile wallet remains secure.

Mobile wallets, while not foolproof, allow owners to more easily freeze their account, while smartphones in general have features that prevent thieves from using stolen phones. Due to an epidemic of Apple iPhone thefts in recent months, newer versions of the phones include a permanent "kill switch."

Compare these security measures to a physical wallet, where a thief can easily access the contents and quickly ring up charges on credit and debit cards both in physical stores and online. EMV card chip technologies for payment cards provide innovations like 3D Secure for card-not-present transactions and should assuage some of these card-fraud fears; however, the security features available on mobile wallets still generally make them more secure. (More on EMV and 3D Secure can be read in the TSYS report *EMV is Not Enough: Considerations for Implementing 3D Secure*.)

Despite the stronger security measures of mobile wallets, studies suggest that U.S. consumers are still leery. An Accenture study, for example, found that 45 percent of people who do not currently make mobile payments said they were concerned about mobile security.

"Paying for a taxi ride using your mobile phone is easier in Nairobi than it is in New York, thanks to Kenya's world-leading mobile-money system, M-Pesa."

The largest concerns included identity theft, device theft, transaction security, and privacy.[20] That level of skepticism and concern may be partially to blame for lower mobile wallet adoption rates in the United States compared to mobile's widespread use in other parts of the world.

Consider Kenya, a country with no formal banking infrastructure. Kenyans have long relied on alternative money-transfer and payment services, which often levied a high fee to pay someone to carry money between rural and urban areas. Sometimes the money was stolen in transit. Today, about two-thirds of Kenyan adults – more than 17 million people — use M-Pesa, a mobile money-transfer program initiated by a local telecom company that relies on prepaid phone credit capabilities.

While M-Pesa isn't a full mobile wallet solution, it is a mobile-phone application (via SMS messaging) that allows for the easy transfer and payment of Kenyan currency between consumers and businesses. And it is bypassing the need for card-based payments in Kenya due to its sheer accessibility by the masses.

While the system has many flaws, it does suggest that an easy-to-use, trusted solution is possible in the U.S. "Paying for a taxi ride using your mobile phone is easier in Nairobi than it is in New York, thanks to Kenya's world-leading mobile-money system, M-Pesa," according to The Economist.[21]

The Intersection of Mobile Wallet and Digital Identities

Much work lies ahead before mobile wallets become ubiquitous within the U.S. While some consumers have migrated a few of their physical wallets' contents, such as photos and loyalty program information to mobile wallet applications, there is still vast opportunity to make mobile wallets more useful and secure.

PayPal is one example of a digital wallet that stores customers' payment and shipping details — and it is among the most popular programs. In 2012, PayPal processed $14 billion in mobile payment volume, up from $4 billion in 2011. PayPal is expecting to process $20 billion in mobile payment volume for 2013.[22]

According to Javelin Strategy & Research, PayPal's 100 million users make it the most trusted brand among the top mobile wallet providers.[23] Mary Monahan, Javelin's executive vice president and mobile research director, says what's interesting is that each of today's major mobile wallet providers, like Google, PayPal and Apple, "has a platform of consumers that are successfully transitioning from the online to the mobile world." These behemoth retailers' operations predominantly focus on ecommerce and increasingly m-commerce — not brick-and-mortar retail, where POS transactions often require a government-issued identification.

If mobile wallet platforms work effectively online, why do they not in a store? Currently, when consumers use their mobile wallets for payment, they may be asked to show identification. And, if not, they are asked to enter a personal identification number (PIN) or make a fingerprint impression. Integrating identification capabilities into the mobile wallet

will create a seamless payment experience and benefit merchants' by lowering interchange rates for card-present transactions, or rather mobile wallet-present ones.

Government-Issued Cards Already Leverage Mobile Identity Technology

No reliable mechanism currently exists to integrate identification such as the driver's license into the mobile phone. The U.S. government could someday, however, adopt a national strategy for digital identity management. According to the Smart Card Alliance, digital identity technology is already used in national identification cards, healthcare cards, enterprise and government employee credentials, and electronic driver's licenses.[1]

Some government-issued ID cards use the same secure technology as EMV chip payment cards. Many states' driver's licenses, however, use barcode technology readable by scanners. As noted in the sidebar "Identification Credentials That Could Securely Integrate into Mobile Devices," certain credentials that people carry in their physical wallets could be securely stored in mobile devices.

A secure digital identity element could enable a mobile wallet to truly be a one-tap-and-pay solution. The integration of the driver's license could create a tipping point and compel consumers to leave their physical wallets at home.

