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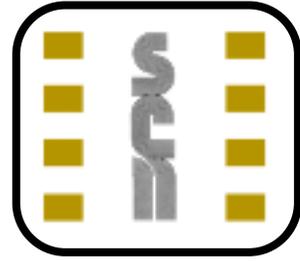
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Dear Subscribers,

The 3GSM conference in Barcelona is fast appearing on the horizon but listening to the news this morning it seems as though British Airways may have yet more internal disruption with a strike of their cabin staff which promises to spoil the week for those travelling from the UK.

The mobile space has become an interesting battleground between the Operators, phone manufacturers and the service providers but decisions that have taken place over the last couple of months have certainly laid out the playing fields to the advantage of the Mobile Operators. The decision to opt for USB to provide the high speed interface to the SIM card is now settled and while I leave the technical merits for others to argue it is clear that phone manufacturers are going to be busy modifying their designs and getting that critical power supply management under control.

The decision apparently also means that there is now just one wire left on the SIM to sort out NFC and I gather there is an equally big tussle going on for the best solution. I just hope it doesn't take too long but it seems to me that NFC has got a further delay if you ignore the proprietary products being used in the various pilots.

But even more significant perhaps is that all this puts the high capacity SIMs into the front of the frame. You can now have high speed communications with the SIM and therefore handle much larger memories. I'm still not quite sure what the killer app is going to be particularly when consumers seem most concerned with voice and text calls but from what I gather it really is on the cards....

Hope to meet up with some of you in Barcelona.

Patsy.

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Smart Card News



UK National ID Database Axed



The UK National Identity Plan calls for introducing biometric registration for foreign nationals on a rolling basis starting in 2008, first targeting those for whom identification is most important - such as immigrant workers seeking to renew their visas in order to stay in the UK. Later the scheme would be rolled out to other immigrants, and eventually made compulsory for all residents of the UK. The UK Government originally planned to build a national identity register from scratch to store the information for the ID cards.

The National Identity Register (NIR) was to be the giant database at the heart of the new ID card project, holding personal identity information and biometric data for everyone enrolled in the scheme. By developing this big new computer system the Government hoped they could avoid duplicating flaws in existing databases. However industry concerns about rising costs and unclear objectives meant that the procurement for the register has been delayed.

Amid all the problems the creation of the NIR has faced, the UK government has now decided to abandon the plans to build a new computer system as part of the national identity cards scheme. Instead information will be held on three separate and existing UK systems, which will be the UK's national insurance, asylum and passport databases. All three of these databases will now share the NIR information instead.



Home Secretary John Reid has denied this was a "U-turn" in the National Identity Card Scheme and potentially this new move would cost business millions in wasted preparatory work for the procurement. Mr Reid dismissed concerns saying that this move would save money, lead to greater efficiency and lower the risk of fraud. He said: "Doing something sensible is not necessarily a U-turn. We have decided it is lower risk, more efficient and faster to take the infrastructure that already exists, although the data will be drawn from other sources."

James Hall, CEO of the Identity and Passport Service said: "These sets of information--biometric, biographical and administrative--do not all need to be held in a single system. In fact, for security reasons, and to make best use of the strengths of existing systems, it makes sense to store them separately." Another significant change the Government has made to the ID card scheme is what type of biometric will be used in the ID cards. Initially the card was to hold three unique biometric identifiers of the holder - fingerprint, Iris and Facial biometrics. However following a review of the ID card project, the Government has decided to now only use two biometrics and not incorporate Iris Scans into the card. With all these current changes to the ID card scheme, procurement for the register has now been delayed by one year which means that the first batch of ID cards will not now be issued until 2009. This will have a knock on effect and it will be 2010 before "significant volumes" of the cards will be ready.

Commenting on the Government change in plans for the ID Card, Liberal Democrat Shadow Home Secretary, Nick Clegg MP said: "These are sticking plaster measures in which the Government is cutting corners to make the increasingly unpopular ID card scheme more palatable. The fact remains that however much John Reid rearranges the deckchairs, ID cards are doomed to be unacceptably expensive, intrusive and unmanageable." Scottish National Party Shadow Home Affairs Minister, Stewart Hosie MP has said, "This embarrassing u-turn confirms what the opponents of ID cards have said from the start. The Central National Identity Register was fraught with danger. It means the Government have wasted tens of millions of pounds on the work carried out so far. This was an ill conceived system from the beginning. While we back biometric passports as a sensible security measure, plans for ID cards should now be scrapped."

And the Conservative Party shadow home secretary David Davis added: "This is an admission of what will be a financial disaster for the taxpayer, with a cost-overrun of billions." However UK Ministers have conceded that the reconfiguration of the system is likely to have little impact on the estimated £5.4bn price tag over 10-year cost for the scheme.



Smart Cards

2007 is Year of the Oyster

London's mayor, Ken Livingstone has declared 2007 the "year to get onto Oyster" as cash fares on London's public transport soar by 33%. Price increases which have already come into effect mean that London passengers paying by Oyster can save more than half the cost of the cash fare on London's bus and train network. In another announcement the Transport for London (TfL) has stated that the 10 millionth Oyster card has been issued. The Mayor of London, Ken Livingstone, said: "Around three quarters of journeys on London's buses and Underground are now paid for by Oyster card compared to only 5% by cash - bringing huge time savings to passengers and the transport system."

Growth for Contactless Standards

Contactless payment systems are fast approaching the tipping point of adoption within UK retail. After numerous pilots and deployments in the last three years, the continued pressure to improve the customer shopping experience is prompting retailers to adopt this technology, says a new Aberdeen report on contactless payment systems. According to their report all contactless technology standards, including the most prevalent ISO 14443 Smart Card contactless standard, are headed for double-digit growth in 2007 & 2008. Aberdeen research reveals that 58% of all respondents across multiple retail classifications indicated that they plan to implement contactless payment solutions within the next 12-to-24 months. Close to 30% of the retailers indicated that they have already adopted and deployed contactless payment systems.

German Healthcare Card Initiative

Gemalto has announced it is taking part in Germany's first healthcare pilot program based on highly secure microprocessor cards. The Gemalto product is fully compliant with the latest specifications from Gematik, the organisation in charge of defining and approving the healthcare infrastructure, which enables the company to deliver cards to the pilot regions. Gemalto received first orders to supply and personalise patient cards for the regions of Bavaria, Baden-Wuerttemberg, North Rhine Westphalia and Saxony. The first trial phase commenced in December 2006, involving 70,000 units in 7 regions. A larger scale experimentation of 300,000 cards is due to start in 2007, which will be followed by mass deployment.

This new advanced digital healthcare solution aims at reducing administrative costs and ensuring better delivery of services and benefits to citizens.

Australian ID Card to Rollout in 2008

The federal Government will start signing up Australians for its \$1.1 billion human services Smart Card from April 2008, using a network of 600 offices and a fleet of vehicles kitted out as mobile registration units. Chief technology architect Marie Johnson said plans to register 16.7 million cardholders were well advanced, although final decisions would be contingent on recommendations from the Allan Fels-led access card Consumer and Privacy Taskforce. Tenders for the systems integration contract have now been issued as the Office of the Access Card launched the first procurement phase of the access card project.

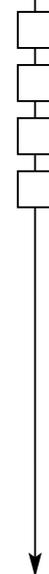
Oyster Issued License to Barclaycard

TranSys, the consortium delivering the Oyster Smart Card on behalf of Transport for London (TfL), has issued the first license for Oyster to Barclaycard. The license gives Barclaycard exclusive rights to place Oyster onto its Visa credit cards for three years. The first cards to include Oyster will be trailed in London in early 2007. The agreement marks the intention of the TranSys consortium to license Oyster to selective third parties in order to maximise access to the ease and convenience Oyster offers to regular travellers in London.

