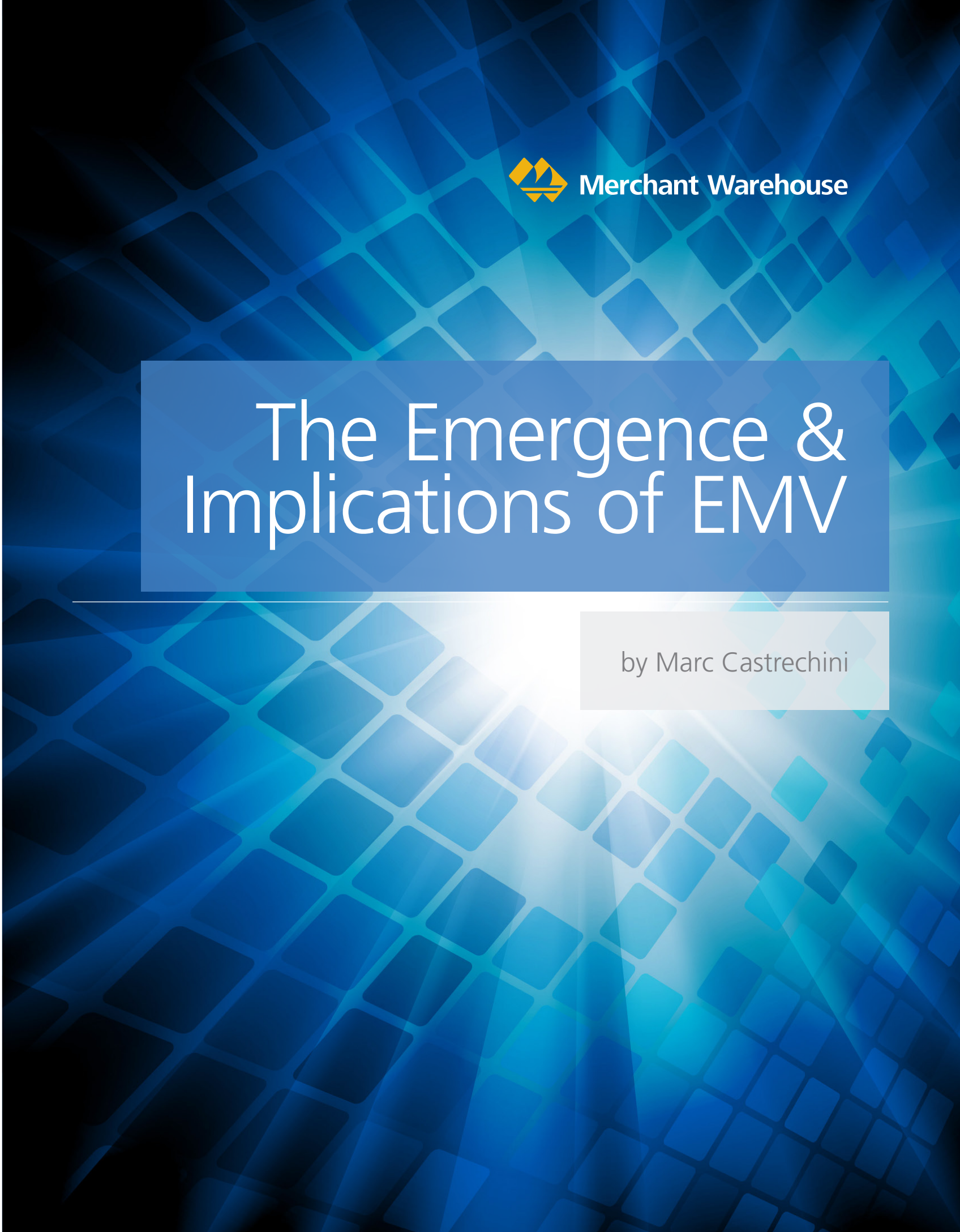

The Emergence & Implications of EMV

by Marc Castrechini

Consideration over the implementation of consumer chip-based payment systems has been on the table in the U.S. for nearly 20 years, but financial institutions have balked at the idea until just recently. One of these chip-based standards is known as EMV, which is an acronym of the major players originally behind it: Europay, MasterCard and Visa. As these three major credit card brands move forward with the implementation of such a system in the United States, merchants, payment solution providers and consumers are beginning to wonder how it works and what it means to them.

