



The DATA CAPTURE Report

Since 1977, the premier management & marketing newsletter of automatic data capture: Bar Coding, RF and related technologies.

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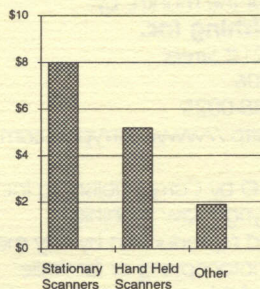
June 28, 1996

DID YOU KNOW?

WORLDWIDE MARKET FOR 2-D BAR CODE PRODUCTS FORECAST TO GROW 73% PER YEAR

The global market for 2-D bar code products is forecast to grow 73% per year from \$14.9 million US in 1995 to more than \$167.3 million US in 2000. **Venture Development Corporation (VDC)** reports that the industrial and technical base for bar code products is being driven by significant technology development by 2-D scanner and software vendors. A major source of demand will be robust consumption in transportation-related industries; key applications include parts tracking, portable databases and sortation and tracking.

1995 GLOBAL CONSUMPTION OF 2-D BAR CODE PRODUCTS BY PRODUCT CATEGORY
Total = \$14.9 million US



For more information regarding the VDC study, "Markets and Applications For 2-D Sympologies, Second Edition," contact:

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Industry Pioneer, Computer Identics To Merge With RVSI

by Rick Morgan

On June 11, **RVSI** (Robotic Vision Systems, Inc.) and **Computer Identics Corporation** (CI) jointly announced an impending merger of the two companies whereby RVSI would acquire all of Computer Identics' outstanding stock. The merger marks a new beginning for CI which pioneered laser scanning and printed labels. Maybe even more important is the emergence of RVSI as a major player in the industrial data capture industry.

For years Computer Identics struggled with money problems but never-the-less maintained its status as a major innovator in industrial bar code scanning. Many of these money problems date back to the early '70s when a decision was made to put the company's emphasis on the railroad-car-scanning business over industrial applications.

Tom Lagaly, now an owner of **Automated Distribution Services**, worked for CI from 1971 until 1980. Lagaly recounted, "When the railroads replaced bar code scanning as a method of tracking [railroad] cars, the bottom literally fell out of CI's market. From 1968 until 1974, CI owned most of this market. The other company addressing this market was Identicon, but they slowly faded away.

"The loss of the railroad business hit CI hard and competitors came out of the woodwork to capitalize on the situation. I don't think the company ever fully recovered financially from these losses. But we had good people and continued to bring innovative technologies and systems to the marketplace." Interestingly, before coming to CI, Lagaly set up a bar code system for Kroger in Nashville, TN, and used CI laser-based scanners. Lagaly was CI's first customer for an industrial laser-scanning system.

Another CI employee, who started on the same day as Lagaly, was Charles Mara (**Charles Mara Consulting**). Mara recalled the early '70s: "CI and Accu-Sort, which incorporated three years after CI (in 1971), were the driving industry leaders. Both companies were way ahead of their time. CI was always a leader with new innovations but often

did not have the capital to act on them. Hopefully, the acquisition will offer CI new opportunities and funds."

Richard Close, president and CEO of Computer Identics, has only good feelings about the acquisition. "There's been no down-side to this merger," said Close. "We now have access to the new 2-D and DataMatrix™ technologies from I.D. Matrix (another RVSI company) as well as RVSI's 3-D machine-vision technology. RVSI will benefit from our multi-tiered distribution channels around the world."

Three years ago Close recognized that the industry was heading toward a broader use of 2-D symbology. To make the move into the 2-D world, Close chose to seek out a merger or someone to acquire his company. Through his search, he met Pat Costa, chairman, president and CEO of RVSI. "Eventually, as we took a look at both our businesses, we realized that it made good sense to bring them together," Close relayed. "Computer Identics would gain a new technology and RVSI would be able to market the new I.D. Matrix technology through our channels."

Over 60% of CI's sales are outside North America. The company has four subsidiaries in Europe (U.K., Germany, France and Belgium), serviced by 46 people. These are basically stand-alone subsidiaries with their own marketing, service, sales and support people. The company also does business in Latin America. Southeast Asia is the company's fastest growing market.

This merger may single out RVSI as the only company in the industry to address all three technologies -- 3-D, 2-D machine-vision and now 1-D or linear vision systems. It also enables RVSI to market the I.D. Matrix product anywhere in the world and offer support services as well.

The President of I.D. Matrix, Dennis Priddy, had a great deal to say about the merger and how CI's technology "rounds out" the total RVSI package. "From a product perspective, this is an ideal match," said Priddy. "RVSI wants to provide a total industrial solution and needs the CI product line to complete the puzzle. CI has designed and implemented one of the best communications architectures for industrial data collection you'll find anywhere. I'm referring to the StarNode (wired) network and the software operator interfaces they've perfected to go along with StarNode network."

