Multifunction Purse Challenge in Germany

EBS Elektronik Banking Systems GmbH, based in Wiesbaden, is to launch the first electronic purse with a multi-function chip in Germany, plans to issue half-a-million cards this year and set up 3,000 to 5,000 new acceptance points.

Called the P-CARD system and described as "bank-independent," it will be a challenge to other electronic purse schemes in Germany such as the Geld Karte being piloted in the town of Ravensburg by 36 banks. This scheme is being organised by ZKA (Zentraler Kredit Ausschuss) representing the savings, public, co-operative and commercial banks. Other bank-driven electronic purses based on the Europay/MasterCard/Visa specifications can also be expected on the scene adding to customer choice or confusion depending on your viewpoint.

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Smart Card News

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The P-CARD system is being introduced by a partner association consisting of Krone Kommunikationssysteme, Bad Hersfeld, ORGA Kartensystem, Paderborn; Goppinger Datenservice and EBS, Wiesbaden. Dresdner Bank is responsible for handling the clearing and management of trust accounts for service providers. IKOSS VAN, Aachen, is providing the interface software for front- end processing.

WERLTGARANTIE AG, Hannover, is one of the first companies to issue the P-CARD and to set up acceptance points in the consumer electronics sector.

Interest paid on card balance

Consumers pay a one-time nominal fee of 15 DM for the card and are charged 0.80 DM per credit loading transaction (up to maximum of 400 DM) for recharging the card. In a unique move in electronic purse schemes, P-CARD users will receive interest on the balance carried on the card.

A spokesperson for the partner association said "With its numerous distributor and user-friendly supplementary functions and its favourable transaction charges, the P-CARD represents an attractive payment alternative."

Currently, over 78 per cent of payments in the German retail sector are made in cash and the European Business Institute in Cologne estimates that between 12 and 13 billion purchases are made annually for amounts less than 50 DM.

P-CARD is an off-line solution offering businesses reduced communications and lower cash handling costs with the highest possible security standards. With the multi-functional chip, it can provide businesses with a range of opportunities to promote individual customer loyalty, for example, users of a business-specific P-CARD can receive special promotions such as loyalty bonuses, special products for cardholders or reduced parking rates.

Supplementary functions enable the card to be used as a telephone card, pocket money card, pre-paid card, ticket card, customer card with a discount and bonus system and as a data and information carrier.

As an individual employee option, the P-CARD can be used for access authorisation and attendance recording as well as for use in a cafeteria and to store company-specific insurance, service and personnel data.

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Hybrid Card from OTI

On Track Innovations (OTI) of Israel has announced that its microprocessor based Smart Card with both contact and contactless interfaces is now commercially available.

Developed, designed and manufactured by OTI, the new card was introduced by CTS Pacific Technology of Hong Kong at the Cards Asia '96 Exhibition and Conference in Singapore last month.

The card is being marketed by CTS as the Stellar Card. Currently it uses a standard microprocessor chip from SGS-Thomson, France and the SCOS-5 operating system from PC3 of the US. The Stellar Card is capable of providing electronic purse and multi-application features. Machine Authentication Code (MAC) is generated by DES (Data Encryption Standard) keys and the card complies with ISO 7816 Part 4.

Ofer Tziperman, Vice President of Marketing for OTI, said OTI's microprocessor based contactless technology will allow electronic purse schemes from banks and credit card companies to meet the requirements of the huge mass transportation market.

***Contacts: Dr. Thomas Chan**, Managing Director, CTS Pacific Technology - **Tel: +852 2827 0065. Fax: +852 2802 1225**.*

Ofer Tziperman**, Vice President Marketing, On Track Innovations - **Tel: +9726 938-884. Fax: +9726 938-887.

NatWest Pilots University Card

NatWest is to pilot a new multi-purpose Smart Card incorporating a Mondex electronic purse for cashless purchases at the UK's University of Exeter. The new card will be available to over 10,000 staff and students from this October.

The all-in-one card has the backing of both the University and the National Union of Students. The card combines:

* a Mondex electronic purse for cashless purchases in restaurants, bars, shops, vending machines, photocopiers, launderettes and at pay-phones
* printed student details and photograph
* library card
* access control card, allowing access to buildings
* voting card, allowing students to register their vote in the local student elections
* discount card, providing a range of savings on goods and services inside and outside the University

Sir Geoffrey Holland, University Vice Chancellor, says "A University is the ideal location in which to test this exciting new concept and Exeter is glad to work with NatWest to develop its potential. The Smart Card will provide us with new opportunities to improve administration and to enable students and staff to manage their cash more effectively."

Patrick Boylan, Managing Director for Card Services, NatWest UK, says the NatWest University Card is the most advanced card of its type in the UK, replacing a handful of existing cards with a single, secure and easy to use Smart Card.

The scheme has been welcomed by the National Union of Students. Shelley Wright, NUS Treasurer, says the multitude of functions available to the card will allow much greater flexibility in student administrative matters and even pass on financial efficiencies and savings to their benefit.

Contact: Paul Lockstone**, NatWest UK - **Tel: +44 (0)171 920 5010.

Interoperability Test in New York

Interoperability between MasterCard and Visa independently developed stored value cards called MasterCard Cash and VISA Cash will be tested for the first time when they are introduced in the New York City market in the last quarter of this year.

Chase Manhattan, Citibank, MasterCard and Visa have announced a pilot programme which will involve the banks issuing about 50,000 cards in the Manhattan area where they will be accepted by some 500 merchants. These merchants will accept the cards of either brand in the same terminal.

The cards are designed for payments under US $20 and the reloadable stored value function is added to an existing credit or debit card and can be used for small purchases made at news stands, fast food restaurants, pay-phones and gas stations.

