

UK Banks to Challenge Mondex with EPUK?

Five banks are said to be preparing to challenge Mondex in the UK electronic purse market. No public statement has been made by the banks believed to be involved - Abbey National, Barclays, Lloyds, The Royal Bank of Scotland and TSB - but *SCN* sources say that consultants are working on a scheme code-named EPUK (Electronic Purse UK) with a pilot planned in 1997 followed by national roll-out.

Some industry observers believe that the banks are looking for competitive advantage with a rival scheme to Mondex . Whether the EPUK Project is designed to operate in conjunction with the APACS (Assocation for Payment Clearing Services) Smart Card project is not yet clear.

Continued on page 43

Smart Card News

Managing Director: Patsy Everett

Editor: Jack Smith

Technical Advisor: Dr David B Everett

Editorial Consultants:

Dr Donald W Davies, CBE FRS
Independent Security Consultant

Peter Hawkes,
Principal Executive
Electronics & Information Technology Division
British Technology Group Ltd

Chris Jarman
Vice President, Chip Card Technology
MasterCard

Published monthly by:

Smart Card News Ltd
PO Box 1383, Rottingdean
Brighton, BN2 8WX, England
Tel: +44-(0)273-302503
Fax: +44-(0)273-300991

ISSN: 0967-196X

Next Month

Smart Card Tutorial - Part 3
From There to Here -
The Making of a Chip continued.

CONTENTS

1	44
2	45
3	45
4	46
5	47
6	47
7	48
8	49
9	50
a	52
b	53
c	54
Smart Card Diary	55
Smart Card Tutorial Part ?	
Next line	56

Banks Plan EPUK

Continued from page 41

It seems at this stage at least the banks have not yet seen the value of interoperability for a national purse scheme. It took them many years to agree to share their cash dispenser machines (ATMs) and give their customers what they wanted - easy access to cash. Another example was the EFTPOS (Electronic Funds Transfer at the Point of Sale) scheme which collapsed when the individual banks created their own schemes.

To go ahead with a purse scheme incompatible with Mondex would just add to the number of cards that people carry and retailers might have to install different card readers to handle purchases on different cards.

Example from Finland

A good example of proactive planning comes from Finland where the three largest commercial banks have taken over the running of the Avant electronic purse scheme to establish one national electronic purse system open to all the retail banks.

Eino Halonen, Chairman of the new electronic purse company Automatia Rahokortit Oy, said at the time of the take over, "It was necessary to make a decision on how to proceed with building the national electronic purse system, otherwise there would have been a risk of several closed systems being developed in the country. This would not have benefited the consumer or the national economy."

It is thought that the banks are still considering if the electronic purse should be a separate card or added as a function to a credit or debit card such as the Visa chip card. In the latter case retailers would have to be registered in the scheme and transactions recorded, unlike Mondex electronic money which is unaccounted and acts like cash in your pocket.

In the UK, Mondex is firmly ahead with its trial in Swindon which started last July. Mondex is backed by the National Westminster Bank which devised the scheme, Midland Bank and BT with the Bank of Scotland scheduled to join in the national roll-out.

The last thing that consumers want is a national

purse war especially as the new UK Smart bank card will be at trial stage next year and will provide the opportunity for all banks to introduce value-added services such as an electronic purse.

Disposable SVC Launch in Dubai

A disposable Stored Value Card (SVC), called NEW CASH, has been launched at the Dubai Shopping Festival from February through March. The uptake of cards has been high with estimates of cards sold ranging from half-a-million at the end of the first month to hundreds of thousands by the end of the festival.

The system has been launched by Emirates Bank International, Gemplus and VeriFone. The Smart Cards can be purchased by visitors and local residents in values of 100 Dhs, 200 Dhs, 365 Dhs (US\$ 100), 500 Dhs and 1,000 Dhs and can be used to pay for purchases in over 1,000 sales outlets equipped with VeriFone point of sale terminals which accept both NEW CASH and current international credit and debit cards.

Planned introduction

He revealed that the bank plans to introduce the NEW CASH card on a more permanent basis throughout the UAE. Discussions are taking place with other major banks and it is planned to issue rechargeable chip cards which can be reloaded at banking terminals and used with Etilsat payphones. Jan-Erik Rottinghuis, VeriFone Vice-president for Europe, the Middle East and Africa, comments, "We were extremely impressed by how versatile the card is and can even pay for tickets in the Dubai shopping festival's lottery."

The system infrastructure was installed by Marshall Electronics, the UAE distributor. Dublin, Ireland-based Card Services International (CSI) installed the EMS electronic payments system to manage the issue of the NEW CASH cards. The EMS includes transaction tracking on all payments and transaction information is collected either via transaction cards (off-line) or via the local X.25 network (on-line).

Contacts: *Flavie Gil, Communication, Gemplus, France - Tel: +33 42 32 56 83. Fax: +33 42 32 50 90. David O'Hagan, Sales & Marketing Director, Card Services International, Ireland - Tel: +353 1 475 2881. Fax: +353 1 475 2887.*

Shanghai/Solaic Card Plant

A Smart Card manufacturing plant will start operating in China later this year with the aim of supplying a significant share of the Chinese market, expected to reach several hundred million cards by 2000.

Solaic, the Smart Card subsidiary of Groupe Sligos and Shanghai's Post and Telecommunications Authority have created a joint venture called Shanghai Solaic IC Cards.

It is expected that 65% of the new company will be owned by Chinese operators, including Shanghai Post and Telecommunications, Shanghai Feilo (a large Chinese electronics company traded on the Shanghai stock exchange) and other partners, notably from the banking sector. Groupe Sligos will own 31% and Alcatel will own 4%

Commenting on the agreement, Franci Lavelle, President and Chief Executive Officer of Solaic, says, "These agreements give Solaic a position in what will become the world's largest Smart Card market, in partnership with China's leading contractor and the world's foremost telecommunications operator."

