EMV: THE CATALYST FOR A NEW U.S. PAYMENT ECOSYSTEM

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PART 1: BUILDING THE FOUNDATION

Over the past decade, a number of countries have made advancements in their payment infrastructures which have brought more revenue, increased efficiencies, and strengthened fraud prevention. Despite the opportunity to realize these and other significant benefits, the evolution of the U.S. retail payment infrastructure has been comparatively slow.

EMV (Europay, MasterCard and Visa) is a standard for globally interoperable, secure payments, and its coming deployment in the U.S. represents a significant move towards an enhanced payment ecosystem.

Part 1 of this white paper explores the opportunities—and threats—driving the adoption of EMV in the U.S. Part 2 discusses the topic of alignment within the industry for the purpose of creating the EMV infrastructure, in order to maximize the benefits for issuers, acquirers, merchants, and consumers.

EMV IS A GLOBAL REALITY, WITH 1.3 BILLION CARDS AND 20.7 MILLION CARD READERS BASED ON THE EMV STANDARD. EXCLUDING THE U.S., 42.4% OF CARDS ISSUED AND OVER 75.9% OF POS CARD READERS ARE EMV-ENABLED.¹

U.S. RETAIL PAYMENTS IN 2012: UNTAPPED OPPORTUNITIES

During the last 30 years, electronic payments have been adopted enthusiastically by U.S. banks, retailers and consumers. New payment innovations based on magnetic stripe data technology, such as contactless payments and electronic signature capture, were also introduced during this period. While the underlying electronic payment infrastructure is more than 30 years old, it continues to meet basic payment needs and maintains fraud at acceptable levels.

Despite its success, the magnetic stripe card payment infrastructure does not provide the rapid, fully secure authentication that characterizes other payment infrastructures. As a result, U.S. banks, merchants, and consumers are not currently enjoying the full benefits that can be realized, such as:

- Mobile payments and their seamless link with the new reality of retailing in both the bricks-and-mortar and online environments. This includes richer interactive and real-time experiences for the consumer, such as location-based services, online reviews and price comparison functionality, digital voucher redemption, group buying, and social network leverage.

- New payment types that offer reliable and rapid authorization that exceed the capabilities of online authentication and transaction authorization. Examples here include vending and public-transit payments.
• Opportunities to increase efficiency by streamlining card payment chargeback handling and the increased use of PIN versus signature verification.
• A significant increase in payment security.

Growing Security Threats
Along with the missed opportunities described above, growing security threats indicate the need to enhance the U.S. payments infrastructure.

On-going improvements in the application of fraud detection systems enabled by the online nature of the U.S. payment infrastructure, have maintained fraud at an acceptable level. To date, this has weakened the U.S. payment industry’s motivation for EMV migration. The situation is changing as more and more countries migrate to EMV technology (Figure 1).

FIGURE 1: EMV ADOPTION RATES BY REGION, 2011

Canada
• 67% of cards, 75% of POS and 40%+ of ATMs EMV Chip enabled
• On a fast track to complete migration around 2012
• Introduction of domestic liability shift March 2011

Europe
• 70%+ of cards EMV Chip enabled
• 90% of POS EMV Chip enabled
• 90% of ATMs EMV Chip enabled
• EU Regulators migration mandate January 2011 for SEPA countries

Asia-Pacific
• 30% of penetration of cards and almost 50%+ of POS devices
• ATM migration to EMV Chip is under way
• Domestic migration mandates in several markets (Malaysia, Korea, Indonesia)
• Dual interface (PayPass M/Chip across key markets)

Latin America / Caribbean
• 80%+ of acceptance now EMV Chip enabled
• Brazil, Mexico, Peru, Venezuela and Colombia are the most advanced markets
• Heavy EMV Chip migration activity across the region (Venezuela, Central America and Caribbean)

Middle East & Africa
• 12 key markets have EMV Chip penetration on POS above 80%, 75%+ penetration across region
• Sharp rises in EMV Chip card issuance in key markets (e.g. South Africa)
• Domestic migration mandates in several markets (Qatar, Bahrain)

Source: MasterCard Analysis, 2011
Despite the growing use of EMV outside the U.S. over the last eight years, the lack of “mature” EMV countries means that fraudsters are still finding opportunities in their home countries (Figure 2). But as global EMV migration moves forward and “loopholes” are closed, fraudsters in EMV-mature countries will look beyond their borders to use counterfeit card magnetic stripes, both at POS and at ATMs. The very low level of EMV terminal and ATM penetration in the U.S. will increasingly make it an easy target.

