



# The Future of Mobile Payments

## Introduction

With more than 1 billion smartphones and tablets projected for sale in 2013<sup>1</sup>, it makes sense that mobile wallets are poised to become the next big channel for payments. This is especially true in the U.S., where Forrester Research expects mobile payments overall to reach \$90 billion in the next five years<sup>2</sup>. Indeed, the vision of fast and convenient mobile payments has earned a certain cache for the potential to take the consumer relationship and experience to another level.

The term “mobile payments” actually encompasses three types of payments: mobile proximity payments, mobile remittances, and mobile remote payments. This paper will focus on mobile proximity payments, the type of transaction in which a mobile phone interacts with a point-of-sale (POS) device to pay in-store. According to Forrester, of the three types of mobile payments listed, mobile proximity payments are going to increase the most dramatically over the next 4 years<sup>3</sup>. Currently, proximity payments make up just 4% of all mobile payment transactions, but that figure is expected to grow to nearly 50% by 2017. eMarketer estimates that by 2016 proximity mobile payments will have “exploded” in the U.S., and total transaction value will hit \$62.24 billion<sup>4</sup>.

This growth will likely be fueled by the increasing availability of proximity mobile payment technologies and mobile wallets. Some of the recent launches include (and this list is by no means exhaustive): the Isis Mobile Wallet from the joint venture of same name formed by AT&T Mobility, T-Mobile USA, and Verizon Wireless; the Google Wallet; the Square Wallet, and last but not least the announcement by a number of nationwide merchants and chains to launch the MCX Wallet.

But, despite the projected growth of the use of proximity mobile payments, questions still remain regarding the potential for widespread adoption of the technology. Will consumers change their payment habits and be satisfied that payments are secure? Which mobile wallet will prevail? We'll examine these questions, along with the emerging mobile payment methods in the U.S., and challenges and drivers for widespread adoption.



<sup>1</sup> Gartner, “Gartner Says 821 Million Smart Devices Will Be Purchased Worldwide in 2012; Sales to Rise to 1.2 Billion in 2013,” November 6, 2012. <http://www.gartner.com/newsroom/id/2227215>

<sup>2</sup> Forrester Research, “US Mobile Payments Forecast, 2013 To 2017,” January 16, 2013.

<http://www.forrester.com/US+Mobile+Payments+Forecast+2013+To+2017/fulltext/-/E-RES89161?docid=89161>

<sup>3</sup> Denee Carrington, “US Mobile Payments Forecast, 2013 To 2017,” Forrester Research, January 2013.

<sup>4</sup> eMarketer, “eMarketer: Proximity Mobile Payments Set to Explode in US,” October 17, 2012.

<http://www.emarketer.com/newsroom/index.php/emarketer-proximity-mobile-payments-set-explode/>

## Emerging Technologies in the U.S.

As with the term “mobile payments,” the term “mobile proximity payments,” is not a one-size-fits-all term. There are several types of payment technologies emerging today to allow consumers to pay in-store with their mobile devices. The challenge facing mobile wallet providers is to provide a secure and convenient mechanism for transferring payment account details to the merchant using the mobile phone instead of a card. We will explore the more popular emerging technologies for accomplishing phone-to-POS transactions.

### Cloud-based Proximity Mobile Payments

Cloud-based mobile payments store your payment information “in the cloud” (i.e. on a remote server), and not on your mobile device. Consumers can typically register one or more payment accounts to be used with the mobile wallet including bank accounts, credit and debit cards, pre-paid cards, store cards, gift cards, and loyalty cards. Most commonly, the consumer accesses their mobile wallet from an application on their mobile device, but cloud-based wallets can also be accessed from other connected devices like computers or tablets. During registration, the consumer can typically set up a username, password, or PIN to secure access to their wallet – credentials that are stored in the cloud as well.



Once the account is set up, there are several methods to employ the wallet from a mobile device to complete an in-store payment. In each case, the customer’s registered account is debited at the time of transaction.

- > Customers launch the application and present an image or code (2D barcode or QR code) to the cashier to be scanned. This is used by Starbucks’ popular payment application (see below).
- > Customers enter their mobile number and PIN on the store’s pin pad to authorize the payment. This method is proposed by PayPal.
- > Using location based-services, when a customer enters the store, their photo is displayed on the merchant’s POS screen. When it’s time to pay, the merchant selects the consumer’s photo on their POS and request to debit their account. This method is used by Square mobile wallet.