Contact: Boris Eloy, Solaic Tel: +33 1 49 00 96 33

Philips and CP8 Offer Dual Source

Philips Smart Cards & Systems and CP8 Transac have joined forces by an agreement that both companies become respective second sources for the CC60 electronic purse card and GSM subscriber cards. Two leading applications areas in the world market.

CP8 Transac's CC60 electronic purse card has been selected by a growing number of countries and banking groups and can boast implementation of six million of these cards in Belgium, Switzerland, The Netherlands, Brazil and Russia.

Philips' GSM SIM card complies with the ETSI GSM 11.11 standard specifications and is in use with major operators in France, Portugal, Italy and Switzerland.

Contacts: André Jacques Selezneff, International Marketing, Philips Smart Cards & Systems - Tel:

+33 1 53 62 51 54. Fax: +33 1 53 62 51 03. Dominique Mercier Chevalier, International marketing Communication, CP8 Transac - Tel: +33 1 39 66 45 20. Fax: +33 1 39 66 44 02.

Barcelona University Purse

The Universitat Autònoma de Barcelona was the first university in Spain to launch a multi-functional Smart Card with an electronic purse and now nearly 40,000 cards are in use and the number is increasing by 8,000 new cards every year.

The card (see front page) is used by students, professors, lecturers and administration staff to offer easy access to university services and to make self-service available. These include: self-registration of students, consultation of academic records and exam results, requests for certificates, use in the university libraries to control access, borrowing or requesting books; reservations of laboratories, computer rooms, sports halls, etc. access to restricted areas or car parks, PC security access, control of absenteeism, cultural and academic information, timetables, exams and transport.

An electronic purse has been included in the card since October 1994 and enables users to pay personal expenses such as public phones, restaurants, bars, shops and administration.

The scheme is being developed with Caixa d'Estalvis i Pensions de Barcelona, a savings bank and it is planned to extend the use of the electronic purse to include public transport, vending machines, photocopiers and access to the Internet's Worldwide Web.

Over 60 point of sale outlets have been installed for payments and there are some 90 card reader/writer terminals for various functions such as control of absenteeism and access control.

The electronic purse can be recharged through any of the 700 self-service interactive units installed by the savings bank all over Spain.

Contact: Josep Llopart, Vice-manger, Unviersitat Autònoma de Barcelona - Tel: +34 3 5821 2021. Fax: +34 3 581 2014.

Internet and EP Warning to Banks

Banks should cash in now on electronic purse schemes and the Internet or lose out later. That is the warning in a new report from Datamonitor called *IT in Electronic Payments: Digital Cash*.

Datamonitor argues that banks have a strategic interest in maintaining a central position in money transmission, or otherwise face the prospect of having their role overshadowed by third parties, with potentially disastrous effects on their core business. It says that banks should work together with the leading players to exploit the opportunities for their own advantage.

It says that banks must act now to secure their share of the Internet payments market and participate in discussions about payment protocol architectures and endorse proposals where they are directly involved in the payment transaction.

Although credit card transactions will undoubtedly continue to be an important means of payment for a certain range of transactions, banks must not rely on these organisations to pay the way into the cyberworld, says the report. It warns that banks cannot turn a blind eye on the Internet and discard the opportunities for fears of security or indeed competitive pressure from players in the converging industries. Those who stay out are likely to be overwhelmed by the prospect of an uphill struggle in order to catch up.

Until now, says the report, stored value cards have been issued solely under the umbrella of one scheme. Banks then add their own distinguishing features to the Smart Card - an excellent means to provide the stored value function under their own brand name.

However, the report predicts that there will be a point when the stored value application will merge with other functions (such as identification or signature, loyalty schemes and access control) and the bank's name is less visible. It is therefore important for banks to support schemes that allow them to participate in some of the complementing areas before this position is filled by non-financial firms with strong brand names.

The largest tangible gain from the introduction of electronic purses is likely to be made by banks in that this payment method is a cheap, off-line

substitute for other non-cash payments with no risk of overdrawing bank accounts. This would reduce cash handling and cash holding costs, together with card fraud (in the case of a combined credit / electronic purse application). Since banks are most likely to be the main issuers of these new payment instruments, they would also gain from the float from card issues.

IT in Electronic Payments: Digital Cash is available from Datamonitor - Tel: +44 (0)171 625 8548. Fax: +44 (0)171 625 5080.

First Student Card in Australia

The University of Newcastle Union in Australia is pioneering the way for other educational institutions by issuing 14,000 students with Smart Cards which will incorporate Union membership and a rechargeable electronic purse.

The card from QuickLink is not a credit card so students cannot build up debt by using it. Students can use the card to purchase stationery, books and other study materials on campus. Vending machines are to be adapted to accept the cards for low value items such as lunch, snacks and soft drinks. The card may also be used to make phone calls from QuickLink-adapted Telstra payphones and ATMs and electronic cash dispensers will be adapted to load the cards.

The card comes preloaded with \$2 so that students can try it out before loading it with their own funds. Outside the university the card can be used to make purchases from a growing number of participating retailers and other outlets in the Newcastle areas. It will soon be accepted on buses. Other University Unions are also eager to make use of the QuickLink card.

Cash handling by Union outlets will be greatly reduced, thus helping to cut back administrative costs and the security risks associated with handling large amounts of cash. These savings will ensure the continuance of significant student discounts at Union trading outlets.

Contacts: John Broughton, Newcastle University Union - Tel: +61 49 68 3717. Fax: +61 49 68 1254. Peter Flower, QuickLink - Tel: +61 2 252 4500. Fax: +61 2 252 4550.

