



The Essential Apple Pay
Your Guide to the Future of Payments



In September, Tim Cook, CEO of Apple Inc., announced the arrival of Apple Pay. The long-awaited mobile payments system will allow consumers to complete payment transactions via a mobile device in physical and online retail stores.

In this guide, you will discover Apple Pay, its features, and added information essential to merchants that are looking to understand the possibilities Apple Pay can offer them in the modern mobile payments revolution.

Introduction

As with all of its products, Apple's business model for Apple Pay places the end user as the primary focus. In many instances, Apple has stated it is not in the business of collecting or distributing consumer data, rather it is entering the payments market to increase product stickiness and sell more hardware. When viewed as an asset, Apple Pay will allow the company to focus on its core, selling more smartphones and smartwatches.

While Apple is not the first to attempt a mobile wallet (several other reputable companies have taken on the challenge) it is the first to come to market with mass consumer awareness. Additionally, Apple Pay's security, partnerships, and innovative brand could distinguish Apple as the market mover. As Maxwell Wessell stated in the Harvard Business Review, "Putting Apple Pay into practice required an entire ecosystem to move in unison—merchants, consumers, credit card companies, and banks."

While the iPhone 6 is the first device to use Apple Pay, it is expected that Apple will announce an iPad device equipped with TouchID, allowing users to use Apple Pay for online payments via tablet. The following paper helps to better understand Apple Pay, how it works and how it may impact a merchant business.

The Merchants

Apple Pay is expected to be widely adopted as the mobile revolution progresses. To work with Apple Pay, merchants must work with a certified processor. At launch, the list of processors include Authorize.Net, Chase



Paymentech, CyberSource, First Data, Stripe, and TSYS.

The EMV Landscape

On the launch date, 220,000 NFC-capable terminals at big-name merchants will accept Apple Pay. Apple's utilization of NFC technology comes at the right time, as merchants are refreshing their terminals to support EMV and, more importantly, contactless EMV. With the arrival of Apple Pay, merchants now have a new consideration in light of the value to accepting NFC payments. Since many of the PIN pads that can process NFC payments are also EMV Level 1 and 2 certified, the decision to support Apple Pay can be as simple as turning it on, forgoing the need to purchase new hardware.

What is NFC?

Near-Field Communication (NFC) is a set of standards for short-range radio transmissions that allows two enabled devices to exchange data when placed within about four centimeters of each other. Apple Pay utilizes two different NFC chips: NXP's 65V10 NFC module and SE combination, and AMS's AS3923 booster IC, which AMS designed to improve the performance of NFC readers in challenging environments.

To complete an NFC transaction using Apple Pay, the cardholder taps the iPhone within proximity of the NFC reader, while authorizing payment by placing their finger on Apple's TouchID fingerprint sensor.

What will it Cost Merchants to Accept Apple Pay?

Apple will not charge merchants to accept transactions via Apple Pay, as the Apple Pay transactions will qualify under the existing interchange qualification model.

Apple will process in-store NFC payments placed via Apple Pay as card-present transactions while in-app payments and Bluetooth low energy (BLE) payments (mostly iPhone 5 transactions) will be processed as card-not-present transactions.

There is much speculation on where future rates will move as security improves; however, there is no published direction to date.

The Consumers

As of September 2014, Apple serves over one billion iOS users and over 800 million iTunes account holders. Nearly all of these account holders have credit cards on file.

