Beyond Certification:
How Merchants can Minimize the Total Cost of EMV

A BRIEFING DOCUMENT

ACQUIRER SYSTEMS

Contents

About this paper

America's merchants are just beginning to feel the impact of the implementation of the EMV smart card as standard. The technology is now being adopted everywhere card payments take place. Every party in the payment chain is changing systems, updating networks, or reissuing cards. The entire industry is beginning its journey towards life in a smart card landscape.

In this paper Acquirer Systems explores why life with EMV is so different to magnetic stripe, and why scheme certification alone is not enough to prepare your business for the transition to EMV.

This paper introduces a test and validation strategy that has been globally proven to protect merchants from the difficulties that can arise when operating smart card payments. It shows how exceptional scenario testing can help to control problematic operational costs that can be incurred as a result of troublesome EMV transaction scenarios. It also looks at how this strategy is key to delivering an exceptional payments experience to retain loyal customers.

The paper provides key learnings and suggested approaches drawing on the international experience of EMV migration over the last 15 years.

September 2015 is tee-off time for smart card payments.

Are you prepared for the game of your life?

Teeing off: EMV transformation doesn't stop at Certification

EMV opens up unprecedented commercial potential for merchants and processors alike. But with reward comes risk. Its inherent complexity presents challenges, many of which can result in additional cost and loss of revenue if merchants are not fully prepared.

When a new technology standard is mandated, it is natural for businesses to want to tick the compliance box as cost effectively as possible. Business pressure dictates the need to avoid inconvenience and to minimize the capital outlay incurred.

EMV's arrival in the US payments market is no different. The payments industry is rightly preoccupied with October 2015's certification deadline. By this date, merchants must be certified to avoid the incoming liability shift. This is the industry's first milestone but it is by no means the end of the EMV journey.

Certification only scratches the surface of life in an EMV world. To borrow a golfing term, it is just the green fee. It's what you pay to play. In terms of business, you haven't even left the clubhouse. Unexpected hazards await along the course.

Merchants should look beyond certification to give their customers the service they expect and to contain the costs that can be incurred during live EMV operation. The price for not preparing is a huge operational burden associated with solving in-field problems as well as reputational damage. Merchants who recognize this will also gain a strong competitive advantage through better service quality.

Why certification falls short in protecting your business

In real life, the complexity of EMV exposes your card acceptance infrastructure to a broad range of transaction scenarios, much more than could ever be realistically covered during a certification process.

Certification confirms interoperability between scheme-branded cards and your payments acceptance infrastructure. It necessarily only covers a finite range of normal scenarios. It is limited to perfect systems and a small sample of card types. It does not attempt to ensure your system can cope with situations that are unusual and out-of-the ordinary. Nor is certification intended to cover the particularities of your unique payments acceptance environment.

Consumer payments depend on smooth and fast interactions. Since an EMV transaction has more moving parts than its magnetic stripe equivalent, many more payment scenarios need to be checked and tested.

Merchants feel the effect of unusual events keenly. Whenever a problem in payment occurs, the disruption invariably hits your bottom line. If you can't accept or process a payment, you will lose revenue and your customer payment experience will suffer.

Certification assumes a perfect day when it comes to communications, timeouts, and the cardholder's behavior. Exceptions to this are simply not considered.

Merchants must ensure their businesses can cope with a much wider range of transaction scenarios and interactions if they are to ensure every customer payment can be processed without difficulty.

> EMV's chip technology offers increased security to cardholders and it offers multiple options for deployment and acceptance in the field.
>
> The critical difference between EMV chip and PIN and magnetic stripe is the dynamic nature of the new smart card standard and, in fact, of each individual payment as it is made.
>
> EMV can be configured to deliver a wide variety of innovative payments products for both merchants and card issuers, which is inevitably more complex a process than that required by magnetic stripe.

EMV: Where your business can lose

Problems can occur for a variety of reasons, whether at the time of payment (a problem with authorization), during the transmittance of payment information (a problem with data quality) or when settling for merchant payment (a problem with settlement). These scenarios can result in a loss of sales revenue, a loss of customer confidence in your service, and delays in receiving funds for settlement. Small problems can also incur additional operating costs in resolving these issues and making patch updates to your payments software.