Priddy outlined what RVSI and each of its subsidiaries contributes to the total industrial data capture solution:

- I.D. Matrix comes to the table with the sensor or the intelligent front-end that reads the Data Matrix code, the linear bar code, or any other 2-D code and extracts that information with a low-cost reader.
- Acuity Imaging (another RVSI company) provides a 2-D machine-vision inspection system for each work station or automation center. This product does the in-process inspection of parts to ensure they are machined accurately. It also lets the operator know if the parts are drifting out of

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Since 1977, the premier management & marketing newsletter of automatic data capture, including:

- Bar coding, 1-D & 2-D symbologies
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- Wireless (RFDC & RFID)
- Magnetic stripe
- OCR products
- Voice recognition systems
- Vision systems, video scanners
- EDI
- Smart cards & optical cards
- Memory tags
- Biometrics
- Application software
- Peripherals or supplies for the above

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tolerance so adjustments can be made at the machining center to compensate for tool wear. This prevents running defective parts.

- RVSI provides the final 3-D inspection equipment to check parts at the end of the manufacturing process. Each of the processes generates information but until the acquisition of CI, there was no place to hand off the information.

- When all operations (including inspection) are finished, information from each process must be stored. The Computer Identics network system receives the hand-off of information from the various collection stations completing the process. It is the combination of equipment from all four companies that allows the conversion of collected data to useful management information.

"The challenge we face is to reduce reject rates by building a better system," said Priddy. "To do that, we must increase quality and decrease defects. This was the motivation for developing the Data Matrix code. We can now help manufacturers in this area and do it quite cost-effectively."

On the subject of interoperability, Priddy stated, "Our products are designed to work more efficiently together but not to the exclusion of any others. We have opened our technology to the public and are confident our products can stand the pressures of an open market."

"As for RVSI, the company owns 70% to 80% of the market share for 3-D inspection of semi-conductors. This makes RVSI extremely vulnerable if something should happen to that market. So RVSI is diversifying to protect the company's interests and strengthen its position industry-wide."

It is evident RVSI management feels the merger is a good combination. Depending on the price of RVSI's stock at the actual time of acquisition, the company will pay somewhere between \$35 and \$40 million for CI, whose revenues for its last fiscal year were \$27,745,000 and whose net profits were only \$683,000.

For more information: **Acuity Imaging, Inc.**, Nashua, NH, PH (603) 598-8400, FX (603) 598-4684, **Automated Distribution Services**, Ponte Vedra, FL, PH (904) 285-7245, FX (904) 285-9838, **Charles Mara Consulting**, Concord, MA, PH (508) 371-9224, FX (508) 371-7240, **Computer Identics Corporation**, Canton, MA, PH (617) 821-0830, FX (617) 828-8942, **I.D. Matrix**, Nashua, NH, PH (603) 577-8300, FX (603) 577-8301, **RVSI**, Hauppauge, NY, PH (516) 273-9700, FX (516) 273-1167

LOGMARS Group Threatened With Elimination

by George Goldberg

A cry for help has gone out from Tobyhanna, PA to save the Army Logistics Symbology Branch (ALOGS) from "going down the drain."

Nineteen years ago, in the first issue of *SCAN Newsletter* (SCAN Sep '77), we reported on LOGMARS, the then nascent Department of Defense (DOD) automatic identification program. LOGMARS was to become the familiar acronym for the DOD project officially named Logistics Applications of Automated Marking and Reading Symbols. We predicted: "The potential impact [of LOGMARS] on industry, here and abroad, is enormous."

In fact, as subsequent events bore out, the commitment to bar coding made by the LOGMARS group in the early 1980s may have been the single most important factor influencing the development of ADC for non-retail applications. Successive government contracts grew larger and larger, culminating in the five-year Automatic Identification Technology (AIT) awards to Intermec in 1988 (totalling \$100 million) and again in 1994 (expected to total \$250 million). These contracts (and related sub-contracts) — particularly those awarded prior to 1990 — provided an important source of income for many small ADC companies struggling to develop products and expand commercial markets (SCAN May '88, April '94).

The ALOGS Branch has had a long and distinguished role in these important developments. In 1980, the Army was designated as the "Executive Agent" for automatic identification and established ALOGS at the Tobyhanna Army Depot to "proliferate bar code objectives throughout the DOD."

[Mike Noll — currently at the Pentagon as the DOD's Program Coordinator for Automated Data Input Programs — was the first leader of ALOGS. For his outstanding work in promoting the use of bar codes, in establishing industry standards and in educating industry groups, Noll received the first *SCAN Newsletter*/AIM Percival Award in 1982.]

