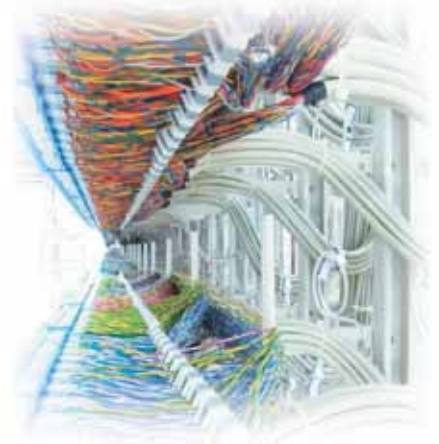


Are Mobile Payments Ready to Cash in Yet?

Neal Leavitt



After years of hype, the use of mobile devices to buy goods and services may be ready for prime time, assuming developers can overcome some obstacles.

For several years, vendors and market analysts have predicted that the ability to buy products via mobile devices will overtake the marketplace, providing greater convenience to consumers and producing a new, untapped source of revenue for many companies.

Mobile payment technology has indeed become more advanced and more popular, but it has yet to become commonplace.

Industry observers say that several factors—including inadequate security, a lack of standards, and limited interoperability among systems—could inhibit rapid growth over the next few years.

For example, there aren't yet enough stores with mobile payment capabilities to enable widespread use, according to Rob Enderle, president and principal analyst of the Enderle Group, a market research firm. In addition, many consumers don't take to change easily and are still content with credit and debit cards.

The sheer number of mobile payment approaches has also limited adoption. "Users and retailers get confused by fragmentation and are unable to tell if the solution they pick is the most widely accepted and supported," said John Devlin, market

analysis firm ABI Research's practice director for security and ID.

Banks, retailers, and wireless carriers haven't always worked together on the technology, further delaying its adoption.

MOBILE PAYMENTS' PROMISE

Mobile payments let banks and other service providers offer additional services to users, which encourages customers to keep doing business with them.

This has begun a shift in purchase methods from static credit cards to dynamic approaches such as mobile payments, according to Mung Ki Woo, MasterCard's global head of mobile.

Many people in developing countries use mobile payment technologies because there are few banks and their incomes are too low for them to qualify for credit cards.

To bridge this gap, telecommunications provider MTN Group is offering its MTN Mobile Money service to customers in parts of Africa and the Middle East. MasterCard has also launched its Mobile Money Partnership Program, aimed at giving the world's billions of financially underserved consumers access to mainstream services via their mobile phones. Last November, Visa rolled

out Visa Mobile Prepaid, accessible via a cell phone, which provides consumers with a globally interoperable electronic payment account.

UNDER THE HOOD

Regardless of the type of mobile payment technology, security is critical. Today's systems provide security via approaches such as PINs and information storage in embedded chips that encrypt the data they contain.

Some mobile payment companies are utilizing cloud computing by, for example, keeping data or functionality in Internet-connected servers. For example, Google has just announced that its Google Wallet 2.0 will employ a cloud-based architecture.

Several cloud service providers, such as NeuStar and TNS, provide API-based access to mobile network assets, including those involved in making purchases.

Cloud technology keeps sensitive data off a device, which can protect the user, but the approach has its own security challenges, noted Ted J. Eull, security vendor viaForensics' vice president for technology services.

Near-field communication

NFC is a radio-based technology enabling devices to exchange



Figure 1. A Samsung smartphone makes a purchase via near-field communication, in which a user transmits payment information by placing the device close to a merchant's NFC reader.

data over a distance of about four centimeters (roughly 1.6 inches). It lets a consumer's smartphone pass payment and identity information to a retailer's NFC reader.

One of the technology's key features is its passive, energy-saving mode, in which the retailer's reader generates an RF field that powers the smartphone's NFC chip without draining the device's limited battery resources.

