Japanese Can Shop in Cyberspace!

Japan is to promote a global platform for electronic commerce using EMV compatible Smart Cards, the Internet and "Virtual Mall Kiosks" placed in convenient locations for those who want to shop in Cyberspace but do not own a home PC.

The idea is to make shopping on the Internet as convenient as shopping in a local store. According to Visa, one of the partners in a big-name consortium formed to launch the project: "Consumers will no longer need to visit different shopping malls to review the very latest in international fashion. Instead they will be able to visit the fashion houses of the world in Cyberspace."

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Cyberspace Shopping

The project, called "Smart Commerce Japan," has the backing of Japan's Ministry of International Trade and Industry and is part of its large-scale project to promote a global platform for electronic commerce using the very latest in payment system technology.

It also has the potential to become Japan's largest single Smart Card project in a country where there are many small implementations of the technology, but no major schemes in comparison, for example, in many European countries.

Consumers will be able to use the same Smart Card which will be a Visa credit or debit card (for major purchases) with an electronic purse (for small transactions) to pay for goods they have found browsing on the Internet as they do when they visit their local department store.

The chip card will be developed according to EMV (Europay, MasterCard and Visa) specifications so that it is compatible with other EMV systems being developed worldwide.

The scheme is to be piloted in the first quarter of 1997 and will be administered by Toshiba Corporation and Visa International in a consortium which will include the Daiei Group, Japan's largest retailer and the Hankyo Toho Group, a diversified entertainment, retail and transportation group. Several card issuers and major retailers will be involved in the pilot and Visa is currently talking with member banks likely to join the scheme but none have so far been named.

In the year-long pilot, tests will involve:

*   Distribution of 300,000 EMV chip cards and compact stored value card readers to current Visa cardholders who have experience using the Internet.
*   Installation of EMV chip card reloading terminals to enable cardholders to load monetary value onto the card.
*   Distribution of browsing software to Internet users involved in the pilot.
*   Construction of virtual-mall kiosks.
*   Distribution of EMV chip card reader / writers to enable cardholders to link their card directly to a PC and retail outlets.

During the pilot a number of payment methods will be tested. These include stored value transactions and experiments (such as virtual- mall kiosks) to deliver shopping in Cyberspace to those who do not have a home PC.

Security obstacles

Currently, the lack of security for financial transactions over open networks like the Internet, is the greatest obstacle to the advancement of the electronic commerce marketplace, says Visa. However, Toshiba and Visa will be working to develop hardware applications to facilitate secure payment over the Internet and expect that there will already be a common standard in place when the pilot starts.

Toshiba will provide the system integration from the EMV compatible chip card and related devices to back-end servers and develop the system for EMV chip transactions over the Internet, as well as the Sun Microsystems' Java based interface software between the EMV chip card and the transaction system. It will also co-operate with Netscape Communications Corporation, the leading Internet related software provider, to develop the Internet platform for the project.

Masaichi Koga, Executive Vice President, Toshiba, comments: "We believe that now is the ideal time to introduce a system that combines the convenience and ease of use of chip cards with the growing potential of Cyberspace. With the new system, it will be possible to do business anywhere and everywhere."

Lindsay C Pyne, President, Visa International Asia-Pacific, said: "We believe consumers will embrace the concept of using their Visa card to carry out transactions in an electronic environment and within a few years we expect that this method of payment will be as commonly used as the traditional Visa credit card product."

Europay is also targeting the Internet and teamed up with IBM to develop a secure electronic purse system (*SCN June 1995*).

Contact: Colin Baptie, *Visa International, UK* **- Tel: +44 (0)171 937 8111**

will be operated by Europay Switzerland which is responsible for the commercial aspects.

Discussions are taking place with the Swiss PTT as the service provider for Switzerland's first electronic

3m EP Card Order for Switzerland

Swiss commercial banks are planning to issue three million electronic purse cards starting at the beginning of 1997. Called CASH, the electronic purse

purse scheme, POSTCARD, in order 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.

The order for three million cards is the biggest for an electronic purse scheme to date. It has been won by CP8 Transac, a division of French Groupe Bull, which will supply its CC 60 1K bytes EEPROM reloadable, multi-supplier, multi-service electronic purse Smart Card. This card is used in the Belgian PROTON electronic purse scheme operated by Banksys which is developing the Swiss CASH system with Telekurs Payserv AG, the Interbank operator associating all the Swiss commercial banks. Banksys is also supplying card reader terminals.

The electronic purse will be implemented on the current Eurocheque card providing double functionality - as a debit card with a magnetic track and as an electronic purse using the chip. The purse will be reloadable at the 3,200 ATMs throughout Switzerland.

Contacts: Jacques Bischoff, CEO Europay Switzerland - Tel: +41 1 832 9111. Fax: +41 1 832 9112. Ms Dominique Mercier Chevalier, CP8 Transac, France - Tel: +33 1 39 66 45 20.

Visa Opens Shanghai Office

Visa International has opened a regional office in Shanghai - the city expected to become the leading international financial centre in China. Visa says it is committed to actively supporting the Chinese government's Golden Card project designed to establish an advanced electronic consumer payment system to cater for an estimated 200 million payment cards by the year 2003.

Contact: Colin Baptie, Visa International, UK - Tel: +44 (0)171 937 8111.

