

# GUIDE TO....

EMV MIGRATION AT THE ATM



A guide to avoiding the challenges associated with EMV migration and ensuring the added complexity at the ATM channel is properly managed

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# The evolving payment card landscape – challenges and opportunities at the ATM

The payments market around the world has evolved significantly in the last ten years, accommodating higher volumes of electronic payments across a growing number of payment channels.

The bank branch has become less relied upon as consumers and businesses increasingly migrate to the internet to make payments and manage their finances. However, one of the longest running automated services, the ATM machine, is continuing to play an important role around the world.

## “there is a wave of investment in the ATM channel”

The ATM may not typically be viewed as an innovative banking service, alongside internet banking and the emergence of mobile payments, but the reality is that it is still a channel of great importance and has the potential to revolutionise the way a bank interacts with its customers.

## How is the current economic situation affecting ATM development?

Innovation in the payments market has been stifled by the present economic environment, as is the case across the entire banking industry. The market conditions mean that financial services companies are focused on re-building trust for customer retention, rather than on customer acquisition as in previous years. As a result, only the most compelling business cases that promise an improved customer experience and bottom line benefit are being implemented.

The drivers for enhanced customer service and continued yet prudent investment in innovation put the ATM in sharp focus as a critical banking channel. Indeed, there is a wave of investment in the ATM channel across the industry. Financial institutions are seeking to update ageing ATM technology infrastructure in order to maximise valuable

revenues but also use the channel to better service growing customer demands.

At the same time as banks face pressure to enhance customer services at core channels such as the ATM, they are also experiencing significant regulatory change. Specifically at the ATM, the migration to chip cards is the biggest change to hit the channel in years. More than one billion EMV cards and 15.4 million EMV terminals are now active as of September 2010, according to EMVCo, the EMV standards body collectively owned by American Express, JCB, MasterCard and Visa. This equates to 36 per cent of total cards in circulation worldwide.

But what about the other 64 per cent of cards? In this Guide, Level Four will look at progress made to date with EMV migration projects around the world, the implications of EMV at the ATM and seven best practice steps to guide banks' migration projects.

# EMV adoption around the world

Globally, the biggest impetus to move to EMV is to reduce fraud losses. Indeed, the additional security that EMV offers means that significant inroads to decrease card fraud have been made in markets that are already fully EMV compliant. In fact, following the roll out of EMV in the UK in 2004, card fraud reduced by 25 per cent within the first two years.

## “fraud losses are put in sharp focus after the liability shift”

The APCA reported that skimming fraud on Australian-issued credit cards has already dropped for the first time ever – from \$50.1m in 2008 to \$37.5m in 2009, a 25 per cent fall. The drop is due to the steady roll-out of EMV credit cards by the country's major banks. However, skimming fraud on PIN-only debit cards increased from around \$5m to \$17.5m following a spate of attacks on merchant terminals in 2009, demonstrating the loophole that only full compliance will reduce.

Once the EMV mandate is in full force after the industry-agreed migration deadline (local to each country), there is a transfer of responsibility from the card-issuing bank to the card-acquiring bank in the event of fraudulent card use. This liability shift is of paramount importance to financial institutions in terms of ensuring that losses are minimised. Not least locally but especially due to the fact that this will include an international fraud liability shift as more countries adopt the EMV standard.

## The knock on implications of EMV adoption on the ATM

The ATM channel will notably benefit from the technology refresh that EMV affects.

New technology will undoubtedly bring greater flexibility to ATM deployers which will improve service level uptime and reliability. In addition, legacy systems that are now earmarked for replacement or upgrade will no longer inhibit banks from rolling out cutting edge ATM services.

For example, most non EMV-compliant ATM terminals are on a dial-up connection to the host which limits the service offerings and therefore limits EMV to all but the simplest of transactions. This means that for the investment that financial institutions make in EMV migration, they are not able to get the full benefit and ROI.

With all of this in mind, banks around the world are currently managing a great deal of change at the ATM and with this change comes an inevitable degree of added complexity. There are significantly more types of card conditions with EMV cards, rather than static magnetic stripe cards, which require the ATM host system to process a much wider range of scenarios.