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Advance Licences Transcard

Advance Bank Group in Australia has licenced the Transcard Smart Card electronic purse system from its developer, Card Technologies Australia following the successful trial of the card in Sydney involving Bank SA, a member of the bank group.

Transcard is a multi-application contactless Smart Card with the capacity to operate a stored value electronic purse, load tickets and passes and run incentive reward loyalty programs on one card. The agreement provides for Advance Bank and Bank SA to issue the card and be an acquirer of the payment transactions. It is expected that the first cards could be issued by the second half of 1996.

Advance Bank is to add the Smart Card applications of reloadable stored value, tickets and incentive reward loyalty programs to their existing debit and credit cards.

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Mars Moving into Smart Vending

Mars Electronics International (MEI), the worldwide vending and cashless payment systems company, is moving into Smart Card technology which it describes as an "area of strategic development" and has signed an exclusive worldwide technology licensing arrangement with DigiCash BV to provide access to their advanced reader technology.

The deal will enable MEI to offer DigiCash Smart Card based products to complement and expand its existing range of payment solutions.

MEI, with 12 years' experience in cashless markets and its current Multicard magnetic stripe technology product, has been working with DigiCash over the last year on a programme of Smart Card reader development and manufacture and plans a new product range as well as the setting up of several joint venture programmes utilising Smart Card technology.

DigiCash, specialists in cryptographic and Smart Card technology, has developed several unique products including e-cash the Internet secure payment product. Managing Director Dr David Chaum, commenting on the deal with MEI says he is enthusiastic that they have chosen not just to commercially exploit this product, but to invest significantly in its on-going development.

Nick Habgood, MEI's Marketing Manager, says the deal with DigiCash will give MEI a Smart Card platform upon which they can base a series of products. He confirmed that they were "investing strongly" in the venture.

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MC in Talks with Mondex?

Rumours that MasterCard would like to take over the Mondex electronic cash system came to the surface this month with a report in the Lafferty Group publication *Cards International* that proposals will be put to the June meeting of MasterCard's international board. Neither MasterCard nor Mondex would confirm that they are in take-over or alliance negotiations.

MasterCard said they never commented on industry rumours while Mondex said they could not comment on speculation and that all negotiations with other parties are confidential.

Certainly Mondex is regarded technically as the flagship amongst the world's electronic purse schemes, is keen to recoup its multi-million development costs and MasterCard could provide the global network Mondex is endeavouring to establish. MasterCard strategy indicates, however, that a precondition of any agreement would be for Mondex to become EMV compliant and the card issuer would be decidedly uneasy with an unaccounted system and no audit trail. No doubt Visa, MasterCard's rival and EMV partner, is worried by rumours which could leave it out in the cold and prevent a possible alliance with Mondex.

DigiCash Sets up in Australia

DigiCash Inc. has announced the formation of a subsidiary - DigiCash Pty Limited - in Sydney to support its current operations in Australia and to serve as a business development bridgehead.

Dr David Chaum, Managing Director of DigiCash Inc and inventor of e-cash, says the introduction of e-cash would boost Internet commerce in Australia. An Australian service provider could allow local Internet users easy access to goods and services being traded for e-cash worldwide. Australian business would be better able to sell goods and services to a global market using e-cash as a way of receiving payments.

The e-cash system is currently in use by Mark Twain Bank in the USA. Last month, EUnet, the largest European Internet service provider, started issuing e-cash in co-operation with Merita Bank, Finland's largest commercial bank.

DigiCash is planning to work with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in stimulating interest for Internet-based electronic commerce.

Contacts: Andreas Furche**, DigiCash Pty Limited, Level 29, Chifley Towers, 2 Chifley Square, Sydney, Australia NSW 2000. **Tel: +61 2 375 2316. Fax: +61 2 375 2121. Paul Dinnissen**, DigiCash Amsterdam - **Tel: +31 20 665 2611. Fax: +31 20 665 1126.

Electronic Purses: A Comparative Review - Part 9

It is less than four years ago that Denmark launched the trial which lead to the first Smart Card electronic purse scheme in the world. Today there are some 35 national or international electronic purse schemes in operation or in trial and development stages.

From figures provided in this survey it would appear that there will be around 11 million electronic purse cards in use around the world by the end of this year with huge potential growth by the year 2000 bearing in mind that many of the schemes are still in pilot stage or under development. Austria forecasts 6-8 million cards, Belgium 6-7 million, Singapore 9 million and South Africa 15 million but it is too early yet to forecast figures for major players like Europay, Visa, MasterCard and Mondex.

The pioneering project in Denmark caused great excitement amongst the financial institutions which sent their representatives to the trial town of Naestved, 70 kilometres south of Copenhagen to make their own assessments.

Smart Card News itself commented "The scheme has attracted attention from observers all over the world, and many are asking the same question Can this relatively small country, with a population of just over five million, succeed in such a massive and costly undertaking? This is a particularly pertinent issue when the scheme is aiming at very small transactions of between 3Kr and 7Kr."

There are three key elements in the scheme. It's now proven strength is derived from co-operation between the financial and telecommunications industries which in the form of TeleDenmark and PBS (Danish Payment Systems Ltd) representing Danish telephone companies and banks/savings banks, joined forces to set up DANMØNT A/S to develop and operate the scheme.

Secondly, was the decision to have an "open system" with one "system operator" providing independence between card issuers and service providers. This enables small merchants to obtain access to the system. Thirdly the strategy was to implement the scheme in five distinct stages with success viewed in the long term.
A measure of DANMØNT's success is the fact that the card is now used in 39 cities throughout the country to replace cash in a wide variety of services - telephones, laundries, canteens, parking meters, stamp postage machines, fast food outlets, convenience stores, chargers for electronic cars, and mass transit ticket dispensers.

Another success is that Visa licensed DANMØNT's Stored Value Card specification to incorporate part of it in its own SVC systems currently being launched.