VISA Cash Launch in Spain

VISA Cash, Visa International's pre-paid electronic purse, is to be launched in Spain as a domestic stored

German Electronic Purse Pilot

Banks in the town of Ravensburg will pilot the Geld Karte electronic purse for Germany. Starting in mid-February, 36 banks in the town will offer three types of electronic purse: a Eurocheque card with a chip, a proprietary card issued by individual banks and a

value card (SVC) system. Around one million cards will be issued by banks and savings banks belonging to Visa Espana over the next year.

The main thrust in the scheme will come from Argentaria, BBV, Cajamadrid and La Caixa, the leading financial institutions within Visa Espana. The cards will be accepted throughout Spain with each Visa Espana member being responsible for acquiring merchants. Visa says that banks will choose whether to add the VISA Cash logo to their existing Visa cards or issue a standalone card. Both cards will be able to be reloaded at ATMs or at electronic terminals within bank branches.

Eduardo Merigo, Chairman of Visa Espana, says: "We are very pleased to announce the start of a national stored value card scheme in Spain which will be implemented over the next few years. The use of the chip in stored value cards is only the first step in the use of microprocessor technology for banking products. It will soon also be used for credit and debit cards, in home banking applications, in electronic commerce and in many other financial applications before the end of the century."

There are almost 17 million Visa cards in Spain and Stephen Schapp, Executive Vice President Marketing for Visa European Union region and Central and Eastern Europe Middle East and Africa region, says: "We are delighted that Spain has become the first country in Europe to use VISA Cash.

"The VISA Cash scheme in Spain will use a system developed by Visa Espana which will also be used by Visa Argentina and Visa Columbia," he said. "We see this as being the first step in making our vision of a worldwide stored value card system a reality."

Visa Espana has 153 members with a total of 25,000 bank branches and 19,200 ATMs. Members issue over 14 million Visa cards and have some 350,000 merchants who accept Visa.

Contact: Colin Baptie, Visa International, UK - Tel: +44 (0)171 937 8111.

non-accounted card for tourists. Deutsche Telekom has also agreed to trial telephone functionality.

The scheme is being organised by ZKA (Zentraler Kredit Ausschuss) representing the savings, public, co-operative and commercial banks. Cards will be supplied by Giesecke & Devrient and ODS R Oldenbourg Datensysteme GmbH and can be used

off-line at point of sale terminals and as an electronic purse at between 500 and 1,000 retail outlets, on buses and trains and at public payphones.

The cards can be reloaded at special terminals in the bank branches. Later loading will be possible at ATMs and at selected retail terminals.

The trial will run until August and it is planned to roll-out the scheme nationwide starting at the end of this year.

Contact: Manfred Krueger, ZKA - Tel: +49 228 204 365. Fax: +49 228 204 250.

Hybrid Card for Public Transport

A contract for the first major public transport project in France involving a Smart Card capable of acting as both a contact and a contactless card has been won by a consortium headed by AES Prodata, a subsidiary of Australian company ERG.

This is a major coup for CP8 Transac, a division of Groupe Bull, which is currently developing the new card (*SCN December 1995*) which will be used in the project in the French city of Valenciennes and the 64 small towns around it.

The project involves a multi-modal transport system and a multi-service use of the card covering a population of 340,000 people. The cards will be used in the network of buses in Valenciennes run by transport authority Siturv and regional trains run by SNCF, the French railways organisation. They will also be capable of use for parking.

The consortium comprises AES Prodata, Bull (CP8 Transac) and Resarail 2000, a subsidiary of SNCF.

The project is scheduled to go into commercial operation in June 1997 allowing time for the development and testing of the new card technology which incorporates microprocessor technology, exchange HF technology and Ferro-electric Random Access Memory (FRAM) technology developed by Racom.

Commenting on the contract worth 28 million French Francs, Franky Carbonez, Managing Director of AES Prodata's European operations, said: "To have won the first major contactless hybrid microprocessor Smart Card project for public transport in France is a great achievement." He added that it provided the opportunity to create the role model for France.

It is anticipated that the project will be extended into the Northern region of France which has a population of four million people.

Note: Siturv, SNCF and the public owned agency URBA2000 are part of the association known as Transcarte which is developing a regional electronic purse in the North of France.

Contacts: Peter Fogarty, ERG Limited, Australia - Tel: +61 9 273 1209. Fax: +61 9 273 1208. Franky Carbonez, AES Prodata, Belgium - Tel: +32 2 722 8775. Fax: +32 2 725 0448.

Bus Card Trial in Korea

Intec Ltd has started a field trial with its MIFARE contactless ticketing system on buses of Seoul Bus Union in Seoul, Korea.

Five hundred buses have been equipped with contactless card readers and 100,000 cards (see photograph on front page) are being issued. On successful completion of the trial, 8,725 buses will be equipped.

Contact: Intec - Tel: +82 2 577 3611. Fax: +82 2 577 4369.

