BARNES INTERNATIONAL

A WHITE PAPER TO SIMPLIFY EMV MIGRATION:
STRATEGIC CHOICES FOR EMV CARD ISSUERS

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PAPER OVERVIEW

The decision has been made to migrate the payment card base and supporting systems to EMV. The card payment schemes have been consulted, the market research has been evaluated, the project phases, targets and timescales have been agreed, and the business plan has been approved.

Now what?

A number of key choices need to be made concerning the EMV cards and their processing. This will provide the framework and direction for the many activities involved in the EMV migration project.

The good news is that it has all been done before in many countries around the world. The companies and organizations involved have accumulated valuable experience and learnt the lessons. Documentation, procedures and testing facilities are in place. Hardware, software and service suppliers have ranges of reliable, approved and field-tested EMV products.

This paper outlines the initial strategic choices to be made in the selection of EMV-related products and services.

CARD FUNCTIONALITY & USAGE

For the EMV cards themselves the following choices are needed.

- **Should the card support contactless as well as contact EMV transactions?**
  Contactless capability adds complexity and cost, but it also adds convenience. It enables the card to be used more widely and makes it more attractive to cardholders.

- **Should the card only support online transactions?**
  Again additional complexity and cost of offline transactions need to be balanced against wider acceptance for low-value, mass transit and international transactions. Most EMV products support both online and offline transactions, so the issuer's choice relates to the customization of issuer software products for cards and host systems.

- **Which cardholder verification methods should be supported & with what priority?**
  ATMs and many debit cards support only online PIN verification. Credit cards must support signature verification. For many low-value unattended terminals, no cardholder verification is needed. In terms of the range of verification method the question may boil down to the EMV-specific option of offline PIN verification. EMV cards and terminal will support it, and for international transactions it is probably needed. However for at least the initial period of EMV migration in the US, it may not be a requirement.

> "One of the errors of past EMV migrations – reflected in the EMV specifications – was the focus on transactions at the point-of-sale. The rapid migration of fraud to ATM and internet transactions has shown that all payment transaction channels and their card verification requirements need to be addressed."

CARD SUPPLIER CHOICE

This choice is particularly important for EMV cards and should represent a strategic partnership. Unlike magnetic stripe cards, supplier changes for EMV cards are likely to be complex and expensive.

In making the choice the following factors need to be included in the checklist.

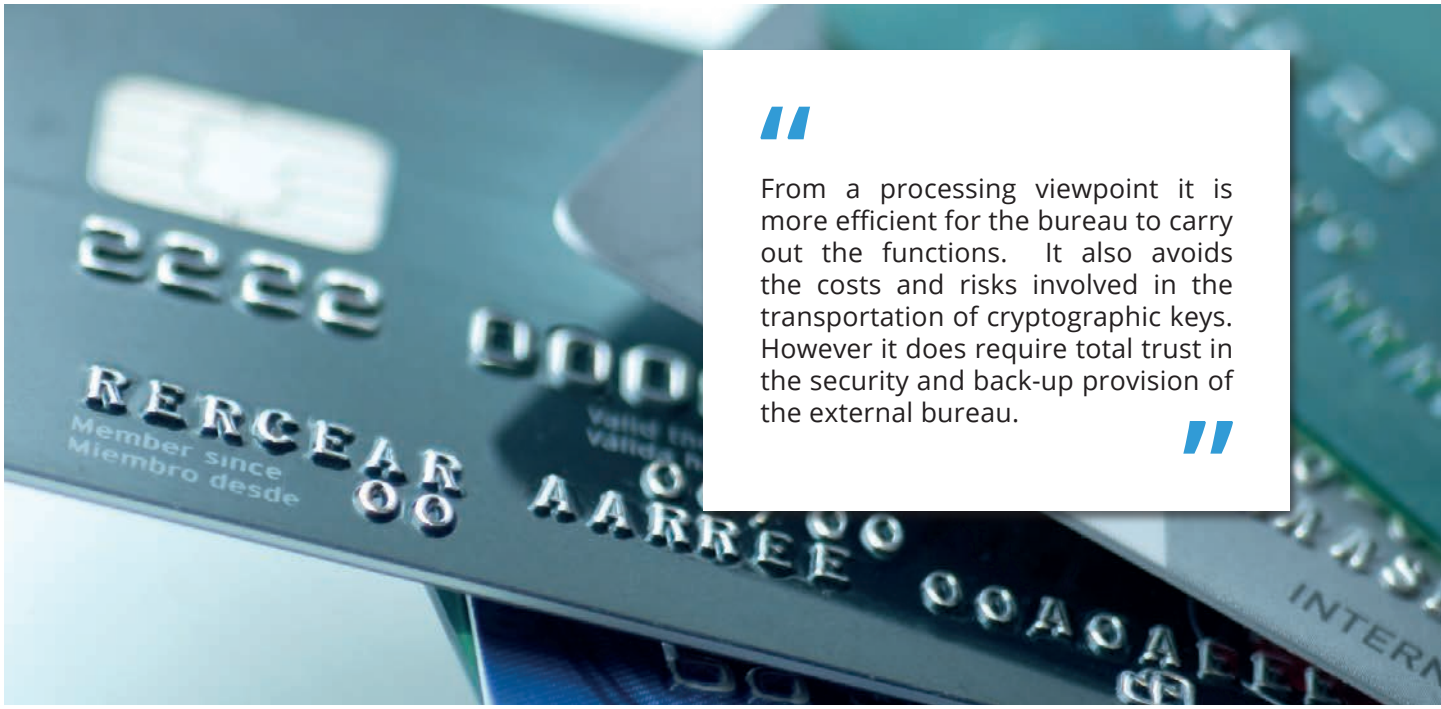
- Families of approved chip cards and applications that not only meet current requirements, but also likely future requirements. Adding functionality in the future should not mean having to change card supplier.
- Length and breadth of experience. The history of EMV has shown the cost and value of experience. There has also been a major consolidation of companies as the costs of product development, product certification, implementation and customer support have become apparent.
- Commitment to the EMV market. With the evolution in chip technology and in EMV applications, issuers need a card supplier who can be with them for the long term.
- If non-EMV card applications are required, these will need to be fully supported by the card/supplier.