### Cloud-based Mobile Payment Snapshot: Starbucks Mobile Card and Square Wallet

In 2011 Starbucks introduced a mobile version of its popular Starbucks Card, the company's prepaid, reloadable loyalty card. Customers can download a mobile application on their iOS or Android device and enroll an existing card or purchase a new one. Through the application, the Mobile Starbucks Card replicates the physical card on the mobile device, allowing consumers to present a QR code for payment.

Starbucks also recently started a second mobile payments program. The company began accepting Square's mobile payment application, Square Wallet, in participating U.S. company-operated locations in November 2012<sup>5</sup>. The cloud-based payment application utilizes QR codes for payment as well.

Like the Mobile Starbucks Card, the Square Wallet can also be downloaded to a customer's iOS or Android device. The customer can set up an account and link payments to a debit or credit card. When ready to pay, the customer presents a QR code generated by the app for scanning. In June 2013, Starbucks said it processes roughly 4 million mobile payment transactions per week, doubling from 2 million at the end of 2012<sup>6</sup>.

### Cloud-based Mobile Payment Snapshot: The MCX Mobile Wallet

MCX, or the Merchant Customer Exchange, was founded in 2012 by major U.S. retailers such as Wal-Mart, Target, Best Buy and 7-Eleven. Since then, 40 merchants have joined the group, including Southwest Airlines, drug stores, department stores, clothing stores, supermarkets, convenience stores, and gasoline retailers.

MCX has announced plans to roll out their own mobile wallet. According to the group, "The initial MCX solution will be primarily barcode and cloud-based, which will allow it to work on the broadest array of smartphones and at a wide range of merchant locations, where barcode payments can be accepted without major new capital expenses."<sup>7</sup>

Consumers will have access to a personalized payment experience integrated with offers, promotions, loyalty, and location-based services, which they will be able to use at many of the large retailers at which they regularly shop.

As of the publishing of this paper, the MCX mobile wallet is still in development. MCX says it will announce additional merchants, as well as more details regarding its product offering and partners, later in 2013.

<sup>5</sup> "Starbucks Offers Square Wallet Beginning Today," Square press release, November 8, 2012.

<https://squareup.com/news/releases/2012/starbucks-offers-square-wallet-beginning-today>

<sup>6</sup> Jason Ankeny, "Starbucks: Mobile payments now 10% of all U.S. transactions," *FierceMobileContent*, June 19, 2013.

<sup>7</sup> Dan Balaban, "U.S. Merchant Group MCX to Launch with Bar-Code, Cloud Technologies; Not NFC Initially," *NFC Times*, January 15, 2013.

<http://nfctimes.com/news/us-merchant-group-mcx-launch-bar-code-cloud-technologies-not-nfc-initially>

## NFC Proximity Mobile Payments

With NFC (Near Field Communication) proximity mobile payments, a contactless payment application is placed inside of an NFC-enabled phone. The application is personalized with a consumer's payment accounts, such as a debit card, a credit card, or prepaid card. Consumers can pay the same way they would with a contactless payment card, holding their mobile device 2-4 inches from a contactless POS terminal. The payment information is relayed via radio frequency. NFC payment applications include American Express ExpressPay, Discover Zip, MasterCard PayPass, Visa payWave.

Instead of storing payment and personal information in the cloud, NFC mobile payments store data on a "secure element", which is a tamper-proof component of the phone's hardware. The secure element, sometimes called an SE, is a special chip inside of a NFC-enabled device that can securely host applications and their confidential data. The strong cryptography afforded by the SE ensures that data is securely stored and accessed.

### NFC Mobile Payment Snapshot: The Google Wallet

Google Wallet is an NFC hybrid payment model: consumers use contactless NFC capability to pay at the POS, but the actual payment information is stored in the cloud, not in a secure element.

When the Google wallet was first launched in September 2011, it was available on just one smartphone, the Samsung's Nexus S, and on just one network, Sprint and one platform, Android. Since then, then number of phones and networks supporting Google Wallet has grown, and it has been through a major overhaul. In August 2012, Google launched what is now known as Google wallet v2, which supports all major credit and signature debit cards from Visa, MasterCard, American Express, and Discover. The details of these cards are not stored in the secure element on the phone but 'in the cloud' on Google's servers. The secure element still houses the credentials for a virtual MasterCard and the PIN to the wallet. This means that when consumers make a purchase, the merchant doesn't see the consumer's credit card information — unless they are using Citi's MasterCard — instead, a "virtual" Google Wallet MasterCard is used. This limits the acceptance of Google wallet v2 to MasterCard PayPass enabled locations, now about 200,000.