Electronic Purses: A Comparative Review - Part 6

Country	CIS (formerly Soviet Union)	Germany
Name of scheme	Zolotaya Korona	Geld Karte
Capital investment	Information not supplied	No data available
Operator		ZKA (Zentraler Kredit

	Network of 106 CIS banks	Ausschuss) representing the savings, public, co-operative and commercial banks
System developer	Center of Financial Technologies	ZKA in co-operation with Debis Systemhaus
Status	Launch 1994	February 1996 - six month pilot in town of Ravensburg National roll-out end 1996
Multiple currencies	Multiple	Single
Loadable amount	Unlimited deposit	400 DM
Current applications	Bank credit, debit cards; reloadable electronic purse, POS, ATM, special card associated products (gas station, social security, electronic loyalty, medical insurance cards)	Purchases off-line at POS and as an electronic purse at retail outlets, on buses and trains and at public payphones. Thirty-six banks will offer three types of EP - a Eurocheque card with a chip, a proprietary card issued by individual banks and a non-accounted card for tourists
Planned applications	Phone cards, driver's licence, fare payment, university card, EMV compatibility	Regional/local/bank-specific applications like - electronic ticket (public transport), enter/exit function for parking, discount systems for merchants (customer fidelity systems)
Method of settlement	Clearing bank services	System of currently four data monitoring centers
Card fabricators	Solaic	Giesecke & Devrient ODS R Oldenbourg Datensysteme GmbH
CPU (Yes/No)	Yes	Yes

Country	CIS (formerly Soviet Union)	Germany
ROM	3K bytes	16K bytes
EPROM/EEPROM	1K bytes EEPROM	8K bytes EEPROM

RAM	128 bytes	256 bytes
Co-processor (Yes/No)	No	No
Chip manufacturer/ Type No.	Motorola / MC 68HC05SC24	Siemens and Motorola
Security algorithm(s)	DES, RSA, IDA	DES
PIN	Yes	Only to reload card, not for payment (if PC-card or bank proprietary card)
Cards issued	98000	-
Card target	1,500,000 by year 2000	80,000 (at time of roll-out)
Card reader/terminal suppliers	Innovatron Verifone DataCard	Giesecke & Devrient Verifone Gemplus
Number installed	3500	500
Portable balance reader	Function is implemented in all POS terminals	Yes
Card recharging points	ATMs, self-service terminals	50
Contact	Nesterova Tatyana	Manfred Krueger, ZKA
Telephone	+3832 399236	+49 228 204365
Fax	+3832 399236	+49 228 204250

Electronic Purses: A Comparative Review - Part 6

Country	**Italy**	**Switzerland**
Name of scheme	MINI PAY	CASH

Capital investment	Information not provided	Not available
Operator	Banks and SSB SpA (Societe Servizi Bancari	Europay Switzerland (acquiring, licencing and marketing); Telekurs Payserv AG (processing)
System developer	SSB SpA Societa per Servizi Bancari	Banksys, Belgium and Telekurs Payserv AG, Switzerland
Status	Launch June 1996	Under development
Multiple currencies	Single	Single
Loadable amount	Up to L 300,000	Up to SFR 300
Current applications	Electronic payment, fidelity function, phone call payment	Electronic Purse will be implemented on the current Eurocheque card providing double functionality - as a debit card with a magnetic track, and as an electronic purse using the chip
Planned applications	Electronic commerce, local and remote identification, interoperability of fidelity functions, free zone for banking application	None
Method of settlement	RT G S	Global pool
Card fabricators	CP8 Transac	CP8 Transac, Trüb, Orell Füssli, Switzerland
CPU (Yes/No)	Yes	Yes

Country	Italy	Switzerland
ROM	16K bytes	6K bytes

EPROM/EEPROM	8K bytes EEPROM	1K bytes EEPROM
RAM	288 bytes	128 bytes
Co-processor (Yes/No)	No. Under evaluation for final version	No
Chip manufacturer/ Type No.	SGS Thomson/16F48	SGS-Thomson/ST 16601
Security algorithm(s)	DES (RSA / DES for final version only)	Not available
PIN	Yes (personal cards) for reloading only No (anonymous cards)	No
Cards issued	150,000 (first phase June-December 1996	None
Card target	-	2 million January 1997 2.6 million December 1997
Card reader/terminal suppliers	Olivetti	Banksys
Number installed	June - December 1996 3,500 shops 2,000 telephones	None
Portable balance reader	Yes	Yes
Card recharging points	Banks	January 1997 - 3,200 ATMs
Contact	Simonetta Ropolo	Jacques Bischoff, CEO Europay Switzerland
Telephone	+39 11 555 3537	+41 1 832 9111
Fax	+39 11 555 5364	+41 1 832 9112

First VISA Cash Cards

First Union, NationsBank and Wachovia Corporation are showing the new VISA Cash cards being issued in Atlanta, Georgia, in what will be the biggest implementation of Visa's new stored value card in the United States.

First Union's promotion says: "Carry one, or carry the entire series, including cards commemorating beautiful Georgia blossoms and cards depicting the competition of international sports."

The cards are disposable and available in values of $10, $20, $50 and $100. Customers do not need to have a bank account, there is no fee to purchase the card and they can be used wherever the VISA Cash logo appears.

First Union's major launch will include more than one million cards and over 5,000 points of sale in Atlanta. By mid-1966, the bank plans to introduce reloadable stored value cards. Customers will be able to add cash value on the cards by using a First Union ATM to access their account. Eventually the card will function as a single stored value, debit and / or credit card.

NationsBank expects to issue more than two million cards in metro Atlanta. It is in a strong position to do so as the Official Bank of the 1966 Olympic Games with exclusive rights to sell the

Smallest Card Reader

Gemplus says it has developed the smallest card

new card within the Olympic venues to people who want to buy food, beverages and Olympic souvenirs. It will also work with many companies, including other Olympic sponsors, to install the card readers that accept the stored value cards.

It will sell cards in a variety of denominations from $5 to $100, enabling Olympic visitors to carry the card instead of large amounts of cash.