So far, the U.S. government has set no standards and provided no guidance in the implementation of EMV. This situation makes it necessary to hold meaningful dialogue and to share information about EMV between all involved parties. One of the most interested parties are merchants, who are often left out of the loop but have more intimate contact with payment systems than any other group.

INTRODUCTION TO EMV

EMV was first introduced almost two decades ago as a standard for smart chip electronic payment systems. EMV was originally created through a joint venture, called EMVCo, of Europay, MasterCard and Visa. MasterCard, Visa, American Express and JCB now own EMVCo.

The EMV payment system uses embedded microchips rather than the magnetic strip on traditional credit cards to transmit consumer account data to merchants.

According to EMVCo, nearly 1.5 billion smart chip payment cards are used at over 21.9 million terminals throughout the world. The largest exception to the widespread use of smart chip cards is the United States, which also happens to be the largest market for payment cards in the world.

It is universally agreed upon that EMV is making its way to the United States. The only unknown is when adoption will begin. Some financial experts say that the U.S. is ill prepared for such a venture, but other analysts' state just the opposite by saying the technology will sweep through the country very soon and very quickly.

Spurring on the belief that EMV is coming to the U.S. sooner rather than later was an announcement made by Visa on August 9, 2011. Visa put out a press release that the company is accelerating efforts to migrate to EMV for both PIN-based and signature-based payments. The second impetus behind early EMV adoption was a report by the Aite Group announcing credit card fraud causes losses totaling $8.6 billion per year. The EMV standard is more secure than traditional credit cards, so card providers are eager to make the change.

As usual, merchants are standing by and waiting for news from credit card providers and merchant account providers. The National Retail Federation states that most merchants need more concrete information and news before they are willing to invest in smart chip terminals and other retail payment infrastructure. Although Visa and MasterCard have released some information about what is to be expected, no official guidelines for merchants exist at this point. The basis of this article is to put together what is known about EMV that it may be more easily digested by merchants and consumers, the two groups that will be on the front lines of the technology.

EMV OVERVIEW

EMV is a smart chip standard that will make chip-based payment cards and merchant terminals compatible throughout the United States and the rest of the world.

EMV transactions are made through a plastic card with an embedded microchip or through a mobile phone with a near-field communication (NFC) chip. The user's account information is securely stored on the chip. The information is encrypted and sent to a similar chip on a payment reader. The encrypted processing adds an additional layer of security, and once the transmission is complete, processing occurs for the merchant in much the same way as traditional credit cards.

One of the biggest reasons why EMV is considered so important is its additional security. Worldwide credit card fraud causes over $1 billion in losses, but that amount is down from nearly $3 billion in 2001, according to The Nilson Report. In comparison, the U.S. card payments industry is set to suffer $10 billion in total losses per year by 2015.

*Industry leading analyst firm, Gartner, reports that, "As the rest of the world deploys EMV, these controls and checks in place within the U.S. market will be insufficient to stem fraud. Fraud follows the path of least resistance — as other countries become more secure, the U.S. will be the obvious target, and fraud levels are anticipated to follow global trends and increase exponentially."**

Another factor that is stimulating the implementation of EMV is the Durbin Amendment, part of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. The amendment regulates interchange fees, and banks are expected to lose an average of 45 percent of the revenue they make from debit card use. This has put the focus on fraud reduction as a way to increase revenue and profit.

Interest in mobile payments is also growing in the U.S.

A forecast by Aite Group expects mobile payments to reach $214 billion by 2015. In 2010, the industry volume was only $16 billion, which puts the expected annual growth rate at 68 percent.