Electronic Purses: A Comparative Review - Part 8

Country	Canada	UK
Name of scheme	Mondex International	Mondex
Capital investment	Not available	Not available
Operator	Mondex International partners: Royal Bank of Canada and Canadian Imperial Bank of Commerce	National Westminster Bank/Midland Bank and BT
System developer	National Westminster development team	National Westminster development team
Status	Pilot early 1996	Launched July 1995 in Swindon, England
Multiple currencies	Single in first phase; five currencies possible in later stages	Single in first phase; five currencies possible in later stages
Loadable amount	Decided by the currency managers. Maximum value said to be up to £10,000 or equivalent	Decided by the currency managers. Maximum value said to be up to £10,000 or equivalent
Current applications	Electronic cash	Electronic cash
Planned applications	-	-
Method of settlement	Not required	Not required
Card fabricators	Dai Nippon Printing Co. (Cards supplied through SPOM Japan)	Dai Nippon Printing Co. (Cards supplied through SPOM Japan)
CPU (Yes/No)	Yes	Yes
ROM	10K bytes	10K bytes
EPROM/EEPROM	8K bytes EEPROM	8K bytes EEPROM
RAM	512 bytes	512 bytes
Co-processor (Yes/No)	Yes	Yes
Chip manufacturer/ Type No.	Hitachi / H8	Hitachi / H8

Country	Canada	UK
Security algorithm(s)	Secure value transfer protocol via digital signature scheme	Secure value transfer protocol via digital signature scheme
PIN	Yes, but only to access cardholder account at the bank via an ATM or telephone. Known as a personal four-digit code it can also be used as a protection device to lock the card so that it has no value if lost or stolen	Yes, but only to access cardholder account at the bank via an ATM or telephone. Known as a personal four-digit code it can also be used as a protection device to lock the card so that it has no value if lost or stolen
Cards issued		8,000 (at December 1995)
Card target		
Card reader/terminal suppliers	Panasonic (Matsushita Electric Industrial/Matsushita Battery) and Oki Electric Industry Co. - pocket-sized electronic wallets (these show cash available and provide a record of the last 10 transactions on the card and can be used for transferring money from one card to another or for transferring cash into the wallet for safer-keeping at home. Panasonic and Hitachi - key ring card readers Bell Canada - Mondex telephones	Panasonic (Matsushita Electric Industrial/Matsushita Battery) and Oki Electric Industry Co. - pocket-sized electronic wallets (these show cash available and provide a record of the last 10 transactions on the card and can be used for transferring money from one card to another or for transferring cash into the wallet for safer-keeping at home. Panasonic and Hitachi - key ring card readers BT - Mondex telephones (public and residential)
Number installed		750 retailers
Portable balance reader		Issued with all consumer cards
Card recharging points	ATMs and telephones	ATMs and telephones
Contact		Angela-Walker Page
Telephone		+44 (0)171 726 1879
Fax		+44(0)171 726 1996

Note: Bank of Scotland is to join Mondex when the scheme is rolled out nationally. Hongkong & Shanghai Banking Corporation (Hongkong Bank) have the rights to franchise Mondex in Hong Kong, China, India, Indonesia, Macau, the Philippines, Sri Lanka, Taiwan and Thailand. Hongkong Bank has the right to franchise Mondex in Malaysia. Wells Fargo Bank, USA started a small-scale trial in San Francisco in July 1995 (no agreement signed with Mondex)

Electronic Purses: A Comparative Review - Part 8

Country	International (Europay)	Japan
Name of scheme	Express	Smart Commerce Japan
Capital investment	Confidential	Not available
Operator	Europay International	Toshiba Corporation and Visa International (Other members of consortium include the Daiei Group, Japan's largest retailer and the Hankyo Toho Group, a diversified entertainment, retail and transportation group.)
System developer	Various	Toshiba Corporation and Visa International
Status	Pilot early 1996	Pilot first quarter 1997
Multiple currencies	Multiple	No
Loadable amount	Issuer defined parameters	*
Current applications	Low-value purchases of goods, services and information on the Internet such as retrieving an article or information, renting a video, ordering a pay-per-view programme	-
Planned applications	Higher value purchases on the Internet when Europay credit and debit cards start being converted from magnetic stripe to chip cards in early 1997. Paying for fast food, public transport, tolls, car parks and making purchases from vending machines	Visa credit or debit Smart Card (for major purchases) with an electronic purse (for small transactions) to pay for goods on the Internet
Method of settlement	Presentment of truncated totals by the acquirers	*
Card fabricators	Various	Toshiba. Card will be developed according to EMV specifications
CPU (Yes/No)	Yes	Yes

Country	International (Europay)	Japan
ROM	Implementation specific	*
EPROM/EEPROM	Implementation specific	*
RAM	Implementation specific	*
Co-processor (Yes/No)	Yes	*
Chip manufacturer/ Type No.	Various	Toshiba
Security algorithm(s)	RSA	*
PIN	Yes, for loading	*
Cards issued	Pilots in 1996	-
Card target	-	Distribution of 300,000 cards to current Visa cardholders who have experience using the Internet
Card reader/terminal suppliers	Various	Toshiba subsidiary TEC Corporation
Number installed	Pilots in 1996	Planned to install 1,000 retail terminals. The 300,000 card holders will also be issued with card readers. Planned to instal EMV chip card reloading terminals to enable cardholders to load value onto the card. Several major retailers will take part in the pilot.
Portable balance reader	-	*
Card recharging points	Any compatible on-line device	Planned to instal EMV chip card reloading terminals to enable cardholders to load value onto the card
Contact	Richard Tischler Europay International	Colin Baptie, Visa International, UK
Telephone	+32 2 352 5304	+44 (0)171 937 8111
Fax	+32 2 352 5732	+44 (0) 171 937 0977

Notes (Smart Commerce Japan):

do Planned to construct a number of virtual-mall kiosks to deliver shopping in Cyberspace to those who not have a home PC.

* Still under discussion.

Smart Park from Israel

An In-Vehicle Parking Meter (IVPM) system called Smart Park developed by Ganis Smart Park System of Israel is now entering the commercial phase after five years of development and piloting.

Ganis, which has invested over US \$1 million in the development, has signed a partnership agreement with Rapac Electronics, a company owned by The Israel Corporation and has successfully completed pilot tests in Tel Aviv, Haifa, Netanya and Beer Sheva.