> The question is how merchants can be assured that they are offering a consistent and reliable payments experience in an inconstant payments environment.

Chip-based payments: Innovation at the price of complexity

The innovation and added security offered by the EMV chip is a powerful landmark in payments technology. But it needs to be carefully managed to deliver a consistent payments experience.

Configurability produces more variations

EMV's configurability produces more interactions between cards, PoS terminals, acquiring hosts, payment scheme networks, and issuing hosts. Additional security, contactless payments, and new chip-based applications all add up to a much richer tapestry of interactions. This is at the root of why there are so many variations in the field.

Each potential payment event scenario should be tested to preserve the quality of the cardholder experience and to eliminate payment interruption or failure.

More complex and dynamic transactions

A successful EMV transaction depends on dynamic communication between the card and the PoS terminal to validate the cardholder. To realize the security that EMV offers, each transaction is also authenticated in real time through a chain of interactions. This is quite different from the static world of the magnetic stripe. Each component must interoperate correctly for your customer to make a successful payment transaction at the checkout.

The issuer-acquirer gap

When offered a new technology, innovative issuers often rush to the market with a vast array of product configurations to build a competitive edge. In contrast, an Acquirer's pace of change is usually led by a compliance schedule and subject to the braking effect of operational cost cutting.

The net result is an acceptance infrastructure that is always at least a step behind the cards being issued. This gap produces untested scenarios in the field, which can lead to acceptance issues.

A stronger emphasis on compliance

Unlike with the magnetic stripe infrastructure, merchants need to make a consistent, concerted effort to maintain compliance with EMV standards. The new dynamic interaction between cards and points of sale demands regular system updates and requires a greater emphasis on testing than the previous system.

Any changes to your payment infrastructure will introduce risk and may require re-certification. Changes may result from new software developments or PoS terminal changes, amongst other examples. In established EMV regions, merchants recertify several times each year. Since compliance testing is more frequent, merchants need to adopt much more efficient testing regimens. Access to a lower-cost and faster regression testing for all the moving parts should be high on every merchant's agenda.

Why EMV's complexity can disrupt merchant business

EMV produces several specific situations that can lead to issues with the consumer's payment experience.

1. EMV parameter conflicts

The most likely time for a transaction exception to occur is during authorization. With so many EMV parameters available, it is not uncommon to find terminals untested or not implemented for the range necessary to support all the required card issuer configurations. Two common issues that occur are:

1. The cardholder verification method listed on the smart card chip is not supported by your PoS device.
2. The Certificate Authority public key is not present on your PoS device.

2. Data quality issues

An EMV transaction contains many elements of data that flow between all of the parties involved in the payment chain. If an interaction is in error or disrupted due to poor data quality, the transaction may be rejected. In such cases, the terminal may not be sending the correct request/response for a specific transaction flow. Certain fields such as the PAN sequence number or currency codes may differ from what is on the card.

Poor data quality during the settlement process can give rise to further exceptions. An example of a common exception is "Issuer Repudiation". This is where the Issuer refutes the payment/settlement request due to poor data because it is unable to verify the transaction's digital signature in the merchant /acquirer message. As a result, the merchant will have to deploy an analyst or IT resources to rectify the situation. This means that the payment will be delayed or, if the problem can't be fixed, no payment will be received at all.

3. Communications problems

Each payment card scheme has specific requirements for response times to authorization messaging. Merchants need to make sure that there are no issues in the system that can cause delays. Failed transactions or transaction reversals can occur if your acceptance infrastructure is unable to communicate within a particular card scheme's tolerance for response times.

4. Cardholder behavior

Cardholder behavior is unpredictable. When customers do something out of the ordinary, unusual interactions with your payments environment can occur. Such scenarios can damage your business, but are not part of standard certification testing.

It is always likely that a customer will enter a PIN incorrectly, remove a card early, or do any number of things differently during the course of a given transaction. This can produce unexpected results. The transaction might fail, or the customer might cancel the transaction, both of which would result in lost revenue. Your cardholder will have a smoother experience if your system has been tested to cope with these exceptional cases.

