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September 2007

Smart Card & Identity News

Smart Cards, Identity Managment, SIM, Biometrics, NFC & RFID

This Month's Lead Story

Progress with the National Identity Management Scheme

"Squeak, Squeak, Squeak" about the UK ID card project went the Rumour Mill on the back of August's SCN (at least for the first 3 paragraphs, after which it got down to serious business), and indeed the wheels of the massive NIS Strategic Supplier Framework procurement vehicle started turning in early August . But does it have 4 or 5 or 6 or 10 wheels, and might they all come off? Perhaps we are more interested in their shape, although certainly the detail of spokes and hubs and axles and the drive train will be important - the bodywork and most of the chassis will be variable, because the consortia supporting the lead bidders may be somewhat dynamic. As this article was being drafted, potential lead suppliers were meeting the NIS team. As it is published, those both rich and brave will have submitted their responses to the Pre-Qualification Questionnaire (PQQ).

Our Comments

The summer is over and now all our thoughts are turned to Cartes 2007 coming up on November 13th. What are we going to see this year I wonder? Well first of all we are bound to be inundated with contactless cash. This month Mastercard's PayPass has been launched in London by Royal Bank of Scotland, apparently the first payment was to buy a Big Mac, who says McDonalds aren't keeping up with the times?

The report boasts the time to make the transaction as just a few seconds, much faster than cash. They clearly didn't have the lady who was in front of me at the newsagents this week who seemed to spend an eternity just finding her purse. It was more like minutes rather than seconds and I don't suppose she'll find her new contactless smart card any faster.

Not to be outdone Barclaycard have launched their OnePulse card that combines the London Oyster card with both credit and cash(less) payments. Oyster is of course contactless using the Mifare technology while the Visa payWave contactless technology will be used for the cashless payments. Again this all happens in a few seconds once you get the card on the reader. You can't miss what's going on here in London as every bill board seems to be promoting the card although there must be a misprint as they seem to be calling it the eyster card. Apparently Barclaycard only has the exclusive rights on the Oyster technology for 3 years so perhaps that's got something to do with it.

You can't help but wonder what has changed, all those years ago the world was full of people convinced that the smart card electronic purse was the way to go. Back in the 90's Smart Card News actually published a directory of major electronic purse schemes, hundreds by my recollection, Mondex, Visacash, Proton to name just a few, all disappeared without trace. Why are these new purse schemes, sorry cashless payments, going to capture the consumer's imagination where all the others failed?

First of all these products are delivered as part of a set of financial payments mixing electronic cash with debit and in the case of Barclaycard a mass transit application. However I feel that our payment culture has changed in most of the West anyway and that is we are now card based not cash, even the local shop gets handed cards for payments of just a few pounds. If you stand in the express check out queue at the supermarket you may be surprised as to how many people use cards for really low value payments. The new contactless payment cards are just going to make this more attractive, not even necessary to enter a PIN and of course you have the framework for the necessary infrastructure because it's all happening under the Mastercard and Visa brands. The retailers are probably equally motivated because the cost of handling cash has ever increased over the last decade and potentially here is a cheap way of solving the problem.

I'm convinced, my card is on order,

Patsy

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Events Diary

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9 - 11	Smart Card Alliance Annual Conference 2007 - Smart Cards: The Future of Digital Transactions - *Marriott Long Wharf, Boston, USA*
16-17	Symbian Smartphone Show 2007 - *London, UK*
24 - 25	Prepaid Cards Summit 2007 - *The Brewery, London - www.prepaidcardssummit.com*
30- 01	6th Asia High Security Printing Conference - *Hong Kong*

November 2007

13-15	Cartes & Identification 2007 - *Paris, France*
12-15	Printed Electronics USA - *San Francisco, USA*
26 - 28	ID World conference - *Milan, Italy*
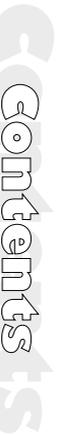
Royal Bank of Scotland first in UK with superfast way to pay

Above: *F1 driver 'pit-stops'at McDonalds Drive-Thru*

The RBS-sponsored AT&T Williams team made the first public contactless card payment in the UK using a RBS contactless debit card, roaring through the McDonald's drive-thru in London on the 28th August to grab a Big Mac. Contactless, the new way to pay, means people can now make fast payments for items up to £10 simply by touching their specially-enabled RBS contactless debit or credit card on an RBS terminal - no need to fish around for change, hand a card over to anyone or swipe a card.

The purchase at McDonalds marks the start of the roll out of contactless cards in the UK. Contactless cards make paying easier and faster than with regular cards and cash. The hamburger was paid for simply by placing a RBS MasterCard PayPass debit card on the reader. Paying for the order took just a few seconds. RBS' trial of the cards showed that they can halve the time taken for a cash transaction.

In addition to McDonalds, RBS has already signed up other retailers including Oddbins and cafes, delis, pharmacies, bars and sandwich shops in the City of London and on the South Bank of the Thames where the new technology is being introduced to allow customers to use contactless cards to make cash-free low value purchases. These retailers will start to use the new technology from September.

RBS employees in Edinburgh and London were the first to trial the new cards in the UK, using them at retailers in the bank's headquarters and one of its London offices and since the trial started in June 2006 over 52,000 purchases have been made. In early

November, RBS will start to issue several hundred thousand contactless debit and credit cards to RBS, NatWest and MINT customers who live or work in the London roll out area.

Combined Oyster, Credit and Cashless Card Launches

TranSys, in partnership with Transport for London and Barclaycard, have announced the launch of Barclaycard OnePulse, the unique card that combines Oyster with credit and cashless acilities. Following successful technology trials earlier in 2007, the cards will be available to consumers for the first time.

The launch of Barclaycard OnePulse marks the first time TranSys, the consortium which delivers Oyster on behalf of Transport for London, has licensed Oyster technology to a third party.

Just nine months after the agreement Barclaycard, endorsed by Transport for London, was signed, the first OnePulse cards are available for Londoners to use, whether to travel on bus, Tube, DLR, tram and some National Rail services in London, or to buy their morning coffee and newspaper.

Barclaycard has exclusive rights for three years to use Oyster card technology.

Barclaycard OnePulse cardholders will be able to use the cashless Visa payWave contactless functionality at thousands of retailers as the technology rolls out in the capital over the coming months. Retailers already signed up to the new technology include Books Etc, Chop'd, Coffee Republic, EAT, Krispy Kreme, Threshers and YO! Sushi.