**FIGURE 2: INDICATION THAT COUNTERFEIT FRAUD CAN MIGRATE TO THE U.S.**

- While counterfeit fraud in the U.S. has been slowly increasing since 2005, cross border counterfeit fraud has seen significant growth, as more countries continue to migrate to EMV.
- Since EMV penetration in Canada began to climb in 2009, cross border counterfeit has shown significant growth in the U.S.
- Prior to beginning EMV migration, Canada noticed a spike in counterfeit fraud; most likely due to migration of fraud from other countries.
- As EMV penetration at POS increased, not only did counterfeit fraud significantly decrease, but other types of fraud showed signs of decline including Card Not Present and Lost & Stolen.

In addition to increased fraud, another threat to U.S. banks is the increase in acceptance issues that arise when cardholders attempt to use non-EMV payment cards in EMV-mature countries. This has real bottom-line consequences. According to Aite Group, of 9.9 million cardholders, 5.6 million would have spent an additional $712 per year on average using their cards had they not experienced cross border acceptance issues. In response, some U.S. payment card issuers have already started issuing EMV cards for travel outside of the U.S.
A third threat is related to the competitiveness of the U.S. payment industry: Many other markets around the world have already deployed EMV which has facilitated the use of innovative payments and related services by banks and consumers. This is sharpening the competitiveness of foreign payment providers. Eventually, this will put U.S. providers at a competitive disadvantage in both domestic and foreign markets.

EMV devices are not impossible to counterfeit, although any benefit in doing so would almost certainly be outstripped by the immense complexities involved. Magnetic stripes, which are considerably easier to counterfeit, will continue to be present on cards for the foreseeable future, to enable card acceptance in non-EMV environments. However, MasterCard’s and Visa’s U.S. liability-shift policies offer protection from this loophole by, in broad terms, transferring liability to any non-EMV party in the event of a counterfeit fraud transaction.

**Opportunity: A New Dynamic U.S. Payment Ecosystem**

Beyond fraud prevention, a new payment ecosystem would also help banks, retailers and consumers benefit from the opportunities described earlier, resulting in a richer consumer shopping experience.

The shift towards a new ecosystem is dependent on enabling dynamic authentication with an enhanced contactless environment. This is essential for providing a robust, reliable and rapid infrastructure that is needed for delivering innovations such as advanced, seamless mobile payments.

Deployment of EMV, including acceptance of contactless payments, reduces the need for significant additional investments in creating this ecosystem. With EMV as the foundation, further future innovations like biometric verification and new payment types could more easily be implemented.

**The Time is Right**

Several trends in the U.S. retail and payment environment indicate that the potential benefits of upgrading to a dynamic ecosystem will continue to grow:

- **Smart phone usage and technology.** As of early 2012, only a small fraction of smart phones support NFC contactless mobile payments. However, given that phone manufacturers are gearing up to include NFC capabilities, and the rapid replacement rates of smart phones by U.S. consumers (every 1.7 years on average), it is predicted that 50% of smart phones will be NFC enabled by 2015.

- **Growing momentum of contactless.** Many major retailers have already implemented contactless payments. While the technology being deployed in the U.S. is not fully dynamic, the growth in usage by consumers indicates that the contactless payments will grow even more significantly in the more feature-rich, dynamic mobile world.

- **Changing shopping behaviors.** The number of consumers using online shopping aids, such as price comparison and product review sites, is growing rapidly. However, there continues to be a missing, seamless link with the payment at POS and online.

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*EMV lays the foundation for a new payment ecosystem in the U.S., enabling deployment of further payments and retail innovations downstream without significant additional investment.*
While these trends add weight to the case for creating a new payment ecosystem, they alone are unlikely to spur the surge of investment by issuers, acquirers, and merchants needed to bring about a dynamic revolution in the payments in the U.S.