Some hundreds of units have been or are being piloted in various places like Volos (Greece, Hamilton (Canada) and Padova (Italy).The company says that a Belgian country has ordered commercial quantities to be installed in Istanbul and in other European cities, a German company is intending to launch a pilot system in Austria this year and there is serious interest in a large city in the US.

Meanwhile Ganis is in the final stage of a tender by the General Organisation of the Israeli Municipalities and is seeking a long term nationwide contract for supplying its parking system.

Smart Park consists of a portable electronic parking meter device which looks like a pocket calculator, a Smart Card and proprietary software to run the system. The parking unit attaches to the inside of the car and displays the park time and specific parking zone data. The parking meter is activated by a prepaid Smart Card with a preset number of parking hours. The driver simply activates the meter which automatically deducts the amount of parking time used. The information stored on the card is then fed into a computer which divides the revenue between the appropriate

parking authorities.

As the cards are programmable, a single Smart Park meter can be used anywhere. In addition, the meter unit is protected by the user's personal password and the card is kept in the driver's wallet while parking.

Different Smart Cards are used according to customer requirements and include Gemplus GPM 416 / 896 and the Philips 2042.

Contacts: Zvi Ganot, Ganis Smart Park Systems - Tel: +972 3 647 5750. Fax: +972 3 648 6257. Avivit Kochavi, Marketing Communications Manager, Rapac Electronics - Tel: +972 3 645 0365. Fax: +972 3 649 1007.

Pacemaker Patient Card

The Royal Sussex County Hospital in Brighton is piloting a further stage in their pacemaker patient card project. The scheme was first launched two years ago and has now been improved. One hundred patients have been issued with Gemplus cards and funding is being provided by Brighton Health Care

The system was developed at Sussex University. John Lewis a bio-medical engineer who worked part-time on the project developed the software and updated the cardiac departments database. A Smart Card reader connected to a PC enables data on the card to be accessed by the medical team.

Before the cards were issued patients carried around a 10" piece of cardboard with their details on which Stephanie Baker, Chief Technician says "became very scraggy and something more durable was needed". Heart specialist Prof. Vincent, who promoted the idea says, "If the pilot is successful the next stage will be to put an ECG record onto the card".

Dione Launches Solo 2000 Reader

Dione Developments has launched its new Solo 2000 Smart Card reader which can be used as a portable device or alternatively connected to EPOS/EFTPOS equipment. It is designed for a variety of applications including EFTPOS, customer loyalty and electronic purse.

The company says it has already installed 4,000 units at Marks & Spencer stores throughout the UK and Europe to meet quite different requirements. Firstly, the card readers support the retailer's Smart Card-based internal staff discount scheme. Secondly the units are used to provide a price look-up "back up" system. A store's entire stock code file can be accessed by the Solo 2000 via a Dione large memory Smart Card enabling store assistants to check any code or price within one second.

Contact: Richard Parsons, Dione Developments
- Tel: +44 (0)1494 429614.

Electronic Purse in Balkhash

Veron, the Olivetti Telemedia Group company is piloting a Smart Card electronic purse scheme called Tamerlano in the city of Balkhash in the former Soviet Union. The project was developed on behalf of Olivetti Moscow for their client the Narodni Bank, the second most important bank in the State of Kazakistan and the only savings bank in the country.

Veron explains that the growing industrialisation of the Republics belonging to the ex-Soviet Union is encouraging the formation of new industrial habitats around production sites which are often hundreds of kilometres away from the nearest city.

Workers employed at these sites receive their wages in cash and the risks involved in transferring and handling the amount of cash necessary for the workers' payroll are being resolved by the introduction of a Smart Card-based system.

Smart Cards issued by branch agencies of the local bank are used as electronic purses. Employees' wages are transferred to the card and they can then use the card to pay for purchases off-line at shops, canteen, restaurants etc. Some 50,000 Veron V428 Smart Cards (see photograph on front page) with 1K bytes of EEPROM, have been issued and more than 50 Veron Lyra multi-functional desktop EFTPOS terminals (see photograph below) installed in retail outlets and branch agencies of the bank.

The system includes a Transaction Manger and a PC application using the Unix operating system.

A card issuing centre where the Smart Cards are personalised with the cardholders personal details is installed at the central bank.

Contact: Gabriele Castellan, Manager
International Projects, Veron SpA, Italy - Tel: +39
2 482 15258. Fax: +39 2 482 15226.

Two Major Contracts for Motorola

Motorola has won two contracts worth US\$ 10s of millions to supply microchips for government Smart Card projects in Europe. It will provide seven million chips for the first phase of the social security card programme in Spain and 10,000 for a pilot health insurance project in the Czech Republic. Both schemes will later be rolled-out nationwide.

According to Allan Hughes, Worldwide Smart Card Operations Manager for Motorola, "These two contracts are prime examples of the growing trend amongst governments across the world to look at Smart Card solutions.

The Spanish Social Security project (*see SCN November 1994 and May 1995*) will use a card manufactured by Spanish card embedder FNMT to store each user's social security and identity details. Eventually, cardholders will be able to use their Smart Cards at over 1,500 kiosk terminals and local healthcare computer networks nationwide. Access to information will be protected by fingerprint recognition devices. Nationwide roll-out is scheduled for completion by 1999 when some 40 million cards will be in operation at an overall cost of US \$400 million.

Czech Health Card

The Czech Republic Health Card scheme is being financed by the Ministry of Health with the support of the European Union PHARE-project, to replace existing health insurance cards with a single Smart Card containing both health insurance company data and selected medical and emergency data. Initially there will be a pilot project with 10,000 cards in the Litomerice region in the first quarter of this year at an estimated cost of US \$3 million. Nationwide roll-out with 10 million cards in 1997/98 is estimated to cost US \$60 million.

The Smart Cards, with Motorola's MC68HC05SC21 microprocessor (3K bytes EEPROM, 6K bytes ROM and 128 bytes of RAM) will be fabricated by ORGA Kartensysteme GmbH of Germany.