NFC is used primarily for contactless payments. However, one emerging application involves marketing, in which users scan a tag on an intelligent poster with their phones. This could take consumers to a website with promotional information or let them download coupons.

Because phones must be very close to readers to pass information, NFC data is difficult to intercept.

Currently, though, the industry is just beginning to adopt the technology, and few mobile devices have had NFC chips until recently, said Tam Hulusi, security vendor HID Global's senior vice president.

Most major smartphone manufacturers say they'll support the technology in the near future.

Google Wallet customers use NFC to make purchases with their devices. The application functions as a virtual payment card that users load with money via their credit cards.

Visa is working with several partners to deliver its NFC-based payWave mobile payment services. For example, Intel is working with Visa to make payWave compatible with devices that use Intel's Medfield mobile chip.

As Figure 1 shows, Samsung is showcasing payWave on a limited edition of its Galaxy S III smartphone, which debuted at the recent 2012 Olympic Games in London.

Vodafone's mobile wallet will work with payWave-capable smartphones beginning in Germany, the Netherlands, Spain, Turkey, and the UK in early 2013.

Later this year, Isis—a mobile commerce network that AT&T Mobility, T-Mobile USA, and Verizon Wireless are spearheading—is

expected to roll out its NFC-based mobile wallet system capable of making payments, storing loyalty card information, and redeeming coupons.

Premium SMS or USSD-based transactional payments

For several years, consumers have used both short message service (SMS) and unstructured supplementary service data (USSD; a protocol that GSM cellular phones use to communicate with a service provider's computers) technologies to buy applications and other content.

These older technologies have typically been used in mobile money programs in developing countries, in which many users have low-end phones, noted Michelle Janes, senior business leader for Visa's Mobile Product Group.

Each approach uses text messaging to send payment information for transactions billed through a consumer's wireless phone account.

Unlike SMS, USSD creates a connection that stays open during a session, enabling a two-way, responsive, real-time exchange of data.

Nonetheless, said Jim McGregor, president of market analysis firm Tirias Research, both technologies will have little appeal in developed countries because of their slow speed, high cost, and limited security.

Direct mobile billing

Consumers generally use direct mobile billing to purchase ring tones, applications, and other inexpensive items from online stores that offer this payment option. A carrier then bills its customers for both the purchase price and a small transaction fee via their wireless account.

This not only generates revenue but also makes purchasing easier and solidifies a provider's relationship with its customers, explained Will Stofega, director of market research firm IDC's Mobile Device Technology and Trends program.

Direct mobile billing systems typically provide security via PINs and passwords.

Mobile web payments

The Wireless Application Protocol is commonly used to access e-commerce websites and make payments. WAP lets mobile phones display specially formatted sites on a small screen.

Users select a website, which sends a request to a gateway server that, in turn, retrieves the desired information via HTTP. The server translates the data into the Wireless Markup Language and sends it to the user's device for display.

To make payments, a consumer accesses an e-commerce webpage and charges transactions to a credit card, mobile wallet, or wireless account. The system then sends the payment information to the merchant. All communications are handled via WAP.

Compared to technologies such as NFC, WAP is slow and unreliable, is not highly secure, and offers limited graphics. Thus, it isn't widely used, noted Ed Moyle, principal of market research firm Security Curve.

Onscreen barcode payments

To process a barcode payment, a retailer typically sends a two-dimensional barcode containing the payment account information to the customer's phone via email.

For example, with Starbucks' barcode-based iPhone application, the user receives a company loyalty card. At checkout, the user opens the application, which displays a barcode on the screen. The cashier scans the barcode and deducts the transaction amount from the buyer's account.

Far-field communications

Tabbedout uses FFC, which has benefits like those of NFC but doesn't require the user's device to be next to a reader.

Also, Tabbedout's technology is integrated with existing point-of-sale systems, so merchants don't have to buy separate readers, noted company executive vice president and cofounder Rick Orr.