Additionally, as the chip is a computer device, it interacts with the ATM and processes data rather than being a static interface as was the case with magnetic stripe cards. As a result, the mandated migration to EMV in the UK, for example, triggered a major hardware replacement cycle as the existing legacy OS/2 machines were not capable of supporting the additional cryptographic processing required under EMV.

Most UK ATMs now run on modern Windows-based machines with much more sophisticated capabilities. The move to Windows is synonymous with the introduction of the XFS open standard layer that allows a single application to run across a multi-vendor ATM estate.

The removal of exclusive ATM software and hardware links enables deployers to adopt a multi-vendor strategy for their ATM networks, giving them greater flexibility and the benefit of a more competitive hardware market.



This means that ATMs now have the ability to interact with the information stored on the chip and have the technical capability to provide advanced functionality to the customer such as a greater level of personalisation in the transaction.

Understandably, all these factors have resulted in a far more complex ATM environment. EMV compliant ATMs are about ten times more labour intensive than traditional ATMs. To ensure that the ATM continues to deliver a high level of customer service and satisfaction, financial institutions must reconsider their ATM testing strategies.

## “New technology will bring greater flexibility to ATM deployers”

Testing a typical EMV card requires hundreds of different test scripts, which, when multiplied by the number of different card types, results in an extensive testing universe. Additionally, the standards behind EMV cards change more frequently and therefore require more rigorous testing. As a result, it is not uncommon for daily test case scenarios to exceed 5,000.

With one manual test taking from five minutes to more than one hour to conduct, migrating to automated ATM testing procedures is increasingly becoming a no brainer for those banks willing to maximise the potential of this channel.

### In this guide

The remainder of this guide outlines the most important areas for consideration for financial institutions that are undertaking migration to EMV. It is not an exhaustive summary but does offer insight to the initial migration challenges and also the ongoing changes that financial institutions must oversee to get the most from their EMV investment in the long term.

# 7 best practice tips for EMV migration

EMV migration is not a simple exercise and financial institutions must be careful to avoid the complacency trap. A significant number of integrated systems must each be adjusted, replaced or upgraded to support a widespread EMV roll out. Many banks embarking on migration are often not fully aware of the scale of the challenge.

Instead of viewing EMV migration as a necessary evil, banks must develop a schedule that enables them to gain maximum ROI from the process. Beyond this however, there is a critical need to safeguard against failing to adequately integrate new EMV software, hardware and processes. If a bank does not update all facets of the business that are connected to EMV systems, there is a danger that ultimately, the customer will suffer.

Taking a very crude measurement of the impact on the ATM channel as an example, there are approximately 10,000 additional tests that must be conducted in an EMV ATM environment in comparison with a traditional network that supports magstripe cards.

## “Gain maximum ROI from the process of EMV migration”

Countries undertaking EMV migration now have the opportunity to learn from and avoid the mistakes that have already been made by other countries that have migrated. So, what are the critical steps that financial institutions must take to ensure that they are able to efficiently and adequately migrate all credit and debit cards to EMV?

In this Guide, Level Four outlines the seven best practice considerations for EMV migration. These will enable banks to continue to deliver a high level of service to its customers and also brings the greatest long term business benefits.

### 1. Appreciate the scale of the task at hand

One of the biggest challenges banks face when rolling out the EMV standard is to commence preparations early. EMV spans many departments and teams, each with their own priorities and checklists for compliance. Often, failure to prepare is not due to a lack of understanding in the team responsible for migration but instead a lack of visibility of the full task ahead, across the whole organisation.

To ensure that all of the separate EMV compliant components successfully integrate with each other, a comprehensive plan with input from the entire financial institution must be in place early on in the project. A single strategy that details all steps is vital, from Visa and MasterCard certification, through to ensuring that all switches are successfully connecting.

The one element of the strategy that is common to all parts is the need for testing. Testing is usually considered as a step at the end of the cycle, however with complexity of EMV testing, it should in fact be the cornerstone of the strategy.

This timeline also serves as a tool to demonstrate the business case for migration to senior management. For example, it is important to decide from the outset of the project how much resource is required to undertake migration. Planning is also key to assessing the technology requirements that will facilitate a smooth adoption of EMV.