Identification details such as name and insurance number will appear visually on the Smart Card

while information relating to health insurance will be stored digitally in the chip. Medical data, such as allergies, risk factors, vaccinations received, blood group and organ donation preferences will only be recorded at the individual's request. Eventually pharmaceutical information will be stored in the card, for example, details of past treatment and the issue of medical aids.

It is planned that healthcare providers will record details of treatments directly on to the cards. Rights of access to read and write data to or from the Smart Card will be restricted to authorised individuals and to their particular areas of the files. PINs will be issued for verification at points of use and a unique signature from the last person to amend data will be recorded so that amendments to the information can be traced.

Contact: Kathleen Reid, Motorola, UK - Tel: +44 (0)1355 565000. Fax: +44 (0)1355 234582.

Remote ID System

A new remote identification system with a range of up to 25 metres has been announced by Nedap, Dutch specialists in contactless cards and access control systems. Called UIVER, it can be used for access control of personnel at entrance doors and in passages where vehicles (fork-lift trucks, cargo traffic, etc.) enter and leave protected areas.

Drivers do not have to leave their vehicles to insert a card in a reader. In the UIVER system the driver puts his card in a booster and when the gate is approached the reading station identifies the card and opens the gate. The system is available in two versions, a compact system with a fixed position for a five-metre identification distance and a system with variable aerials with an identification distance of up to 25 metres. Separate aerials mean that in the case of two different ramps, for example, the identification beam is directional.

In France, EDF (Electricite de France) uses the system for regulation of the access to parking sites, and the Swiss PTT at St. Gallen uses the system on their loading platforms where fork-lift trucks are criss-crossing the site.

Contact: Jon Hogan Esch, Nedap, The Netherlands - Tel: +31 544 471111. Fax: +31 544

464255.

Seven Million Phonocard Order

An order for more than seven million Smart memory and eurochip payphone cards has been won by Coventry-based GPT Card Technology, the UK's largest Smart Card manufacturer and a division of GPT Payphone Systems. GPT will supply TM (Telephone Manufacturers of South Africa) who also supply cards to Botswana, Namibia and numerous other countries.

Contact: GPT - Tel: +44 (0)115 943 3687. E-mail press_office@ncp.gpt.co.uk

Remembering PIN Numbers

Two of the biggest problems with Personal Identification Numbers (PINs) are forgetting them, which can be inconvenient and writing them down somewhere "safe" which can lead to fraud if they fall into the wrong hands.

Now CPP Card Protection Plan, Europe's leading plastic card protection service, is launching a new device in the UK called PINCARD designed to help people remember all their PINs.

According to CPP's research, on average each person in the UK has three PINs to remember and PINs are being used in an ever growing range of security applications such as burglar alarms, padlocks, mobile phones, luggage, cards and of course cash machines. They are also being increasingly used as a means of cardholder verification in shops and restaurants.

CPP says that more than 50% of all card fraud claims involve the misuse of a PIN so it is planning to introduce PINCARD to retailers at a recommended retail price of £2.95. The device, presented in a wallet-style package, uses a series of grids and a simple two character code which, says CPP, means nothing to anyone except the PINCARD holder. The device provides a simple means of recalling up to six different PINs.

Martin Fielding, Managing Director of CPP, says: "We rely on the PIN as a reliable security system - not only for plastic cards but also for a host of other applications such as mobile phones, car stereos, burglar alarms, etc. The problem is remembering all those different numbers. For the

first time, the PINCARD unlocks the full potential of the PIN and helps people to gain control in an increasingly security conscious world."

Initial sales targets for PINCARD are 300,000 units in the first year.

Contact: Martin Fielding, Managing Director, Card Protection Plan - Tel: +44 (0)171 353 7755.

Over-the-air Customisation

Schlumberger's OTAC "over-the-air customisation system" enables GSM, DCS and PCS network operators to customise SIM (Subscriber Identity Module) Smart Cards remotely over the telephone.

Software installed at the network operator's control centre allows information to be transmitted to a new-style SIM card, enabling or disabling the functions available to the user.

Schlumberger says that while GSM Phase 2 enables a new range of facilities - such as fax and e-mail, broadcast messaging, conference calls and closed user groups - offering additional revenue generating opportunities to network operators, the problems of activating the facility are increased. However, with OTAC, changes can be requested by phone and immediately downloaded.

Economy SIM card

In another development, Schlumberger has announced an economy SIM card with 1K bytes memory for GSM/PCS cellphones, allowing operators to release basic-functionality SIMs at lower cost - Schlumberger projects prices below 50% of existing designs.

At the same time, Schlumberger announced SIM cards based on the latest three volt chip technology, supporting the move towards new-generation phones which are more compact and consume less power. The cards are said to cut power consumption by around 15% and offer additional power saving modes which designers can exploit to extend the battery life of terminals by as much as 100%.

Contact: Isabelle Ferdane-Couderc, Schlumberger Electronic Transactions, France -

Tel: +33 1 47 46 70 20. Fax: +33 1 47 46 68 66.

Million+ Contactless Card Order

An order for 1.1 million Mikron Mifare contactless Smart Cards has been placed by Card Technologies Australia (CTA) for the launch of its Transcard implementation in Sydney and in other Australian cities as roll-out begins.

It is the biggest single order for contactless Smart Cards placed with Gemplus since it entered the contactless technology field last year. Gemplus General Manager John Atkinson, who negotiated the contract, said it was a significant milestone for contactless technology.

David Mac.Smith, Managing Director of CTA, says, "The sheer size of our order reflects our belief in the future of contactless technology for multi-application cards and our commitment to the Mikron technology."

CTA is to launch Transcard in Western Sydney next month following successful trials in transport and retail applications last year. Transcard enables multi-applications of electronic purse, tickets and incentive reward programs on a single contactless card.

Contact: David Mac.Smith, Card Technologies Australia - Tel: +61 2 332 4955.

Ingenico Takes Over IDS

Ingenico, French specialists in EFT terminals with an installed base of over 400,000, has taken over Innovatron Data System (IDS), a branch of Groupe Innovatron.