Website: http://www.barclaycard-onepulse.co.uk

Infineon Provides Security Chips for Largest US Patient Smart Card Project

Infineon Technologies AG, a supplier of integrated circuits for chip cards, announced it is the sole chip supplier for the largest patient healthcare card in United States. Siemens, Mount Sinai Medical Center and Elmhurst Hospital Center formed the health Smart Card alliance in 2005 to deploy up to 1.2 million Patient Health Smart Cards to 45 affiliated and

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related medical facilities in the New York metro area. The patient health Smart Card trial begun late 2006 and is scheduled to end in 2007. In 2008, the health Smart Card alliance expects to issue approximately 500,000 Smart Cards that integrate the Infineon micro controller.

The Smart Card will securely store the demographic data for the patient, including name, gender, contact information; allergies; current medical history; and lab results. The Patient Health Smart Card initiative uses a Smart Card operating system of Siemens. This OS is embedded onto the highly secure contact-based Infineon Smart Card controller SLE 66CX680PE. The crypto-controller features an integral security concept providing multiple levels of physical protection and encryption and is certified according to Common Criteria "EAL 5+ high" certification. It offers 68 Kbytes of EEPROM, 196 Kbytes of ROM, and 4 Kbytes of RAM.

Sagem Orga Smart Cards awarded SECCOS 6.1 Certification

The new SECCOS 6.1 smart cards offer a legally valid electronic signature function while also enabling a major step forward in the standardization of European payment transactions. "SECCOS 6.1 means that Sagem Orga is ready for the electronic euro," said Silvio Stockmann. The SECCOS 6.1 smart cards now comply with the requirements of the European SEPA framework for the first time. The goal of the Single Euro Payments Area is to standardize cashless payment so that there is no difference between national and international payments within the EU for bank customers in Europe.

SECCOS, which is based on an ISO 7816 system, is seen as the strategic product of the German banking industry for issuing smart cards. Data structures created using a highly developed security architecture enable a wide range of applications, making SECCOS a major economic instrument. In addition to the electronic health card and the future electronic identity card, SECCOS is the third digital signature card for electronic, legally binding transactions with government agencies in Germany. Customers of savings banks can already submit their tax returns online with the aid of their EC smart card, combining electronic payment and secure, legally binding signing in the Internet.

Free Travel Passes for Old and Disabled

A meeting of Greater Manchester Passenger Transport Authority welcomed the government initiative that will allow over 60s and disabled people to travel for free on buses throughout England from next April.

Plans are now underway to issue the new passes with the minimum of inconvenience. In the coming weeks over 400,000 local residents - whether they have a travel pass already or not - will receive a letter asking them to confirm their details and provide passport style photos for their new pass.

From April next year, the Smartcard passes will replace the existing free travel passes. They will continue to entitle Greater Manchester pass holders to free travel on the county's tram and train network after 9.30am, and concessions before then.

First EMV Deployment in Vietnam

On the 30th August, Gemalto and Vietnam's FPT Information Systems partnered for the first Europay, MasterCard, and Visa deployment in Vietnam with Vietnam Joint-Stock Commercial Bank for Private Enterprises (VPBank). This collaboration meant that VPBank got their first EMV microprocessor cards.

EMVCo was formed in 1999 and in 2004 Gemplus supplied the first French EMV bank cards.

Biometrics

Britain First EU Country to Collect Ten fingerprints from Every Visa Applicant

Since the introduction of the first UK biometric visas, several hundred applicants have been detected while attempting to immigrate illegally to the UK. Fingerprints taken as part of the visa application process are checked against UK Government records to see if the individual is already known to the Border and Immigration Agency. Over 8,000 sets of prints have been matched quickly and successfully to individuals of concern using this technology.

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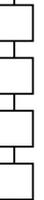
Andrew Pestell, Head of Procurement for UKvisas, said: "The introduction of biometric visas is a key part of our contribution to the Border and Immigration Agency's strategic objective to strengthen our borders."

Cross Match Technologies, has been awarded a $4.4 million contract via the United Kingdom's Home Office Biometrics Framework Agreement for 1,385 Guardian fingerprint scanning systems, as part of its new visa program implemented by UKvisas.

The scanners will be in operation by the end of this year in UK overseas missions, embassies and consulates around the globe.

BioLink Fingerprint Biometrics in Maldivian Passports

The new passport introduced in Male on July 26, Maldives' Independence Day, implements fingerprint and face image templates digitized and embedded into the microchip contained in its back cover and provides complance with the standard for machine-readable travel documents introduced by the International Civil Aviation Organization (ICAO).

BioLink supplied its advanced development toolkit (BSDK) being the core of the identification component of the passport creation and issuance system.

Website: www.biolinksolutions.com

RFID

Gemalto and NXP are paving the way for a boom in NFC

Gemalto and NXP Semiconductors, announced their collaboration on SIM-enabled Near Field Communication solutions based on the Single Wire Protocol. Both companies will together define and develop SIM products for SWP-based solutions to ensure interoperability with Mifare technology as well as other widely deployed contactless protocols with the aim of speeding up the availability of SIM-based NFC phones compliant with telecom operators' requirements.

NXP is designing a new SIM-enabled NFC chip and

SIM chip that support the SWP protocol and provide Mifare capability. Gemalto is developing a SIM card and trusted service management offering for banks, transport companies and telecom operators to manage the provisioning and the personalization of mobile contactless applications.

Visa to launch public trial of Visa mobile platform in Taiwan

Visa International is partnering with Chunghwa Telecom, Chinatrust Commercial Bank and Nokia to launch a landmark trial in Taiwan of the Visa mobile platform.

The trial will bring together near field communication (NFC)-enabled mobile phones, over-the-air (OTA) personalization, Visa payWave contactless payments and merchant direct marketing offers sent to the phone.

The six-month trial involves 500 Chunghwa Telecom Call Call co-brand cardholders using NFC-enabled Nokia 6131i handsets to make contactless payments at any of the 3,000 stores that accept Visa payWave contactless cards in Taiwan.

MicroRead NFC chip for China Mobile Payment System

INSIDE Contactless, announced that its MicroRead platform has been selected as the preferred NFC chip for China's Chongqing Province contactless mobile payment commercial deployment. With a population of more than 31 million, this initiative also represents the first large-scale commercial mobile payment deployment in the world.