Visa Europe Signs First V PAY Deal

Visa Europe has signed a deal with key German banks over the first issuance deal for V PAY cards in Europe. The deal will see DZ BANK, WGZ BANK and the national association of German cooperative banks (BVR) commence issuance of the new European debit card V PAY in 2007. The Cooperative banking group has stated that it supports with immediate effect the introduction of more competition through the co-branding of electronic cash and V PAY on the debit cards of Volksbanken and Raiffeisenbanken (VR-BankCards).

The central banks of the Cooperative bank group, DZ Bank and WGZ Bank, will now enable their partner banks to issue payment cards co-branding with electronic cash and V PAY. This agreement between DZ BANK, WGZ BANK, BVR and Visa Europe is an important step towards the realisation of the Single Euro Payments Area (SEPA).





Brazil Sold on Digital Signature Cards

In January 2007, Brazil's National Notaries Association (ANOREG), which has around 20,000 members throughout the country, will begin using digital signature cards supplied by Giesecke & Devrient. The cards enable data to be transmitted securely between notaries and their clients. The cards being supplied by G&D are powered by the STARCOS SPK 2.4 Smart Card operating system, which offers a high level of security for hardware as well as asymmetric encryption using RSA keys with a length of up to 1,024 bits. Issuance of the cards to ANOREG has begun this month (January 2007).

Venezuela Issues Smart ID Cards

Venezuelans will have new smart identity cards in 2007 thanks to new technologies, Greis Urdaneta, an official from the National Office for Identification and Alien Status (Onidex) stated. Urdaneta, who heads Onidex in the eastern Venezuela state of Zulia, said all the equipment needed was already in Venezuela, and that Hugo Cabezas, national head of Onidex had informed the staff about the new documents. "The ID cards will have all the citizen's data: facial features, name and family name," Urdaneta said. The document will also include tax identification details, the first version of the document will be free, and help avoid forgery.

e-Passport for South Korea

South Korean passports issued from the second half of 2007 will carry a Smart Card chip that contains personal information such as a facial picture, fingerprints and iris patterns. The upgrade to an e-Passport system will help deter forgery, and is especially needed for South Korea to qualify for the US Visa Waver Program (VWP). Just like the Smart Card system used on buses and subways in Seoul and many other cities, the e-Passport chip will be contactless using a radio signal scanner.

Electronic Passports for Latvia

Giesecke & Devrient has been awarded a contract by the Latvian government to produce 1.1 million electronic passports (e-passports) over the next five years. G&D will also supply all the necessary systems for data capture and processing, personalisation, and issuing of the documents. The first electronic passports will be issued to the citizens of Latvia in the third quarter of 2007.

Driver's License Program in Norway

Gemalto has announced that it will provide its highly secure polycarbonate cards, based on Setec technology, for driver's licenses in Norway. The agreement with the Norwegian authorities calls for the supply and personalisation of the cards and direct mailing to the end-user. The four-year contract came into force on January 1, 2007 and includes an option for two additional years.

Contactless Fobs Used in US Trial

Bank of America has chosen Oberthur Card Systems to provide contactless payment fobs as part of a trial to test radio frequency contactless payment companion devices. As contactless cards continue to grow in issuance, Bank of America is testing consumer interest in companion devices for contactless payment, and plans to issue Oberthur Card Systems VersaFOBs with MasterCard PayPass - a first in the US marketplace.

The Bank of America user acceptance trial program will distribute Oberthur's VersaFOBs with MasterCard PayPass as companion devices to its traditional credit cards. VersaFOB is a contactless payment sub-card that snaps out of a full-size payment card and is inserted in a key-chain casing. Oberthur will supply the cards and fob casings, while Bank of America will handle personalisation and fulfillment in-house. MasterCard has certified the Bank of America VersaFOB trial program.

OZ Banks Lobby Over Smart Cards

An alliance of Australian banks and electronic payment firms have begun publicly lobbying the Australian federal government to deliver its \$1.1 billion human services Smart Card over private networks with the claim it would cost \$500 million to replicate existing systems. The newly-formed Australian Smart-card Users' Forum also claimed it would cost the government a further \$60 million a year to maintain a payments network comparable to that operated by the private sector.

Cubic Extends MetroCard System

The transportation systems segment of Cubic Corporation has been awarded an \$8.3 million contract from the MTA New York City Transit to extend the benefits and efficiencies of the MetroCard fare payment system to all of the 390 buses operated by the Westchester County Department of Transportation.



The Bahamas Gets e-Passport

Indusa LLC has signed a contract with The Ministry of Foreign Affairs, Government of The Bahamas, to provide one of the first biometrics based E-Passport solutions implemented in the Americas. In accordance with ICAO's global objectives, requiring all countries to have machine-readable passports by May 2010, The Bahamas Passport project is a comprehensive system for the issuance of E-Passports, Visas, Work Permits, and other travel documents, extending to Border Control Management as well as the overall collection, verification and management of biometric data.

ITSO Solution for Bolton Council

Bolton Metropolitan Borough Council has selected Applied Card Technologies Limited to deliver its ITSO back office through the provision of their fully certified Full HOPS (AMS) system integrated to Bolton ITSO card personalisation equipment. Roll-out of the ITSO service within the Bolton Smart Card scheme is due over the next 4 months, with an initial citizen cardholder estate of 50,000 cards. In addition, what makes the project special is the fact that it is the first ever project to embrace ITSO within an existing multi-application citizen card programme.

G&D and Nokia JV Completed

Giesecke & Devrient and Nokia have completed a global joint venture. The name of the company is Venyon, and it is 57% owned by G&D and 43% owned by Nokia. Venyon prepares the way for mobile operators, transport operators, retailers, banks, credit card companies, and providers of digital services and media worldwide to offer their services and applications to consumers' Near Field Communication enabled mobile devices.

Manila Gets Smart Card System

The ERG Group has concluded negotiations and signed a contract in the Philippines with First Versatile Smartcard Solutions Corp to supply a Smart Card based payment system in Manila. Initially the project will involve the issuance of 500,000 Smart Cards for cashless purchases in the city of Manila, followed by a transit application for use on public transport in the greater Manila Region. The system will be implemented on the light and metro rail systems in the City of Manila, later expanding to rail and buses in the Luzon region.

The contract includes the installation of 200 point of sale devices for both reloading value onto Smart Cards and to facilitate cashless purchases, installation of 20 ticket vending machines and 50 gates at railway stations for the transit application in Manila, and the delivery of a Multi Application Smartcard System (MASS) based back office system for transaction processing and financial settlement. The system is expected to be operational in Manila providing for cashless purchase functionality during 2007, with the deployment of the transit-based application in 2008. The contract will generate revenue of approximately \$A 26 million for the company.

1st Microcontrollers for Vitale 2 Cards

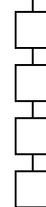
Atmel Corporation has announced that it has delivered volume quantities of its AT90SC12836RCT secure microcontroller, for the new generation Vitale 2 French National Health Card. The AT90SC12836RCT incorporates 36K bytes of EEPROM, 128K bytes of ROM program memory and 5K bytes of RAM on chip. The processor is based on Atmel's secureAVR family utilizing an 8/16-bit RISC core and the AdvX crypto accelerator for increased PKI performance and security.

RSA Wins US Government Contract

RSA Security Inc has been awarded a contract by the US Government's General Services Administration (GSA), to provide RSA Card Manager to an unnamed Federal Agency in support of their Homeland Security Presidential Directive 12 (HSPD-12) compliance. RSA Card Manager is powered by Intercede's MyID technology, under an OEM licence agreement announced in 2005. This order was placed by GSA on behalf of a significant +100,000 person independent federal agency, not previously announced by Intercede.

Secure Ticketing System for GTA

Thales has been named the subcontractor to supply the Greater Toronto Area (GTA) transit network with an integrated secure ticketing system. A ten-year contract, awarded to Accenture, for the design, production, installation, support and administration of the system will involve nine transit agencies with a total of approximately 2,000 vehicles, including bus, subway and rail. The total value for the fixed contract is CAD 250 million including sales taxes (175 million euros). This contract win is a strategic step for Thales in the North American transit market.