Enrollment

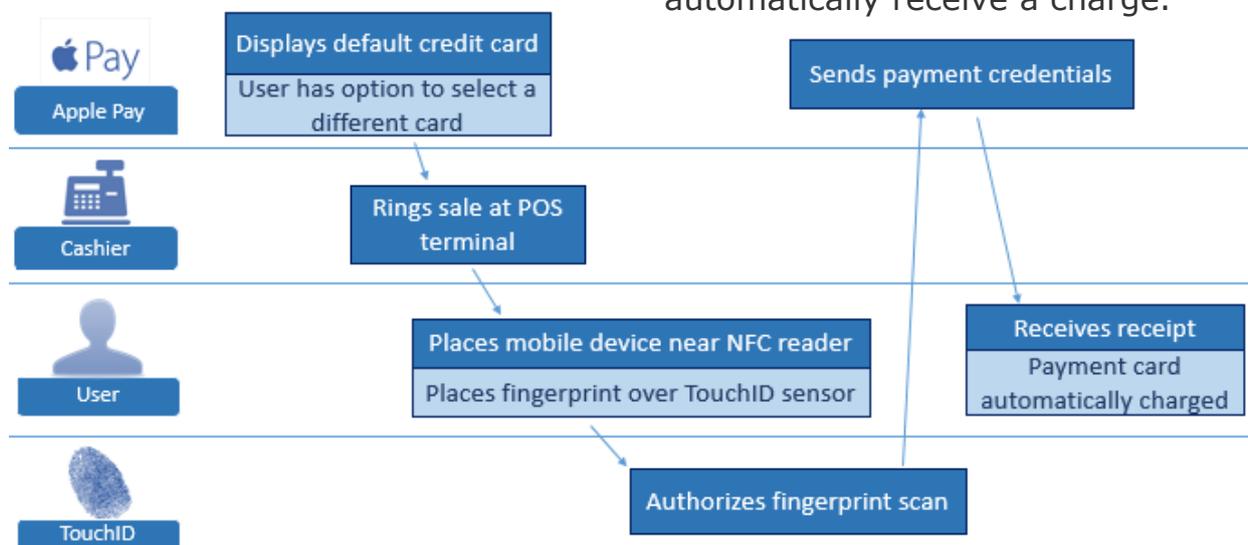
Previous versions of Apple's Passbook application enabled consumers to store gift cards, loyalty cards, event tickets, and airline boarding passes. The latest version of Passbook allows for credit card storage as well following an iOS update scheduled for October.

To provision a card to Apple Pay, cardholders can link their card information directly from their iTunes account or through a direct enrollment option. Users taking advantage of direct enrollment can load a card by taking a picture of the desired card with their device camera, using Apple's iSight application. Apple will verify the card information with the relevant scheme and card issuer. Following verification, token services will send the Device Account Number (DAN) to

Apple's wallet server, which stores the tokenized device number in Apple's Secure Element.

Check Out at a Store that Supports Apple Pay

With Apple Pay, there is no need for the consumer to open an application or wake the iPhone display to complete a transaction. When in proximity of an NFC terminal, Apple Pay will automatically select the user's default credit card for use in the mobile transaction. The default card will appear on the mobile screen, providing the user with an option to select a different card. When the cashier rings the sale at the POS terminal, the user will place their mobile device near the NFC reader. To initiate payment, the user must place their fingerprint on Apple's TouchID sensor while the reader scans the mobile device. Apple's TouchID authorizes the fingerprint scan before sending payment credentials. The user's phone will receive a receipt upon approval of the transaction, and the payment card will automatically receive a charge. With Apple Pay, neither the application nor the merchant will see the user's payment credentials. The user's phone will receive a receipt upon approval of the transaction, and the payment card will automatically receive a charge.



TouchID authentication is a mandatory component of transacting via Apple Pay. TouchID should be viewed as a more secure method of payment authentication than the current PIN— a PIN is something you *know* combined with something you *have* (a card), while a scan is something you *are* (a fingerprint) combined with something you *have* (a phone).

Remote Payments

Merchant developers can use Apple Pay's API to create mobile applications through which consumers can complete remote transactions. To pay, the user chooses Apple Pay as the preferred mode of payment at checkout. To initiate payment, as with in-store transactions, the user must authorize the transaction via TouchID. Again, neither the application nor the merchant will see the user's payment credentials.

Opening access to this API will drive broad usage of the Apple Pay feature throughout the app store, thus driving consumer awareness, education and adoption.

To pay remotely, a user must pay from within an application. Apple Pay will not work from a web page.

The Card Networks

As of October 2014, Apple has signed agreements with Visa, MasterCard, and American Express while it is rumored that Apple is amid negotiations with Discover. It is conjectured that in agreements with payment networks, Apple negotiated a reduced rate for payments transacted in the Apple Store and iTunes Store to 25 Basis Points (reduced from 40 Basis Points). These

negotiations may have saved Apple an estimated \$27 million in costs.