The application is based on the PBOC (People's Bank of China, http://www.pbc.gov.cn/english/) standard payment application, which is already deployed on millions of contactless banking cards. The application is stored on the phone's SIM card, which is connected to the INSIDE's MicroRead chip, using the Single Wire Protocol, which INSIDE has developed in conjunction with Gemalto. SWP has now been adopted by the entire SIM card industry, following the GSMA's support in its Near Field Communications technical guidelines white paper, which was published in April 2007.
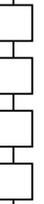
Smart Card Alliance Says No to Long-Range RFID Choice for Driver's Licenses

Within the WHTI specification and in the Washington and Arizona enhanced driver's license projects, DHS has proposed a long-range vicinity-read RFID technology solution. This proposal raised serious privacy, security, and operational functionality issues among industry experts within the Smart Card Alliance believing it is an inappropriate technology for human identity documents.

Website: www.smartcardalliance.org

Beijing Olympic Games Prompts RFID Development in China.

According to Beijing Olympic Games Organizing Committee, RFID technology will be introduced in the processes of ticket manufacturing, sales and verification to fight counterfeiting tickets. The committee will issue 12.2 million RFID tickets, and nearly 1000 terminal devices will be involved in ticket inspection. Tsinghua Tongfang, a leading RFID company in China, will participate in the construction of the electronic ticket system. Tsinghua Tongfang will provide RFID ticket (without anti-counterfeiting printing), readers and services of system implementation for free, which will add up to 54.86 million Yuan. The company expects this action will prompt the development of its RFID tag division and improve the company's profile.

In addition, Beijing Olympic Games will deploy a food safety tracking system for the first time. Food to be delivered to athletes will be closely monitored with RFID systems throughout the process of production, processing and transport. After Beijing Olympic Games is over, the system and related experiences will be further utilized to improve the life quality of Beijing civilians.

As a constructer of the food safety tracking system, AeroInfo expects such a application will drive the development of RFID technology and solve some key problems, as well as set an example for RFID applications in China.

Merger & Acquisitions

STMicroelectronics to become Behemoth

The potential takeover of Infineon Technologies by STMicroelectronics could see the combined company become a power semiconductor behemoth, dwarfing its competitors in the power management market, according to IMS Research.

The combined company would become by far the largest global supplier of power discretes, with a market share of more than 15% - significantly more than current leaders.

Research Director Ash Sharma commented. "Whilst rumours are rife, the possible French-Italian-German merger could attract the attention of the European competition authorities, as it would hold one-third of the European power discretes market. As well as dwarfing other suppliers to the power discretes market, this merger would see the company dominating the global power ICs market, making it huge in comparison to the current largest suppliers Texas Instruments and National Semiconductor."

On The Move

Bell ID Open First Office in the U.S.

From the new office near Washington D.C., Bell ID will build on its current activities in North and South America, with a focus on growing the corporate ID, mobile, government ID and contactless banking business. In addition, the U.S. office will provide local support for ongoing pilots and the implementation of test systems to prospective partners and customers. Bell ID's new office is located at 2325 Dulles Corner Boulevard, Suite 500, Herndon, Virginia 20171.

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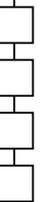
Progress with the National Identity Management Scheme

By Peter Tomlinson, Iosis Associates

Above: Key elements to be delivered

Stepping back to early last year, a fundamental review of the whole National Identity Management concept was under way. Now we have a new architecture (launched last December) which features migration, over quite a long period, from the best collections of centrally held historic citizen identity data (DWP's CIS database and IPS' passport issuing data) to re-verified, biometrically linked information. The aim is to define your and my official identity for many of our relationships, directly or indirectly (e.g. car insurance, banking), with government.
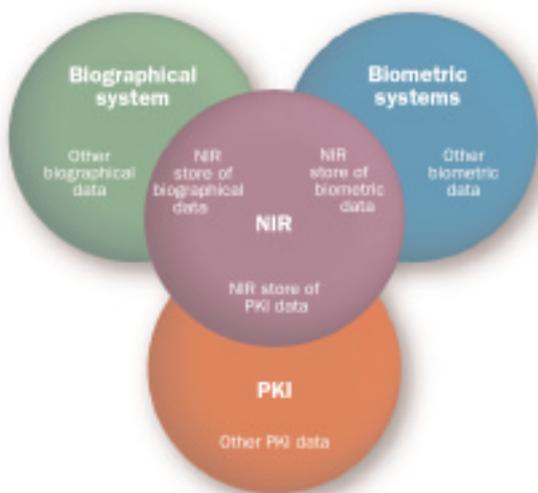

Above:: Separation of National Identity Register (NIR) information

The hope is that off-the-shelf solutions can be purchased for each part of the scheme, so the NIS team have cranked up the fairly new EU Competitive Dialogue procurement process to allow for discussion before the main, formal ITTs start to be issued.

But there is a short term requirement to re-tender for two programmes : the passport issuing systems , and the biometric (fingerprint) immigration and asylum seeker smart card system. The first is in the hands of Siemens Business Services (SBS), the second currently uses Sagem proprietary fingerprint biometric technology . Thus it has been decided to get the full Framework Agreement process moving ASAP, in order to include the urgent re-tendering under that umbrella.

At the start of last year, the visible basic question was the same as it had been for some time: What exactly will the smart ID cards be used for? There have never been any detailed, credible answers. However, central government appeared to be more concerned internally about another question: How will the set of systems work? In other words, how can other govt depts connect to HO's new baby? ICT methods have specific processes and outputs, based on specific inputs, but HO never seemed to grasp that, and thus no answers. Its an engineering job, as Prof Martyn Thomas blogged about another public sector scheme problem: NHS staff sharing a system access card (i.e. one person logs on and the whole team use that terminal) because the
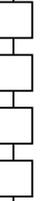
system did not otherwise meet their urgent need for access. Martyn asked what the detailed specification (including security policy) said, and why one Health Authority could simply say "OK to share". Cambridge University people (Martyn is a Visiting Professor) have consistently pointed out that ICT is engineering, subject to the disciplines of that profession, and the new trade association PSSG (www.pssg.biz) supports that stance.