Smart Card System for Fuzhou City

China Expert Technology, Inc has announced the company has been awarded two new e-government contracts to construct e-government systems for 2 city governments in Fuzhou City, located within the Fujian Province of China. As part of a contract valued at \$57 million, China Expert Technology will design and implement a Smart Card System along with several other security based systems.

OTI Acquires SuperCom's Assets

On Track Innovations Ltd and SuperCom Ltd have announced that they have completed the acquisition by OTI of the main assets of SuperCom, including the International Project Solution (IPS) division of SuperCom Ltd. for 2,827,200 ordinary shares of OTI.

1st Contactless Banking Cards

Gemalto has announced it is providing Garanti Bank, a credit card issuer in Turkey, with Europe's first smart banking cards featuring EMV technology, loyalty schemes and the contactless payment capability. Gemalto has been a major supplier to Garanti Bank since 2000 and has already provided the bank with several million of its multi-application Smart Cards, which incorporate EMV-compliant credit functions and a loyalty program. Leveraging the success of this first deployment, Gemalto is now upgrading Garanti's BonusCard with the MasterCard PayPass functionality to allow consumers to benefit from the speed and convenience of contactless at movie theatres, fast food restaurants and supermarkets.

CCL for CAC Solution

NetCentrics Corporation has announced their involvement in successfully deploying one of the first enterprise wide Common Cryptographic Login (CCL) using Common Access Cards (CAC) solutions to improve the security of the network at US Headquarters, Department of the Army (HQDA). This implementation was a pilot to identify challenges that could occur while deploying CCL to computer systems and secure email systems throughout the entire US Army.

This level of effort was put forth in order to comply with Homeland Security and Presidential Directive 12 (HSPD-12). Presidential Directive HSPD-12 directs all government agencies to improve the security of their physical locations, and to increase security to computer networks and systems.

Watchdata Joins GlobalPlatform

GlobalPlatform has announced that Watchdata has become the latest company to join its expanding member base which aims to develop and promote interoperable standards for the entire Smart Card infrastructure. Watchdata joins the consortium as an Observer Member. In this capacity, Watchdata will be able to closely monitor the discussions and output of all GlobalPlatform technical committees and will join other member organisations by participating in GlobalPlatform's Advisory Council.

Europay, MasterCard & Visa

Cambridge Researchers Crack EMV

A specialist research team at Cambridge University have found a way to compromise Chip and PIN technology. They took control of an EMV terminal machine and reconfigured it so that it would copy sensitive personal data and PIN numbers. Researchers Steven Murdoch and Saar Drimer stated that fraudsters could replicate this method easily and could get all the equipment they needed online for as little as £1,000.

Payment Terminals for French Bank

Sagem Monotel and the Crédit Agricole have signed a new agreement for payment terminals. Crédit Agricole has just chosen the Telium range of SAGEM Monotel terminals for its merchants. This contract will no doubt involve several tens of thousands of terminals, if it is like the last agreement with SAGEM Monotel.

Doha Bank's New EMV Credit Card

Doha Bank has released its EMV-compliant Dream credit card with loyalty programme, The Peninsula reported. The smart chip cards give more security over personal information, such as PIN numbers, and store loyalty points and rewards information.

Terminals for Norwegian Outlets

Ingenico UK has announced that it will begin supplying terminals to retail outlets across Norway. The deal is being done in conjunction with strategic partner Banking and Business Solutions (BBS). Thanks to the Ingenico devices, Norway is set to take a significant step towards complete Chip and PIN coverage and so begin enjoying the same security benefits as the UK, where card fraud was reduced by £58.4 million between 2004 and 2005.



T2100 Terminals for Bangkok Airport

Hypercom Corporation has announced that the new Thailand Suvarnabhumi International Airport in Bangkok has selected Hypercom's Optimum T2100 payment terminal as the preferred choice for card payment solutions. More than 1,000 units are being deployed in the airport's retail outlets and duty free shops.

Biometrics

Biometric Scanning at Heathrow

A new biometric scanning system will prove to air travellers the benefits of ID card technology according to Immigration Minister Liam Byrne. The pilot scheme will let travellers register their fingerprints and iris pattern in order to prove their identity at airport border controls. The miSense system will be trialled at London Heathrow's Terminal 3 initially for passengers on Emirates and Cathay Pacific flights to Hong Kong and Dubai. Passengers will be able to register their fingerprints and their passport at the beginning of the check-in process and use that as their "key" to get through passport checks and boarding.

Smart Card Fingerprint Verification

National Bank of Oman has announced the implementation of a National ID Smart Card reader plus fingerprint reader solution at its selected branches. This facility has been launched for the first time in the Sultanate and is a pioneering progress in banking technology and customer service in the country. The facility automates and simplifies the process of identity verification for retail customers during transactions, especially illiterate customer transactions, by providing one-point Thumb Impression (TI) identity verification.

Radio Frequency Identification

Atmel and SkyeTek Partner in RFID

Atmel Corporation and SkyeTek, Inc have announced they have entered into a technology partnership that will provide the market with one of the most secure HF reader / tag platforms available. The partnership will also provide customers with an ultra-secure option for embedded RFID applications.

RFID Impacts China's Economy

The Chinese government has laid special emphasis on the development of RFID technology. The government envisages that large-scale implementation of this technology in different sectors of the economy will fuel increased efficiency with respect to supply-chain management, availability of accurate and relevant data, and crucial cost savings. The government zeal for RFID systems for overall efficiency is louder than ever. RFID finds applications in security access, or even for tracking library books and in vending machines for money transactions.

Most systems that deploy RFID technology use High Frequency devices such as Smart Cards that have a variety of applications such as in transportation, anti-counterfeiting, ticketing and others. Experts say there's immense scope of High Frequency RFID systems in China especially in citizen identification cards such as passports for authorised access. Multi-national companies like WalMart has made public that its suppliers should use RFID chips that will enable the company to efficiently keep track of inventory across the supply chain.

RFID Chips for US Passport Cards

The US government plans to integrate Radio Frequency Identification chips in passport cards to enable close and easy surveillance across the nation. Fire has been drawn from some quarters as the US government plans to use RFID chips in the proposed program of passport cards for US citizens. These ID cards will be mandatory for residents who do not have passports for identification. This program has been proposed so that security can be shored up throughout the nation.

Passengers who travel by air among different countries may be asked to show this kind of ID proof anytime from 1st January 2007 onwards, whereas for those who travel by land or sea this rule is going to be applicable from January 2008. The State Department said, instead of using contactless Smart Card technology "proximity read" it will use the RFID technology "vicinity read" in cards in these new e-Passports. The objective is to have passport cards of credit card size. Therefore, customs & border security officials can read these cards even when they are 20-30 feet away.



Alliance Criticises US Passport Card

The Smart Card Alliance is urging the federal government to reconsider the use of RFID chips for passport cards. The US Department of State has proposed using cards containing RFID chips for people travelling in and out of areas, such as Mexico, Canada and the Caribbean, where passports have not previously been required. Alliance members believe the vicinity read RFID (or ISO/IEC 18000-6 Type C) technology proposed by the government "is the wrong technology to implement a secure identification in a secure identification card."

"RFID tag technology that was designed to track packages and products is not the appropriate technology to use for securing human identification systems," the group said through a prepared statement. The government is using Smart Card Alliance-supported (ISO/IEC 14443) contactless technology in e-passports, but the State Department proposed vicinity-read RFID cards to speed travel across borders in the western hemisphere.

On The Move

Oberthur Names New CEO

The Board of Directors of Oberthur Card Systems has announced that Philippe Geyres has become the new Chief Executive Officer of the company, as of January 2 2007. Jean-Pierre Savare, Chairman, is delighted to announce the strengthening of Oberthur Card Systems' senior management team.