It is possible that Apple Pay could, in the long run, reduce the rates that card networks and issuers charge, as the cost of fraud decreases due to Apple Pay's TouchID fingerprint signature and tokenization technology

The Issuers

At launch, Bank of America, Capital One, Chase Paymentech, Citigroup, and Wells Fargo will support Apple Pay. The aggregation of these banks accounts for 83% of card purchase volume in the US. It is rumored that Apple is amid negotiations with Barclaycard, Navy Federal Credit Union, PNC Bank, USAA, and U.S. Bank.

Sources state that Apple may be collecting 15 BPS per transaction (15 cents for every \$100 transaction), which would hint that larger banks, at least in the beginning, will be the primary revenue source for Apple Pay.

Apple Pay shares a delicate relationship with issuers. By making more transactions digital, Apple has the potential to significantly increase the issuers' share of mobile payment revenue.



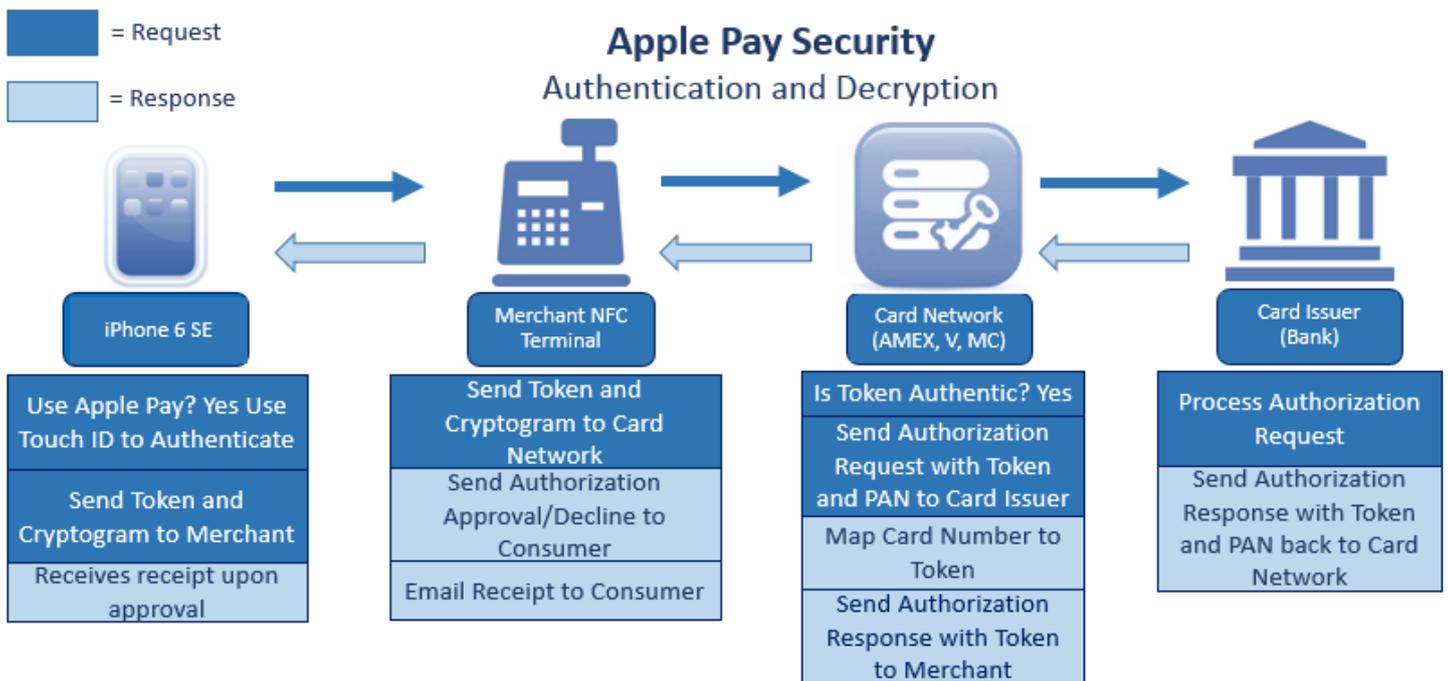
Security

The Secure Element (SE)

All sensitive consumer payment credentials will be stored on the iPhone's Secure Element. Consumers can either add the credit card from the iTunes account, or add a new card via PassBook. When the consumer uploads credit card information, Apple Pay will create a unique DAN for each payment card, which will be stored in the SE. The consumer's actual credit card number (or PAN) is reportedly never stored on the iPhone or Apple servers, as the issuer and/or card network stores the actual PAN. Following authentication, the SE will receive payment confirmation. The SE will then use this confirmation to store recent purchases in Apple's Passbook application.