Wachovia Corporation has also unveiled the designs of its first series of VISA Cash cards. It has announced its five-card "Salute to Atlanta" series described as featuring athletes in dramatic motion against a backdrop of the Atlanta cityscape.

On the $50 denomination card, a swimmer strokes aggressively through clear blue water. The $20 card features a hurdler taking the city's downtown in stride. Other cards in the series highlight cycling, gymnastics and soccer.

Currently under trial, these cards will go on sale to the public in April.

Contacts: Jeep Bryant, First Union - Tel: +1 800 669 5855. Scott Scredon, NationsBank - Tel: +1 404 607 5225. John D Marsh, Wachovia Corporation - Tel: +1 404 332 4237.
reader in the world with its GPR400 Compact Smart Card Reader Writer in PCMCIA format. Only slightly larger than the Smart Card, it slips

easily into any desktop or portable PC with a PCMCIA slot to allow reading from and writing to, a Smart Card through the information system.

Applications include securing payment systems on open networks such as Internet and on the information super highway; managing medical data in the healthcare sector, systems security in the banking sector and in the mobile digital phone industry as the reader is SIM (Subscriber Identity Module) card compatible.

To protect confidential data, the unit has encryption circuitry for coding and decoding data at speeds of 40 Mbit/s and up to 160 Mbit/s for some specific applications. Gemplus says the same system can also verify the electronic signatures on data files.

Technical details:

Dimensions: 85 x 54 x 5mm (PCMCIA card type II)
Weight: 20 g
Power: 3.4 mA idle, 12 mA in use
Compatibility: Most microprocessor memory and embossed standard cards including SIM Phase 2, COS, MCOS, MPCOS, GFM4K and GPM256.
Protocols: T=0, T=1 and T=14.

*Contact: **Beng Hong**, Gemplus Technologies Asia, Singapore - **Tel: +65 776 1989.***

"Touch and Go" in Hong Kong

It's "touch and go" with Hong Kong's new contactless Smart Card technology currently under test as the new pre-paid single ticket for all forms of public transport in the Mass Transit system. Scheduled to be introduced to the public at the end of 1996, the Smart Cards will be used throughout the rail, bus and cross harbour ferry services.

So far, 4,000 cards have been issued to staff and 40,000 transactions successfully carried out without any card failures. Sony's FeliCa batteryless contactless IC Card need only be touched or placed near to the reader for the transaction to be completed in less than one-third of a second. The company is to supply more than three million cards and around 5,000 card reader/writers for the project.

Industry Review 1995

The Smart Card industry has undergone an

The system is being developed by Creative Star, a joint venture company formed by the Mass Transit Railway Corporation, Kowloon-Canton Railway Corporation, The Kowloon Motor Bus Co. (1933), The Hongkong & Yaumati Ferry Co and Citybus which awarded ERG Limited of Australia, a design and install contract. Mitsubishi Corporation and Sony Corporation have been awarded contracts for the supply of contactless Smart Cards and card processors.

Trials underway involve the staff of the MTRC and KCRC (both heavy and light rail), while KMB staff will start testing the cards on their buses at the end of January. The other operators will also test the processing equipment as it is progressively installed for the four transport modes. Passengers will take part in later tests before the public launch.

*Contact: **Mrs Betty Chung**, Creative Star - **Tel: +852 2993 2929***

organisation and efficiency shake-up in 1995 as it consolidates in preparation for an assault on the market worldwide. After years of struggle it now

has a renewed vitality as it sees real growth in the market. Companies have been sharpening their competitive edge and gearing up to provide a wider base of products in a series of acquisitions and working partnership agreements.

All market segments are growing with phonecards currently the biggest. A major driving force has been the interest in national and international electronic purse schemes as Europay, MasterCard, Visa and Mondex race into the market. In transportation, contactless Smart Cards are favoured by most operators and this has lead to a renewed interest by the major players who are now offering contactless technology. Other growth areas are in GSM, pay-TV, loyalty cards and healthcare, while ID cards could take off if national schemes are approved.

This review concentrates on the acquisitions and agreements announced in the Smart Card industry in 1995 only and is arranged in alphabetical order by country.

China

China entered the Smart Card production arena when **China Banknote Printing & Minting Corporation** and the **Peoples Bank of China** in Beijing signed a major contract with Louda Systems of Germany for the supply of manufacturing equipment. It is planned to manufacture plastic cards to Visa and MasterCard specifications, including the milling and insertion of chips. Bank of China says the plant will be the country's prime credit card and chip card manufacturing facility.

France

French **Groupe Bull** merged four Bull CP8 companies - Bull PCC (Point of Customer Contact), Bull CP8, Bull Telesincro and North American subsidiary Micro Card - to form a single global organisation under the name **CP8 Transac**. It will provide a contact and contactless Smart Card platform, secure operating systems, development tools and card personalisation systems; general purpose Smart Card terminals; EFTPOS terminals, Schlumberger also took over **Danyl Corporation**, manufacturer of self-service electronic transaction systems using stored value magnetic strip and chip

ATMs and cash dispensing machines, interactive self-service kiosks, local and wide area network security software and consulting services.

The move that took most industry observers by surprise was the take-over by **Gemplus**, the French card manufacturer, of **DataCard Corporation**'s four world-wide plants - manufacturing plastic magnetic stripe cards, serial memory cards and microprocessor cards - to create a new card giant. The sale to Gemplus involved manufacturing facilities in the USA, UK, The Netherlands and Germany with a total production capacity of 400 million cards a year, significantly strengthening the position of the Gemplus Group by adding PVC plastic and magnetic stripe cards to its own Smart Card fabrication and giving it a production capacity in excess of 600 million cards a year.