By the time that the NIS watershed was reached in December 2006, a government Minister was reduced to illustrating the NIS by explaining that the person who wants to verify your identity will contact a call centre by phone - that is all that there was in the architecture. The scheme was to be fed by a brand new enrolment process, but for verification of your details when you (or govt) want something done, the design just had an identity register and a call centre with terminals to the register's database. We the people would have to show our cards to a person in authority (public or private sector) who would phone the call centre. Forget the smart cards (the smart bit in practice had no role): we were running big systems like that 35 years ago!

It all reminds me of the little Welsh waitress in the days when innovative boil-in-a-bag gourmet (sic) food supported the creation of large mouth-watering menus in out of town roadhouses that no longer had any business from changing horses. When the waitress was serving a party of businessmen celebrating a con-tract, one of the diners asked for a little more sauce with his Duck a l'Orange. She reportedly replied "That's all there was in the bag, Sir". Inadvertent sauce indeed! The further report was that the entire party walked out. Today, or more likely tomorrow, there is money to be made, so the potential NIS suppliers do not walk out. Maybe they fret instead; maybe some of them are also frit. But some credible suppliers (not necessarily in the NIS PQQ lead) do not wish to be involved unless they are dealing with a knowledgeable customer who takes charge of the project.

With no answers about NIS core systems connectivity, so that other central government departments did not know how they could use the scheme via a network connection when they are dealing with the public, another major change last autumn was to say that there will not be a bulk issue of ID cards to the average citizen until they are useful to us. The technical questions remain basically the same today, albeit expressed in more general terms: How will the NIS work for all those who want to use it?

There has also been another question around for some time, the civil liberties question: Will the system be used to track the activities of those who use (who are forced to use) their cards in normal everyday interac-tions? Procedural safeguards may not be enough to defend our civil liberties, so there may have to be pro-tective technology fundamentals in place as well - but that is not directly the topic of this article.

Feeling for the answers are now a host of groups. This is the best information that we can currently find in the public domain:

- The Framework Agreement procurement is the responsibility of the NIS team in the Immigration and Passport Service (IPS) www.identitycards.gov.uk.
- A central government cross-department Identity Management Strategy Group (IMSG: 'IMSG (Strategy)') is operating, under the chairmanship of Sir David Normington, Per-manent Secretary at Home Office.
- Observing and discussing the situation has for some time occupied EURIM (parliamen-tarians and others, including suppliers www.eurim.org.uk), who in July, with others, met IPS to discuss how standards (they mean common methods) and possibly new specifica-tions (exact methods) might be needed - they are forming advice for an IMSG (EURIM) to advise IMSG (Strategy).
- Others' in the July meeting included a representative of LeGSB (Local eGovernment Standards Board www.legsb.gov.uk), that, with CLG money, is to set standards (common methods) for identity management across local government by way of an about to be formed Identity Management Standards Group (another IMSG: 'IMSG (Standards)').
- EURIM is endorsing the creation of 4 IMSG (Standards) WGs of volunteers who will be given directions by a fifth WG run by LeSGB .
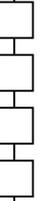
- LeGSB is governed by a constitution but is ultimately responsible, via NWeGG , to Tameside LA (east of Manchester) as purse holder for CLG.

IMSG (Standards) is going to have all this sorted by the end of this year (well, maybe) and thus provide advice to IMSG (Strategy). But IMSG (Standards) appears to be not quite yet constituted, so we don't know how it will be governed.

Note that suppliers, who might also be bidding for NIS Framework Agreements or be part of a consortium whose leader is bidding, can be part of LeGSB's (sorry: EURIM's) Working Groups that advise IMSG (Standards) that advises IMSG (Strategy) and/or advises EURIM's members. Get it? And who advises NIS (which is operated by the IPS part of HO)?

Peel that all away and another, now double, question pops up: What is the risk that all of this will be late and/or not work properly? Two other schemes can be used in evidence here:

- Defra's Single Farm Payment scheme crashed last year when it tried to make payments. That scheme had a series of interconnected systems: farm data went in at one end, and money didn't come out at the other. NIS is not like that: there will be a network of schemes in a mesh, so a complete crash is unlikely.

- Last year the Newport Passport Office put into operation a new variant of their system. When heavily loaded it fouled up. They have explained that in detail to the public , which is a change from 9 years ago when many of us were caught by the too low throughput of their then new system.

There is a very high risk that the NIS will be late and also foul up: it is going to have a much higher new design content than the online passport system that Newport had to withdraw last year.

Behind all this is the ID Card Act , whose Section 29 says that criminal offences apply and imprisonment may result. Here is part of the text:

29 Tampering with the Register etc.

(1) A person is guilty of an offence under this section if-

(a) he engages in any conduct that causes an unauthorised modification of information recorded in the Register; and

(b) at the time when he engages in the conduct, he has the requisite intent.

(2) For the purposes of this section a person has the requisite intent if he-

(a) intends to cause a modification of information recorded in the Register; or

(b) is reckless as to whether or not his conduct will cause such a modification.

(3) For the purposes of this section the cases in which conduct causes a modification of information recorded in the Register include-

(a) where it contributes to a modification of such information; and

(b) where it makes it more difficult or impossible for such information to be retrieved in a legible form from a computer on which it is stored by the Secretary of State, or contributes to making that more difficult or impossible.

…

 (9) In this section-

·   "conduct" includes acts and omissions; and

·   "modification" includes a temporary modification.

Note how a common term has been re-defined in Clause 3. All of the members of the above groups (including the volunteers) could be caught by that if something that they did at any time is deemed to have been the cause of a problem that maybe appears much later. Given a government that fully understands the scheme that has been put in place, I would not be too concerned. Given a government that does not have the expertise to fully understand, I'm scared. But, in the government's defence, it has been said that scrutiny of the Bill was truncated before that section had been fully discussed - thus there may be an opportunity to
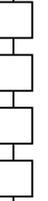
amend the Act before the scheme goes live.

A government that does not have the expertise to fully understand… In the NIS draft Prospectus (see earlier footnote), section 6.2 is about the Design Authority:

> IPS will, as Design Authority, retain responsibility for the overall architecture of the NIS.
>
> This will describe the top level picture of NIS components.

In many UK public sector public administration projects, the fundamental flaw is the disconnect between strategy and implementation, and reading the Prospectus reinforces the view that NIS has this fault line. For a high probability that an ICT scheme will be a success (which is what we need), within an organisation there needs to be a continuity between strategy and implementation, with accurate and comprehensive information flowing up and down that chain, with the application of engineering discipline throughout the organisation and across to its suppliers, and with appropriately skilled senior people within the organisation taking full responsibility for the scheme. There is no need to labour this point any further, for others (including parliamentary Select Committees) have set it out clearly, but there is a need for it to be heeded.