Stu Crouse is currently in charge of the ALOGS Branch and has told *SCAN/DCR* that "ALOGS has been slated to have its mission abolished." According to Crouse: "There is no other DOD group that has the expertise and historical experience to carry on this [AIT] mission. To disband such a highly-qualified group of individuals

and such an important program will severely impact the entire DOD information system. [This] appears to be a decision made by a misinformed manager whom I believe does not fully understand what is being proposed."

Crouse described many unique functions and facilities provided by ALOGS which are important to the AIT program, including: expertise in ADC technologies beyond bar coding, such as RFID and smart cards; the only DOD laboratory fully equipped with every AIT item presently available to the DOD; representation on ISO and ANSI standards bodies; and close liaison with private industry as the "central knowledge base" on AIT issues.


Steve Winter, Intermec's General Manager, Strategic and Government Programs, agreed with Crouse's assessment of the importance of the ALOGS group. "Although the elimination of the ALOGS Branch may have no immediate effect on the current [Intermec] AIT contract," Winter told SCAN/DCR, "it will have serious implications for the future development of automatic identification throughout the U.S. government. ALOGS personnel chair many of the AIT sitting committees and technical evaluation teams. Our office interacts with the ALOGS people weekly — sometimes daily — and we have always found them to be a valuable source of information and support."

Intermec feels so strongly about this unexpected possible loss that it has sent letters to Congress and to senior members of the Department of Defense describing the importance of the ALOGS Branch and requesting that any proposal to eliminate this group "be reviewed and reconsidered in the light of the important missions and functions performed."

Comment:

Is this a classic case of "throwing out the baby with the bath water?" In the government's commendable efforts to cut costs and balance the budget, does it make sense to eliminate a department whose primary function is to reduce operating expenses and increase efficiency?

The government's use of ADC systems is growing rapidly with purchases under Intermec's AIT contract running at \$50 million per year. It certainly behooves the DOD to retain the elite, knowledgeable ALOGS Branch, which has the expertise to evaluate hardware, software, supplies and systems to insure the success of the AIT program.

To voice your opinion on this issue, contact: Stu Crouse: PH (717)895-7146; FX (717)895-7894. 

Make Room For On-Demand ID Cards

by George Goldberg

The technology may not appear to be a sophisticated automatic data capture system, but the on-demand printing of identification cards has become a burgeoning ADC market.

Most of the on-demand ID card business currently encompasses personalized security and information identification, at numerous levels: e.g., credit/debit cards; company photo ID access cards; "loyalty" cards for preferred retail customers; military ID cards; sports/health club membership; and driver's licenses.

Until a few years ago, on-demand photo ID cards were made using a **Polaroid** camera; the quickly developed photo was cut to size and laminated to a prepared card. The process took time, was labor-intensive, and reportedly cost as much as a few dollars for each card.



On-demand printing of ID cards has become a burgeoning market in the ADC industry.

The newer on-demand systems capture the subject's video image, which is then digitized and fed to a PC. Software is available to compose and preview the finished card on-screen, complete with the cardholder's image, signature, bar code and other control data. The information is then sent to a multi-color printer. Total time: about one minute per card; cost: about \$.50.

Although the great bulk of credit/debit cards (such as **American Express, Visa, Mastercard** and other bank cards) are still embossed plastic with magnetic stripe, a strong move is underway toward the integrated photo ID card. In addition, the growth of "smart" cards with an embedded computer chip — already widely used in France and other European countries — is closely tied to these newer-style photo IDs.

The most recent player to enter this market is **Eltron International** (Simi Valley, CA). On January 26, Eltron acquired **Privilege S.A.**, a French manufacturer of on-demand card printers. Patrice Foliard, founder and president of Privilege, will continue as president of Eltron's newly formed **Card Printer Group**. He will relocate to Eltron's

corporate headquarters in Simi Valley. The R&D and European marketing operations of Privilege will remain in Varades, France.

"There is little research on this market," Eltron's President, Don Skinner, told SCAN. "Our conservative estimate is that the current annual market for on-demand printers is about \$45 million, and we have projected annual growth of 25% to the year 2000." [These numbers work out to a market of \$110 million per year at the turn of the century.]

Eltron will emphasize the less-expensive printers. Its current models — the Privilege 300 series — sell for \$3,500 to \$4,800, depending on features. The device includes four printing stations: three primary colors and an overlay varnish. The printer will also encode or program smart card computer chips or mag stripes in the same pass.

On January 30, immediately following the acquisition of Privilege, Eltron signed a "long-term, multimillion-dollar" OEM contract with **Card Identification Machines** (CIM) of Bologna, Italy. CIM is a manufacturer of card embossing equipment and related supplies for financial transactions and banking applications. The agreement will grant CIM worldwide distribution rights to sell Eltron's new plastic card printer line. CIM will market the printers under its CIMAGE brand.