PROTON success

Banksys, developer and operator of the Belgian electronic purse PROTON, has supplied cards and PROTON technology for the Dutch national electronic purse project, Chip Knip (chip purse).

It has also sold the technology to Telekurs in Switzerland; to ERG Australia for the Quicklink consortium for use in Australia, Hong Kong and New Zealand; and MITEL for use in the Brazilian electronic purse also named PROTON.

A feature of the scheme is that Banksys itself developed two new types of payment terminals for service providers - a terminal for small retail outlets in a fixed or portable/cordless version; and an integratible module for vending machines, automatic ticket dispensers, parking meters and pay-phones etc. so it is able to offer a complete service.

Banksys is the operator of the Belgian national network for electronic payment Bancontact/Mister Cash which has its own card. At a later stage it is probable that both means of payment will be joined in one card.

Who is supplying the cards?

All the major contact Smart Card fabricators are involved in various schemes and as these grow it is likely that system operators will dual source their supplies. Gemplus has won most of the initial contracts with CP8 Transac scoring successes with their electronic purse card and a recent order from Interpay for four million cards for the Chip Knip national roll-out.

Contactless card purses

Italy's Cassamat NEWCASH system uses contactless cards from VERON SpA while in Australia the Transcard scheme uses Mikron contactless technology. To date, contactless technology has found its main use in public transport, access control and security applications in relatively low volumes, but current interest in the development of combined contact and contactless cards, or hybrid cards, may herald changes in the electronic purse scenario if operators wish to extend the range of their value added services to the lucrative public transport sector.

Rival schemes

In some countries, notably Australia, rival schemes have been launched in direct competition with each other. Quicklink SVC was the first to be announced, but Transcard was the first in the field with pilot trials in March 1995 and has started national roll-out in Sydney's Great Western transport corridor and plans to extend to other major cities. VISA Cash is still in major pilot stage on Australia's Gold Coast while MasterCard Cash has started a nine-month pilot in Canberra.

Germany's recently announced Geld Karte backed by the banks, already has a serious competitor in the P-CARD backed by a commercial partnership. The P-CARD features a multi-function chip and is also the first system to offer customers interest on the balance held in the electronic purse - a move likely to cause card issuers to review their charges and offerings to the consumer.

In Italy, there is Cassamat, an electronic purse launched by 52 rural banks locally, and MINI PAY which plans to have more than double Cassamat's 1997 card target by the end of this year. MINI PAY does not consider it is competing with Cassamat which is aimed at a different and more localised market.

Spain has serious contenders in SEMP the Spanish EP operated by a Spanish banking consortium with a card target of "several million" by end 1996, and VISA Cash backed by Visa Espana financial institutions including some of the countries biggest banks aiming to issue one million cards by the end of this year.

There are two schemes in Switzerland. The Swiss commercial banks are planning to issue three million CASH electronic purse cards implemented on the Eurocheque card next year in a scheme which will be operated by Europay Switzerland.

However, discussions are taking place with the Swiss PTT as the service provider for Switzerland's first electronic purse scheme, POSTCARD, to find a common basis of operation. It is likely that POSTCARD will follow the bank standard so that there will be one national electronic purse.

In the USA, MasterCash SVC and VISA Cash will compete with schemes based on the EMV (Europay/MasterCard/Visa) specifications designed to provide interoperability.

Need for co-operation

Co-operation, not competition, is the route most other schemes have taken following Denmark's role model. At the time of the launch, DANMØNT's Managing Director Henning N Jensen, commented "If you cannot co-operate you cannot get low cost. So even the biggest bank and the smallest savings bank are theoretically having the same unit cost in Denmark on their payments because you are not killing your competitor on payment systems".

"You have to find ways of co-operation between the major parties behind the card because if a bank issues it or the banking industry, they will not succeed.

Finland last year moved to ensure a national electronic purse when the country's three largest commercial banks took over the running of the AVANT card scheme. They set up a joint electronic purse company Automatia Rahakortit Oy and acquired the company running the scheme, Toimiraha Ltd from the Bank of Finland. It is planned to combine the experience of Toimiraha with the branch and ATM networks and customer base of the banks. All retail banks have the right to join the system.

Eino Halonen, Chairman commented "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."

Interoperability is a key issue

The success of any Smart Card scheme depends on having a critical mass of outlets at least sufficient to warrant the scheme being introduced in the first place. There is not much fun or convenience from the customers point of view in having the latest card technology if there are few places to use it.

Retailers, large and small, will only be persuaded to join a scheme if it encourages customer loyalty and brings financial reward so they want terminals which can read all cards which means interoperability of systems.

The big card issuers only just entering the arena have been researching the use of Smart Cards for years while relying on magnetic stripe cards and on-line authorisation. Following Denmark's lead, other countries began launching their own electronic purses and the financial institutions and card issuers became more apprehensive about losing market share. They became even more alarmed at the prospect of losing business to non-financial organisations such as public transport and government road pricing programmes.

Finally, Mondex announced its global electronic purse, the first unaccounted replacement for cash this allows the potential for low overheads by avoiding the need for a clearing and settlement system.

In unprecedented co-operation, Europay, MasterCard and Visa produced the EMV specifications for the interoperability of Smart Cards in the financial sector. Not only did they produce the specifications in an unbelievably short time, they have "raced" in banking terms to However, large value transactions are a different matter and the electronic purse offers a secure and non-obvious way of carrying "cash." An example of this can be found in Nigeria where Allstates Trust Bank is piloting an electronic purse system market with several major pilot schemes.

No doubt the EMV move halted individual banks from going it alone and in a way forced them into waiting for the "collective wisdom" from the organisations of which they are members. EMV has brought sense, direction and impetus onto the electronic purse scene worldwide and has probably gone a long way to preventing chaos which would have stalled the development of Smart Card applications in general and the electronic purse in particular.