The certification dilemma

EMV certification typically only covers about 10% of real-world scenarios. Being operationally capable of EMV by definition requires testing for those scenarios that lie outside of the certification requirement.

Broadening the testing mindset

Maintaining interoperability between differently configured terminals, cards, and host systems helps to mitigate the potential impact on your business of exceptional events. This requires testing your systems for a much broader range of scenarios than is covered by certification.

Some payment schemes have attempted to build test cases into their certification process for known interoperability issues. However, the schemes cannot respond as quickly as the industry is moving, and as a result will never be able to reflect all the specifics of an individual merchant's payment infrastructure.

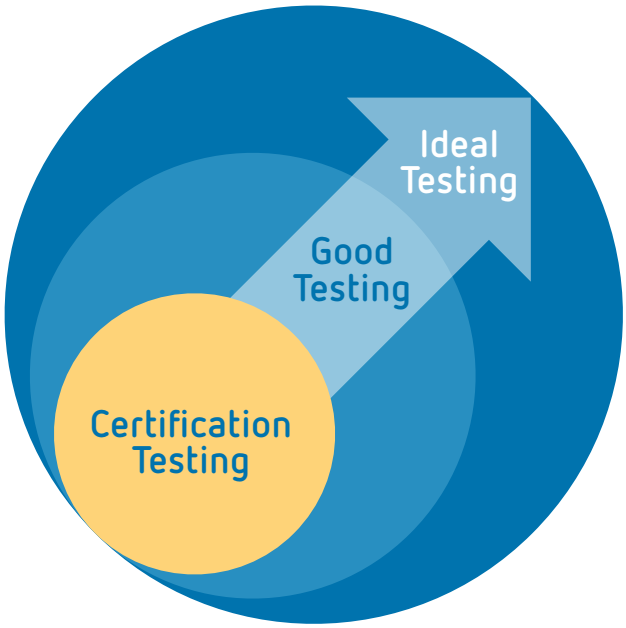
What constitutes a broader scope of testing?

Good testing means doing more than is demanded by certification. Your cards and test cases must cover the majority of scenarios commonly encountered in the real world. For a large merchant who owns their own terminal estate, this means testing and validating your entire payments environment by replicating the entire payments chain.

"Ideal" Testing
- Not limited by time **or** resources

"Good" Testing
- Limited by time and resources
- Needs to comprehensively replicate **in-field** scenarios
- Requires testing **collaboratively**.... and **in-field** performance

"Certification" Testing
- A minimum **test of conformity**



Exception testing: The key to staying on top of EMV

Once you have the test tools, cards and test cases, which cover all the normal scenarios, the next and final part of good testing is to deal with the exceptional cases.

These are the real troublemakers when it comes to in-field failure and resulting costs. Global EMV experience suggests that the key weapon to protect merchants against the infrequent scenarios that cause the most damage to business is exception, also known as negative, testing.

Exception testing is the closest we can practically get to ideal testing. It relies on cards and tests that replicate the most problematic of scenarios. To do this, a testing programme will typically draw upon the many exceptional cases that have evolved during EMV's global rollout over two decades. Each test run you perform utilizes this repertoire of exceptional scenarios to ensure that your system can still stand up to them.

How can I conduct exception testing?

Exception testing depends on knowledge and expertise to create the negative tests. It also requires a testing platform with two key features. Firstly, it needs to be able to deploy rapidly and to manage the necessary volume of test cases. Secondly, it needs to be able to replicate the payments chain so that the test cases can be run in the right environment. Finally, it needs to be automated and fast. With more tests to run, manual regression testing will be sidelined for being too resource-intensive. Test automation provides the solution to getting through a full suite of tests – including all the negative test cases you need – every time, without it being an ordeal.

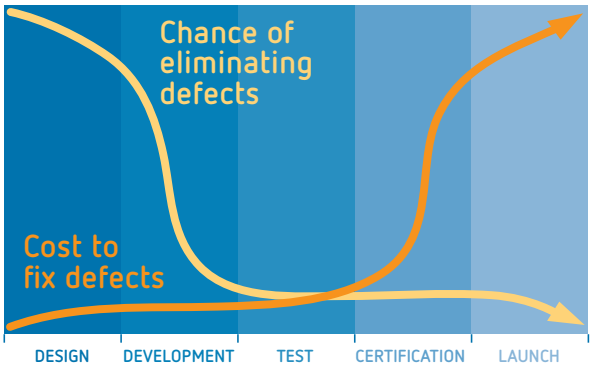
> It's a truism to say that 1% of payment transaction traffic causes 99% of problems. It's deep in this 1% that we find exceptional scenarios than can only be uncovered by broadening your test coverage and, specifically, by what is known as exception testing.