Included in the deal is DataCard personalisation centres in the USA, England, Germany, The Netherlands and Belgium, giving Gemplus a leadership role in personalisation bureau services including packaging and distribution direct to the end user. In exchange, DataCard assumes an equity position in Gemplus and acquires the manufacturing and sales of a range of card personalisation equipment and is now focussing on its core business of card personalisation systems, transaction terminals and systems integration.

Towards the end of the year, **Gemplus** and **ADE Angewandte Digital Elektronik GmbH** of Germany announced the formation of a joint company to develop the market for the CombiCard - a combined contact and contactless Smart Card. The new company will hold all patent rights for the CombiCard and plan to grant licences to all card and equipment manufacturers

Philips Smart Cards & Systems bought the banking card personalisation business of **SG2**, a subsidiary of Société Générale banking group in France. The agreement involves 4.5 million cards per year.

French Smart Card manufacturer, **Schlumberger**, obtained a US manufacturing base by acquiring **Malco, Inc.**, in Owings Mills, Maryland, and the largest US producer of secure credit and debit cards.

cards, strengthening its position in the US electronic payment market. Danyl, based in Moorestown, New Jersey specialises in vending and

access control systems using stored value cards.

Schlumberger Electronic Transactions and the Cowells card division of **Serif plc**, a leading UK manufacturer of plastic cards, entered a joint venture called **Cowells Schlumberger** to offer design and manufacturing services for all major Smart and magnetic stripe card application areas, as well as plain plastic cards. The move gives Schlumberger a second manufacturing plant in Europe and an annual worldwide card manufacturing capacity of 400 million. The new company will operate from the Cowells site at Ipswich in Suffolk, England.

SGS-Thomson Microelectronics announced that it is to build a new high volume integrated circuit production plant at Rousset, in the Bouches du Rhone region of south east France, to handle new generation products. The new facility, called Rousset 2000, will produce 8" (200mm) wafers with a planned weekly throughput of 5,000 wafers and handle advanced generations of ULSI (Ultra Large Scale Integration) products using 0.5 micron, 0.35 micron and even smaller scale technologies.

The company says the product range will mostly comprise future micro-controllers, EEPROM-type non-volatile memory chips, new generation bank and telephone Smart Card chips and multi-function technology-driven products.

Netherlands

Netherlands-based **Philips Semiconductors** bought **Mikron of Austria** which produces components for radio frequency identification and contactless Smart Cards.

South Africa

South Africa's first Smart Card manufacturing plant opened in Johannesburg and will compete with European suppliers. The multi-million rand venture is by specialist card supplier Multi Security Technology (MST) - owned jointly by packaging group Nampak and German Smart Card fabricator GPT consolidated its card technology division as part of GPT Payphone Systems to bring together the production of its three core technologies - GPT Imprint Magnetic (GIM) cards, GPT Integrated

Giesecke & Devrient. It has formed a new MST subsidiary called **Integrated Card Technology** (ICT), in which publishing group Nasionale Pers has a holding, to undertake the production of Smart Cards. The plant has a production capacity of 1,500 cards an hour and is initially targeting the mobile cellular phone industry by supplying Smart SIM (Subscriber Identity Module) cards and will expand into other markets in the banking, transport and retail sectors.

Switzerland

In a move to give it a presence in the growing market of toll collection systems, **Ascom** of Switzerland took over French company **Elsydel SA**, a leading supplier in this field and in parking systems - a market in which Ascom already has a strong presence through its subsidiary Ascom Zeag.

Elsydel and Ascom subsidiary Monétel SA will be incorporated in a French holding company with Ascom as majority shareholder and become part of Ascom Vendomation, the fare collection and parking systems division.

United Kingdom

Fujitsu of Japan announced a £816 million expansion of its semiconductor plant in County Durham, England.

London-based **GiroVend Holdings**, the world's largest manufacturer of cashless catering and vending systems, supplying about 60% of the in-house pre-paid card systems markets, teamed up with **AT&T Smart Cards** to promote new contactless Smart Card applications for cashless, low value consumer payments.

Their joint agreement will initially target the US market for Smart Card payments as an alternative to cash handling systems in the educational field and will later target global markets in healthcare, banking, retail, entertainment and travel.

Smart (GIS) Cards and GPT Integrated Contactless (GIC) cards - at new headquarters in Coventry, England. The new division, known as **GPT Card Technology**, already produces over 100 million

cards a year and has the backing of GEC of the UK and Siemens AG of Germany.

Motorola said it was to increase its microchip production capacity tenfold by the year 2000 when it would be able to produce 10 million Smart Card microchips per week. Scotland has been designated its worldwide headquarters for Smart Cards and Motorola's South Queensferry plant, purchased from Digital Equipment Corporation, will start production soon. In addition the company's two chip plants in East Kilbride are being expanded.

Shin-Etsu Handotai Europe (SEH-E) - a subsidiary of Tokyo-based Shin-Etsu Handotai Company - is investing £160 million in a significant expansion of its plant in Scotland to increase its production of silicon wafers for making semiconductors used by manufacturers in the production of integrated circuits. It is currently completing a £23 million expansion at its Livingston plant near Edinburgh.