Progress with the National Identity Management Scheme was written by Peter Tomlinson - Iosis Associates.

Peter is an consultant in ICT strategy and secure solution design, with particular interest in smart cards and associated secure terminal equipment. He has contributed to several European pre-standardisation and standardisation projects in this area and to UK policy material.

Peter Tomlinson

Sources of Infomation:

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Information and resources for suppliers - Industry meetings - January/ February 2007
http://www.identitycards.gov.uk/working-suppliers-events.asp
Procurement strategy briefing – May 2007 - http://www.identitycards.gov.uk/working-suppliers-procurement.asp
Strategic Action Plan - http://www.identitycards.gov.uk/news-publications-general.asp
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http://www.ogc.gov.uk/procurement_policy_and_practice_procurement_policy_and_application_of_eu_rules.asp
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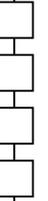**North West eGovernment Group -** www.nwegg.org.uk
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Lessons learned from failure of online passport application system EPA2 -
http://www.computerweekly.com/blogs/tony_collins/2007/02/lessons-learned-from-failure-o.html

Smart cards in the transport sector - a cornerstone of contactless technology uptake

By Pierre-Antoine Benatar, Marketing Director, Thales Transportation Systems

Global smart card uptake in the transportation sector is advancing at a rapid rate with transport operators all over the world embarking on upgrading existing transportation networks and also constructing new ones. With considerations spanning from safety, security and passenger satisfaction to the environment and economic prosperity, it is vital that transport networks evolve with the demands being placed on them and smart cards can be seen as part of the solution.

Many transport operators, across the globe, are already keeping pace with new technology to meet the changing demands placed on transportation systems by implementing sophisticated smart card systems in their public transport infrastructures. Awareness of the benefits that this technology can bring is not exclusive to the most economically advanced countries - many developing nations have also successfully rolled out transport projects using cutting-edge smart card solutions.
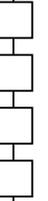
What does smart card technology offer the transport sector?

Local authorities, transport operators and passengers alike can benefit from the implementation of smart card-based fare collection system in a transportation network. An obvious advantage that all parties can gain is the increased security that smart card ticketing and access offers. Operators have far greater control of passenger flow, enabling them to restrict and re-route users of transportation systems based on real-time events that the network may be facing. Networks that can be monitored in this way provide passengers with a safer environment, reduced waiting times at peak hours and overall ease-of use. Operators also gain from having a far more comprehensive view of their system that allows greater security, a reduction in fare evasion and also a reduction in maintenance demands on the network. Smart card-based fare collection systems even help local authorities to encourage more users to embrace public transport.

Whereas traditional paper-based ticketing does not allow operators to gain insight into passenger behaviours and patterns of travel, smart card ticketing allows for the management of much greater amount of passenger related information and hence does afford this overview. By investing in a smart card infrastructure, operators often see passenger satisfaction levels rise, as timetables and even routes can be adapted following analysis of the information collected by the system. As a result, operators often also experience an increase in revenue. For example, operators may see a spike of passenger traffic at certain times of the day or at certain sites and therefore decide to increase the number of vehicles within the heightened periods of travel. Likewise, through investing in a smart card system, passenger journey information may illustrate the need for more bus stops or metro stations in a particular area as a city expands. If new routes are being considered, this kind of information can form a valuable part of the planning process, benefiting local authorities as they consider public transport provision. Finally, smart card based ticketing allows operators to better tailor their fares and service to the needs of their travellers, for example by implementing specific discounts on chosen routes or loyalty programmes linked with usage of the transport network.

Smart card technology applied to transport fare collection allows transport operators and local authorities to offer much better services to passengers. Interoperable multi-operator and multi-modal transport schemes have only been able to emerge thanks to the development of the smart card, which is able to handle and compute all the information necessary to implement such highly complex schemes. A typical example of such system is the nationwide interoperable ticketing system currently been rolled out in the Netherlands, where a single transport card can be used to travel across the entire country, for all modes of transport (metro, tram, bus, train…), regardless of which company is operating the transport.

Networks of this magnitude have multiple zones, distance and/or time-based payment structures in place between the various operators. The system is complex and responsive to passenger demand and truly demon-

strates how much smart card schemes have already evolved. Passengers benefit from reduced cost of travel, easier access to the networks and reduced transfer time. A similar system is also being developed in Denmark.

Does it have to be a smart 'card'?

As some of the more advanced projects successfully demonstrate, smart tickets are not restricted to the 'card' format. Considerations of different customer preferences and usage of public transport should be taken into account in order to best serve passenger needs.

Occasional passengers, for example, have no need for a smart card. Some operators of smart card systems for example still use paper magnetic stripe tickets for single fares. However, less information can be collected on mag stripe tickets, more waste is produced every day and more maintenance of access gates is required. Contactless tickets can be used for single rides and occasional journeys, but the cost of those tickets compared to the cost of travel can be prohibitive and are therefore reserved to the more economically developed countries. A technologically advanced, as well as economically sound, alternative to the magnetic stripe for occasional passengers is recyclable tokens and tickets. Even single-use passengers can provide operators with valuable information that can benefit the running of the transport system and tokens enable operators to gain the same kind of insight as with smart cards. The overall benefit is that they are recyclable as they are collected at the end of the journey in the exit gates. Not only does this help the operator through the information collected and the reduction in waste, but it also reduces costs of supplying occasional travellers with single use tickets. Such systems are especially useful in networks that are preparing for a large increase in volumes of traffic. In preparation for the 2010 Commonwealth Games, the city of New Delhi, with a population of 16 million, has implemented a recyclable token system on its new metro network.

Other formats are also being considered for holding passenger rights and transport tickets. Mobile devices such as mobile phones and PDAs are seen as key candidates for the future of smart ticketing. Mobile ticketing using the new Near Field Communication (NFC) standard will provide a key platform for allowing these new services. Not only will the smart card contained in the phone be able to hold transport tickets and information, but the mobile phone will act as a terminal providing value added over-the-air services such as ticket purchase and period pass renewals. Some operators that have already started implementing such systems for ticketing and access control on their networks. Whilst deployment of mobile-based ticketing is not currently widespread, it is a form that will undoubtedly grow in the future.