Authentication

As mentioned earlier, TouchID authenticates payment transactions on the iPhone. Apple introduced TouchID last year with their iPhone 5S. The 5S consists of a fingerprint scanner and the Secure Enclave, which is optimized for secure mobile payments. TouchID, combined with the NFC chip in the iPhone 6, make up Apple Pay's technical framework.



Only after TouchID authenticates the transaction does Apple Pay send a transaction token to the merchant's system. The merchant's system will then send the token and associated cryptogram to the payment network. If the token is determined to be authentic (by authenticating the cryptogram), the card network will translate the token into the PAN and send this information to the card issuer. Again, if the information is determined to be genuine, the card issuer will forward the authorization and the PAN back to the network. The network then maps the PAN to the token, and sends the response to the issuer, processor, and merchant.

Privacy

Apple Pay assigns a DAN alongside a transaction-specific dynamic security code to securely process a payment. Thus, a user's actual credit and debit card numbers are never transmitted or shared with merchants. To tokenize account numbers, Apple currently utilizes American Express Tokenization Service, MasterCard Digital Enablement Services, and Visa Token Service.

If the consumer's iPhone becomes lost or stolen, the user can suspend all payment credentials remotely through the Find My iPhone application or website. The capability to suspend payment credentials ensures that users will not need to cancel credit cards in the event their phone is misplaced or stolen.

This functionality requires an internet connection. However, if a thief disables internet connection on the iPhone while still keeping NFC enabled, Apple Pay will always require TouchID to authenticate payments.

Possibility

Consumers have demonstrated a tremendous level of trust in the Apple brand. The fact that 40% of smartphones in the US are Apple iPhones shows that consumers are already comfortable with the idea of Apple handling a certain measure of their payment transactions. Apple's consumer-centric payment strategy combines elements of providing data and helping business become smarter.

At the time of this publication, Apple Pay is still in its early live stages. Many details remain unknown. How will Apple

Pay impact Apple? How will Apple Pay impact payments competitors like PayPal and MCX? Both Square and Stripe have already announced that they plan to accept payments via Apple Pay. This begs the question— how will Apple Pay impact commerce at large?

With its focus on security and privacy, Apple is positioning itself as a trusted partner in the payments industry. A consumer experience that once seemed futuristic is now within our reach with Apple Pay. Conceivably, we can prepopulate a user's entire consumer history, across all channels, in the instant they enter the store.

NFC technology, once shunned by payment giants, has become the front-runner for our future payments technology overnight.

The future looks promising for mobile payments. Apple has introduced a platform through which merchants and retailers could exercise their own creativity to enhance their brand and customer experience.

The next generation of payments is upon us. With new means to accept payments, to engage consumers, and to hone customer relationships, merchants and retailers should approach Apple Pay with their focus not on what it is, but what it could be— possibility.



The Apple Watch

Predicted to hit the market in 2015, consumers can use Apple Pay to purchase goods through the Apple Watch. Like the iPhone 6 and 6 plus, the Apple Watch contains NFC capability and securely stores payment information on the SE. Users will authorize Apple Watch payments via PIN code. The PIN code is triggered by sensors that monitor skin contact. If a user removes the watch from their wrist, the PIN must be reentered the next time the user wears the watch. If a thief steals the watch he must reenter the PIN upon triggering the skin-detecting sensors. The Apple Watch allows for remote payments on the iPhone 5 series. Since the 5 series does not use the SE, iPhone 5 devices will use the Apple Watch's SE via Bluetooth connection to complete transactions remotely.



If you have additional questions regarding Apple Pay and its implications, please contact Daniel Kahan (dkahan@wcapra.com, 312-873-3300).

About W. Capra

W. Capra Consulting Group is a professional services organization focused on identifying, leading, integrating and delivering technology, payment, security, and loyalty solutions to a broad range of major established retail firms and emerging businesses. We have a passion for our business and for seeing our clients succeed.

Sources: CNET 2014, Computerworld 2014, Glenbrook 2014, IMore2014, The New York Times 2014, NFC World+ 2014. Pando 2014. PYMNTS 2014. UL 2014