Siemens AG of Munich, Germany, announced plans to build a new £680 million semiconductor plant in Newcastle in north east England to manufacture chips for Smart Cards, mobile telephones and consumer electric equipment. Building work has started and first production runs are scheduled for the Summer of 1997. Plans for a £450 million second phase development on the site, says Siemens, are subject to market forces.

United States

AT&T Smart Cards teamed up with **Lockheed Martin Electronic Security Systems** to develop and market contactless Smart Card security solutions to control access to buildings and information. AT&T also announced it is to licence its contactless Smart Card technology to customers in the US and elsewhere. Currently the communications giant is shedding 40,000 jobs, 23,000 of them in a new systems and technology company which includes Smart Cards and Systems, the fate of which will not be known until the end of February said a spokesperson.

Cubic Automatic Revenue Collection Group (CARCG), a subsidiary of the San Diego, California-based Cubic Corporation, acquired automatic fare collection systems company **Scanpoint Technology A/S** of Copenhagen,

Denmark, from its Danish parent company NKT Holdings. Scanpoint is a leader in providing AFC systems for buses and has contracts in Denmark, Sweden, Norway, Germany, France and Spain. CARCG pioneered contactless Smart Card technology for transit systems on the London Underground and is supplying AFC systems in Washington DC and Chicago, Illinois.

De La Rue, with its eyes on the move from magnetic strip to microprocessor cards, acquired **McCorquodale Security Cards Inc.** (MSCI) based in Exton, Pennsylvania and the leading producer of MasterCard and Visa payment cards in North America.

NBS Card Services Inc., based in South Plains, New Jersey and North America's second-largest producer of financial transaction cards, announced plans to enter the Smart Card marketplace. NBS manufactures 160 million cards per year at its two North American manufacturing plants in the United States and Canada, and 40 million cards in the UK.

ORGA Card Systems Inc., the US subsidiary of German-based ORGA Kartensysteme GmbH, formed a strategic partnership with **Kirk Plastic Company** based in Rancho Dominguez, California, to manufacture, market and distribute Smart Cards. Kirk Plastic produces some 116 million payment cards a year of which half are Visa or MasterCard branded. It will continue to operate its magnetic stripe manufacturing business but will also produce Smart Cards with ORGA know-how.

Racom Systems, Inc., of Denver Colorado, USA, formed a partnership with **Rohm Co**. of Japan. One of the world's largest semiconductor companies, Rohm is starting up a new wafer fabrication in Kyoto, Japan, dedicated to the high volume manufacture of ferroelectric application specific integrated circuits (ASICs) and has licensed Racom's contactless, battery-free ferroelectric technology to specifically serve the Japanese market. The partnership includes the manufacture of ferroelectric ASICs for use in Racom's contactless cards.

SGS-Thomson announced that work on a new US $800 million chip plant will start during the first quarter of 1996 with production starting early 1998.

Smart Card Diary

Asia Pacific Smart Card '96: Improving Services and Profitability Through Smart Card Applications, Grand Hyatt, Hong Kong, 5-7 February.

Wide ranging conference including a global update, technology, security, standards, electronic cash, cards on the Internet and as marketing tools. Contact: Ms Rochelle Li, IBC Technical Services, Singapore - Tel: +65 732 1970. Fax: +65 733 5087.

Smart Card '96, Olympia, London, 13-15 February.
Contact: QMS - Tel: +44 (0)1733 394304.

IMRG/CBI Conference, Centrepoint, London, 29 February.

Secure electronic payment systems and the impact of interactive media on advertising and publishing are just a couple of the issues to be discussed at this conference. Contact: Jo Tucker, IMRG - Tel: +44 (0)171 303 6603. Fax: +44 (0)171 303 5881.

CeBIT '96, Hannover, Germany, 14-20 March.

One of the biggest computer and communications trade shows in the world and expected to attract some 700,000 visitors. Contact: Deutsche Mess AG - Tel: +49 511 89-0. Hannover Fairs USA - Tel: +1 609 987 1202.

Car Parks Asia, Crown Princess Hotel, Kuala Lumpur, Malaysia, 26/27 March.

Conference focusing on parking policy, design, operations and technological developments. Contact: IBC Technical Services, Singapore - Tel: +65 732 1970. Fax: +65 733 5087.

The Cashless Economy, Jurys Hotel, Ballsbridge, Ireland, 27/28 March.

Contact: Deborah Living, The Conference Partnership - Tel: +44 (0)1256 810088.

Intelligent Transport Systems, Crown Princess Hotel, Kuala Lumpur, Malaysia, 28/29 March.

Applying intelligent technology, including Smart Cards, to managing transportation systems. Contact: IBC Technical Services, Singapore - Tel: +65 7321970. Fax: +65 733 5087.

Trends in security evaluations

Corporate Purchasing Cards: The Pilot Stage and Beyond, Merchant Centre, London, 29 March.

One day conference including six user case studies. Interactive pre-conference seminar on 28 March. AIC Conferences: Tel: +44 (0)171 242 2324. Fax: +44 (0)171 242 2320.

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

Contact: Nick Redfern, International Conference Group - Tel: +44 (0)181 743 8787. Fax: 740 1717.

Electronic Payments Systems, The Mayfair Conference Centre, London, 22/23 April.

Contact: Dipti Chauhan, IBC Technical Services - Tel: +44 (0)171 453 2135. Fax:(0)171 636 1976.