Which regions have successfully implemented smart card transport projects?

Traditionally, Asian countries have been recognised as the early adopters of cutting-edge technologies. For example, the Octopus card in Hong Kong was the first widely implemented contactless ticketing system in the world. Other systems such as those rolled out in Singapore and Taiwan in the late 1990's, represented great innovations in the early age of the contactless smart card technology.

Many operators, such as those based in Hong Kong, have looked at the possibilities of using travel cards to pay for low-cost items and transport-related services. These plans often centre on retailers within the public transport network, such as newsagents and coffee houses. As is often the case with the roll-out of e-purses, the Octupus card was originally launched as a fare collection solution for the city's mass transit system. Its multi-application, e-purse functionality today reveals to the rest of the world's operators a strong business case for how smart cards can be solutions for low-value payments in convenience stores, fast-food restaurants, parking meters and many other point-of-sale applications. In addition, the Octopus card is now also used for other non-monetary value-added applications such as school attendance for children and identification for access to civil services, making it the most widely deployed true multi-functional city card. The extension of interoperability is key to the success of smart card systems and signals the future for such technology.

However, transportation innovation is not exclusive to the Asian market and there are many examples from outside the region of intelligent transport networks that offer those operators considering implementing smart card solutions an insight into how best to serve the needs of their passengers.

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Looking to other parts of the world, one of the first examples of an integrated transport system in the North American sector is in Toronto. It illustrates how the collation of resources and information can benefit both passengers and operators.

Case Study: Toronto

The Greater Toronto Area (GTA) Fare System will be introduced on a limited basis in 2007 and will be fully implemented by 2010 at eight transit agencies and five subway stations. It aims to make travel across the GTA easier by using smart card technology to replace tickets, tokens or passes. The convenience of a seamless transit system will give people the incentive to leave their cars at home, as the use of a single ticket for different modes of transport will take much of the hassle out of travelling. Passengers will be able to load their fare card with value at terminals and select retail outlets, via pre-authorised payments, by telephone or the Internet. As a passenger boards a public form of transport, the card is placed in front of an electronic reader, which scans the card to calculate the fare and deduct it from the card balance. The system will involve nine transit agencies with a total of approximately 2,000 vehicles including bus, subway and rail. Once it is fully operational, it will accommodate between one and two million passengers travelling across GTA transit systems from Hamilton to Durham each day.

The future of metro networks

The evolution of pressures on public transport on a global scale, such as growing passenger numbers and expectations and the increasing threat of security, mean that operators should be considering when, not if, to upgrade or build their network around contactless smart card ticketing and access control. Operators will benefit greatly from such developments as they will have access to more information, enabling them to better organise themselves and make more informed decisions about the running of their networks.

Interoperability is the ultimate goal for future developments to public transport networks. In cities like London and Naples, passengers are now able to use their smart cards on a variety of public transport networks, from trains to buses to trams. Such systems encourage public transport take-up due to ease-of-use and flexibility.

Interoperability need not be restricted by country borders in the future. As individuals travel from one country to another, transport applications offering an end-to-end travel service, enabling the purchase and renewal of tickets for example, will be available to help plan an entire journey. This service could even take advantage of the consumer drive towards convenient online payments by offering all travel services through multiple access channels. Multi-channel services are becoming important for operators as they try to drive down 'attended' services delivered by staff behind counters, in order to reallocate these people for better customer service. The shift in paradigm from 'attended' to 'self service' ticketing is helped by the development of unattended channels such as ticket vending machines, but more importantly by online access channels such as Internet or mobile phone ticketing. Similarly, smart PDAs and other electronic equipment will have the same ability in the future, further eroding the need to carry a physical ticket.

We can expect transport operators to become more imaginative and flexible as to the form of the ticket, whether it is a card or some other sort of device, as long as it is able to carry the necessary smart chip. As contactless technology becomes more widespread and generally accepted as a form of payment, the use of contactless payment and access in the transport sector is being used as the basis for rolling out multi-application smart cards that can be used across numerous sectors, such as retail and identification. The adoption of smart cards for contactless payments across the board will only increase in the future, further emphasising transport operators' need to consider not if but when they implement world-class smart card solutions to benefit their business, the local area and, of course, their passengers.

Open-Specification Smartcard Schemes benefit Transport Networks

By Jeremy Acklam - Business Development Director, thetrainline.com

The 5th of September 2007 will go down as one of the historic dates in the calendar of smartcard adoption across the world's transport networks as the UK Department of Transport (DfT) announced that the concession pass for bus services across England would be implemented for up to 11m people using a smartcard to the ITSO specification. Widely trailed, the announcement completes the UK line-up for bus transport smartcards using ITSO as it follows similar announcements in Scotland and Wales by their regional Governments. The importance of this announcement to the future adoption of smartcards based on open-specifications cannot be underestimated. In England, 291 Local Government Authorities are responsible for the administration and reimbursement of bus concessions and clearly such a country-wide implementation would have been unworkable without the guarantee of interoperability delivered by an open-specification.

ITSO is going from strength to strength in the UK in the near-decade since it was instigated by transport operators with the support of Government. ITSO (originally the Integrated Transport Smartcard Organisation, but now just ITSO) is a specification for how smartcards and systems all need to communicate with each other to make a larger (eg country-wide, multi-operator) scheme work. It is an "open specification" which means that the details of how to encode data to smartcards and how readers need to communicate with other readers, is public information available to any equipment supplier, operator or Government authority. The specification is available to be used in any other country in the world - several have already created derived versions.

Each party must be a member of the open-specification organisation (ITSO Ltd in the UK) to be able to issue and manage ITSO smart media and products in a working ITSO environment and they must also be signed up to standard operating agreements (i.e. they need to be a 'Licensed ITSO Member'). This is necessary to ensure that all members of the open-specification organisation agree ways to transfer data between themselves (their components will be built by different companies) and to agree changes to the specification in the long term going forward. Additionally, the only way that you can get the unique ITSO security chips (ITSO Secure Application Modules, ISAMs) that go into card encoding machines and card readers is to have ITSO provide them - as well as al the security keys and key management service. This requires ITSO membership by transport operators and their suppliers and there are associated administration costs & certifications which go with this requirement.