The first public test of interoperability starts in the fourth quarter of this year in New York and involves Chase Manhattan, Citbank, MasterCard and Visa. The banks will issue about 50,000 stored value cards to consumers in the Manhattan area and will test the MasterCard and Visa independently developed and different stored value products called MasterCard Cash and VISA Cash. The pilot will allow merchants to accept the SVC cards from either brand with a single merchant terminal.

Clearly, interoperability is a major concern for financial institutions and retailers, but for card users, other than international business travellers, it is not a vital concern except that it encourages more outlets to participate.

The ordinary card user will use his or her electronic cash locally and perhaps as far away as the next town. It is of little personal concern that the same card can be used in other countries unless the cardholder is on holiday there or travelling on business. After all he can use his credit card to draw cash at an ATM or at a bank in the currency of the country visited and have the value deducted from his bank account at home.

Of course, one of the attractions in theory of the electronic purse is its capability to hold several different currencies in separate sections of the purse. In practice this feature is not much use for low value transactions unless there is interoperability and the critical mass of outlets mentioned earlier.

called the Electronic Smart Card Account which is used by the bank's most important customers to carry large amounts of value without the risks associated with carrying cash. They can download value to the card from their bank

accounts (up to 16,000,000 Naira - more than £100,000) which can be used for purchases at retail and wholesale merchants or cashed at any Allstates branch.

Another example is Necor's Megalink electronic wallet carried by delivery drivers working for South African Breweries (SAB), often a target for hi-jackers. Customers pay for their beer consignments with a Megalink card. The average monthly turnover with SAB is estimated at R40 million, with high average transaction values.

These are exceptions to the electronic purse concept which is aimed at payments for small value transactions to take cash out of the system.

Security is the vital issue

Security is an issue which affects all parties - card issuers, service providers, retailers and consumers - all of whom want to be assured that their money is protected by security systems which cannot be tampered with and cards counterfeited as has frequently occurred with magnetic stripe cards.

Personal Identification Numbers (PINs) are used extensively for loading value into the card purse but are not normally used for making low value purchases as the systems are designed to be off-line. There are, however, some interesting variations. Mondex, for example, has a neat system enabling the cardholder to use a personal four-digit code as a protection device to lock the card so that it has no value if lost or stolen. In Indonesia, the SMARTBRI EP and Passbook can have up to three PINs for a family to share a card.

In most systems transactions can be tracked so if a card is lost or stolen the owner can be issued with a new card and reimbursed with the value that was on the card at the time it left his or her possession. This is not the case with Mondex which is an unaccounted system in which money is the same as the cash in your pocket. Mondex users can have an electronic wallet to which money can be transferred from the card to other cards.

In the PROTON system no PIN is involved and cardholders can lend the cards to anyone they choose. As there is no PIN protection the cardholder is not reimbursed if the card is lost or stolen and is expected to look after his card in the same way he takes care of his cash.
Cards in the various electronic purse schemes range from pre-paid throw-away cards to reloadable Smart Cards with 1K bytes to 8K bytes of EEPROM.

The majority use the US Data Encryption Standard DES as their security algorithm while the PROTON card and the cards in the other countries which have adopted this system, employ Triple DES. Europay's Express card uses RSA public key, DANMØNT has a Secure Application Module (SAM) to authenticate the card user, Mondex has developed a Secure Value Transfer Protocol via a digital signature scheme.

Several systems, notably PROTON, Mondex and Express have chips with a co-processor enabling advanced cryptographic features to be calculated at high speed by application software.

Security standards for the Internet

Europay was the first organisation to announce it would launch a card, called Express, for low value purchases of goods, services and information on the Internet. Many other financial institutions, including Mondex, have since said that they will offer services on the Internet.

One of the biggest projects will be in Tokyo, Japan where a consortium headed by Toshiba Corporation and Visa International plan to issue 300,000 Smart Commerce Japan cards for use on the Internet.

The cards will be Visa credit or debit Smart Cards (for major purchases) with an electronic purse (for small transactions). Plans include the building of a number of virtual-mall kiosks in public places to enable those who do not have a home PC to go shopping in Cyberspace.

Here too, security is vital as the Internet is notoriously insecure. MasterCard and Visa are currently developing a technical standard called Secure Electronic Transactions (SET) to enable consumers and merchants to conduct bank card transactions on the Internet and they expect that banks will offer secure bank card services to their cardholders in the fourth quarter of this year. A number of companies are involved in SET

including RSA Data Security which has developed encryption technology for the project.

Smart Driving Licence

Argentina has become the first country in the world to introduce a Smart Card driving licence and French card manufacturer Gemplus says the scheme is being watched with keen interest in other countries, including China where similar projects are being studied.

The scheme has been introduced in the Mendoza province of Argentina labelled as having the highest accident rate in the country and a poor record of paying fines with only about 30 per cent being eventually recovered.

Faced with carnage on the roads, rising traffic levels, increasing incidents of careless driving with culprits ignoring verbal cautions and often displaying rude or aggressive behaviour and failing to pay on-the-spot fines, the provincial government decided to introduce Smart Card technology to combat these problems.

Talsud, an Argentinean systems integrator specialised in ID applications, implemented the solution which is enabling the Mendoza authorities to keep a closer track of driving habits and repeat offenders and to control on-the-spot fines and offences. It is anticipated that they will recover more than $10 million of unpaid fines per year.

To obtain or renew a licence, the driver has to complete an application form at the provincial Driving Licence Service. The information is entered on a database and a Smart Card is issued containing the licence number and type, personal details and photograph. The administration can also choose to include emergency medical information such as blood type and allergies and biometric data such as a thumbprint.

In addition to this traditional and fixed data requirement, "living" information concerning the driver and driving record is initialised before card delivery and can be changed and updated at any time during the card's life, for example with driving offences and fines. This makes it easier to ensure that fines are paid and means frequent offenders or non-payers can be penalised.