ASK's Founder and CEO Retires

Georges Kayanakis has decided to retire from his position as Chief Executive Officer at ASK by the end of the year after he founded the company 9 years ago. Bruno Moreau, ASK's co-founder and former Deputy General Manager and Business Development Manager will take over Mr Kayanakis position.

SST Announces Resignation of CEO

SST (Silicon Storage Technology, Inc) has announced that Arthur O. Whipple, Vice President of Finance, CFO and Secretary has submitted his resignation. Whipple is expected to remain at the company until February and will assist in the release of the company's financial results for the year ended December 31, 2006 scheduled for January 24, 2007.

New Regional Director for Welcome

Welcome has announced that Rose Del Col has been appointed Welcome's Latin America Regional Director. Rose is based in Sao Paulo, Brazil and she is responsible for developing all Welcome's activities in Latin America.

Nick Cooney Retires from VCT

Nick Cooney has retired after 17 years as president of Versatile Card Technology. "It's been a wonderful ride. I have been a part of great change in the plastic card and direct marketing industries," said Cooney. "This comes as no surprise to the senior management or employees at VCT as I had informed Velu (VCT founder and owner Pethinaidu Veluchamy) in late 2005 that this would be my last year." Veluchamy praised Cooney's dedication and hard-work over his tenure with the company. "He has been instrumental in significantly growing this company."

New Managing Director for Visa UK

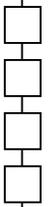
Jose San-Juan has been appointed as the new Managing Director of Visa UK Ltd. Jose is an experienced card industry executive who has spent the last six years managing significant parts of Visa Europe's business in Southern, Northern and Central Europe. Prior to that he held management positions with Sistemas 4B, one of Spain's card associations and processors. During this time, he was a member of Visa's European and International Card Product and Marketing Advisors.

CRI Expands Team

Cryptography Research, Inc has announced the appointment of Robert Ross as Vice President of Business Development. Ross will help lead the company's anti-piracy licensing business and will focus on the BD+ digital anti-piracy solution, which is part of the Blu-ray Disc format.

New Director at Alaric

Alaric International has announced that Steve Lomax has been appointed as new Director of Sales and Marketing, based at the company's head office in London. This appointment supersedes Lomax's former position as head of marketing. In his new role, Lomax will be responsible for Alaric's continued sales growth and the development of its award-winning EFT payment and card fraud detection solutions.



Rumours From the Front Line

By "The Squeaker" (*a source who wishes to remain anonymous*)



Do you have a Rembrandt in your attic? In 2000 Rivette and Kline produced a book called 'Rembrandts in the Attic: Unlocking the Hidden Value of Patents' which tells the reader how to unlock the enormous financial and competitive power hidden in a company's patent portfolio. There have been some famous cases in recent years and particularly well known is the settlement of \$612.5 million in March 2006 that RIM the developers of the Blackberry had to make to NTP in order to avoid a shutdown of their email operations.

The Smart Card world is littered with patents many of which cut across international standards. The major standards bodies all have rules or at least recommendations that oblige the developers of standards to declare any potential IPR conflicts and to agree that licenses will be made available on fair and reasonable terms.

Well that's the theory but Near Field Communication (NFC) seems to be particularly vulnerable at least in part because it was rushed through the standards process. Bruno Charat of Inside Contactless appears to be one of those who arguably anticipated the emergence of NFC when he developed their Reader to Reader (R2R) technology. From what I understand Inside has made no such agreement on licensing their patents on fair and reasonable terms. Philips and Sony were the prime developers of the NFC concept and are also both well versed in the art of patents.



Unfortunately the story carries on because now that the USB protocol has been agreed in ETSI for the high speed communications with the SIM, attention surrounds the single wire (the only one left) connection between the NFC chip and the SIM. There are two main contenders, Gemalto who have IPR interests (originally from Axalto) in their full duplex SWP (Single Wire Protocol) and NXP (Philips Semiconductors) who have proposed their DIOCTL half duplex protocol.

I can't tell you exactly what all this means technically but it seems pretty clear to me that there are some enormous IPR issues just waiting to be resolved on the horizon. Apparently a patent licensing program for NFC is being set up by Via Licensing Corporation a subsidiary of Dolby laboratories and as they claim with 35 years experience in licensing experience. The trouble is that the major companies probably already have adequate in house expertise.

Wandering around in the same space is Keith Benson who has a patent on a Virtual-SIM, an identification process in mobile phones where the identification process is additional to that used between the SIM and the Mobile Network Operator (MNO). This also potentially impacts on NFC where applications in the phone are using secondary authentication mechanisms as part of say some payment process.



Benson has formed Mobile VPT Europe plc to own the patent and believes that 'Any GSM or 3G mobile device with a central signal processor that receives interrogation signals for user authentication that are directed other than to the network operator' is likely to infringe his patent. Sounds like more battles on the horizon for NFC or perhaps mobile applications more generally.

In the semiconductor industry there is more rationalisation under way with Atmel looking to slash 1300 jobs out of a total workforce of 8000 and to sell its factories in North Tyneside (UK) and Heilbronn in Germany. It's not clear who the likely purchasers might be. There is still no more news from Gemalto on their rationalisation program but insiders tell us that changes can't be far away.

Squeak squeak!





RFID in the Supply Chain - a New Demand- for Availability



By Frank Hill, Director, Worldwide Manufacturing Sales, Stratus



Frank Hill

Knowing where items are in your supply chain is crucial to maintaining an efficient manufacturing process, and anything that can improve and automate this process is always hailed as the "next big thing". Radio Frequency Identification tagging, or RFID for short, is one of the technologies that organisations are evaluating with this in mind. According to analyst firm IDTechEx, the number of RFID tags being used during the last year was around 200 million, with high-value individual items being the most likely to be tagged. These can include electronic equipment, prescription drugs or jewelry, to give some examples.

Large retailers such as Tesco and Marks and Spencer have also started RFID projects, and the number of organisations who could benefit from using this technology is continuing to grow. The uses that RFID can be put to within manufacturing companies are impressive: it has the potential to offer a near real-time overview of where all the components or products within a supply chain are at all times. Using data from their RFID tags, organisations can use this information to get a better insight into their manufacturing processes. Examples of how this information could be used include, monitoring the level of components compared to levels of completed goods for sale or demonstrating how all the stages of the manufacturing process are working.

However, there are two main areas of concern with implementing RFID projects: the first comes from customers who are concerned about RFID data security, as they don't want to have information on their purchases available to other parties. To allay these concerns, all the information generated by an RFID project has to be stored within a secure database, and the tags should be rendered inoperable once they leave the domain of the manufacturer or supplier. The second area of concern is that relying on a single powerful IT system in manufacturing exposes the organisation to the risk of IT downtime and data loss. The IT infrastructure responsible for the interrogation and writing of data to the tags has to be very dependable. The impact of losing a few minutes of transaction data can create a complicated inventory nightmare, requiring hours of manual work to correct. The new generation of shopfloor and supply chain applications require companies to re-evaluate the design and lifecycle management of their IT infrastructures.

Data is read from or written to RFID tags by either handheld or mounted interrogators placed at key points within the manufacturing process and in the supply chain. With the information from these tags becoming so valuable, assessing the availability of the critical applications that run on this data requires the entire IT infrastructure to be treated as an ecosystem. Some components are more sensitive to downtime than others but you will need the server, network, and RFID readers to all be working properly. When considering the overall IT infrastructure, look for possible single points of failure in the system and plan to eliminate these as much as possible. This could be based on having fault-tolerant hardware in place to protect against a component failure, or putting a standard procedure into place to work around the problem. Close attention should be paid to the server infrastructure as a failure of the application or database servers will halt the entire system and therefore becomes a key part of the design of any implementation of RFID.