Just because a specification is open does not mean that it's simpler to implement - and in the UK the component parts of ITSO have been developed and refined over a number of years to the point where it is now feasible to reliably implement interoperable journeys across multiple operators using open-specification smart media ticketing - hence the DfT's recent announcement and its importance. There is also some pretty impressive technology behind ITSO in the form of the Multefile system developed by Ecebs, which is the core technology behind the security necessary for an open specification smartcard scheme involving many transport operators. Ecebs and it's owning company Advanced Smartcard Technologies plc was recently acquired by the UK's independent rail ticketing company Trainline.com Ltd as part of a drive to accelerate the adoption of smart ticketing media in the UK rail market, where again the UK Government has been mandating the introduction of ITSO ticketing, this time on a franchise-by-franchise basis.

One of the interesting side-effects of an open smartcard ticketing specification, beginning to emerge in the UK transport smartcard space, is the impact that an open specification has on supplier and transport operator behaviour. Previously suppliers would always ensure that there was some sort of lock-in at either the card level, transaction equipment level or systems level. However, it's increasingly apparent that the ITSO implementations in the UK will push forward market-oriented behaviour much sooner that some people expected. For instance, a transport operator implementing smartcard ticketing using an open specification has the 'new' space to themselves for only a short while. As soon as the next geographically local implemen-

Industry Insight

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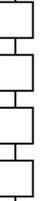
tation goes live, the first implementation is obliged to accept smartcards from the second implementation (because they are both the same open specification) and if both are operating in the same transport mode, there will be political pressure to ensure that fares available through one set of smartcard ticket media are also available through the other. And onwards the process goes with each new implementation until market forces begin rapidly to dominate the choice of smart ticketing media that the customer makes. This is similar to the mature markets for financial-services cards, where all suppliers participate in the open EMV specification, but differentiate to attract customers, not on the basis of the core specification, but on the basis of customer value as represented by the customer media itself.

Differentiation of ticketing media on the basis of customer value (or at least perceived customer value) is where open smartcard specifications can take transport networks, once political interference is out of the way. This trend will cause some consternation at the transport operator level initially, because the perceived loss of control over ticketing media may be palpable. After all, transport networks have controlled ticket fulfilment media for over two centuries. In practice of course control of ticketing media by transport operators doesn't actually matter because the purpose of a transport operator is to generally to carry as many people as possible profitably and the payment/ticketing media is merely a way of achieving that, irrespective of how those tickets are sold or on who's media they are placed. In particularly competitive transport industries such as air, there is the added angle of customer brand loyalty which may shape how ticketing media is offered, but in most land transport networks, retail loyalty is not usually high on the agenda. The consequence of the differentiation of ticketing media on the basis of customer value is that smartcard ticketing will lead to a disenfranchisement of the transport operator at the ticket retailing and fulfilment levels. This in itself is actually likely to be beneficial to transport operators because retailers (either independent or as subsidiaries of transport operators) who depend on selling tickets for their income, are much more likely to invest in achieving this and promoting ticket sales to a wider audience, which is to the benefit of customers and transport operators alike.

Key to driving the transport industry forward over the next 10 years is not so much ticket price (which is under the control of the operators) but ticket fulfilment media, the ubiquitous paper ticket. The challenge is that the paper ticket has to be delivered into the customer's hand - either in person, by post or via a collection machine, all adding cost and complexity. Replacing the paper ticket and the processes that go with it are therefore at the heart of trends in transport ticketing worldwide, designed to reduce industry costs over time and enhance customer service and experience. This is why, ultimately, transport operators will embrace an open market of smart-based fulfilment media provided to the customer by non-transport companies.
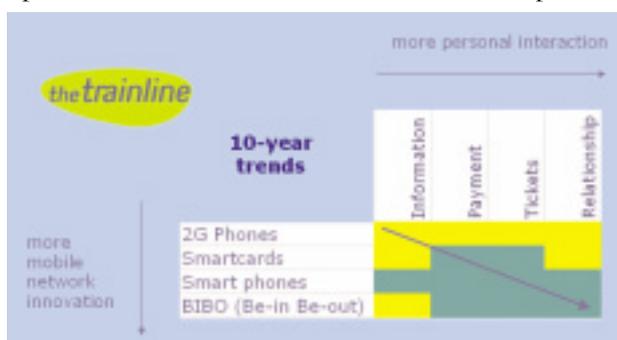
The long-term target for transport operators is to have be-in, be-out automated ticketing where the customer does not need to touch a card or show a ticket in the traditional sense. A lot more innovation is needed in remote device reading and fraud management before this will become feasible. Consequently, the next 10 years will see a mixture of bar code (phone & home printing) and smartcard technologies used increasingly for transport ticketing worldwide. Using Contactless media in the UK from 2008 and Smartcard (NFC) phones from 2010, information, payment, ticketing and relationship-building services will be progressively delivered, creating an open market and maybe in 20+ years' time we will be saying a fond farewell to paper tickets on transport - after more than 200 years. That would indeed be an interesting consequence of open specification smart media, and the 5th of September 2007 will be recalled in future reviews as a key milestone in achieving this.

Jeremy Acklam is the Business Development Director of thetrainline.com in the UK, responsible for the implementation of smartcard media. Earlier he helped design and create the ITSO specification and has enjoyed a career introducing change into transport.

Jeremy Acklam

Internet security must take a fresh focus on the needs of the blind and visually impaired

By VASCO Data Security International, Inc

Many people would find it is almost impossible to imagine their lives without the Internet. Both personally and professionally, it has become an integral part of our everyday lives. But together with the great opportunities the Internet presents, also come great risks; that of Internet-related crime. This is an ever growing problem that touches every Internet user, as everyone is a potential target.

But are people doing enough to protect themselves online? The answer is probably 'no'. For example, stealing passwords isn't all that difficult when most people still jot their passwords down on sticky notes and put them next to their computer. Or, people use the same easy to remember passwords, like birth dates and children's names, for all the different online applications they use. As a result many people have already been victims of fraudsters who steal personal login details to shop on your account, or steal your virtual online identity; in worse case scenarios, they may even file a fraudulent tax return using your information.

If that is not enough, fraudsters regularly spam Internet users with fraudulent mails and websites. 'Phishing' is the term used for the act of sending an email in name of an trustworthy organization (bank, government, online store) and asking for personal details like credit card numbers or passwords. When - naively - people give their details, they will be used for illegal purposes. With a fraud scheme called Pharming, Internet criminals use a link in an email to persuade you to go to a website of a financial institution. But by clicking the link, the user is forwarded to a fake website with a similar layout as the real website; it's another sophisticated way to dupe victims into innocently submitting their details.