IDS's activities will be integrated through Sofracin, a wholly owned subsidiary of Ingenico and will be headed by Philippe Rousselet, previously Chairman and Managing Director of IDS from 1991 when the company's international expansion started in the CIS (the former Soviet Union) and the Baltic States, and then in Mexico, India, the Czech Republic and the United States.

The acquisition gives Ingenico a strong base in Smart Card technology with cards, electronic payment terminals, software, servers and personalisation tools. In addition to providing the opportunity to tackle new markets such as local

authorities in France, Gérard Compain, Managing Director of Ingenico points out that they are already involved in MasterCard and Visa projects in Australia will be Europay International's partner in the first pilot scheme in Eastern Europe, starting in the third quarter of this year when an electronic purse complying with EMV specifications will be issued.

Innovatron Data Systems' products are based on Unicapt, a terminal dedicated architecture to protect programs and the Totally Secure Chain designed to protect exchanges between all components of a system.

Contact: Geneviève Bœuf - Tel: +33 1 46 25 82 00. Fax: +33 1 47 72 56 95.

New Reader from VeriFone

VeriFone has announced that it has added a higher functionality Smart Card reader/writer product to its family of point of sale payment solutions. Called the SC 552, it is a compact hand-held unit which can be used for a wide range of Smart Card and magnetic stripe card applications. It can be either connected to one of VeriFone's transaction automation systems or directly to an EPOS terminal.

The reader includes a second Smart Card reader which allows a retailer chip card or a security access module to be inserted completely into the device for added data storage or supporting local security schemes. The module works with DES encryption plus Master/Session Key, DUKPT (Derived Unique Key Per Transactions) and regional key management methods. It can display two languages simultaneously, such as French and English, for use in multilingual markets.

Contact: Mark McMurtrie, VeriFone - Tel: +44 (0)1895 824031.

Visa Makes Barnes Group EVP

Visa International has promoted Ray Barnes to Group Executive Vice President and Chief Administrative Officer from Executive Vice President and Chief Financial Officer of Visa's former Europe, Middle East and Africa Region.

Smart Card Diary

Plastic Card Fraud Prevention, The Churchill Inter-Continental, London, 1-2 April.

Aimed at improving fraud prevention strategies, this conference includes chips cards, verification techniques, neural networks and biometrics. IIR Limited - Tel: +44 (0)171 915 5055.

International Payment Systems, The Four Seasons Hotel, London, 15/16 April.

Preceded by a one-day workshop on designing and building a national payment system, the conference features speakers from the European Monetary Institute, Deutsche Bundesbank, European Commission, The Federal Reserve Board and the Bank of England. IBC Financial Focus - Tel: +44 (0)171 637 4383. Fax: +44 (0)171 323 4298.

Successful Business & Marketing Strategies for Electronic Cash, The Forum Hotel, London, 16/17 April.

Presentations from Mondex, Banksys, MasterCard, DigiCash etc. Workshop follows on 18 April. International Quality & Productivity Centre - Tel: +44 (0)181 332 1112.

Maximising the Potential of Calling Cards in the Telecoms Industry, The Merchant Centre, London, 16/17 April. Workshop 18 April.

IIR Limited - Tel: +44 (0)171 915 5055.

Latin American Card Conference, Intercontinental Hotel, Miami, Florida, USA, 17/18 April

World Research Group, USA - Tel: +1 212 421 9410. Fax: +1 212 421 7325.

Smart Cards in Transport: Practical Progress and the Way Ahead, Landmark Hotel, London, 17/18 April.

Reviews of advanced card applications in the transport market, developing technology and operational procedures required to implement new systems. International Conference Group - Tel: +44 (0)181 743 8787. Fax: +44 (0)181 740 1717.

Bridging the Card Gap, Vienna, 18/19 April.

Jointly organised by the Smart Card Forum, Germany and the Austrian Smart Card Association, the conference aims to forge a better understanding of the needs of emerging card markets while presenting new opportunities arising from the application of new card-based technologies in both East and West Europe. Contact: Gilla Lörcher, Smart Card Forum Deutschland - Tel: +49 4131 983414. Fax: +49 4131 983498.

Solving the Financial Challenges of the Airline Industry, New York World Trade Center Hotel, 21-23 April.

IATA's 7th annual financial management conference. Subjects include the financial impact of technology. Joanna Robinson, Seminar & Exhibition Services, IATA - Tel: +44 (0)181 572 4934. Fax: +44 (0)181 572 4929.

CardTech/SecureTech '96, Atlanta, Georgia, USA, 13-16 May.

The largest conference and exhibition covering advanced card and security technology. CTST - Tel: +1 301 881 3383. Fax: +1 301 881 2430.

10th European Financial Self-Service '96 Conference and Exhibition, Sheraton Grand Hotel, Edinburgh, Scotland, 21/22 May.

Sessions include Smart Cards / Pre-payment and the Internet. SETG - Tel: +44 (0)141 553 1930. Fax: +44 (0)141552 0511.

Cards Australia '96 Conference & Exhibition, Convention & Exhibition, Sydney, Australia, 20-22 August.

Erika Morton, AIC Exhibitions, Australia - Tel:

March 1996

Smart Card News

+61 2 210 5704. Fax: +61 2 223 9216.

Electronic Commerce and Payment Mechanism

The Internet is starting to invade our everyday way of live, no matter where you look those e-mail addresses and Web page URLs (Universal Resource Locator) have become the new of business communications. Global commerce has suddenly become a fact of life no matter whether the company is just down the road or on the other side of the globe. This is not just some passing fad it is the basis of a whole new form of business generally know as " Electronic Commerce".

The real future of electronic commerce lies in the capability of trading in assets which are in them selves in an electronic form of which information is probably the most important commodity. The value of such information covers the whole business spectrum, every from a few cents upwards. Company financial information, encyclopedias, music, pictures and every form of reference material. The basis for success is to achieve the necessary infrastructure for electronic payment and as we shall see here lies a role for the Smart Card.