An iOS app is rumored to come, along with a companion card which Google has said would work wherever Discover cards are accepted. Since the iPhone does not yet support NFC, the companion card would be needed to provide real life connection between a Google wallet on the iPhone and a merchant POS.



## NFC Mobile Payment Snapshot: The Isis Mobile Wallet

Isis is a mobile commerce joint venture created by AT&T Mobility, T-Mobile USA and Verizon Wireless. Isis has partnered with leading payment networks, banks, point of sale (POS) terminal manufacturers, security providers and handset manufacturers to create the Isis Mobile Wallet™. Isis launched the mobile wallet in Salt Lake City, Utah, and Austin, Texas in September 2012.

To use the Isis Mobile Wallet, a consumer must have an Isis-ready, NFC-enabled mobile device with the Android operating system, and an NFC SIM card with a secure element (according to Isis, consumers can obtain a new SIM card at no charge by visiting their mobile operator). Isis lists a large number of mobile handsets that are considered “Isis-ready” on its website.

Consumers download a free app and load a credit card from American Express, Capital One or Chase onto the Isis Mobile Wallet. Isis also offers an Isis Cash card in the wallet, which can be loaded with cash separately. Isis encrypts and stores payment information in the SIM’s secure element. For security, Isis requires consumers to enter a PIN to access the wallet.

After enrolling, Isis Mobile Wallet users can use their mobile devices to make payments anywhere that contactless payments are accepted. According to Isis, results thus far have been positive, with active users paying with Isis five or more times per week<sup>8</sup>. As of this paper being published, there has not been an announcement from Isis on broad rollout of the mobile wallet.

## Mobile Wallet Adoption

Appealing to merchants is paramount to a mobile wallet’s success. As the consumer’s sole touch point, the merchant has the power to choose the technology that their customers will ultimately use, as in the case of Starbucks and MCX, and encourage them to use it.

Though mobile wallets offer a convenient alternative to physical wallets, they are not without their challenges. Consumers are unlikely to use a mobile wallet unless it meets some basic criteria: easy to enroll; easy to use; widely accepted; and secure.

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<sup>8</sup> Kevin Fitchard, “Isis: Salt Lake City mobile wallet users average 5 transactions a week,” *GigaOM*, February 5, 2013. <http://gigaom.com/2013/02/05/isis-salt-lake-city-mobile-wallet-users-average-5-transactions-a-week/>

## What's motivating merchants?

Many merchants are excited about mobile proximity payments for the increased marketing opportunities. Mobile wallets provide merchants with a direct marketing and communication channel to consumers, right on their mobile device, and right in the middle of their shopping experience. Merchants can offer loyalty programs, discounts, and personalized offers which draw customers to stores, encourage repeat visits, increase spending, and increase customer loyalty. Merchants also love the quicker checkout speed that comes with mobile payment transactions, often resulting in shorter lines and happier customers. Another appealing feature for merchants: mobile payments can streamline operations for shopkeepers by reducing the amount of receipts and paperwork to reconcile each day, as well as boost efficiency during peak hours, for example by supporting pre-order / pre-pay options from their mobile apps.

While the benefits are clear, merchants need to decide which technology to roll out day one. Today, some merchants are resistant to upgrade to NFC-enabled POS terminals because of the cost, and prefer cloud-based wallets that require mostly software updates and often utilize existing scanners or pin pads they already use.

On the other hand, one of the challenges of cloud-based mobile wallets is that payments made with them are considered "card not present" transactions, and the merchant may have to pay higher interchange fees for this type of in-store transactions. Merchants may also need to implement additional backend infrastructure to accept cloud-based payments.

## What's motivating consumers?

In mobile wallet adoption, consumers are driven by convenience, security, and rewards. Consider all the times you reach the checkout counter, already holding your mobile phone in hand. The speed at which you can pay with your mobile device can be faster than with a payment card, making mobile wallets attractive to consumers. Especially enticing is the notion of leaving your physical cards at home and leaving home with just your phone, lightening your load.

According to a recent study conducted by PayPal, a large majority of consumers said they do not want to have to carry a wallet and would prefer a digital payment method. A massive 83% of customers would like an alternative to the physical wallet, especially to use in places that typically restrict them to cash (parking meters, laundromats) or where it's a hassle to carry a wallet (gym). Consumers also indicated a desire for digital wallets as a means for receiving on the spot payment from friends.

Almost all of the major wallet providers have begun using reward incentives to entice consumers to begin using their app. This trend is likely to continue as offers and discounts have proven quite effective in guiding consumer behavior.