The Mendoza police are equipped with hand-held readers to access the data stored in the card and can either read information from the chip and/or update it if necessary. Depending on the severity of the offence and/or unpaid previous fines, immediate payment may be demanded, the driving licence confiscated or the car may be impounded. Police also hope to prevent accidents by keeping a closer track of potentially dangerous drivers and making them more aware of the risks to themselves and other road users.

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Contract for 22.5m Phonecards

Solaic, the Smart Card subsidiary of Groupe Sligos is to supply at least 22.5 million phonecards over an 18-month period in 1996 and 1997 to Deutsche Telecom and the Dutch PTT Telecom.

Announcing the renewal of its contract with the two telecoms, Solaic said the cards will be supplied with the Eurochip, a second generation integrated circuit. In 1995, Solaic was the first to manufacture this type of phonecard for the two telecom carriers.

***Contact: Caroline Eygonnet**, Solaic Smart Cards*

L&G Smart Phones for Telenor

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

The new generation Comet 65 pay-phones 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 pay-phones can also be upgraded for new and future applications, including electronic purse applications and multi-function cards.

Each Comet pay-phone 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 pay-phones are already installed in the Czech Republic, France and Malaysia and will soon be installed by Telecom PTT Switzerland.

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Chief Executive for GiroVend

Nick Rowe, Managing Director Diners Club International until 1993 and recently Chief Executive of Harpur International, has been appointed Group Chief Executive of GiroVend, the London-based UK cashless systems group part owned by Coca-Cola Enterprises Inc.

Collectors and consumers of DANMØNT cards have voted a Donald Duck card as the most beautiful produced in 1995. Danish licence holder and distributor of Disney products, Seriforlaget, bought an advertisement on the card from the Donald Duck magazine. Second in the competition was a card issued by Vordingborg Bank with a local scenic view by the sea at sunset, third was a card issued by DANMØNT to celebrate the royal wedding in Denmark.

SmartCampus System for Florida

A SmartCampus system offering multi-purpose, secure Smart Card applications to colleges and universities will debut at Florida State University in the United States in the second quarter of 1996.

The new system brings together Florida State University's Card Application Technology Centre, MCI Corporation as systems integrator, V-One Corporation, a provider of network security technologies, Debitek Inc., developer and manufacturer of Smart Card readers and revalue stations, Product Technologies Incorporated, developer of turnkey, secure, financial Smart Card solutions, notably its SmartCity stored value architecture and Gemplus Cards International, the leading supplier of Smart Cards and personalisation systems. The intention is to offer the system to other colleges and universities as well as for commercial applications.

SmartCampus combines Smart Card technology, secure Internet access, flexible electronic financial transaction capabilities, an array of card readers and point of sale devices and university systems integration to form a multi-purpose Smart Card-based ID system.

Students will be able to access their records, information and services such as the Internet for financial services, distance learning and electronic publishing. Other applications include stored value purchases for fast food restaurants, public transportation, telephones and vending machines.

Bill Norwood, Executive Director of the Card Application Technology Centre, says "This unprecedented move could reshape the campus card market. These six leading technology groups have the collective power to advance the use of Smart Cards and security technology in a way never seen before."

According to Florida State University President Sandy D'Alemberte "Very soon our students will be able to securely conduct university business from dormitory rooms, computer labs and home PCS."
SmartCampus uses a multi-purpose, multi-functional integrated circuit Smart Card with security of applications made through authentication, encryption and database access control.
Dual authentication first establishes permission to use the card, then determines eligibility for the card and its owner to gain access to information.

The Card Application Technology Centre at Florida State University is a leading developer of ID systems in the campus environment and was the first to develop and demonstrate many of the innovations that characterise today's campus one-card systems and has helped hundreds of other institutions implement advanced card systems. Currently 40,000 students, faculty and staff use the University's dual magnetic stripe system which serves as an ID, access control card, library card, food and vending card, ATM, point of sale and telephone calling card. In the Autumn term last year, more than half of the students receiving financial aid carried the money on the card - a total of nearly US $30 million.

Renewed interest in campus systems

There has been a renewed interest in student card systems by both technology companies and the education authorities recently. IBM's multi-function microprocessor card is being issued to 20,000 students at three Dutch universities in a one-year pilot scheme which may lead to the cards being issued to all 700,000 university students in The Netherlands (*SCN October 1995*).

Schlumberger Danyl announced at the end of last year its SingleCard system for university campuses (*SCN December 1995*) and in this issue (*see page 64*) we report on NatWest's University Card being piloted at the University of Exeter in the UK.

In addition to providing student ID, the cards offer access control to buildings and computer systems, cashless payments for goods and services etc while streamlining the campus/university administration system and reduce operating costs. The cards can also provide a convenient way of holding student education grants.

Contacts: Bill Norwood**, Card Application Technology Center - **Tel: +1 904 644 2880. Kristen Barletta**, MCI - **Tel: +1 703 902 6094. Ron Farmer**, Debitek - **Tel: +1 423 894 6177. Luke Weinstein**, Product Technologies - **Tel: +1 860 343 1500 ext 225. David J Jordan**, V-One - **e-mail - djordan@v-one.com. Charles Cagliostro**, Gemplus (US) - **Tel: +1 301 990 8800.

INGENICO Acquires EPC/EPOS

Groupe INGENICO, which took over Innovatron Data Systems' activities in February to open up its East European markets, last month acquired the German group EPC/EPOS which designs, manufactures and sells electronic payment terminals and manages an installed base of 15,000 machines.

The acquisition of the Hamburg-based company gives INGENICO a base in three countries: Germany, Switzerland and Austria.

INGENICO has its sights on the "very promising market across the Rhine." After the health card and telephony, it sees the payment sector developing through the extension of chip bank cards.