CARD PERSONALIZATION OPTIONS

The first decision is whether to personalize the EMV cards in-house or use an external personalization bureau. EMV card personalization is far more complex than magnetic stripe card personalization. All but the largest issuers are likely to outsource EMV personalization to a qualified bureau. The bureau will need to have been certified by the relevant payment card schemes, and for the EMV cards and card applications to be used.

Some of the functions linked to EMV card personalization can be carried out either by the issuer or the bureau.

- Generation of Issuer Public Key pairs, and communications with the card scheme Certification Authorities (CAs) to obtain the Issuer Public Key Certificates.
- Generation of the card's DES and RSA keys, and if applicable, the card's PIN.
- The instant issuance of replacement EMV cards when the originals have been lost, stolen or damaged. Here the data preparation can be done at the bureau, and the card personalization at an issuer branch.



> "From a processing viewpoint it is more efficient for the bureau to carry out the functions. It also avoids the costs and risks involved in the transportation of cryptographic keys. However it does require total trust in the security and back-up provision of the external bureau."

AUTHORIZATION HOST – EMV PROCESSING

Even if the issuer has chosen to start by outsourcing the processing of EMV transaction authorization data to the payment card scheme network concerned, or has decided not to process this data at all (!), the great majority of issuers will graduate to bringing this processing in-house. The additional transaction information and the ability to send script commands will aid decision making and risk control.

In many cases the additional host processing for EMV transactions can be handled by a separate processor and software package that links to the main authorization host system.

The main EMV functions are:

- Analysis of the EMV transaction data for risk indicators
- Checking the authorization request cryptogram (ARQC)
- Creating the EMV authorization response data, including the response cryptogram (ARPC) plus any issuer script commands
- Interacting with the relevant modules of the main authorization host system to enhance the quality of the process.

Apart from evaluating the functionality of EMV host packages, it is important to examine the extent and ease of customizing the package to reflect current and possible future requirements.

IN SUMMARY

The above choices will allow the issuer to set the stage for a successful EMV migration. Like most decisions they will require reviewing as the card payment environment evolves, and as new technologies (e.g. NFC mobile device payments) offer additional opportunities.

ABOUT THE AUTHOR

Richard Johnstone is an experienced EMV consultant. He worked for APACS during the first EMV implementation and then for 12 years for MasterCard Worldwide at their Chip Centre of Excellence. As an independent consultant he has worked on a variety of EMV-related assignments. For Barnes International he provides customised EMV training and consultancy, based around a two-day EMV course.

ABOUT BARNES

Barnes International is the world leader in the development and supply of Chip Card Test Tools and Magnetic Stripe Analysers. Barnes world class Test Tools enable the manufacture and issue of valid magnetic stripe, contact and contactless EMV chip cards, ensuring quicker approval by Payment Schemes and minimising pre-issue costs. Its Test Tools for Laboratory, Manufacturing and Bureau include QC testing to ISO, EMV, Amex, JCB, MasterCard, Visa, CUP, Discover, Interac, SPAN, GlobalPlatform and GSM specifications. Barnes also offers EMV Consultancy and Card Testing. For further information on Barnes' products and services go to www.barnestest.com