THE GREAT PAYMENTS MIGRATION

From magnetic stripe to chip-technology and mobile payments
Many of the payments innovations in the United States have leveraged traditional payment methods and infrastructures. Growth in tablet and smartphone adoption and increased popularity of card payments has led to many payments innovations that seek to improve the ways in which payments are made. Now there is an innovation in card technology itself and it has the potential to spur adoption of mobile payments—something that has been speculated about for several years now.

In a 2015 analysis, Terri Bradford, a payments research specialist, and Jesse Leigh Maniff, a payments research analyst, both at the Federal Reserve Bank of Kansas City, explained that the shift away from magnetic stripe technology to computer chip technology based on a global standard called Europay, MasterCard, and Visa (EMV) in payments cards may not only affect the survival of current card-based payment innovations, but also may create opportunities for growth of alternative payment products, such as mobile payments.

Though some card brands began migrating to the EMV standard in the early 2000s, magnetic stripe payment cards are still the norm in the United States. Just this past October the United States began the implementation of chip-based cards. However, the shift is not mandatory and has been slow in developing.

Magnetic stripe card technology involves using static information stored on the magnetic stripe. Because some payment information—such as the primary account number—never changes, counterfeiters can use stolen card data captured through the transaction to commit fraud. In contrast, cards with an EMV chip technology use dynamic data: the chip creates a unique transaction code for each payment transaction. The ability to use dynamic data provides valuable security as a transaction is initiated and processed at the point of sale (POS).

So it would seem like a “no-brainer” to adopt the technology. But the implementation faces several obstacles such as an aging universal payments system based on checks and magnetic stripe cards, cost effectiveness for merchants and the need for consumer education.

**New innovations**

Payments innovations for magnetic stripe cards typically target either merchants or consumers. EMV migration may affect these groups in different ways, Bradford and Maniff say.

“The proliferation of mobile devices, for example, led to greater innovation focused on merchant acceptance of magnetic stripe payment cards. Nonbank providers such as Square, PayPal, Heartland Payments Systems, and others offer products enabling mobile phones and tablets to accept magnetic stripe payment cards. These innovations have facilitated card acceptance by merchants of all sizes, including those that otherwise would have been unable or unwilling to accept such payments given the complexity of the associated fees.”

Now the payments system is making a long-anticipated move by changing the payments technology from magnetic stripe to chip technology. One way payment networks are prompting merchants to make the switch to more secure chip cards is by shifting fraud loss liability for POS transactions to the merchant if the merchant has not invested in EMV technology and the card issuer has—otherwise liability remains the same, with the card issuer absorbing most of the loss. Banks and nonbanks also are issuing payments cards that use both an EMV chip and magnetic stripe to ease the public into an EMV marketplace.

But what does this mean to companies that have invested in magnetic stripe innovations?

**The acceptance of EMV**

Some payments innovation companies are not developing new software for EMV because of the associated costs, Bradford and Maniff said, while other companies, such as Square
and Inuit, re-engineered their software and hardware to be compatible with EMV.

As America continues the move to chip technology these U.S. companies could face stiff competition from European and Asian companies that have already been providing EMV technology to merchants and consumers for several years.

Bradford and Maniff said that although merchants are being encouraged to upgrade their POS equipment as fraud liability shifts from the issuer to them, considerations such as susceptibility to fraud, types of merchandise sold, and chargebacks factor into their investment decisions. If merchants find the benefits of upgrading their POS equipment do not outweigh the costs, providers of magnetic stripe acceptance devices are safe from being shut out of the market completely. However, to remain competitive in an EMV card environment, innovators will also have to decide whether upgrading their POS equipment offerings is cost effective.

Although the chip-technology migration may have a limited effect on the survival of magnetic stripe card innovations for merchants, Bradford and Maniff said, for consumers, it could make paying with cards more confusing because some EMV terminals include contactless or near-field communication capabilities (NFC), which allow for mobile payment devices.

As a result, consumers may choose the payment method—swipe, dip or tap—that is most convenient.

**Mobile payments**

A number of surveys and analyst assessments indicate that despite the excitement generated by mobile payments that use NFC-type payment devices and systems, such as Apple Pay or Google wallet, a majority of the U.S. public isn’t excited about paying for merchandise from a phone or watch.

This doesn’t mean the demand for mobile
payments isn’t growing among merchants, especially those who serve a more technology-driven clientele. According to a report published in Compendium, 88 percent of the 18-to-29 age demographic in the United States is the fastest growing consumer group to use the smartphone for some type of financial transaction. And a Pew Internet & American Life Project survey found that a majority (65 percent) of respondents agree with the statement that by 2020 “most people will have embraced and fully adopted the use of smart-device swiping for purchases they make, nearly eliminating the need for cash or credit cards.”

The conundrum analysts say is that other consumers groups, especially those with more disposal incomes, remain skeptical of mobile payments. They are worried the new technology is less secure and private than using a magnetic stripe card, even with the dynamic authentication process in NFC-based systems, which is more secure than the magnetic stripe. And many consumers also think the mobile systems are inconvenient—it’s easier to swipe a card or pay with cash than fiddle with a phone or watch.

Consumers also face the lack of merchants capable of accepting NFC-device payments. Although Apple reported 700,000 merchants supporting its system in 2015—and receiving marketing support from card issuers and holding a two-thirds share of all mobile payments made—there are an estimated 10 million payment terminals in United States. According to research by the Aite Group, of the roughly 10 million U.S. POS terminals, only 59 percent were expected to be chip compatible by the end of 2015. Some of these terminals will have the contactless, or NFC functionality enabled, while others will not.

That’s why Aquirer Systems, a test and validation solutions provider to the global payment industry, recently said in a company blog: “EMV is the way forward for a secure foundation for all future NFC/mobile payments.” EMV will provide a global format that will allow the acceptance of NFC-device payments in the future.

Whether this will result in full acceptance of smart-device swiping by 2020 in the United States, as mentioned in Pew Internet & American Life Project survey, remains to be seen, because reliable statistics on mobile wallet payments are difficult to obtain, according to 2015 Reuters report.

“Neither the companies offering payment systems nor credit card issuers will disclose detailed data about usage. But analysts agree that they are used for only a tiny percentage of U.S. retail transactions,” the report said.

And industry analysts don’t think there’s going to be a sudden jump to EMV or mobile payments, but as more and more people use it and as the technology is more pervasive, it will happen, similar to the evolution of the ATM machine and debit card.

COMMENTS/QUESTIONS are welcome and should be sent to teneditors@kc.frb.org.

FURTHER RESOURCES

“Change Is Coming: What the EMV Migration May Mean for Payments Innovation”
By Terri Bradford and Jesse Leigh Maniff

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