Industry legislation around the physical processes within industries such as pharmaceutical manufacturing also requires having continuous availability of data on manufacturing and delivery at all times, so data loss can result in an entire batch of product having to be reworked or scrapped. For organisations that don't have the added incentive of legislation, there is still plenty to be concerned about when it comes to unreadable or erroneous tag data in your operations. RFID-based supply and manufacturing solutions are being adopted to provide needed information and make dramatic improvements in product quality, timeliness, and security. Taking into consideration the impact these solutions will have on your IT infrastructure will help avoid adding unnecessary risk to your operations. Any project looking at the benefits of RFID within this should have the availability of the IT infrastructure as a key requirement before starting work.



Digital Identity

By Dave Birch, Director, Consult Hyperion



Dave Birch

Why would a government decide to issue multi-application cards to its citizens when it has only one application (some form of national identity) that it wants to give them? To answer this question we have to remind ourselves of the principal advantages of Smart Cards that use a standard open multi-application platform (which means, in practice, Multos or Global Platform Javacard) over proprietary cards:

- ❑ Since several applications can share the card, the cost per application is much reduced and there is the potential to reduce the number of cards carried by citizens. Polls show that consumers think that multi-application cards mean that they will benefit by having to carry fewer cards.
- ❑ The "virtual machine" used to insulate applications both from one another and from the low-level card operations, delivers a high level of security even when applications from different sources share the card.
- ❑ Applications can be loaded on to, or removed from, cards that are out in circulation. This provides for future-proofing: as circumstances change, the mix of applications on cards can be changed.

These platforms therefore provide a convenient way to 'mix and match' applications across cards, thus giving card issuers and card users maximum flexibility. In practice the kind of multi-application solution envisaged in the early days of Multos and JavaCard (eg, the combined payment, health, driving and golf club membership card) never materialized because while the multi-application environments were being developed, the environment moved on from the one in which Smart Cards grew: an environment where patchy and expensive network coverage meant that the ability to carry lots of data around (and authenticate access to it offline) was important. As the Internet, mobile phones and digital television spread so the concept of pervasive networking became reality and the role of the Smart Card changed from that of a secure, personal data store to a kind of key container for secure access to data stored on networks. So how do multi-application platforms work for national identity in this new environment?

Let's look at the sharing potential first. If the cost of deploying a very smart national identity card can be shared between multiple issuers, then that is beneficial to the citizens both as consumers and as taxpayers. The "Smartics" ID card in Hong Kong is often cited as the benchmark for a smart scheme, and it works in precisely that way. The card, which is a Multos multi-application card, is issued by the Hong Kong Immigration Department with the identity application pre-loaded.



There is spare memory on the card, however, and other organisations can reach agreement with the Immigration Department to load their own applications on to the card. The first organisation to do this was the Hong Kong Post Office. They have a digital signature application that can be loaded on to the card for customers who want to use e-government and e-commerce applications.

Remember that because of the "firewalling" of applications on the card, the government does not have to trust (in the technical sense) the other organisations who want to share card real estate. A bank could, for example, allow customers to download their EMV application to identity cards without the government having to inspect and certify the specific application.

Post-issuance applications management provides the other key reason for adopting a multi-application platform in that it provides a means to update cards in the field. In Hong Kong, for example, government's IT Services Department (ITSD) can easily change the applications that they have loaded onto the card.





Suppose the requirements for security change over the card lifetime? Perhaps key lengths need to be extended or new algorithms implemented? For an ID card with a ten-year in-service target, these circumstances are not unlikely. Therefore there must be a means of maintaining applications on the identity card out in the field. It would obviously be a pointless expense to have to re-issue millions of cards to add another biometric authentication method (voice, for example) when all that is required is to download a few kilobytes of information to the card. As long as there is a mechanism to do this securely (eg, the STEP mechanism used in Multos) then the in-service lifetime of cards can be extended significantly.



Taking some of the ideas discussed above on board, we can see where we need to go. A good scheme—as our experiences in several countries have confirmed—needs to manage identity applications (based on PKI) and authentication (PINs and biometrics) all on one card. Far from adding complexity, putting this kind of identity management infrastructure on the card delivers something that a "dumb" ID (whether cardboard or plastic) can never deliver: privacy.

This is because the smart ID card can disclose facts about someone without disclosing their full identity. Your ID card could, for example, send a message to a machine confirming that you are over 18 without disclosing who you are or what your citizen number is. The recipient of that message—Ladbrokes, say—would know that the digital signature from the ID card is real and that the message had not been forged and let you place a bet: but who you are could remain confidential.

The new vision is, then, not of a multi-application card that stores lots of applications and lots of data but a multi-application card that stores a small number of applications in a highly secure fashion and provides a means to manage those applications over a long lifetime. What "few" applications? Well, a multi-application smart card that has on board an identity management sufficiently sophisticated to disclose specific subsets of information depending on context together with a digital signature application for online use—both sharing on-card biometric and PIN authentication—is the basic platform for the 21st century identity card.

There are alternatives to this architecture, of course. A recent global survey by Unisys found that rather than use PINs, ID cards or biometrics, one in 10 Asia-Pacific consumers would prefer to have a chip implanted in their body! I'm not sure if even the Home Office is ready for that yet!

Events Diary

February 2007

- 05-09 RSA Conference 2007 - *San Francisco* - www.rsaconference.com/2007/US/
- 06 The Credit Card Awards 2007 - *The Grosvenor House Hotel, London* - www.thecreditcardawards.com
- 12-15 3GSM World Congress - *Barcelona, Spain* - <http://3gsmworldcongress.com>
- 21-22 RFID Smart Labels USA 2007 - *Boston, USA* - www.smartlabelsusa.com
- 26 - 27 Real ID Technology Summit - *Washington, D.C, USA* - www.real-id-summit.com

March 2007

- 06-09 IC Card World 2007 - *Tokyo* - www.shopbiz.jp
- 15 - 21 CeBIT - *Hannover, Germany* - www.cebit.de
- 16 Biometrics Institute New Zealand Conference - *New Zealand* - www.biometricsinstitute.org
- 26-27 Central and East European Card Markets - *Budapest, Hungary* - www.smi-online.co.uk/ceecards.asp
- 27 NFC Planet - *Orlando, Florida* - www.scievents.com/nfcPlanet/



RFID in 2006: A Story of Extremes

By Raghu Das, CEO, IDTechEx Ltd

IDTechEx



Raghu Das

As we enter 2007, many RFID suppliers are licking their wounds, while for others, RFID business is booming. At the beginning of 2006, there was much optimism in the retail mandate sector. RFID tag production capacities had been put in place and Gen 2 was delivering superior performance than previous versions. However, arguably the pallet/case market for RFID tags became the nearest thing to a black hole in the RFID universe in 2006, thanks to reluctant mandated customers, technical problems and pricing for volumes that never came despite retailers reporting excellent paybacks.

Speaking to many consumer goods manufacturers IDTechEx has found considerable foot dragging resulting in pallet/case tag purchases being as little as 250-300 million tags in 2006 at the heavily loss making price of around 10 to 15 cents each. Readers are also being sold at a heavy loss. Some participants have seen benefits. Procter and Gamble found that tagging display cases for Wal-Mart with shared information led to a sales increase 19% of Fusion blades caused by more timely arrival at shelf. Hanna Candle Company found 90 pallets worth \$12.6 million went missing but were found with the RFID reducing a knock on effect for ordering.

However, these benefits are not necessarily paybacks and companies are not saying they are sustainable. These sums of money are among the smallest of any RFID sector, less than esoteric niches like one company tagging random samples of mail to assess performance or one company earns from tagging cows. The point is that the mail tags are ten dollars or more and the cow tags are two dollars. Both of those companies have around \$50 million of probably profitable sales. One could go on and on with examples like this. RFID hardware suppliers that had prioritized the retail sector started to look elsewhere though none left the sector altogether because they know there will be a winner one day and most have strong backing. They are playing "Last man standing". There is oversupply, although some system integrators make money.