Testing: Your competitive edge in an EMV world

World wide, merchants report that once full testing coverage is introduced, EMV issues practically disappeared. The net effect represents a saving of over 1,000 hours of investigations, calls, and administration at various levels within the organization. It also prevents reputational damage, a priceless win for merchants in competitive markets.

Test and validation is often where merchants, VARs and processors scale back their investment of time and money in order to get products to market faster. However, in a market populated by consumers with high service expectations, any in-field under performance or failure can be costly. Compromises in test quality have bottom-line consequences.

By incorporating test and validation into your EMV development and migration process from the start, you can spot trouble sooner, especially if it includes those troublesome exceptional cases. Proactive early detection improves significantly the chances of fixing defects before software is released and lowers the cost to remedy them.



Final words

To capitalize on the benefits of EMV, merchants must be fully prepared for its complexity. This means building test strategies that look beyond certification to exceptional scenarios.

Migrating to and remaining compliant with the EMV standard can seem a daunting process, but it doesn't need to be.

Developing a comprehensive test strategy, and deploying an automated solution that replicates the entire payments value chain, will significantly reduce the effort and cost involved in migrating to and remaining compliant with EMV.

In the end, Merchants who protect themselves against the broadest possible range of problem scenarios will gain a competitive advantage in the EMV world.

Key Takeaways

1. **EMV is a world apart from the current payments environment**
   EMV will bring commercial and operational gain to merchants, but it is also more complex and is implemented differently than magnetic strip. Merchants need to prepare for these differences to protect their businesses.

2. **Exceptional EMV transaction scenarios impact your bottom line directly**
   The complexity of EMV can result in problems that cannot reasonably be covered during certification. Infrequent though exceptional transaction scenarios may be, merchants' failure to take steps to protect themselves against them can lead to transaction failures, loss of takings, higher operational costs and customer dissatisfaction.

3. **Merchants must look beyond certification to cope with EMV's complexity**
   The answer to coping with exceptional scenarios under EMV is to broaden your testing capacity beyond certification. Exception testing is proven internationally to ensure your systems can cope with the EMV environment.

4. **Exception testing requires knowledge and the right test platform**
   Exception testing depends on being able to set up, manage, and process enough test cases to cover likely troublesome scenarios. This requires EMV knowledge and automated testing capable of catering for exceptional scenarios.

5. **EMV is a lifetime operational concern**
   Managing EMV does not stop at certification. Ongoing certification for compliance will be required for most large retailers. The most efficient way to meet compliance requirements is to use automated test and validation solutions.

About Acquirer Systems

A perspective on EMV migration founded on in-depth experience

Acquirer Systems provides test and validation software and solutions for real-time payment systems.

We offer transaction-based testing solutions that dramatically improves the quality and speed of card and payment testing for our clients so they can reduce costs, become more efficient, and get higher-quality products to market faster.

Our insight to EMV migration and testing strategy is built on our expertise working on dozens of critical migration projects as providers of test tools and platforms to the payments industry since 1999. Many of our customers involve us from the earliest stages of their migration planning through to migration completion because of our unmatched testing experience and migration know-how.

- Hundreds of migration projects and certifications completed
- Dedicated payments testing specialists
- A growing global customer base including blue-chip institutions such as Elavon, MBNA, First Data, Tsys, Global Payments, SwissCard, and Standard Bank
- 80+ installations across the United States, Europe, Middle East, Africa and Asia.

Get in touch with our migration experts today to hear how we can help you!

Founded in 1997, Acquirer Systems is a leading provider of testing solutions for payment cards, devices and networks.

With extensive international experience, we support some of the world's largest issuers, acquirers and vendors as well as many national and international payment networks.

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