To make payments, users store information about their credit cards or other payment sources in the Tabbedout application on their phone. At the time of purchase, a buyer shows a code to the business, views the bill, and sends encrypted payment information directly to the merchant.

Tabbedout users can find nearby participating merchants via their phone's location services or they can use the application to search manually for such businesses by zip code.

Dongles plug in via the headphone jack and turn mobile devices into credit and debit card readers.

Dongles

Numerous companies offer payment dongles—such as Intuit GoPayment, Square, and VeriFone Sail—that work with mobile devices.

The dongles plug in via the headphone jack and turn the mobile devices into credit and debit card readers. This makes merchants mobile, whether on a sales floor, at a flea market, or in a food truck.

The dongle vendor collects between 2 and 3 percent of the purchase price per transaction.

The PayPal Here application lets small businesses accept almost any form of mobile payment. They could swipe cards on a fully encrypted thumb-sized card reader. Or by downloading an application for the purpose, they could use a device

camera to scan and process cards and checks.

STOP PAYMENT

Mobile payment technologies face several noteworthy challenges.

According to TIRIAS Research's McGregor, "We won't see widespread adoption in the US until consistent standards across multiple points in the value chain emerge, ... and it doesn't look like it will happen anytime soon."

According to viaForensics' Eull, these standards could address the contesting of fraudulent transactions, the protection of consumer data on devices, the safety of user account information in the cloud, and application security certification.

Another significant barrier to adoption is the question of return on investment for businesses on, for example, purchases of NFC readers, added John Shuster, senior analyst for market analysis firm VDC Research.

Also, many users might avoid mobile payment technologies because they either tend to resist new approaches or see no compelling reason to adopt them.

"Consumers using credit cards may espouse the 'if it isn't broken, don't fix it,' mentality," said Shuster.

One of the key issues today is determining how the revenue that mobile payment technologies generate will be controlled by and divided up among the different types of companies involved.

To date, getting the entire ecosystem of payment service providers, banks, wireless carriers, and handset makers to work together has been difficult, noted McGregor. The real problems, he added, are "greed and resentment," with everyone wanting to control the money flow.

As smartphones become more involved in financial transactions, they'll become an even bigger hacking target. Key industry players and government regulators have yet to set

clear privacy and security guidelines. And in many cases, vendors haven't implemented effective security systems and processes, said Eull.

The market is somewhat fragmented among numerous national and regional banks, payment providers, and mobile services providers but will become less so as leaders emerge with the size and strength to turn their own technologies into standards and protocols, noted Edward Wilford, a consultant with market research firm Finaccord.

Despite the concerns, mobile payments will grow in popularity, albeit slowly, predicted Visa's Janes.

Brian Gendron, MasterCard's business leader for worldwide communications, said all market segments that adopt mobile payments are seeing benefits.

However, he added, cooperation among financial institutions, telecommunications companies, other technology providers, and govern-

ments will be necessary to enable mobile payments to reach critical mass.

A recent Pew Research Center report said 65 percent of people worldwide will use their phones to pay for a product or service by 2020. Market analysis firm Juniper Research forecasts that mobile payments for NFC transactions, goods, and money transfers will total about \$670 billion by 2015.

Ultimately, noted VDC Research's Shuster, mobile payment systems will also encompass marketing, loyalty campaigns, coupons, and other related features that benefit consumers and merchants.

Tirias Research's McGregor predicted that widespread adoption will occur first in markets—such as Japan—that converge around a few platforms and later in markets with many competing approaches, like the US.

Additional security, particularly via biometrics, could make consumers feel more comfortable about using mobile payment technology.

"We're quickly moving to a world beyond cash and plastic," said MasterCard's Woo.

"Mobile payments will leapfrog the traditional card-based infrastructure," Janes said. "It's an on-ramp for consumers everywhere and will especially benefit people in developing countries."

"Consumers want their information accessible everywhere," said viaForensics' Eull. "Mobile payments will be one dimension of that consumer expectation." **G**

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