Recently announced fraud liability shift policies from MasterCard and Visa, however, combined with the risk of a significant increase in counterfeit fraud, provide the additional motivation needed to migrate to an EMV-compliant infrastructure. The U.K., France, and Canada were driven by fear of increased fraud losses and, in some countries (Malaysia), by government mandate. The risk of increasing fraud will also be a major factor in the U.S. case for EMV migration, but additional weight will be provided by the benefits that a new dynamic ecosystem can provide.

In addition, the U.S. is likely to benefit from the maturity of EMV, a tested, proven, and accepted technology elsewhere in the world. The costs of migrating to EMV have been decreasing, thanks largely to scale economies created in non-U.S. markets, while in the U.S. the costs of manufacturing POS terminals that do not incorporate EMV chip-reading continue to increase—rendering these terminals expensive anomalies. Also, there are entities in the U.S. that have already developed and are currently processing EMV payment transactions originating in other countries.

The fraud prevention benefits of EMV provide a tipping point for investment in this ecosystem, based on the upside for Issuers, Acquirers, Merchants and other players.
PART 2: BENEFITS OF INDUSTRY ALIGNMENT

The way in which payment industry players respond to EMV migration has a huge impact on the speed of benefit realization. Experience from other countries indicates that some degree of alignment within the industry on deployments—most significantly between issuers of such EMV-enabled devices as cards and mobile handsets, and payment acceptors—creates a greater value pool for the industry, and enables it to be realized sooner.

The benefits of industry alignment are well recognized, based on experiences in other developed economies such as the U.K. and Canada. But while the benefits are clear, the approach for bringing about alignment in the U.S. presents unique, but surmountable, challenges.

Alignment Fundamentals

The move to an EMV-enabled dynamic payment infrastructure in the U.S. requires that the main players in the retail payment network modify key elements of their business, including:

- Operational processes
- Customer-facing processes; for example, call centers and cashier training
- Front-line device and reader upgrade or replacement
- Back-office IT system upgrade or replacement
- Marketing and communication materials

These changes require investments by all players. The success of each player’s investment depends on similar commitments by the other players in the value chain, as the benefit to each player depends on the entire ecosystem’s investment in this new infrastructure. In other words, successful investments are, to some extent, mutually dependant.

Also, special attention to marketing and communication messages greatly enhances the chances for alignment success. When the key players align customer communication, EMV adoption is less confusing to consumers and merchants alike.

It is important to note that this kind of industry alignment is focused on bringing forward an enhanced payment infrastructure and does not risk giving one player a competitive advantage over another. The emphasis is on openness and including all players, so that they have the opportunity to compete—and benefit.
Alignment Benefits

There are two main reasons why industry alignment on some aspects of EMV deployment would be advantageous in the U.S.:

1. **The sooner the investment in deployment, the sooner all players benefit.** Put simply, device issuers and transaction acceptors (acquirers and merchants) will invest in EMV deployment when they know that other parties in the payment value chain are also investing. For example, transaction acquirers will more willingly invest in providing an EMV-enabled service to merchants if they believe that issuers of devices, such as card issuers and mobile handset providers, will demonstrate similar support. This will be an especially powerful driver as the U.S. moves closer to the 2015 liability shift announced by the major payment brands, when the benefits of EMV migration will be focused on fraud-loss reduction rather than new revenue opportunities.

Conversely, from the device-issuer perspective, if there is evidence of sufficient investment in EMV compliant acceptance, including POS terminals and associated infrastructure, two things are likely to happen. First, U.S. card issuers will be more motivated to issue EMV cards, develop NFC applications and mobile wallet compatibility. Second, handset manufacturers will be more likely to extend NFC through their product ranges.

Terminal investment is also likely to motivate other organizations into actions that push the value of the investment even further. For example, third-party providers of smart phone applications, retail applications, retail intelligence systems, and loyalty applications will develop innovative products that leverage this new ecosystem in the U.S. Along the way, the media will take note and make consumers aware of—and excited about—these new applications and their capabilities.

All of this ultimately encourages consumers to not only use the new ecosystem more and more frequently, but also to use it for payments they previously made with cash. This benefits all players.

The degree of industry alignment appears to be strongly correlated to the speed of EMV deployment that exists, based on research by MasterCard Advisors (Figure 3).
2. The new ecosystem will increase consumer usability and spend.