CardTech/SecurTech '96, Atlanta, Georgia, USA, 13-16 May. Contact: Tel: +1 301 881 3383.

New MD for Groupe Sligos

Dominique Illien, aged 42, has been appointed Managing Director of Groupe Sligos and will be in charge of the Group's four core business segments which include payment services and Smart Cards. A graduate of Ecole Supérieure de Commerce de Paris, he handled functional and operating responsibilities for nearly 15 years at Cap Gemini Sogeti and Axime where he was Chief Financial Officer.

Miele advertise with DANMØNT

The electronics company, Miele, are using DANMØNT's cards to advertise their logo (see card on front page). Around 20,000 100 Kroner cards and 2200 200 Kroner cards have been issued. As well as being used at the launderette, they can also be used in parking meters, telephones and at point of sale terminals. Other well known companies who have advertised on DANMØNT cards include Siemens, IBM, Shell, Avis and Coca-Cola.

Contact: Henning Jensen, DANMØNT - Tel: +45 43 44 99 99. Fax: +45 43 44 90 30.

The outcome of a security evaluation of a product, prototype or any step in a design process can be used to change (improve) the design or design process of future developments. The key process where security evaluation is useful is the design process.

Secondly, an evaluation can be used in risk analysis, for example of financial systems, to gain trust and to make a judgement on security risks. Finally, it can be used to verify the security claims made by a manufacturer, or to set the security targets in a design process.

The design process

Because of growing security awareness due to attacks, at some time the need for a security device (e.g. PIN-pad, host security module, Smart Card, passport etc.) becomes apparent. To estimate the extent of the threats, a risk analysis has to be made. This gives an insight into what the losses (financial, public trust etc.) can be. It also indicates the threats from which the system has to be protected. This leads to a security policy which enables the users (banks, credit card organisations) to formulate their security requirements.

The system designer uses this information to design the security scheme. Every security method has its own implementational advantages and disadvantages with respect to fraud resistance, reliability and cost. At that time a comparison has to be made between the possible losses as a result of the anticipated attacks and the costs associated with choosing certain security measures.

In principle, security evaluations can be carried out between every transition between two phases in the design process as in Figure 1. During an evaluation, the design is checked from a security point of view to see if the characteristics of a phase match with the goals set out in the previous phase.

The more or less traditional evaluations of final products occur less often. The TNO security evaluations group recognises a trend that evaluations are carried out earlier, and more often in the design process. In some cases the evaluations group is involved even before the actual design phase in assisting the users in determining the system (or device) requirements. Another trend is Thirdly, there is the informal evaluation. The basis of such an evaluation is not a list of claims of the

that not only single devices are evaluated, but devices as part of a entire system. This is an important development because weaknesses often occur at the interface between a device and the rest of the system. These weaknesses are often not found by looking at the device only.

Figure 1

Evaluation methods

Depending on the anticipated risks and on the trust in a product or manufacturer there are three types of evaluations.

One is self assessment by the manufacturer, particularly when the security risks are estimated to be low.

The second is the formal evaluation (e.g. ITSEC) where risks are estimated to be high. Here the manufacturer/designer has to present a variety of documentation to the evaluation facility. The main objective in a formal evaluation is to evaluate the product in a well defined highly structured, static way against a list of claims. Due to the formal structure and the large amounts of documentation and support to be provided by the manufacturer, evaluations at a high level will be time consuming and prices can become high. The advantage of a formal evaluation is the certification of a device.

characteristics a device should have but either the device itself or the device as part of a system. The

evaluation is started with a (theoretical) security analysis of the device. The characteristics of the device are checked against attacks which are considered to be viable. Generally the design should be such that any attack is covered by at least one security measure (or by security measures in the system). This analysis leads to an initial list of weak and strong aspects, the so-called critical aspects. When one of these critical aspects can be utilised successfully by an attacker the system can be damaged.

The following types of damage can occur:

- small damage on a large scale
- large damage per event
- compromise of an entire system

The critical aspects are then verified by experiments. The critical aspects evaluation does not lead to a certificate, but to a report containing the findings of the theoretical and experimental analysis and the (verified) list of strong and weak aspects. The report is concluded by a list with all critical aspects indicating the strength of those aspects in terms of attack time, money and expertise needed to prepare and carry out an attack.

These reports can then used by the users of the system to verify if the evaluated device is secure enough for the intended application in the intended environment. Or the report can be used by manufacturers to improve the security characteristics of a product (or system).

Matrix

In order to be able to design a security device, the designer generally has a good idea of the potential threats. For every threat at least one (adequate) security measure should be implemented. With this principle in mind TNO uses a security model in the form of a matrix. In the top row all threats are indicated, and the left column contains the security measures implemented within the device under investigation (Table 1).

The table is an example of an arbitrary evaluation. The numbers in the table indicate first of all which threats are influenced by a security measure and the quality of that measure against the threat.

If the device is designed well, all threats should be
Iain - should the following table be all

covered by at least one protection method. If a threat is covered by a lot of adequate methods, that threat may have been over-protected and the device may turn out to be too expensive.

Negative numbers are given when alleged protection methods open new ways to compromise a device, or decrease the security level of other methods. The table also shows what the effect is of leaving protection methods out.

The table can be filled out in two ways. In the first place the table can service as a model for a device on theoretical grounds. The security levels given for a protection method against a certain attack depends on what is (theoretically) achievable.