Basically, the RFID tagging of pallets and cases for major Western retailers of under 400 million pallets and cases over two years has already improved their margins by up to \$100 million. This was provided at a loss of about \$100 million by the consumer goods companies that supply them. In addition, the RFID suppliers to these consumer goods companies also lost about \$100 million in the exercise. In the case of the RFID suppliers, that money came from investors and parent companies. It was certainly not predicted that those investments in RFID companies would, in effect, flow rapidly to the large retailers.

At least with anti-theft tags earlier mandated by retailers, the tag and system suppliers to the mandated CPG companies - notably Sensormatic (now in Tyco-ADT) and Checkpoint Systems - stayed profitable because they did not price for volumes that never came. However, anti-theft tags did and still do cost the CPG companies heavily for no return and pallet/case RFID is history repeating itself. Although IDTechEx forecast that eventually retail will be the biggest market by far for RFID, consumer goods companies are yet to see sustainable paybacks. The real opportunity for them is with item level tagging. Retail mandates asked for their top suppliers to tag the pallets and cases of the highest volume products they sell. For RFID suppliers, item level tagging for retailers is a better business where high value products are tagged first, such as Marks & Spencer apparel, BGN books or Best Buy video games. However, it is vulnerable to rapid design change. Like anti-theft tags, there are three incompatible options here - Near Field UHF, Far Field UHF and HF.

Hot Countries for RFID: IDTechEx keeps a close eye on which countries are eagerly adopting RFID and which are not. Our sources include intensive travelling, conferences, literature searches and our IDTechEx RFID Knowledgebase of over 2400 case studies covering over 2600 organisations and 91 countries. The results are rather surprising. Firstly, the US is the greatest adopter, with by far the largest number of cases of RFID in action and orders that are often the world's largest by value. It has even pulled ahead in the last year, with over 840 recorded projects. More surprising is the UK holding second place by number of cases, though not the money spent, where China has more claim to fame and Korea and Japan are strong rivals.



China and Korea have jumped up a notch and, remarkably, Australia has jumped from number ten to number seven. When we saw the unusual activity in Australia we focused research onto the region for a new report RFID in Australasia 2007-2017 and we reveal some of the results here. New Zealand is a follower, with the exception of the work of Fonterra, the world's largest milk cooperative. What is going on in Australia? The rapid advance of Australia in RFID is on a broad front, from books in libraries to tagging of humans in hospitals, but one could say that about many countries. What sets Australia apart from most of its peers are aspects such as the legal requirement to tag cattle and racehorses, and the trials and rollouts of tagging fish, tomatoes and other foods by its vibrant food industry. Australia will not stop there. It is likely to introduce legislation to tag all four legged livestock ahead of most other countries. With the major trading blocs finding reasons to protect their food industries, external suppliers such as Australia, with the world's largest population of sheep, must be beyond suspicion. RFID is a part of that.

RFID sectors taking off: Other sectors of the RFID business is booming. Andrew Price RFID Manager at IATA, the airline trade association, enthuses, "In the next few years the air industry will be tagging an ever higher proportion of its two billion bags yearly and it will use RFID in other new applications as well." This is a global phenomenon, not least in government applications. Dr Jimmy Li, Deputy Director of the Initiative Office for Government RFID Applications at the Ministry of Economic Affairs Taiwan and Senior Advisor of the Institute for Information Industry in Taiwan says, "Government applications of RFID are now growing rapidly. We started five RFID projects in the government area this year and there are more to come next year." Steve Georgevitch, Total Asset Visibility Program Manager of Boeing Integrated Defense Systems says, "The aerospace and defense industries are on a rapid RFID adoption path with substantial benefits anticipated in the next several years". Martin Capper, President, Mark IV IVHS Division says, "Mark IV sees RFID as an explosive market particularly in the Transportation segment with the evolution from the existing electronic payment systems to new applications delivering safety and mobility for both individuals and commercial traffic.

The emergence of DSRC at 5.9GHz will create the next paradigm shift in surface transportation." There are also new markets opening up beyond transport. Dr Chang-Hun Lee of the National Information Society Agency, Korea says, "Ubiquitous Sensor Networks will be a huge RFID market in a few years." RFID tagging of livestock is driven by ever wider legislation. For example, the European Community and New Zealand join the party in 2008-2010, creating a market for tagging sheep, goats, pigs and cows, the total demand for these two regions being over 150 million tags yearly at about \$2 each in 2010 from almost none today. Add a big demand for systems to that figure. The largest bookseller in the Netherlands BGN is ordering several million tags yearly for its new scheme and its payback is so compelling that others will rapidly follow.

RFID cards biggest market by value and growing: Contactless Smart Cards is the biggest RFID market. Big players are making major bets on contactless, and forcing competitors to catch up. They are issuing large numbers of contactless cards and fobs and, in Japan, adding contactless functionality to millions of mobile phones, giving many consumers the chance to pay with a wave. Contactless cards are a huge success and contactless ticket sales are also taking off exponentially. The China National ID card and system is the biggest RFID rollout but an even larger budget of at least \$15 billion is planned for the UK National ID card. Then there is continued growth in secure access applications and the start of the process of converting over three billion financial cards from Visa, MasterCard, American Express and JCB to RFID. In the US alone, 150,000 readers have just been installed for these financial cards but that is only the beginning. RFID cards and tickets and RFID enabled mobile phones (Near Field Communication) increasingly provide payments, ticketing, and secure access. All three devices are seeing rapid growth.

The China National ID scheme will peak at a huge 300 million US \$2.45 cards delivered in 2007. Card readers valued at \$1.2 billion are being ordered to go with them. The global market for RFID cards and systems will pass \$3 billion in 2008. The figures, which are fully analyzed together with tickets and RFID phones, are in the new IDTechEx report Contactless Smart Cards and Near Field Communication 2007-2017. IDTechEx forecasts that sales of RFID tickets will rocket from 100 million in 2007 to 450 million in 2010. Others are even more bullish in their forecasts. Certainly, the national railway system in China uses three billion tickets yearly, so its recent order for hundreds of millions of RFID tickets is only a beginning.



Mumbai Adopts Smart Driving Licenses

By Jason Smith, Staff Reporter, Smart Card News Ltd



Jason Smith

The Indian state government of Maharashtra has kick-started a new system of Smart Card driving licences and optical strip-enabled certificates of registration (RC Book) in a bid to encourage paperless travel and monitor drivers in the state. All drivers applying for a driving licence in the state of Maharashtra will now be issued with a new Smart Card. To get one of these new Smart Card driving licenses applicants have to pass the mandatory tests and then go to the new biometric lab in Tardeo in central Mumbai, where they will be photographed, finger printed and made to electronically sign their licenses.

"It is a move that will help curb malpractices like forged licences and false entries in the vehicle's registration book. No one will be able to tamper with the licence or duplicate signatures and misuse it. The licence will have a 4kb memory chip embedded within it and the authorities will be able to get a list of all the traffic offence history and other background details using these cards," said Chief Minister Vilasrao Deshmukh. The new licences will require a person to compulsorily come down to our office to get photographed. The real time photograph will be saved in our database and replicated on the card issued." "This will make touts and agents very difficult to operate as no passport-size photographs and documents will do, but only a personal visit," said Transport Commissioner Shyamsunder D Shinde.

Transport and State Excise Principal Secretary G S Gill said, "The card is going to bring about a revolutionary change in the state's road transport scenario. It will capture an individual's driving habits on the card, by making available a list of traffic offences and it will help us grade drivers. Those with least traffic offences on the card will be considered the best among them. Nearly a week after the State government launched the Smart Card driving license the RTO fell short with an inadequate number of Smart Card readers. According to the Transport Commissioner the RTO only has a few actual Smart Card readers. "We have ordered 200 card readers from Germany through our service provider as per the contract. These readers are expected to arrive in Mumbai in a month's time. Currently we have only eight Smart Card readers," he said.