This will occur in two ways. First, consumers are likely to use their EMV-enabled devices more frequently and enthusiastically when they have a clear understanding of the benefits—particularly around fraud prevention. Creating this understanding requires consistent messaging from all parties, including issuers, merchants, and the media. The impact of consumers’ perception can be both significant and positive. In Latin America, for example, card usage following EMV migration increased with the perception of stronger payment security.

Second, where cards are issued with PIN as a Cardholder Verification Method (CVM), some cardholders may need to adopt a new behavior. Experience elsewhere shows that this behavioral change can be managed effectively when the consumer receives clear and simple advice on ways to memorize their PIN, along with guidance on using signature verification as a fallback during the introductory period.

Creating clarity in consumer communication requires that banks align not only to ensure a consistent process, but also to ensure non-contradictory and consistent messages that announce, inform, and support the message of EMV migration.

Other benefits from alignment include reductions in merchant training costs and increased operational reliability.
The Risks of Non-Alignment

Magnetic stripe counterfeit fraud in the U.S. is likely to rise over the next four years driven by the increasing volume of counterfeit fraud migrating from EMV mature markets. This threat, coupled with the coming liability shift, are major motivators for issuers and acquirers to migrate to EMV. But without some degree of alignment between issuers, acquirers, and merchants, there is a risk of an issuer/acquirer “stand-off” that pushes the bulk of EMV implementation up against the liability shift date.

This would create a costly delay, putting pressure on critical resources (such as terminal certification) and creating major bottlenecks that push a large part of the migration past the liability shift, causing parties to incur additional fraud losses. This happened during the EMV rollout in Mexico.

In short, the emergence of a new payment infrastructure that benefits all industry players and consumers would happen more quickly and with less risk if:

- There is broad alignment on where, when and how EMV devices and terminals will be deployed.
- Clear and consistent messages are aligned and communicated to consumers and merchants.

INDUSTRY ALIGNMENT: TWO CASE STUDIES

Case One: The United Kingdom and Canada

Industry alignment in large economies resulted in rapid, well-ordered rollouts

Both the U.K. and Canada formed coordinating bodies for the purpose of conducting EMV trials and continued guiding efforts into the national deployment itself. Key activities were alignment on the high-level deployment plan, communications to consumers and merchants, and technical configurations. In both countries, the approach was complete inclusion: No payment industry participants were excluded. All material produced by the Project Management Office (PMO) was accessible to the whole industry, including post-trial reporting and issue-and-risk management communication.

THE UNITED KINGDOM. The U.K. EMV migration was the first coordinated EMV migration in a large developed economy. The industry trial and rollout was coordinated by a PMO and sponsored by the banking association, APACS (now the U.K. Payments Administration (UKPA)). The PMO sponsored roundtable discussions between industry participants who directed the coordinated effort. Participants included Brands, Banks, and Processors. Working Groups were also established to produce a forum for joint resolution of issues between stakeholders. Given the U.K.’s heavy level of coordination and collective advertising spend, the costs were significant.

CANADA. Canada drew upon the U.K. experience for the design and approach of their own alignment effort, creating a similar structure for trial and rollout. The payment brands played a much more significant role in initiating the migration effort, but relinquished control to a more issuer/acquirer led effort once there was wide stakeholder buy-in to the alignment concept.
FIGURE 4: COMPARISON OF U.K. AND CANADA MIGRATION APPROACH