**Gartner, Inc., Industry Research, Hype Cycle for Financial Services Payment Systems, 2012, Christophe Uzureau, July 20, 2012. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose*

The growth of mobile payments may be hampered without a standard. Consumers and merchants require the stability and assurance of a standard technology adopted by credit card providers and processors. EMV will provide consumers the assurance of security and reliability they need, and merchants will be assured that they will not be required to install multiple payment systems.

The final reason why EMV must be implemented quickly in the United States is that U.S. travelers are beginning to find merchants in other countries unable to accept their traditional credit cards. According to the Aite Group, many international merchants refuse to accept magnetic swipe cards, and when travelers return home, they are less likely to use the card that was refused abroad for domestic purchases. The European Payments Council (EPC) has already announced that traditional credit cards will be banned in only a few years.

In the U.S., it is argued that the technology used for traditional credit cards is at the end of its time. Magnetic strip technology has been used for over 40 years, and security can no longer be sufficiently improved to deal with the ever-advancing technology used to commit fraud. Supplemental security measures cost billions of dollars to implement, and banks are beginning to see that the money would be better spent on EMV.

VISA & MASTERCARD PUSH FOR EMV ADOPTION

So far, the U.S. government and the Federal Reserve have remained quiet on the prospect of implementing EMV. With no policy recommendations over how smart chip payment systems will be implemented, it is up to those in the industry to decide how to get it done.

One of the first steps taken in the implementation of EMV was by Visa, who released a statement outlining how the company will proceed in the next few years. The outline provided by Visa for EMV is being called a roadmap toward dynamic authentication. In the outline, Visa officially proposes a timeframe for EMV conversion and a format for the hardware required. Finally, Visa put forth a strategy to help EMV gain acceptance by both merchants and consumers.

Jim McCarthy of Visa stated that part of the goal of the company is to encourage investors to support EMV chip technology. Once investors are onboard, EMV functionality and security can begin to be improved, speeding up the adoption of this payment standard.

In order to encourage merchants, Visa is expanding its Technology Innovation Program (TIP) in October 2012. Merchants that do at least 75 percent of their Visa business through terminals that support both contact and contactless chips will not be required to validate their compliance with the PCI Data Security Standard on an annual basis.

Although it will not be necessary to validate compliance, these merchants must remain in compliance.

Another initiative taken by Visa is meant to ensure that payment solution providers will accommodate EMV payments accepted by merchants. Credit card processors and sub-processors will be required to support chip transactions by April 1, 2013. This means the merchant services companies must be sure they can handle the additional data necessary for EMV transaction processing.

The final initiative set forth by Visa is a shift in fraud liability to merchants' acquirers rather than card providers. This liability shift for point-of-sale (POS) transactions is meant to speed the adoption of EMV because it is more difficult to commit fraud through EMV cards at POS terminals than it is through magnetic strip cards. The liability shift is scheduled to take effect on October 1, 2015, but a two-year delay will be given to fuel merchants that use automated fuel dispensers.

For its part, MasterCard announced that it is also shifting EMV liability for Maestro ATMs. This liability shift goes into effect on April 19, 2013. A spokesperson for MasterCard said that the company is not mandating that ATMs accept EMV payments, but if they do not, the ATM owners will be responsible for any fraud that occurs.

While the announcements from Visa and MasterCard are a start, it will take much more for a full-scale conversion to be successful. A full conversion will require the support of every group throughout the payment chain. The sooner consumers, merchants and payment solution providers become educated about EMV payments, the greater the chance the conversion process will be a success.

PROS & CONS OF EMV PAYMENTS

Although adopting EMV payments has a plethora of advantages, a few downsides will come with the implementation of a chip-based standard. Both merchants and consumers must take a close look at all of the pros and cons in order to maximize the benefits and minimize any detriments. Both users of such a system will need to purchase new hardware or equipment, especially in the case of mobile phone payments. However, a return on investment is indicated for both parties should implementation and adoption of EMV be done properly.