The subject of electron commerce must by its nature cover the whole scope of business relationships. In this article we will look in particular at payment mechanisms and try to understand the implication of electronic payments and in particular the security systems upon which they are based. By this means we can see the role Smart Cards are likely to play in the future although this application of Smart Cards is not yet readily apparent. We will look at the necessary requirements for such an electronic payment schemes and then examine how some of the commercial products are designed to meet these needs.

We can define the principle requirements of electronic commerce payment schemes as follows,

- Reliable
- Low cost
- Ubiquitous

It must be possible to use the payment instrument anywhere or more correctly we must achieve an adequate critical mass. In the U.K for example few

- Easy to use
- Fast
- Anonymous
- Secure

Reliable

This is fundamental to any payment scheme, in conventional systems we tend to take it for granted but with these new electronic systems which have more direct end user interaction there is far more happening behind the scenes and the scope for problems is higher. A fundamental requirement for electronic payment schemes is to ensure that such problems are managed and that the ability to recognised and recover from errors is a paramount characteristic of the system. Payments which disappear without trace into some black hole are not a recipe for a credible system and yet regrettably we are all aware of how our computer systems are capable of corrupting or losing data.

Low cost

Of course we would ideally like zero cost but in truth every thing has a price including money itself. The objective must be to ensure that the transaction costs are a small fraction of the transaction value. The problem here is that there are so many new payment mechanisms which we are assured have negligible marginal cost. Just a few cents we often hear (those that propose settlement and clearing costs in fractions of a cent don't understand payment systems) but of course many of the new information services we are interested in may themselves attract a transaction value in terms of a few cents. The difficulty here is also one of perception, many people view the use of cash as free. When viewed as a system the facts must speak for themselves, in the U.K the cost of handling cash is estimated at 4.5 billion pounds per year. With electronic systems these costs can be considerably reduced but probably with the penalty of moving the viable cost collection further towards the payment point.

Ubiquitous

people would doubt the critical mass for payments by Visa and Mastercard even though we can sometimes finish a delightful meal in a restaurant

only to discover we have no way of paying. Travelling to other countries can be a quick way of studying the critical mass of payment schemes where cash is often the only sure product. Acceptability is the same requirement by another name but also important is scale-ability. Pilot schemes that can not be economically expanded are pointless.

Fast

How fast is fast? Again its all a matter of perception against the frame work of the payment in a particular application. In a point of sale environment typical electronic payments take a few seconds perhaps 10 seconds if the transaction involves a printed receipt. It is also generally agreed that in such situations there is also a minimum transaction time of 1 or 2 seconds. This is to reassure the user that something has actually happened. Those people used to the heavy loading often experienced on the Internet will probably be happy to except a payment mechanism that can be implemented in a few seconds.

Simple to use

This is a very important attribute, the success of the Internet today is almost certainly due to the introduction of friendly browsers such as that produced by Netscape that operate over the World Wide Web (WWW or W3). One suspects that any successful payments system will have to operate in this environment with the minimum of user interaction. The primary task of the user in this situation is to control the authorisation process. Much more than click and pay is likely to meet considerable consumer resistance.

Anonymous

This is a really tricky one, what do we mean by anonymous? and is it really necessary? The reality of the situation is that with most people in most situations anonymity is not a necessary requirement. However there are always exceptions and with some people this is an emotional subject where anonymity should be assured at all cost. Clearly the use of coins is untraceable and in practice so is the use of notes although we might In many commercial payment scenarios it is usually necessary to authenticate the corresponding business entities and here the problem relates to how the linking between the

observe that since notes are uniquely numbered it would in principle be possible to trace there passage through the payment infrastructure. As we shall see some electronic payment schemes are anonymous while others by their very nature carry the identity of the consumer.

Secure

Well of course this is the crux of the whole problem. If the payment mechanism is not adequately secure nobody will use it. Security is a pervasive property and the requirement is for the payment scheme to exhibit the necessary security properties. The use of the best cryptographic algorithms is pointless if you can easily obtain the cryptographic keys. There are a number of security properties that the payment scheme must achieve,

- Authentication
- Integrity
- Authorisation
- Confidentiality
- Non-repudiation
- Audit-ability

Authentication

Authentication of the parties involved in a payment is not always necessary. When you buy a newspaper with cash from the street vendor neither party cares about the identity of the other. However the news seller does worry about the authenticity of the notes or coins with which the payment is made. In an electronic system where payment is made by the use of security modules whether in the form of a computer or a Smart Card the authenticity of the payment messages are by their very nature dependent on the authenticity of the module that generates the messages. If fact electronic payments are effectively made between security modules where it is necessary for bilateral authentication to be assured.

entity and the electronic terminal is achieved. For example we may be assured that a message comes from a particular security module but how do we know that the authorised user was involved. In

order to achieve proof of payment we need some form of message generated by the recipient that can be used to prove to a third party that payment was received by the intended party.

Authentication services are provided by various cryptographic mechanisms, that we shall describe later. The security of the authentication process is an essential part of the payment scheme.

Integrity

The integrity of both data and messages involved in a payment is an essential requirement. We must be assured that the data in the messages has not been accidentally or deliberately modified and also that the flow and timelessness of the messages is unmodified. When dealing with electronic payment schemes the failure of adequate integrity mechanisms is obvious. A single bit change in a payment value field could have an alarming effect upon the payment. Similarly the successful repetition of value messages would destroy the credibility of the payment scheme.

The integrity of the message data can be assured by the use of appropriate cryptographic mechanisms that we will describe later but the integrity of the messages is dependent on the use of additional controls such as the use of sequence numbers or time stamps. These fields must be similarly protected for data integrity. It is clear that you cannot stop data or messages being manipulated and that all such controls are based on the detection of an integrity failure before the payments are affected.

Authorisation

This security service is often overlooked but it is fundamental to the whole payment process. There is often a dual authorisation process which depends entirely on where the asset is held.