Both cloud- and NFC-based mobile proximity payments keep data much more secure than our current magnetic stripe cards, but many consumers aren't aware of that yet. As people become familiar with mobile payment security, we're likely to see adoption grow. One study found that 51 percent of consumers said they would use a mobile wallet if they were confident in the security of the wallet<sup>9</sup>. Savvy consumers looking for tighter security around their payment and personal information can appreciate the encryption provided by the NFC secure element as well as the instant feedback on the mobile device when a payment is made.



For consumers, a potential problem exists with cloud-based mobile wallets that are unique to individual merchants. How many mobile wallet applications is a consumer willing to download and use? One for each merchant? Not likely. Mobile wallets that can be widely used at many retail locations, like MCX (cloud) and Isis (NFC), could potentially be more attractive to consumers.

One barrier to adoption of NFC contactless payments is the availability of contactless POS terminals provided by merchants, but that seems to be changing. Currently only a small fraction of the POS terminals in the U.S. are equipped for contactless payments. Most terminals were installed to accept magnetic strip cards only.

However, this entire installed base is slated to be revamped to accept EMV payments. This “once in a lifetime” technology change may cause many merchants in the U.S. to upgrade POS terminals over the next few years. Many of these merchants are likely to install contactless-enabled terminals during the upgrade. If so, U.S. could see the number of POS terminals ready to accept NFC mobile payments soar. According to ABI Research, “85 percent of terminals shipped worldwide will be contactless-enabled in 2016, driven by increased proliferation of contactless cards and, especially, rapid adoption of NFC-enabled cell phones<sup>10</sup>.”

Another barrier to broad adoption of NFC mobile payments has been the requirement of the secure element inside the mobile device. Many consumers do not have an NFC-equipped mobile phone, and have been hesitant to invest in a new one or a special NFC SIM or a microSD. However, many handset manufacturers and mobile network operators have committed to implementing secure elements in their devices. Half a billion NFC-enabled handsets equipped with

<sup>9</sup> ICM Research, “2013: The year of the Mobile Wallet?” January 3, 2013. <http://www.icmresearch.com/2013-the-year-of-the-mobile-wallet>

<sup>10</sup> ABI Research, “Google Wallet and NFC Smartphones Spark Buzz Around Retail Contactless Technology,” August 10, 2011. <http://www.abiresearch.com/press/google-wallet-and-nfc-smartphones-spark-buzz-around>



NFC technology are expected to hit the market by 2014<sup>11</sup>. Goldman Sachs concurs, forecasting that over 40 percent of smart phones and tablets, or 555 million devices, will be NFC enabled by 2014<sup>12</sup>. In addition, NFC SIM shipments are on the upswing – smart card vendor association Eurosmart forecasts that secure element shipments will grow by 67 percent in 2013 to 250 million units<sup>13</sup>.

## Conclusion

By all accounts, mobile is set to become the next big channel for payments. This is especially true in the U.S., and especially true for proximity mobile payments. Though the different technologies that can be implemented for mobile wallets have their benefits and challenges, all types of wallets provide mobile network operators, payment service providers, financial institutions, and merchants with a means of reaching consumers in ways more advanced – and more personal – than ever before.

But what will ultimately drive the adoption of proximity mobile payments? Ease of enrollment and ease of use are essential to remove barriers of initial activation. Beyond that, broad adoption may require a comprehensive solution that takes advantage of mobile marketing and loyalty offers. Security cannot be forgotten or stressed enough.

Therefore, mobile wallet providers should consider building highly secure and easy to use mobile wallets that include payments, loyalty programs, location-based services, and coupons, discounts and offers. This strategy may be the key to shifting consumer behavior towards using a mobile wallet in place of their physical wallet.

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<sup>11</sup> ABI Research, “NFC Installed Base to Exceed 500m Devices Within 12 Months.” March 2013. <http://www.abiresearch.com/press/nfc-installed-base-to-exceed-500m-devices-within-1>

<sup>12</sup> Goldman Sachs Global Investment Research, “Mobile monetization: Does the shift in traffic pay?” June 4, 2012, p. 37-38. [http://pg.jrj.com.cn/acc/Res/CN\\_RES/INVEST/2012/6/4/c082230d-932a-4720-87b3-608f1edaa40d.pdf](http://pg.jrj.com.cn/acc/Res/CN_RES/INVEST/2012/6/4/c082230d-932a-4720-87b3-608f1edaa40d.pdf)

<sup>13</sup> Eurosmart, “Eurosmart General Assembly Confirms Strong Growth,” April 23, 2013. <http://www.eurosmart.com/index.php/publications/3-publications/204-figures-may-2012.html>