"The German market looks like the most promising market in Europe for the years to come," says the company. "German banks have decided to replace the Eurocheque system by a chip bank card fitted with a reloadable electronic purse. Estimates show that 55 million cards and one million Electronic Payment Terminals will be issued by the end of the century."

EPC is one of the selected partners to supply terminals used for the German pilot scheme in Ravensburg involving chip bank cards and 1,000 terminals.

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

New MD for Mikron

Roland Koo (39), founder in 1987 of Mikron and Managing Director, left the company at the end of last month for health reasons. Koo, who developed Mikron into one of the most innovative companies in the Radio Frequency identification and contactless Smart Card industry, will remain available to the company as an advisor.

He is succeeded by Günter Schlatte (32), who has been with Mikron for over five years in a variety of management positions, latterly as Director of Sales and Marketing.

Mikron is a wholly-owned subsidiary of Philips Semiconductors and Kees Hage, General Manager of the Philips Semiconductors product group Identification and Automotive and responsible for Mikron, says he will appoint a second Managing Director later this year to support future growth.

Contacts: Dr. Wilfried Truppe**, Philips Corporate Communications* - ***Tel: +43 1 60101 1458. Fax: +43 1 60101 1500. Martin Bührlen**, Mikron* - ***Tel: +43 3124 299 210. Fax: +43 3124 299 270.

ACI / Mondex Agreement

Applied Communications, Inc. (ACI), of Omaha, Nebraska, USA, has signed an agreement with Mondex which will allow both companies to co-operate in the joint promotion and sharing of development information to assist customers deploy the Mondex electronic cash scheme being introduced by banks around the world.

ACI provides applications and networking for many of the world's leading financial institutions and its expertise in the electronic payment arena is important to the Mondex product and service requirements.

Judy Prusa, Vice President of Corporate Marketing at ACI, says "Nearly 300 institutions use ACI's proven BASE24 software for electronic payments. Our customers are now asking us to consider value-added extensions to our product line to enable them to participate in the Mondex scheme and we are committed to supporting those initiatives."

Sonia Reed, ACI's Senior Product Manager, says they are evaluating product functionality and addressing compatibility issues with Mondex. "The goal is to ensure the technology's interoperability across diverse business applications and to integrate these features into the customer's existing BASE24 infrastructure," she says. "Thus our customers can better leverage their existing retail delivery capabilities to add new products and services."

Mondex Chief Executive Tim Jones, says ACI's extensive experience with financial institutions around the world will be especially important to Mondex as a global payments system.

Contacts: Ann Freestone**, Applied Communications, Inc.* - ***Tel: +1 402 392 8246.

Robin O'Kelly**, Mondex - **Tel:+44 (0)171 726 1957.

PCMCIA Smart Card Reader

A PCMCIA-compatible reader offering a secure and cost-effective bridge between Smart Cards and the notebook PC, has been announced by Schlumberger Electronic Transactions.

Called Reflex 20, the reader provides universal support for a wide range of Smart Cards including the new EMV (Europay/MasterCard/Visa) specifications for chip cards and simplifies access to and the development of, applications in the telecom, health and transportation markets. It also enables the high level of data protection offered by Smart Cards to be used to ensure secure payment transactions over the Internet and other information highways.

As an example, Schlumberger says that by adding Reflex to a notebook PC, health professionals can read Smart health care cards during home visits to patients as well as at the hospital, clinic or surgery. Secure e-mail links could also be established quickly through the use of Smart Cards by both sender and receiver, enabling messages and files to be encrypted and transferred across the Internet or private data networks in total confidentiality.

Reflex 20 conforms to PCMCIA form factor Type II extended - making it compatible with almost all PCMCIA slots fitted to PCS - and is capable of accepting Smart Cards to ISO 7816-1/2/3 T0, T1 and T14 standards.

Contact: Isabelle Ferdane-Couderc**, Schlumberger Electronic Transactions - **Tel: +33 1 47 46 70 20. Fax: +33 1 47 46 68 66.

ProLine Self-service Systems

Siemens Nixdorf Information Systems has launched the ProLine range of advanced self-service systems for financial institutions, public authorities and service providers.

ProCash 400 is an entry-level automatic cash dispenser for fast indoor cash service and is suitable for small bank branches and as an extension to existing installations. It comes equipped with encrypting PIN-pad, Smart and magnetic card reader, receipt printer and four banknote cassettes.

The ProLine series is based on PC technology and includes the ProService system for transactions, the ProInfo multi-media terminal with sound and video and the ProPrint customer information printer.

Contact: Chris Maycock**, Self-Service Line of Business, Siemens Nixdorf Information Systems - **Tel: +44 (0)1344 862222. e-mail: cmaycock@sni.co.uk

ORGA on the Internet

ORGA, one of the market leaders in Smart Card technology, can now be located on the Internet **http://www.orga.co.uk**

By connecting to the Welcome Page a whole database of information can be accessed under six broad subject areas including ORGA company profile, Smart Cards, products and services and applications. This includes introductions, technical analysis, features and recent press releases.

A feature of the Home Page is an educational tutorial section providing a guide to Smart Cards, personalisation and other related areas. Registration allows the user to contact ORGA via the Internet and request information on any subject area.

Contact: Simon Reed**, Business Development Manager, ORGA Card Systems (UK) - **Tel: +44 (0)1491 410997. Fax: +44 (0)1491 410295.

Hypercom International Formed

Hypercom, Inc., manufacturer of point of sale terminal products and networking systems with its corporate headquarters in Phoenix, Arizona, USA, has formed a new corporate subsidiary, Hypercom International, Inc to manage the sales, marketing and technical support for its international subsidiaries and distributors.

Jairo Gonzalez, who was President of Hypercom Latino America, has been appointed President of the new company and will lead the senior management team taking over the work previously carried out by several separate subsidiaries.