SECURITY & FRAUD

One of the greatest advantages of EMV over traditional credit cards is the layered security used by EMV. However, an argument still exists over whether EMV in the U.S. will handle PIN transactions, signature transactions or both. One of the issues that EMV does not address is how a cardholder's identity will be validated. An application may be loaded onto a chip as it is issued, but the card issuer will dictate the specific security mechanism. The card issuer will declare whether verification is by PIN, signature or not used at all.

So far, those that have adopted contactless payments have used a PIN as the preferred method of verification.

The chip and PIN authentication procedure provides two levels of security to fight the fraudulent use of lost or stolen cards. The first layer is the chip's built-in encryption, while the second layer consists of the PIN.

The card issuer is also free to incorporate additional layers if it is seen as beneficial.

One of the security issues with EMV is how to resolve fraud in transactions where the card is not present, such as with purchases over the phone or online. According to the Royal Canadian Mounted Police, credit card fraud rose by over 2 percent in the two years when smart chip payments were being implemented in Canada. Solutions to this problem may never be achieved because of the difficulty involved.

One solution would require every consumer to use an EMV card reader to authenticate online transactions. It has been suggested that a card reader could be built into laptops and home computers. Another solution is the implementation of 3-D secure protocol. Most major U.S. credit card issuers have already approved some form of this service, but actual adoption of the protocol remains very low because consumers see it as a hassle and merchants must pay additional fees.

Another issue that EMV addresses is cross-border fraud. International credit card fraud may be reduced after EMV is implemented in the United States because most of the world will be on the same standard. This global standard will also work to facilitate international trade and tourism.

TIME & COST OF EMV IMPLEMENTATION

One of the biggest issues with EMV implementation is the time and cost required. According to an article featured in Computerworld, over 360,000 ATMs will have to be replaced. In addition, Ben Woolsey and Matt Schulz, authors of "Credit card statistics, industry facts, debt statistics," state that over 609 million credit cards and 520 million debit cards will have to be replaced. Finally, The Nilson Report estimates that over 15 million POS terminals will have to be replaced or converted. The total cost of replacing the POS terminals alone will come to $6.75 billion, according to Javelin Strategy & Research. Replacing the credit and debit cards will cost $1.4 billion, and ATM replacement will cost $500 million.

Analysts say the above figures may not be 100 percent accurate because many of the upgrades and replacements have already taken place. According to the Smart Card Alliance, many merchants and banks have already made the upgrades, and manufacturers of terminals and ATMs have already been selling products in the U.S. that were originally required for international markets. Modifying the machines for EMV use in the U.S. is a simple, low-cost matter.

Merchants will pay the bulk of the cost, but some of the merchant cost will be offset by incentives, such as those being provided by Visa.

The cost for consumers is expected to be very low. Consumers will pay little to nothing for the conversion, except for the fact that mobile phone payments will usually require a new phone that has an NFC chip installed. However, low-cost external chips are being developed to help consumers convert their existing mobile devices.

Financial institutions are expected to pay a large portion of the cost. Smart chip cards will have to be produced and distributed. These cards are more expensive to manufacture than traditional cards, but they have a longer lifespan. This means card issuers will eventually recover the initial cost of deploying the cards.

When considering that U.S. credit card fraud totals $8.6 billion annually, the $8 billion price tag for EMV implementation is very reasonable. Experts expect that the cost will be recovered quickly due to reduced fraud. The benefits of reduced fraud are also long-term, in contrast to the short-term cost of implementation.

EMV & MOBILE PAYMENTS

EMV will facilitate the acceptance of mobile payments, the fastest growing form of payment in the United States. The foundation for mobile payments began to be laid out years ago, but it is quickly gaining momentum. President of the Federal Reserve Bank of Atlanta has stated that mobile commerce is becoming a transformational element in the financial sector of the United States, and the ability of mobile commerce to use a standardized payment system could be a key element of the acceptance of mobile payments by merchants and consumers.