The timeline must chart the end-to-end EMV lifecycle. However, there is no ‘one size fits all’ approach. Particularly in those countries such as Australia, where EMV migration has already started and is not being conducted under a rapid deployment programme, each financial institution is at a different stage in the process.

## “ATM testing is a cornerstone of EMV migration”

It is important for institutions developing a timeline for their country’s deadline that incorporates specific business goals for the company. EMV migration involves a number of flexible options rather than stringent legislation and this means that a blueprint for migration doesn’t exist – each bank must review and plan its own path.

### 2. Learn from other countries’ mistakes and experiences

There are a growing number of countries in the world that are embarking on the migration from magnetic stripe cards to smart cards. As a result, there is already a lot of knowledge available globally that can be used to support banks in their efforts to make the transition as smooth as possible.

For various aspects of the transaction lifecycle, there are numerous vendors and industry bodies that can provide best practice support. EMVCo, owned by American Express, JCB, MasterCard and Visa, manages, maintains and enhances the EMV specifications and offers several working groups for example. In addition, many banks

## The long term role of automated testing at the ATM

EMV cards vastly increase the numbers of paths that exist from card to authorisation entity. Multiple applications reside on a single EMV smartcard so it is essentially a number of magstripe cards rolled-up into one. Each of these applications may be used for services at the ATM, increasing the complexity of the interaction with the cardholder.

Furthermore, the EMV chip in the card will have commands, queries or updates that are sent by the various authorisation hosts which increase the complexity of the message matrix that needs to be supported.

In addition, cardholders increasingly expect an ever-improved level of service quality, putting increased pressure on the need to fully test the end to end environment to mitigate errors and downtime. With the addition of new services being introduced at the ATM on an ongoing basis this problem does not diminish but it increases over time.

Automation has been proven to deliver savings to the financial institution in the range of 25:1. Simply, manual testing that takes 25 days can be completed in one. These time savings are not only cost effective but they also allow banks to run a greater volume of tests. The significant amount of time and resource required to conduct manual testing often results in financial institutions choosing to conduct only those tests that are most important rather than exhaustively testing all systems.

Furthermore, automation and the use of simulation tools add another, sometimes overlooked benefit. They provide planning flexibility to any project. In a non-automated, non-simulated environment each element of the system must be ready before testing can commence. With automation and simulation, however, it is possible to conduct rapid retests if any system is delayed or even to replace that component with a simulation thus allowing all systems to be tested as they are developed, as opposed to at the last moment when everything is in place. This means that projects can run in a more fluid manner as the testing of each component isn't critically interlinked.

In this respect, the long term benefits of EMV migration are clear. Not only can financial institutions ensure improved quality control but they can also deliver new services to market more rapidly. This is critical to the future innovation of the ATM channel and as new features such as mobile phone top up or ticket purchases are integrated, speed will be a real competitive differentiator.

in the UK chose to outsource the planning and migration to EMV. This has resulted in a specialised sector in the vendor community with a positive track record in the delivery of EMV-compliant solutions. Banks can leverage this knowledge and experience to ensure their own subsequent migrations meet industry best practice.

### 3. Change anything, test everything

In return for stronger security and improved fraud prevention, EMV brings a vastly increased complexity which must not be underestimated. In particular, EMV presents deployers of issuing and acquiring systems with increased challenges in the development, testing and deployment of EMV cards, when compared to magnetic stripe cards. This is not only in terms of managing the actual migration to EMV but critically, this relates to the ongoing need to test the EMV infrastructure.

This is particularly important at the ATM as EMV migration changes the entire network environment. There are hundreds or thousands of different transaction scenarios resulting from the many different types of EMV cards and this increases the likelihood of faults occurring. Banks require comprehensive testing strategies to ensure that they can spot and quickly fix any potential problems. If banks do not have testing strategies in place, then they are vulnerable to significant levels of downtime, which will negatively impact brand reputation and customer service.

As a result, a manual testing regime for EMV-based transactions is not viable, which means many financial institutions will need to update their testing strategies. What's more, testing of the ATM is just the tip of the iceberg. There are numerous other interacting systems that sit behind the ATM machine itself, all of which need to be functioning and fully tested.