Interestingly, the Mumbai Police do not have any Smart Card readers allocated to them. "I plan to put forward a proposal for buying more card readers for the Mumbai Police," said Shinde. However, according to Deputy Transport Commissioner Prasad Mahajan, the RTO will not be providing card readers to the city police. "The Mumbai Police will have to procure the card readers on their own. RTO will only provide the authorisation card, through which they can enter the offence committed by the driver," said Mahajan. Joint Commissioner of Police (Traffic) Satish Mathur confirmed that traffic policemen currently do not have any card readers for the new licenses. Mathur did not have any comments on when the Mumbai Police will aim to procure the new card readers.



RTO in Tardeo is the first Indian state to start issuing Smart Cards but according to Shinde "Andheri and Wadala RTOs will also soon start issuing Smart Card driving licenses," He added, "We have over 70 vehicles in which our enforcement officers will be carrying these card readers to check on the drivers till the time the Mumbai Police procure them." Shinde said that the RTO would be educating the Mumbai Police on how to use the card readers once they have procured them.

Regardless of the lack of readers for the new licenses, the Western India Automobile Association (WIAA) is thrilled with this development in driving licenses as they are fed up with the rise in accidents on the roads of Mumbai. In fact they've just been given permission to issue learners' licenses. The computerisation of licenses and allowing responsible organisations such as the WIAA to issue learners licenses are positive steps in the states battle to make Mumbai's roads accident free. It is indeed still a long road ahead for Mumbai but the introduction of Smart Card driving licenses is a good beginning for a safer future.



Choosing the Right NFC Tag for the Job

By Heikki Huomo, Chief Technology Officer, Innovision Research & Technology



Heikki Huomo

Near Field Communication (NFC) is ripe for adoption across a whole range of applications. However, to ensure a mass market and create profitable businesses around the technology, designers and manufacturers need to make the right technology choices, especially when it comes to the NFC tag. Features and capabilities must match the needs of the application, at a price level that is appropriate for mass-market deployment. NFC opens up new product and service opportunities for everyone from network operators and handset device manufacturers, through application and service developers, to service providers.

For users, NFC will make it easier and more intuitive to access new media and content services, to pay for things, to discover, synchronize and share information, and to use transport and other public services. The initial mass-market applications of NFC are likely to build on existing payment and communications infrastructure and user behaviour, where the user benefits are most compelling, the business case is strongest, and the commercial risks are lowest. This implies a need for low-cost NFC integrated circuits (ICs) that can be applied to a broad range of uses cost-effectively, in a way that is compatible with the broadest range of pre-existing devices and reader infrastructure. Developers have a choice of four NFC Forum mandated tag types to choose from. How do they ensure they choose the right tag for the job? First, let's look at the key mainstream applications for NFC in the next few years.

Where will NFC be used? - It's likely that the first mass-market applications for NFC will be in relatively low-financial value applications - with low risk of fraud - that do not require large investment in new back-end infrastructure. These fall into three main categories: peer-to-peer; payment & ticketing; and service initiation. In peer-to-peer applications, NFC is used to set up local communication between two devices. When the content, or payload, to be transferred is relatively small (up to a few kilobytes), NFC can be used to transmit the data itself. For larger amounts of data, however, NFC is likely to be used to establish a separate wireless connection - such as Bluetooth or WiFi - to carry the content. A typical peer-to-peer application would be printing photos straight from a picture phone or digital camera.

One of the drivers for the creation of the NFC standard was to build payment and ticketing capabilities into mobile phones. For banks, NFC-enabled payments are much easier and less costly to handle than cash and other traditional payment methods. Initially, NFC-enabled devices are likely to be used for example for vending machines and parking meters. In the service initiation case, the user touches an NFC-enabled device against an NFC tag, which then transfers a small amount of information to the NFC device. This could be plain text, a web address (URL), phone number or other simple piece of data. So what types of NFC tags are available to serve these applications?

Mandated tag types - In June 2006, the NFC Forum announced the initial set of four tag formats that all NFC Forum-compliant devices must support. Tags compatible with these mandatory formats are available initially from Innovision, Philips and Sony. They were selected to cater for the broadest possible range of applications and device capabilities. They are: *Type 1* - based on ISO 14443 A, this has a 96-byte memory capacity; *Type 2* - also based on ISO 14443 A, this has half the memory capacity of *Type 1* tags; *Type 3* - based on FeliCa, this has a larger memory (currently 2kbyte) and operates at a higher data rate (212kbit/s), which means it is suitable for more complex applications and *Type 4* - fully compatible with ISO 14443A/B, this offers large memory-addressing capability with read speeds of between 106kbit/s and 424kbit/s, making it suitable for multiple applications.

It is worth noting that *Type 1* and *2* tags and *Type 3* and *4* tags are two very different groups, with very different memory capacities. There is very little overlap in the types of applications they are likely to be used for. It is important, therefore, that designers consider the relative merits of each before committing to one type or another.



Horses for courses - With initial mass-market deployments likely to be in low-financial value, low-risk applications, it is important that NFC tags meet the requirements with the right balance of cost and performance. In smart poster applications, users touch their mobile phones against a tag embedded in the poster itself, which triggers the transmission of a URL to the phone. This URL could, for example, direct users to a web site where they can find out further information or download a special coupon or token. The trade-off here is to have a tag that is small and low-cost enough for mass deployment, but with sufficient memory to contain a reasonably long URL and some additional security features. A similar application is MMS or ringtone downloads, where users touch their phones to a product or promotional piece, for example, to obtain an associated picture message or ringtone. Once again, small size is important, but so are sufficient memory and security features. The larger the memory capacity on the tag, the more information that can be transferred directly to the phone.

However, there are limitations arising from the short 'touch time' between the NFC device and the tag. In practice, this sets an upper limit for the amount of data exchanged to just a few kilobytes during the touch. In shortcut applications, users can automatically send an SMS or phone number by touching their phone against a tag embedded in all kinds of objects. One possibility is the provision of 'tags in a box' with new mobile phones. Users would be able to save a phone number or text message on the tags, which are embedded in stickers. These could be affixed to photo frames, for example, and used to provide the phone number of the person in the picture, either as a fun application or as a very practical one for the elderly or disabled. In this case, small size and low cost are the main considerations, as the memory requirements are small.

Bluetooth pairing - for example, between a mobile phone and a hands-free headset, or a digital camera and a printer - is made much more convenient by NFC. Generally, only a small amount of memory is required, and small size, low cost - with low risk of 'tearing' the data transfer - are the main requirements. Larger memory may be useful in applications that also involve the automatic transfer of some data between the two devices.

Features to focus on - The read/write memory capacity offered by the NFC tag is key, particularly in mass-market applications, as larger memory comes at the expense of unit price and footprint. For example, in smart poster applications, larger memory translates into longer URLs and greater security options. The larger memory offered by Type 3 and 4 tags could be useful in certain applications - for example, for high data content downloads such as MMS or ringtones - but is overkill for smart posters, Bluetooth pairing or low-data shortcut applications. It is nonetheless important to balance cost with capability, especially when some level of security is required. Smart posters need to be protected from fraudulent copying or tampering with the URL or phone number provided in public environments. Also, there needs to be sufficient memory to provide a full URL even when a digital signature is required. Type 1 tags offer 96 bytes of read/write memory, while the nearest comparable competitor product (Type 2 tag) offers 48 bytes. After writing data to a tag, it can be irreversibly locked to read-only mode to prevent it being overwritten or altered in any way - no-one can modify the tag once it has been published. This is an important security and privacy feature offered by the Type 1 tag format.

The unit price of NFC tags is naturally a key factor in determining its suitability for certain applications. For example, if the IC is only to be used for Bluetooth pairing in a hands-free headset - which users only need to do occasionally - features like high read speed and large memory are irrelevant. The die size area of the NFC tag is important, especially in applications that require unobtrusive positioning, or integration on to other chipsets. In smart poster applications, Type 1 and 2 can provide a much more appropriate balance of cost, size and memory capacity than Type 3 and 4 tags, for example.