The second method of filling out a table is by giving security levels to the protection methods of the actual implementation. The difference in both tables makes clear what the effect of implementing a protection method is on its security potential. If a good method is implemented badly this will become apparent. The table also shows on what security measures, the critical security aspects, the overall security mainly rests.

Summary

The trend is for security evaluations to be carried out earlier and more often in the design process. It is not the device as such which is evaluated, but the device as being part of a system. The informal evaluation offers the opportunity of flexible evaluations not bound to the limitations of formal evaluation. The device is evaluated with respect to its weak aspects and weak aspects introduced by the system.

This critical aspects approach often makes use of a device security model in the form of a matrix. The matrix is used to find out the system's critical aspects, weaknesses, implementation effects and the balance in security measures.

(Continues next month)

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Threat Security measure	Threat 1	Threat 2	Threat 3	Threat 4	Threat group A			
					Sub threat 1	Sub threat 2	Sub threat 3	Sub threat 4
Measure 1	4	4			4	4	4	4
Measure 2				2				
Measure 3		3						
Measure 4					5	5	5	5
Measure 5					5	1	5	3
Measure 6					4	4	4	
Measure 7								3
Measure 8	-3	-2			5	5	5	5
Measure 9	5		2		5	5	5	5
TOTAL	6	5	2	2	28	24	28	25

1. No security	2. Low security	3. Reasonable security
4. Adequate security	5. very excellent security	Negative values indicate decreasing over-all security

JerseyCard Take-over by ITL

JerseyCard, operator of the multi-function Smart Card payment system in the Channel Islands, has been acquired by the Interactive Telephony Limited (ITL) Group and is now known as Supercard Limited.

The company started trading in 1991 and has a network of 500 card reader terminals at retail outlets mainly in Jersey, Guernsey and the Isle of Man, and handles over £24 million in client transactions per annum. It launched GuernseyCard, a version of JerseyCard, in October 1992.

ITL is a Jersey company and has the largest Internet site in Europe. It launched Supernet, an on-line interactive information system last October. In partnership with Energis, ITL launched its first Smart Card based around the Supercard technology. Known as WebCaller, it enables cardholders to dial the Supernet communications network at local call rates from 46 countries.

The take-over will not affect the service provided to retailers and card customers who will be offered a one month free trial on the Supernet interactive system on the Internet. They will also be encouraged to join the Jersey and Guernsey electronic shopping malls planned by ITL for this year.

*Contact: Colin Goss, Supercard - **Tel: +44 (0)1534 880044.***

Jacob Goldman Joins Solaic

Solaic, the Smart Card subsidiary of Groupe Sligos, has appointed Jacob Goldman Vice President Business Development. Previously he was World Sales and Marketing Director for Mitsubishi's SM2E subsidiary.

Subs form

Munich City Council in Germany has converted over 100 parking ticket machines in the inner city area to accept pre-paid chip cards as well as coins.

Most of the machines will accept coins to reload the ParkCard which holds an initial value of 20 DM (equivalent to four hours of parking). The cards are available at various ARAL petrol stations where they can also be revalued.

InterCard has supplied 10,000 GPM 896 Gemplus Smart Cards for the project. The ticket machines have been supplied by Bremicker and the Smart Card reader-writer interface by Fischer Computer.

Contact: Arno Fröba, *InterCard, Germany* - *Tel: +49 7721 915 125. Fax: +49 7721 915 121.*

DelPhic to Develop UK Bank Card

DelPhic Card System in the UK has been selected as one of the contractors by the Association for Payment and Clearing Service (APACS) for the development of the new UK Smart bank card to be tested during 1996 and trialed in 1997. This is in addition to DelPhic's original contract to provide Smart Card expertise in developing the Functional Requirements Specification.

Stocko Smart Card Acceptors

Card Systems (UK), the national distributor for OMRON cardware, has signed a marketing agreement with Stocko (UK) to distribute their range of friction contact Smart Card acceptors.

Contact: Guy Boxall, *Card Systems (UK)* - *Tel: +44 (0)1273 495034. Fax: +44 (0)1273 495234.*

Smart Card Industry Guide or CSI

Munich ParkCard

Finnish Beer Card

Pubs in the UK have been experimenting with contact Smart Cards for use in gaming machines and for paying for drinks after the bar staff have poured them, but in Finland you can pour your own pint of beer and pay for it at the same time using a contactless Smart Card.

Called the Pintcard it can be programmed to provide payment for up to 99 pints. The customer can fill his own glass by showing the card to the reader on the tap which deducts the price from the card's memory.

Even if the customer loses the card, the number of drinks left can be checked from the computer controlling the tap and the old card cancelled and a new one issued.

The system was developed by Rescontrol Oy and is activated by an Idesco contactless card with 256 bits memory except in Vaala (see below) where the 1K card with 1024 bits memory is memory is used.

The first Pintcard application was in the Korkki restaurant which is mentioned in *The Guinness Book of Records* as "the smallest restaurant in the world." It only has two seats and is located in Iisalmi in the middle of Finland. The system was installed in 1993. Others followed in 1994 in Jyväsklä (restaurant Amarillo and Hotel Alba with 100 cards in use), and in the capital Helsinki (Hamlet restaurant with 100 cards in use).

Last year, further applications followed in Vaala (restaurant Siitari with 100 cards in use), Oulu (restaurant Jumpru, two beer taps and 50 cards in use) and Kuopio where there is a wine card system in a small vineyard which also has a restaurant.

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