When it comes to deploying automated testing tools, the business benefits are only realised if a bank is able to meet the requirements from a single system. Typically, end-to-end testing for EMV migration and beyond must encompass the ATM, relevant card types, the host that drives the ATM, as well as the external switching and authorisation networks (e.g. card schemes) that are involved in the transaction chain.

### “EMV migration changes the entire network environment”

The real advantage of end-to-end testing comes from ensuring that change is managed and that change does not disrupt the quality of the system. Ongoing ATM testing is critical to manage the channel on a long term basis.

With banks now embarking on full-scale EMV migration, implementing a comprehensive testing strategy requires more than just a product or technical solution. It requires all relevant stakeholders in the bank to work in unison to ensure the end-to-end systems are rigorously prepared for the increased complexity that EMV cards bring in migration and in the ongoing operation of the EMV environment.

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#### **4. Don't wait until the deadline to run a full EMV environment**

Due to the number of integrated systems that must be made EMV compliant in the back and front office it is important to test everything but essential to test the system. Simulating the final end-to-end EMV infrastructure is critical to its ultimate reliability and success. All too often, IT teams ensure that new deployments work in isolation but fail to ensure that the whole environment works in unison. This is a short-sighted approach that does not acknowledge the simple fact that it is the whole system that ends up in production, not the individual components that make it up.

Simulation will expose all of the changes that will result from EMV migration thus avoiding a complicated step by step deployment process which could force a significant extension of the migration deadline. For this reason, it is important for financial institutions to conduct end-to-end tests as soon as possible.

#### **“Simulating the final end-to-end EMV infrastructure is critical”**

With the right technology in place, simulating the EMV environment can be done without the support of a card issuer. This enables the financial institution to control the speed at which it manages its EMV migration and also allows repeated access to resolve issues in an offline setting. For example, a card issuer should use automated testing technology with a host simulator to prepare all Visa certification requirements. Simple steps such as these will ensure that customer service is not impacted and will avoid a situation where financial institutions are competing with other banks for the card schemes' time to run tests and accreditations at the last minute.

Although simulation can save valuable time in the preparatory phase, it is still important for banks to also factor in enough time ahead of their migration deadline to run a full system test of all components. Even a comprehensive simulation tool is not foolproof and running a pre-production environment will provide an added layer of protection against faults and downtime occurring after the system goes live.

#### **5. Collaborate to meet strict timelines**

All too often, there is no agreed timeline for the migration process among the various parties involved, from issuers

and acquirers to switch vendors and banks. The standards are also open to interpretation so there is no set way for the numerous parties involved to comply. Furthermore, not only it is likely that the EMV compliant systems have never been tested against each other, they have also never been used with full set of EMV compliant cards.

Clearly, every EMV component must integrate in the transaction chain for an EMV transaction to be successful and therefore it is important for financial institutions to foster a collaborative approach with in house teams and vendors to support EMV migration. This is particularly important since EMV compliance results in a multi-faceted transaction process with a greater number and complexity of components in the transaction chain.

Working in collaboration with vendors should help card issuers deal with this complexity and help ensure they don't overlook the more detailed elements of compliance. For example, a key difference between EMV cards and magnetic stripe cards is the ability of the former to hold multiple applications. As a result, the host must be able to respond to a far greater number of EMV messages throughout a transaction. Smaller, yet crucial, considerations like these are less likely to be overlooked when working in partnership with other industry players and encouraging them to take a collaborative approach with each other.

#### **“it is critical to foster a collaborative approach with in house teams and vendors”**

Finally, internal collaboration is just as important as external partnerships. Previous country deployments have demonstrated the need to ensure the EMV migration process does not take place sequentially; there is a danger that any timelines will be missed if different departments await each other's completion of EMV migration before embarking on their own compliance tasks. It is critical that the timeline works in tandem across multiple areas of the bank.