The higher the read speed, the lower the chance of a read/write 'tear' occurring (where data is not fully or properly transferred). Read speed therefore has a direct impact on system reliability and user experience. The proprietary 'Read All' command in Type 1 tags enables the whole content of the tag to be read in one shot, rather than a block at a time - which can improve read performance considerably. The first mass-market applications for NFC are likely to build on existing infrastructure, initially in relatively simple shortcut, identification, service discovery/initiation or device pairing applications. For these, developers need a standardized tag format that is small, low-cost and flexible enough to be successfully integrated into existing form factors and integrated circuitry.



Near Field Communication (NFC)



By Dr David Everett, Principal Consultant, Microexpert Ltd



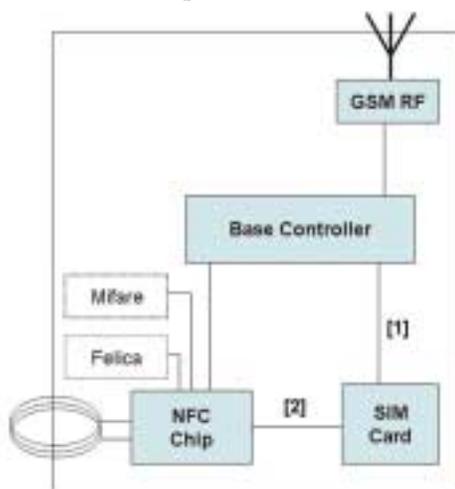
Dr David Everett

In 2002 Philips (now NXP) and Sony developed a specification for NFC which was generally perceived as a way of getting the Sony Felica specifications into a standard. ISO 14443 is the main standard for High Frequency (HF) contactless cards operating at 13.56 MHz which defines two modulation techniques, Type A and Type B. Type A which is 100% Amplitude Shift Keying (ASK - for 100% this means that the carrier which provides the chip power is switched on and off) represents the Philips Mifare modulation while Type B was put forward by others to operate on 10% ASK which was deemed more suitable for powering microcontrollers. Subsequently Type A has been shown to be more than adequate for powering microcontrollers.

Mifare is a memory only chip device. There were plans for a type C which would represent the Sony Felica modulation method but the ISO committee decided to stop with just approval for Types A and B. Their fear was to end up with a plethora of Types (there were many others in the wings) which would make the standard untenable. So NFC was designed to allow 2 NFC devices to communicate with each other based on the ISO 14443 RF standard but which additionally allows the Sony Felica specification. The standard was originally published as ECMA 340 but was subsequently fast tracked through ISO to become ISO 18092, this fast tracking with its attendant IPR issues has been criticised by many observers. It should be noted that at the top of the RF stack that both Mifare and Felica have proprietary cryptography for protecting the communications air gap. This is outside of all the standards and any developer of cards or terminals using these products requires a licence which in practice usually means an appropriate chip from either NXP or Sony.

NFC can operate in passive or active mode. In passive mode the communications are more like a conventional reader to card scenario. The reader is powered and provides the necessary power to the card by inductive coupling. Data communications use the ASK modulation from reader to card while the return data path is induced by load modulation which is like switching a resistor on and off to alter the power taken by the chip in the card which the reader can sense. In active mode both NFC devices are powered and the data flow in both directions is by ASK.

So in summary NFC is a way for two devices to communicate contactlessly at 13.56 MHz based on the ISO 14443 proximity (i.e. up to 10cm) RF standard (Type A and optionally Type B) with the addition of the Sony Felica modulation option. The option to include ISO 15693 (vicinity up to 1 metre range) was rejected by the NFC standard makers. Borrowing from all the standards under ISO, ECMA and ETSI an NFC device can operate like a contactless reader, a contactless card or even in reader to reader mode. In the figure on the right you can see what that means in terms of the core components of a mobile phone where the Mifare and Felica crypto blocks are optional.



In particular there are two SIM card interfaces (the contactless antenna is connected to the NFC chip not the SIM as developed by some companies such as Watchdata), [1] is the connection from the SIM card to the base processor which has the conventional ISO 7816 serial half duplex mode and now the option of the recently (agreed by ETSI) USB interface. This means that there is only one pin left on the SIM card for the NFC interface [2], the old Vpp (EPROM programming voltage which is now generated on chip) pin. The standard for this interface has not yet been agreed, ETSI is looking at several contenders including the Single Wire Protocol (SWP) from Gemalto and the very new DIOCTL from NXP. You can understand that NFC phone manufacturers might be somewhat hesitant while this standard is still under development. Readers should also note that somewhere in the phone you need to install the software applications that uses the NFC interface, either in the SIM or in the phone memory but that's another story.....



US Pilots Mobile Phone NFC



By Jeff Semenchuk, Executive Vice President, Citigroup



The latest US trial of contactless payment involving mobile phones and near-field communication technology (NFC), which began on January 10th in New York City, USA, combines key elements of the two other US pilots mounted so far, and represents the first in which users can access credit cards issued by a major bank in an open, urban environment. Citigroup Inc.'s Citibank is sponsoring the New York pilot along with MasterCard PayPass, Nokia, and Cingular Wireless.

The goal of this trial is to evaluate the speed and convenience that "tap and go" payments made through mobile phones can provide to Citi credit cards and Cingular customers in the New York City area. Pre-selected Citi MasterCard cardholders with Cingular Wireless accounts are participating in the trial and will receive Nokia NFC-enabled mobile phones with MasterCard PayPass payment functionality. Like MasterCard's Dallas NFC pilot, announced last month, the one in New York will feature over-the-air personalisation (OTA), a technology that allows users to download their account information, payment applications, and other data to their phones over the carrier network.



In a separate pilot conducted between December and May in Atlanta by Visa USA, JPMorgan Chase Co., Nokia, and Cingular, phones were handed out with account data already loaded, a tactic that facilitated the pilot but is considered impractical for mass issuance. Like the Atlanta pilot, the one in New York will feature so-called smart posters, or advertising signs with embedded NFC chips that will let users download digital content over the Cingular network. In New York, this will include movie trailers from Universal Studios and restaurant information from the Zagat guides. Such media could be important to securing the involvement of mobile carriers like Cingular, since their networks don't play a role in point-of-sale contactless payment. MasterCard says smart posters will eventually feature in its Dallas pilot, as well.

The New York trial will be the first in the US, however, in which participants will be able to use their phones in an open environment to pay for merchandise anywhere contactless payment is accepted, with credit card issuance by a major bank. That includes three subway stations in Manhattan that have started taking contactless cards for transit fares. Visa's Atlanta pilot included Chase card accounts but was confined to the closed environment of a sports stadium. The PayPass pilot in Dallas is open but involves prepaid accounts held by Peoples Bank of Paris, Texas, and processed by Bluko Information Group Inc. MasterCard says 36,000 locations now accept PayPass, most of them in the US, but refuses to say how many of these stores are in the New York metropolitan area.

Citi began issuing contactless key fobs and cards last year for both credit and debit card accounts. Early results of this program, which include somewhat higher usage of the fob compared to the card, may bode well for the NFC test. We have some early indicators that form factor is very important to customers. Citi hopes the NFC pilot will reveal how consumers might change their payment behaviour when using a handset rather than a card. The pilot will feature some consumer incentives, including credits for Cingular air time.



With NFC, mobile devices embedded with an NFC chip, made by NXP Semiconductors, can establish a two-way link with point-of-sale transceivers and act as contactless payment tokens. Transmission distance is extremely short range-typically no more than 4 centimeters. In the New York pilot, the chip will be embedded in the clamshell of the Nokia 613x, a new model. As in Dallas, MasterCard is relying on an OTA platform developed by Munich-based Smart Card maker Giesecke & Devrient. ViVOTech provided the NFC software and services to enable the trial working in concert with the partners.