Fig. 1 shows a typical payment model for a cash payment and a payment by cheque. With a cash payment the asset is directly transferred from the consumer to the retailer in exchange for goods (or services) neither the consumer, bank or the retailer bank are involved in this transaction. The authorisation process is effected by the act of the consumer handing over the cash.

The use of a cheque is more complicated. The asset

(cash excellent) is held by the consumer's bank. This bank gives the consumer a cheque book which allows him to write instructions that will eventually result in an asset being passed from the consumer bank to the retailer bank. In this payment architecture there are two authorisation processes. In the first instance the consumer authorises a payment by passing a cheque containing the payment instructions to the retailer in exchange for goods. The retailer submits this cheque to his bank who presents it to the consumer's bank for subsequent payment. This is the second authorisation process where the consumer's bank agrees to make a payment to the retailer's bank. In a practical situation the retailer would like to have the payment authorised before handing over the goods. This is what often happens with an electronic cheque (debit card) where on-line authorisation is obtained by the retailer at the point of sale.

We shall return to this subject again but we should observe now that most electronic payments systems including electronic purses or stored value cards operate in a similar fashion to an electronic cheque. The stored value card sets out to achieve a pre-authorisation process by passing rights to a token (Smart Card) held by the consumer. However it should be noted that even in this case there is a further authorisation process in checking the authenticity of the instruction before the payment to the retailer bank is effected. The Mondex electronic cash scheme is a notable exception in that the asset is transferred directly between the tokens held by the consumer and the retailer. Neither the consumer bank or retailer bank takes any part in the transaction.

It can also be observed that in the case of payment by cheque or any payment that involves a remotely held asset that the holder of the asset must be adequately assured that the owner of the asset gave the appropriate authorisation for the payment. When we consider payment over the Internet we shall see that this is a problem that is difficult to achieve without the use of a security module solely controlled by the consumer. Just encrypting credit card numbers and sending them over the Internet doesn't prove that the payment is authorised in fact there is not any proof that the card holder is involved in the transaction. Here lies the role of the Smart Card.

Confidentiality

The use of confidentiality services varies with the different approaches to the payment mechanisms. Clearly any use of sensitive information such as credit card numbers needs to be carefully controlled. However the payment instructions may not need such services unless they directly lead to the misuse of information about individual consumer payment habits.

When confidentiality services are required they are usually effected by the use cryptographic encipherment mechanisms which we will examine later. For the moment it should be noted that encipherment on its own does not allow the unauthorised manipulation of data to be adequately detected.

Non-repudiation

This is the security property that ensures that the sender of payment instruction can not subsequently deny his actions. In many payment scenarios this is a necessary requirement. In the case of a cheque the signature forms the necessary non-repudiation process and also has the benefit of offering forensic evidence.

The electronic equivalent is a digital signature which we will discuss later but it should be noted now that electronic systems in general fail to provide such forensic evidence. If you take two hand written cheques they will (I the eyes of an expert) be different. If you copy a digital signature it will be impossible to identify which was the original. This is a problem with electronic payment systems where we have to establish controls to prevent duplicate spending.

Audit-ability

With any financial system it is essential that the appropriate audit trails can be established. There are two primary concerns here, one is to be able to prove the correctness of the system and the other is the ability to resolve disputes or error conditions in a way that is acceptable to all parties.

This concept of audit-ability should not be confused with the unaccounted concept of some electronic purse schemes whether inherent such as Mondex or by using a transaction truncation mode which is available in other schemes. Most electronic purse schemes apply a level of

transaction logging which can be used to prove the correctness of the system and to resolve problem conditions. This is quite a different concept to transaction settlement and clearing which is inherent in most electronic payment systems, here Mondex is the principle exception.

L&G Smart Phones for Telenor

An order for "several thousand" chip card payphones has been placed with Landis & Gyr Communications by Telenor AS Norway with delivery starting this year.

The new generation Comet 65 payphones are designed to accept multi-generation prepaid cards, including the new Eurochip and T2G standards, as well as magnetic credit cards. L&G says the payphones can also be upgraded for new and future applications, including electronic purse applications and multi-function cards.

Each Comet payphone can be equipped with L&G's Phoenix security module offering a unique anti-fraud device which encrypts data and locally authenticates the new generation chip cards.

Comet payphones are already installed in the Czech Republic, France and Malaysia and will soon be installed by Telecom PTT Switzerland.

Contact: Rank Kessaratos, Vice President Sales, Landis & Gyr Communications, Switzerland - Tel: +41 22 749 3355. Fax: +41 22 749 3539.

Japan Blocks EP Patents

A group of Tokyo banks spearheaded by Sakura Bank and Mitsubishi Bank are blocking moves by Citibank to have its patents for electronic money technology approved in Japan. The banks have complained to the Japanese patent office that Citibank's claims on proprietary electronic cash technology are too broad and could hamper their

own move into electronic commerce using EMV compatible Smart Cards with an electronic purse to shop in Cyberspace via the Internet (SCN January, 1996).

Citibank has patent protection in The United States and in many other countries but it could be years before the position is resolved in Japan. Meanwhile, Japan is forging ahead with "Smart Commerce Japan" project which has the backing of Japan's Ministry of International Trade and Industry, Visa and Toshiba amongst others. (See *Electronic Purses* -pages 8 & 9).

In addition, Japanese companies are major suppliers to the Mondex electronic cash system pioneered by the UK's National Westminster Bank with Midland Bank and B.T., Hitachi for example, has developed a special advanced chip for the Mondex Smart Card and last month was showing it's latest electronic wallet equipped with a modem to allow Mondex customers to bank on the move.

There has been speculation for some time that Japanese businesses will take a stake in Mondex international a licence the franchise rights.

Smart Card Workshop

Information Technology Training in association with Smart Card News are organising a two day workshop on Smart Cards.

To be held at Herstmonceux Castle, 30th and 31st of May, this workshop will appeal to those who want to understand the technical and commercial applications available now and in the future for this exciting technology.

Contact: Estelle Coughlan, Sales & Marketing,