***Contact: Mary Ann Lawson**, Hypercom*

Smart Card Diary

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.

Retail Solutions, National Exhibition Centre, Birmingham, UK, 14-16 May.

Europe's leading retail technology event with over 200 exhibitors, free exhibitor seminars and an international conference with key speakers from around the world. Emap Business Communications - Tel: +44 (0)1203 695929. Fax: +44 (0)1203 421214.

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

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

Information Technology Training in association with Smart Card News 30/31 May, Herstmonceux Castle in Sussex. Intensive hands-on technical workshop - Tel: +44 (0)1273 626677

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

Three-day trade exhibition and a multi-streamed conference organised by the Asia Pacific Smart Card Forum and AIC Exhibitions to cover Smart Cards, Stored Value Cards and electronic purse, co-branded/loyalty cards and procurement cards. Erika Morton, AIC Exhibitions, Australia - Tel: +61 2 210 5704. Fax: +61 2 223 9216.

ICMA 6th Annual Card Manufacturing Expo, Bermuda, 21-25 October.

The annual gathering of the International Card Manufacturers Association which has taken "The Globalisation of the Plastic Card Industry" as this year's conference theme. Lynn McCullough at ICMA - Tel: +1 609 799 4900. Fax: +1 609 799 7032.

*International - **Tel: +1 602 504 5333.***

Czech Bank to Launch Purse Card

Czech bank Investićni a Poštovní Banka (investment and postal bank) is to launch a Smart Card system combining debit card and electronic purse functions on the same card. The contract has been won by Innovatron Data Systems (IDS), the new subsidiary of Groupe INGENICO following an invitation to tender.

IDS is to supply more than 3,000 terminals and one million microprocessor cards in several stages until the end of 1997. According to IDS, the agreement they signed with Europay International last February to develop in Eastern Europe the first electronic purse complying with EMV specifications, persuaded the Czech bank of its ability to upgrade the system to EMV standards.

The new card will identify the holder at post office counters to obtain personal information such as a bank statement. Initially, the debit account will be used only in post offices whereas the electronic purse account is meant to be used at merchant outlets. Eventually, both accounts will be used in the Czech post offices as well as at retail outlets.

The system will use the Pocket Book cards of Solaic, IDS's partner, TPScam 1000 terminals and software, the second generation FUNCHIP Payment front office and MAGIX back office (running under Unix and Informix). The software has been developed by IDS in partnership with its Moroccan subsidiary M2M and Sligos.

Moravan, a subsidiary of the Czech bank, will ensure the personalisation of cards, the installation and sub-contracted production of terminals and the management of the processing centre.

Contact: Geneviève Bœuf**, IDS - **Tel: +33 1 46 25 82 87. Fax: +33 1 46 25 82 71.

New Marketing VP for DataCard

Keith Clayton has been appointed Vice President of Marketing for DataCard Corporation's expanded systems integration business unit. Previously he was Vice President of Marketing for the company's Americas sales group. DataCard, best known for its card issuance systems and transaction terminals,

plans to promote its expertise in systems integration worldwide.

Electronic Commerce and Payment Mechanisms- Part 2

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 of 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 instructions cannot 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 (in 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.

Cryptographic Security Services

There are three primary security services that must be provided to achieve the necessary security controls for electronic commerce,

-Authentication
-Data Integrity
-Data Confidentiality

These services are provided by the use of two classes of cryptographic algorithm, symmetric and asymmetric. The difference between these two different types of algorithm can be appreciated by reference to *figure 2*.

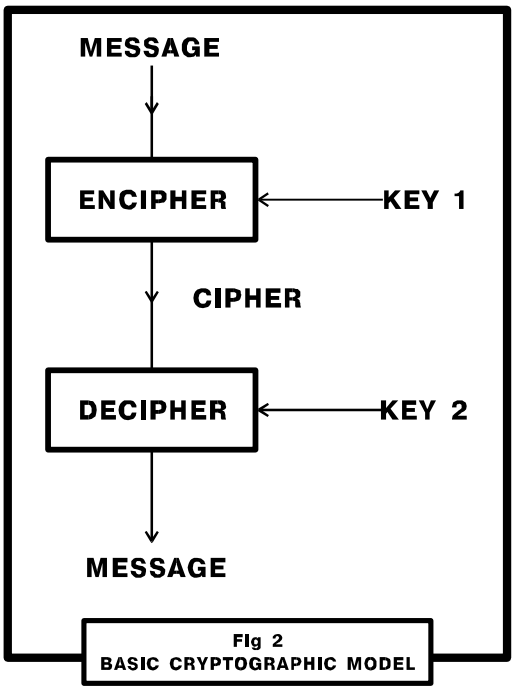

Fig 2
BASIC CRYPTOGRAPHIC MODEL

The message can be enciphered by a cryptographic algorithm using key 1 to produce a cipher. The original message can be recovered by using key 2. If key 1 is equal to key 2 then this class of algorithm is called a symmetric cipher. In other words the sender and receiver of a message must share the same common key which clearly must be kept secret. Well-known symmetric cryptographic algorithms include:

-DES (Data Encryption Standard)
-IDEA (International Data Encryption Algorithm used by PGP, Pretty Good Privacy)
-RC4 (Ron's 'Rivest' Code 4)

When Key 1 is not equal to key 2 we are dealing with an asymmetric class of algorithm. These are often referred to as public key algorithms since in many cases only the decipherment key 2 needs to be kept secret. Well known asymmetric algorithms include:

- RSA (Rivest, Shamir and Adleman)
- DSA (Digital Signature Algorithm - NIST)
- El Gamal
- ESIGN (NTT Japan Digital Signature Algorithm)

As we shall see later most security schemes for electronic commerce use a combination of symmetric and asymmetrical algorithms. The asymmetric algorithm is used for the cryptographic key management and for creating digital signatures whilst the symmetric algorithm is used for ciphering data as part of a confidentiality security service.