These could be secured through a variety of approaches, whether one-time passwords, PINs, or biometric data. Such personal authentication and identification would not just benefit merchants, card issuers and payment providers; it would provide a great convenience to consumers, who could carry a single mobile device instead of needing to carry around multiple ID cards.[1] Additionally, the variety of digital formats available for integration into a mobile device could provide strong identity verification with multifactor authentication and could pull in other relevant data, such as device location, voice recognition, or fingerprints.

Government Partnership: Digital Identities and Fruition of Full Mobile Wallet

Government entities are already recognizing the need to better understand and deploy digital identification. Elements of anti-money laundering measures and the Office of Foreign Assets Control, for example, track identity to follow and intercept money flow from organized crime rings, which occurs increasingly online and via mobile devices. The REAL-ID Act of 2005 set in motion regulations that require states to comply with electronically verifiable government issued IDs by 2017. Twenty-one states are already compliant.[24]

The increased integration of chip and barcode technology into government-issued ID cards suggests that the U.S. and state governments are recognizing that fraud prevention in today's world requires moving away from issuing checks and moving toward adoption of electronic authentication. Governments are using electronic payments in an effort to reduce fraud and save money, while improving the speed at which consumers receive government benefits such as Social Security.

Since U.S. consumers trust FIs with their money and state government agencies issue ID cards, together they are positioned to deliver a mobile wallet that consumers would embrace. A logical next step would be to forge a partnership among a regional bank, one or more state governments, and an experienced payment processor in order to build out a full wallet solution that mirrors the contents of a physical one.

A pilot program could target consumers younger than age 45, since they seem to be most interested in and willing to use a mobile wallet solution today. The governments involved would address the identification aspects, the regional bank would handle payments and execution of benefits, and a processor would contribute EMV, international and innovation experience. Such cooperation would reduce fraud and lead to a more robust, all-encompassing solution.

Prescription for Success: Next Steps for Issuers

The development of such digital identification and authentication via mobile wallet involves many stakeholders, including merchants, consumers, MNOs, and potentially even government entities. It seems logical and imperative that these groups come together and bring a comprehensive mobile wallet solution that includes the most secure authentication protocols. A question that remains, however: Are state governments willing to partner with FIs and MNOs to test such a mobile identification program? States have vast experience partnering with industry and are more nimble. In this case, it would be interesting to see a pilot mobile or digital identification program from a regional bank, or a national wireless carrier that partners with one or multiple state governments.

An interim first step of such a program could be to offer new drivers, or those renewing their license, the option of integrating their license information with their mobile phone. When the identification is needed, the holder of the license would have the ability to conveniently and securely access it in the cloud. Those who are uncertain of moving away from a physical card-based license could choose to receive both a digital and a card-based license.

The TSYS Mobile Wallet Study found that 37 percent of respondents would be comfortable leaving their wallet home for a day. Perhaps this interim step or hybrid solution would appease the 29 percent not sure about leaving their wallet

behind. This interim solution could drive consumer adoption and save the DMV time and costs associated with issuing physical driver's licenses.

Conclusion: Identification is Key to Spurring Mobile Wallet Adoption

Various factors contribute to the complexity of bringing a comprehensive mobile wallet solution to market in the U.S. These include the sheer number of MNOs, a large and diverse U.S. population, merchants' willingness to accept mobile payments and the role of banks and government. However, the groundwork has been laid. The big thing missing from today's mobile wallet solutions is the integration of personal identification, such as driver's license information, which would allow a mobile wallet to truly replace the physical wallet.

This could be solved, however, by collaboration between government agencies, mobile platform providers, wireless carriers and the financial services industry. Meanwhile, the U.S. can look to international markets and adopt their best practices for creating mobile identities and fostering collaboration between government bodies and the private sector. Who will be the first to innovate and bring to market an effective, comprehensive mobile wallet solution capable of replacing the physical wallet? We may know sooner than you think.

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ABOUT THE AUTHOR

Chris Colson is director of innovation for TSYS. He is an 18-year veteran of the payments and financial services industry, having previously served as vice president, product management, of Equifax in Alpharetta, Georgia, where he was responsible for managing multiple business units and product portfolio teams. Colson's additional responsibilities at Equifax included defining product and market strategies; identifying, developing, and working with segment partners to create joint products; and defining and describing innovative ideas. Prior to TSYS and Equifax, he gained additional experience working at companies such as S1 Corporation, Magnet Corporation, Bank One and Bank of America.

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