Mobile payments have several advantages over other payment systems, as pointed out by the Smart Card Alliance. Some of those benefits include the following:

- Additional security
- Convenience
- Reliability
- Value-added applications, such as electronic coupons and loyalty programs
- Wallet functionality

NO CENTRAL REGULATION

At the moment, EMV technology is not regulated or directed by the federal government, and it does not seem that any action will be taken to force smart card implementation onto the public. All that has been officially said about the matter comes from a senior economist at the Federal Reserve Bank of Kansas City. It was stated that the Federal Reserve must see to it that transactions are safe and efficient. Confidence in the security of the system is important, but it has been the policy of the Federal Reserve to encourage the electronic payment industry to develop its own standards. It is unclear whether this position by the U.S. government will help or hinder EMV implementation.

EMV IMPLICATIONS FOR MERCHANTS & CONSUMERS

The implementation of EMV for smart card payments will have several implications for both merchants and consumers. Considering the implications at this early stage of adoption will help both of these groups ease into the transition. As more merchants and consumers become educated on the issue, the implementation will become less frightening, and the benefits will become more apparent.

IMPLICATIONS FOR MERCHANTS

Nearly every merchant in the United States will eventually be affected by EMV implementation, and important decisions about the future of each business will have to be made. So far, only Visa has come out in an attempt to alleviate the fear of transition. It is expected that other top players involved in EMV adoption will eventually make statements and offer incentives to merchants, but no one is sure when that will occur. Visa's announcement is already seen as a call to action throughout the industry, and many merchants are doing their part by becoming educated on what EMV implementation means to them.

Merchants will be responsible for upgrading or replacing their credit card terminals should they choose to accept EMV payments. This cost will fall solely on the merchants, but some incentives may help to defray the total. Large merchants will put forth the effort to research the market and choose the best way to do this, but smaller merchants will most likely listen to the advice of their payment solution provider. The brands and features of the terminals will affect the actual cost of upgrading terminals.

In addition to purchasing terminals, merchants will have to coordinate with their payment solution provider to make sure the network can accommodate EMV transactions. In the beginning, it will be necessary for a network to support both magnetic strip cards and smart chip cards. This phase-in period is expected to last for two years. Merchants will also have to coordinate with their account provider on the issue of individual verification. It is still not clear which cards or which providers will require a PIN or a signature.

Another factor that merchants must consider is personnel training because procedures will change slightly when EMV payments are implemented. In addition, the responsibility for teaching customers how to use their smart chip cards will largely fall onto the individual merchants.

The upside to the EMV conversion is that merchants will be able to accept mobile payments. Mobile payments are one of the fastest growing types of payments because they provide additional security and convenience for customers.

IMPLICATIONS FOR CONSUMERS

The biggest issue consumers will face in the implementation of EMV payments is learning how to use their new cards or mobile devices. Some terminals and cards will require that the card is inserted and left in the terminal while a PIN is entered. Other cards will be contactless and require only a tap on the terminal.

It is expected that banks and merchants will join forces to provide the education consumers need to make the jump to EMV payments. This could take time because contactless MasterCard credit cards have been around for several years, yet most consumers still choose to use the magnetic strip. According to Discover, 95 percent of contactless cards that have been issued are always used in the conventional manner.

CONCLUSION

It is difficult to determine when EMV payments will finally be implemented in the United States, but most experts agree that this payment system is inevitable. The increased security and worldwide adoption of the standard are clear indicators that it is time for the United States to replace outdated magnetic strip technology with newer smart chip technology.

The challenges of EMV implementation in the United States are based on the country's large non-cash infrastructure. The transition is expected to cost several billion dollars, and much of it is to be paid by merchants. Eventually, the costs will be recouped due to reduced fraud, but large expenditures upfront are difficult for many merchants.

The key to implementing an EMV payment standard is in education and preparation. Merchants will have to coordinate not only with consumers but also with their merchant account providers and the major credit card issuers to make the transition fast and effective. In order to accomplish the transition, merchants can begin preparing immediately by talking to their POS system providers and their merchant account providers. Many POS system developers already have plans on how merchants can prepare for the transition. Additional questions about EMV terminals can be directed to the merchant account providers and the credit card issuers.

When everyone affected is sufficiently educated on how the implementation is to work, the transition can begin smoothly and finish within a two-year timeframe.

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