Another popular way to steal passwords and identities is the man-in-the-middle attack, where a third party intercepts information exchanged by two parties who know each other. Often, like with Phishing and Pharming, victims are unaware of the theft of their identity, until they later review their bank statements.

Security is at hot topic for companies as they can all be targeted by Internet criminals. When companies try to secure their applications, they often rely on visual security schemes. One example is "captcha's", distorted letters that users need to decode and enter in a box to get access or register for a service. The use of CAPTCHA's, should prevent (spam) computers from registering for a service, but in the mean time they also prevent people with sight problems - whose software cannot convert the captcha into audio- from getting access to the service.

Above: Example CAPTCHA

While Captchas are a useful way to reduce fraudulent activity, companies and organizations fail to take into account that these visual security schemes prevent the blind and visually impaired from using their application or service. In other words, they do not realize that they are excluding a group that - in the UK alone - already accounts for more than two million people; with about 100 people a day losing their sight, it is a number that is constantly growing.

With the internet proving to be a life-changing enabler for many millions of people, a safe trading environment should be made available to everyone. This will help to keep the fraudsters at bay, thus ensuring that the online experience remains a positive - and safe - one.
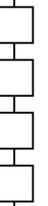
To give the blind and visually impaired the same opportunities and level of internet security as everyone else, VASCO has developed the Digipass 840 Comfort Voice (CV). Digipass 840 Comfort Voice provides strong authentication to people with sight problems, while making the use of the card reader as comfortable as possible for them.

First of all, the Digipass 840 CV is brightly colored, so it can be easily located. The display and keypad are extra-large, with oversized tactile keys for effortlessly entering the PIN-code. The slot is designed in a way that a smart card can easily be inserted by touch. The Digipass 840 CV has e-signature and one-time password functionalities, converted into voice and output through an internal speaker or headphones if privacy is required. The device also supports Digipass standard, EMV-CAP, VISA dynamic password authentication 1.1, German Sm@rt TAN and the Belgian eID Card.

"Accessibility is one of the most important success factors for any e-commerce application," said Jan Valcke, VASCO's President and COO. "Unfortunately, few technology vendors have considered the needs of visually impaired consumers. As a consequence, this user segment doesn't reach the e-commerce vendors' offering. By offering speech-enabled Digipass client authentication products, VASCO makes e-banking and e-commerce accessible for the blind and visually impaired. Worldwide, over 20 leading banks already offer speech enabled Digipasses to a part of their customer base."

Above: *Digipass 840 Comfort Voice (CV).*

Rumours From the Front Line

By "The Squeaker" (*a source who wishes to remain anonymous*)
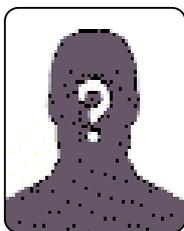
Signs of recovery at Gemalto, the struggling smart card maker chirped the FT this month. The article goes on to tell us that Gemalto was formed by Axalto's takeover of its Swiss rival Gemplus. Well we always thought that although I'd never looked on Gemplus as being a Swiss company. However I'm sure we would all agree that struggling is probably a good word and that also applies to most of the other card manufacturers. As for a takeover, well what's the difference between a merger and a takeover? I guess in the later case you name the dominant party although in this case it probably wasn't necessary.

So where is all the good news that resulted in the shares in the group having their largest one day gain in more than a year? Well net sales for the first half were down from Ä846m to Ä760m, net profits for the first half fell 15.2% to Ä24.5 compared with a year ago but Olivier Piou the CEO (ex Axalto) has told analysts that he expects the group to return to revenue growth in the second half. So why should he be so confident for the company which has about 50% of the GSM SIM market and the major chunk of the banking smart card business both of which have seen their prices slated at times by as much as 50%. Ah I missed a bit, a 'probable' return to sales growth iterated Mr Piou, as a result of more favourable trading conditions. So where exactly are these more favourable trading conditions? Well to start with analysts have been impressed with the profit margin recovery in the mobile division and Olivier Piou seemed happy with the more optimistic forecasts of Ä60m - Ä65m for 2007's operating profits.

We have had this discussion before but there is a limit to how far you can go on the margins for the high volume products, there is only so much cost that you can drive out of the business and of course its asymptotic, big improvements come quickly and then you fight for every cent. Let's not kid ourselves, Gemalto's core business is the production of a commodity and this is something our friends in Asia are very good at turning their hands to, so Gemalto has to climb the value chain,
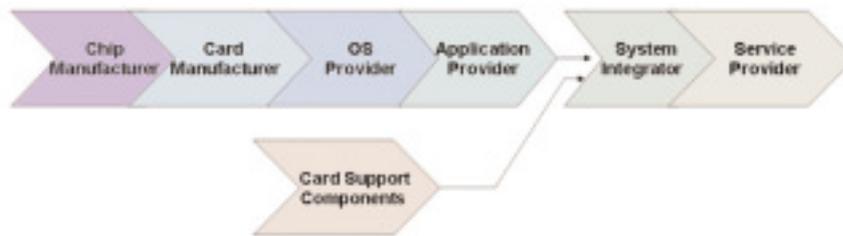
Above : *The Smart Card Value Chain*

We can knock out some of the boxes pretty quickly, Gemalto is not going to make chips and will find it difficult to be a service provider and is unlikely to become famous as a system integrator. The core card manufacturing is as we have said a commodity so not much value add here. The operating system (often created as part of the chip manufacturing process) is however something that Gemalto (through its founder companies, with pedigrees going back to Bull CP8 and Gemplus) has excelled at from the early days of smart cards, the problem here is even this box is becoming a commodity, more so as the customer doesn't want to be single sourced. Hence we can see the growing popularity of Java Card and Multos which is provided by a large number of licensees.

The trouble is that it gets worse, if you have a generic OS such as Java Card or Multos then the proprietary nature of the application also starts to diminish. Arguably there is a debateable future here, so we are down to one box, card support services.

So what goes in this box? Fortunately it's a large box, everything from the initialisation of the chip through personalisation, card management, cryptographic infrastructure, to the access control and identity management platforms upon which the card will eventually be used.

The dilemma for Gemalto is how far up this chain can it reach? The target is clearly everything but even well placed insiders wonder if the company is really capable of getting past the card management level. You can't help wonder why Olivier Piou is not on the acquisition trail, perhaps he is?

Squeak squeak.

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