David Everett

Part 3 of Electronic Commerce and Payment Mechanisms next month.

German Model Patient Data Card

A patient data card is being introduced in two German cities. It will be piloted first in Neuwied, a county seat near Koblenz, on the Rhine River, with some 50,000 inhabitants, 100 private practice physicians and 25 pharmacies. After successful introduction, the test will be expanded to Andernach, a city roughly the same size as Neuwied, on the opposite bank of the Rhine.

The patient card is being introduced by the Kassenärztliche Vereinigung Koblenz in co-operation with the Zentralinstitut für die kassenärztliche Versorgung in Germany and the Bundesvereinigung Deutscher Apothekerverbände to solve the technical, organisational and well as the contractual, logistic and data protection problems related to patient cards in Germany.

Germany already has a statutory Health Insurance Card with a memory chip containing only basic, statutorily prescribed information such as name, address of the insured, health insurance number, birth date and the expiry date of the card. In contrast, the patient card should eventually contain all of an insured individual's relevant medical information on the patient's condition such as chronic diseases, completed operations, continuous medications and allergies.

In addition to giving health care professionals continuous access to basic health status information and on-going medication, the card can enable a quick response to a patient's needs in an emergency situation. It will also carry information on the patient's primary care physician and who to notify in an emergency.

Described as a "model project," the Koblenz card will be a microprocessor card from Gemplus with 8K bytes of EEPROM and a PIN protection option. It will only be available on a voluntary basis and the insured person has to formally give written consent to the capture of information on the patient card.

Contacts: Dr Gerhard Brenner**, Zentralinstitut für die Kassenärzliche Versorgung in der Bundersrepublik Deutschland - **Tel: +49 221 40 05 124. Fax: +49 221 40 80 55. Andreas Fuchs,** Gemplus GmbH - **Tel: +49 71 58 1 85-00. Fax: +49 71 58 1 85-1 70.

Asia-Pacific will overtake Europe

The European market-birthplace of Smart Card technology and consumer of 90% of the world's Smart Card output to date - will be overtaken by Asia-Pacific by the year 2000.

This prediction comes from Schlumberger Electronic Transactions which has opened a new technical centre in Hong Kong.

Schlumberger argues that the Asia-Pacific region is the fastest growing market in the world for Smart Cards as its young economics invest in building new commercial infrastructures and can move directly to the most advanced technical solutions without worrying about migrating user bases from older technologies.

More than 20 engineers and managers drawn mainly from Asia-Pacific countries have been recruited initially for the centre and Schlumberger plans to have around 50 in place before the end of the year.

Zhian Hedayati** has been appointed Director of the centre which is at the following address: Schlumberger Electronic Transactions Hong Kong Technical Centre, Suites 3204-5, The Gateway Tower 1, Harbour City, 25-27 Canton Road, Kowloon, Hong Kong. **Tel: +852 2956 1598. Fax:+852 2956 1670.

Data Card Badging Upgrade

DataCard Corporation has introduced a software upgrade that expands the capabilities of the DataCard Badging System - a software-driven system that produces full colour, multi-purpose photo ID cards in a fast, single-pass operation.

The new QuikWorks 2.1 software is compatible with DataCard's ImageCard II PLUS duplex printer and supports printing of fingerprints and the PDF-417 bar code. Key enhancements include variable bitmap printing. For example, if universities want to colour code their student IDs, they can use this feature to add colours behind blocks of text without slowing the production process. ***Contact: Mark Iverson**, Director, Marketing Communications - **Tel: +1 612 9881763.***

Lottokarte for Germany

Organisers of the German national lottery are to switch from paper tickets to an on-line system and players will use the Lottokarte, a Smart Card from Gemplus, which will record their name, address and bank details making it faster and easier to play and pick up their winnings.

Currently the national lottery is managed autonomously by the 16 federal states, but in line with recent EU regulations, the government is to abandon its monopoly and open the market to national and foreign competition.

A nation wide network of point of sale terminals is being set up, starting with an on-line test with 30 outlets in the summer/autumn of this year in the Stuttgart area.

Gemplus has delivered the first cards of the initial order for 500,000 Smart Cards along with personalisation equipment. The card, which has the Siemens SLE4432 chip with 256 bytes EEPROM will be available to customers at a cost of 10 DM.

In the Stuttgart test only the name of the customer will be stored in the card in addition to the technical data. Later, the card will contain their address and bank details. Provisional estimates put the number of cards required over the next three years at around four million

Contact: Flavie Gil**, Gemplus Communication -* ***Tel: +33 42 32 50 00. Fax: +33 42 32 50 90.

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Smart Card Workshop

Information Technology Training in association with *Smart Card News* is organising a two-day workshop on Smart Cards on 30/31 May at the modern conference centre within Herstmonceux Castle situated in Sussex 30 minutes from London Gatwick Airport.

The course presenters will be Dr. David Everett, technical adviser to SCN and Lynn Whitley a specialist trainer in technology, Peter Hawkes of the BTG who specializes in Tags, Tokens and Smart Cards and Graham Higgins Senior Executive at Mondex.

Students will have the use of Smart Card development kits to put into practice what they have learnt during the course and have ample opportunities to discuss with the presenters any questions that have not been covered by the course.

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.

There will also be a course dinner at a restaurant that has been featured in the BBC food & drink programme where students can carry on with the workshop in a relaxed atmosphere.

Contact: Estelle Coughlan**, Sales & Marketing -* ***Tel: +44(0)1273 626677. Fax: +44(0)1273 624433

GPT is to install more than 500 Smart Card pay-phones throughout the province of Zhejiang PTA in China in May of this year as part of an initial order. This follows GPT's supply of pay-phones in Beijing and Guangdong.