#### **6. Invest in the long term opportunities EMV will offer**

The long term impact of operating an EMV environment is significant but not always considered during the upheaval of migration itself. The most cited benefit following the adoption of Chip and PIN is its proven ability to support fraud prevention and make bottom line savings as a result. However, the fundamental advantage that is often overlooked is the ongoing impact that technologies, processes and systems that were specifically introduced to support EMV migration can bring to the business in the long term.

For example, using EMV migration as an opportunity to update and refresh back office processes can improve the time to market of new products and services. The net result for customers is that the technology underpinning day to day banking activity delivers a higher quality of service and greater level of innovation.

On top of this, EMV also enables financial institutions to deploy multi-application cards. Many banks and card

schemes such as Visa and MasterCard will look to roll out multiple applications to an Integrated Circuit Chip (ICC) card to generate additional return on investment over the coming years. This will include anything from a national electronic purse, such as the Octopus card in Singapore, to branded loyalty programmes.

All of these factors enable financial institutions to maximise the value of their EMV investment but it is important to remember that they will also further increase the complexity of the ATM and host environment. Consequently, it is essential that banks and ATM operators prepare for these changes in order to ensure that customer facing components function successfully on an ongoing basis. With the migration itself such a significant undertaking, it can be easy to lose sight of the long term changes that must be accommodated.

## “automated ATM testing brings cost and time efficiencies”

Automating processes that until now have been conducted manually will facilitate a more streamlined back office and make it easier to realise long term gains. For the long term benefits that investment in EMV can deliver it is important that these technologies and process are in place to maintain the momentum. For example, automated ATM testing can not only bring cost and time efficiencies but also help to maintain uptime and service level consistency thereby repaying the initial investment in EMV projects.

### 7. Are you adequately resourced for EMV migration?

If banks leave migration to the last minute without agreeing implementation timescales among all the parties involved, there is a very real risk that the process will be hampered by a lack of manpower since the capacity of financial services professionals would be severely stretched. This issue would add bottom line costs and put deadlines for migration in jeopardy.

For this reason, it is critical that banks embarking on EMV migration learn from the past example of the UK, where a number of steps were left until the eleventh hour to finalise. Complacency now will lead to resourcing and compliance challenges later.

## About this guide

Level Four Software has experience of supporting some of the world's leading financial institutions in their migrations of the ATM environment to EMV.

Abbey National, (now Santander), partnered with Level Four, “To understand the complexity of EMV compliance and the potential impact this could have on our business if we are not fully prepared. One of our primary goals [in the partnership] is to ensure that we do not inconvenience our customers during the transition.”

Giro Bankcard needed help from Level Four to rapidly deploy content and applications, incorporating the complex functionality of EMV smart cards.

Samba Financial Group said, “With high volumes of ATM transactions across the network of ATMs, and the increasing complexities introduced by EMV, a high standard of quality assurance is required from the testing environment.”

TecBan, the largest processor of off-premise ATMs in Brazil, said, “Customers using TecBan ATMs now have access to one of the most reliable, high functionality ATM networks in Brazil”, following its project with Level Four.

Rabobank in the Netherlands said, “The key reason why our EMV project was such a success was the ability of our testers to use computer-based simulations to plan and project scenarios with the new cards. It enabled us to be the first large Dutch bank to roll out our EMV credit cards and be compliant with EMV standards.”

Link, (now VocaLink), on using software tooling for their EMV migration, said, “This helps us break down all the commands going back and forth, and achieve complete visibility of what is happening.”

### European sales and support

Level Four House  
Pitreavie Court  
Pitreavie Business Park  
Dunfermline  
KY11 8UU  
UK

Tel: +44 (0)1383 720118  
Fax: +44 (0)1383 720119

### Middle East sales and support

Al Thuraya Tower 1  
2nd Floor, office 209  
Dubai Internet City  
P.O. Box 500274  
Dubai  
UAE

Tel: +971 4 368 1808  
Fax: +971 4 368 8091

### Level Four Americas

Level Four Americas LLC  
5960 Fairview Road  
Suite 400  
Charlotte  
NC 28210  
USA

Tel: +1 (704) 837 8050  
Fax: +1 (866) 560 9783

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[enquiries@levelfour.com](mailto:enquiries@levelfour.com)  
[www.levelfour.com](http://www.levelfour.com)