<table>
<thead>
<tr>
<th>UNITED KINGDOM</th>
<th>CANADA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination initiated by</td>
<td>Payment Association APACS, now known as UKPA</td>
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<tr>
<td>Government involvement</td>
<td>No involvement</td>
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<tr>
<td>Kept informed; not mandated</td>
<td></td>
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<tr>
<td>Timing</td>
<td>Four-month trial in Northampton in 2003 led directly to a national rollout, which was virtually complete in 2005</td>
</tr>
<tr>
<td>One year trial in Kitchener-Waterloo in 2007, led directly into national rollout which is due to complete in 2012</td>
<td></td>
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<tr>
<td>Focus of trial alignment</td>
<td>1. Technical and operational interoperability</td>
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<tr>
<td>2. Coordinating the trial deployment</td>
<td></td>
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<tr>
<td>3. Consumer and merchant communication (emphasis on collective)</td>
<td></td>
</tr>
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<td></td>
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<tr>
<td>2. Coordinating the trial deployment</td>
<td></td>
</tr>
<tr>
<td>3. Technical and operational interoperability</td>
<td></td>
</tr>
<tr>
<td>Governance structure</td>
<td>An overall Program Steering Committee directed the work of three separate Steering Committees (Implementation, Technical &amp; Operations and Stakeholder and Communications)</td>
</tr>
<tr>
<td>• Initially had Payment Brands as overall decision-makers</td>
<td></td>
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<tr>
<td>• For trial, evolved to have Management Committee, reporting to Steering Committee (with voting and non-voting members), supported by a PMO</td>
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<tr>
<td>• Structure carried forward into national deployment</td>
<td></td>
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<tr>
<td>Key issues encountered and resolved</td>
<td>• Lack of cardholder awareness of the need for using PIN on credit was an issue in the trial, causing an increase in fallback to signature</td>
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<tr>
<td>• Due to newness of standards, early adopters faced significant problems with testing and certification</td>
<td></td>
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<tr>
<td>• Cardholder awareness of PIN (in Canada this was a behavioral change for credit transactions only)</td>
<td></td>
</tr>
<tr>
<td>• Merchant training and awareness</td>
<td></td>
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</tbody>
</table>

Source: Interviews of MasterCard employees and Tracey Black, Canadian PMO Director, 2012.
Case Two: Mexico

Issues with alignment structure led to problematic deployment

Mexico began migration to EMV in 2002, and it is still not complete. Although the country’s payment industry attempted some alignment, its scope and focus did not bring about the easy migration it had set as its objective.

A coordinating committee for the banks was created, but excluded the international brands and other stakeholders. Generally, there was a much lighter touch than the PMO-driven approaches used in the U.K. and Canada, and interoperability issues surfaced based on two key factors:

- There was a decision to implement partial-grade rather than full-grade EMV, resulting in dynamic data authentication being ignored, and transactions processed as magnetic stripe. The driver for this, against the advice of many in the industry, was to create a simpler and cheaper approach to migration (as the conversion from magnetic stripe is an easier process).

- Brand testing requirements were not followed.

Additionally, a lack of coordination among the key players on the timing of the EMV deployment led to heavy demand on critical certification resources. This, in turn, led to a significant bottleneck in the certification process, and further lengthened the deployment.

Alignment in the U.S.

The degree of coordination in migrating to EMV has varied country by country. In Canada and the U.K., a structure of committees and working groups was established and backed by a large PMO. This would be difficult to achieve in the U.S. for two key reasons:

- The large number of industry players presents a large coordination challenge. MasterCard alone deals with over 8,000 payment handling banking institutions in the U.S.

- There is currently no banking association with the strength needed to be an effective central point for alignment.

These issues seem to indicate that the industry alignment strategies undertaken in other countries, such as Canada and the U.K., would not necessarily be achievable or desirable in the U.S. There are, however, three areas in which the U.S. migration could benefit from industry alignment:

1. **Broad agreement between stakeholders on where and when national deployment will happen.** This will expedite the migration and improve operational reliability and merchant-training effectiveness.

2. **Alignment of consumer experience and messaging.** This will enhance consumer usability and increase transaction rates.

3. **Testing of technical interoperability.** This will identify issues that need to be addressed to increase infrastructure reliability and consumers’ confidence.
Given the challenges in the U.S. market, a realistic approach might be a “light-touch” alignment. In fact, given the maturity of the EMV technology, the heavy technical coordination that characterized the migrations in the U.K. and Canada may no longer be required. Still, focusing on aligning, deployment timing, and high-level customer messaging could bring enormous benefits.

CONCLUSION

The creation of a new retail payment ecosystem presents the U.S. with a huge opportunity. EMV, together with the brands’ liability shift policies, should be strongly welcomed by the retail and payment industries in the U.S., as together they provide industry-wide impetus for the U.S. to make a leap to this new ecosystem. They also protect the U.S. against rising counterfeit fraud from EMV-mature countries. Aligning the industry to make this happen is likely to increase benefits and reduce costs of EMV migration for the industry and all of its participants.

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ENDNOTES

1. EMVCo, Q3 2011.
3. ABI Research, 2011.