[Eltron's major competition for this low-end ID card printer market is **Fargo Electronics** (Eden Prairie, MN). Fargo is the same company that led the aggressive pricing of bar code label thermal printers several years ago before the company sold that line of printing products to **Datamax** in March 1993. During the pre-1993 period, Eltron had competed directly with the less expensive Fargo products. In 1993, after the Fargo-Datamax deal, Fargo's President Bob Cummins told SCAN: "Our company will now concentrate on the manufacture of thermal transfer color printers for the PC." Fargo singled out on-demand ID card printers as one of the primary applications. So Eltron and Fargo will now meet head-to-head once more.]

An attractive feature of selling on-demand printers is the aftermarket for cards and ribbons. Although cards have become a commodity and can be purchased at competitive prices from a number of suppliers, the dye sublimation transfer ribbons are unique to each model machine and are usually bought from the equipment manufacturer.

The on-demand ID card business is much larger than just the production and sale of printers. Companies like **Identatronics** (Elk Grove Village, IL) and **DataCard** (Minneapolis, MN) sell complete

systems, which include the video camera, PC, software and printer — priced from \$15,000 and up. Eltron and Fargo compete to OEM their low-cost printers to these systems companies.

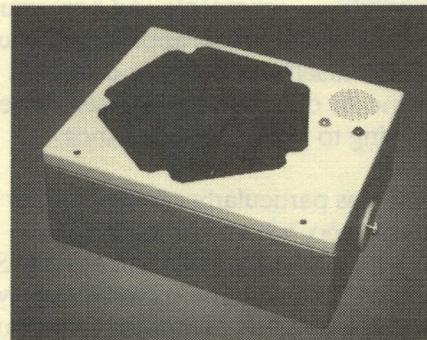
With the expected explosion of electronic cash ("smart") cards — even **Microsoft** announced last year that they plan to enter this field — the market potential for the card printers may be much larger than the number projected by Eltron's Skinner. In addition to the rapidly expanding use of smart cards in Europe, many other experimental applications are being pursued for these cards that incorporate the embedded read/write computer chips: Major UK banks are in test; Mastercard is experimenting in Australia; Visa will try it at the Summer Olympics in Atlanta; the state government of Ohio is set to launch a smart card program for the electronic distribution of food stamps; and a number of US supermarket chains are launching trials to expand non-cash transactions at their checkout counters.

The U.S. is currently lagging behind the rest of the world in smart card implementation, primarily due to the continuing commitment of all major credit card companies to mag stripe. But there is still a very large market potential for the on-demand cards in many other applications. SCAN

Times Have Changed ... Have You?

by Rick Morgan

As the ADC industry matures, customers have become less tolerant of new products that are introduced "before their time." End-users of ADC products are increasingly discriminate when choosing solutions for their businesses, causing vendors to re-evaluate policies on new product introductions.



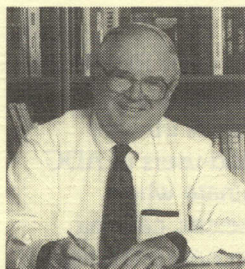
The introduction of new products like the Metrologic IS 5800 must be well-planned. Vendors will often have only one chance to impress prospective buyers.

At ID Expo 96, we discussed this issue with Harry Knowles, president and CEO, Metrologic Instruments. He told us — in his inimitable no-

nonsense manner — about his past experiences with launching new products and how the industry has changed. "We've had customers preview our products before they were fully engineered and ready for the market," Knowles confided. "The results were disastrous. We'd fix the problems and try to get them to take a second look. Usually the response was, 'I already looked and evaluated it ... the issue of me buying it is dead.' We missed that opportunity. It was impossible to get them to reopen the book on it and wipe away the disappointment from their initial experience with the product."

"When you announce a new product, you're trying to reach a few thousand people world-wide who may be interested or influential in buying what you have to offer," Knowles explained. "So when you think about how many companies are doing business in the entire world, that's a pretty small target for a product that you spent most of your R&D funds developing."

"These prospective buyers are extremely busy. As you know, when they come to a trade show, they walk the aisles very rapidly. If you have a new product you want them to see, you may only have a few seconds to capture their attention. If they're interested, they may stay another few minutes. So you better know who it is you're trying to attract to your booth and your presentation must be polished and geared specifically for that buyer."



C. Harry Knowles,
President and CEO,
Metrologic Instruments

Continuing, Knowles stated, "This buyer is not going to waste his time. If anywhere during your sales presentation, you encounter a stumbling block that you haven't anticipated, you're going to lose that customer. If you haven't thought about what market this buyer represents and how your new product addresses his specific application, you may as well count yourself out with that customer. And once that window of opportunity closes, forget it. You're not going to get a second chance."

This subject was particularly appropriate for Knowles at ID Expo, where Metrologic had introduced a new holographic scanner (the IS 5800). We asked him what he did differently with the launch of this product compared to product launches in the past.

"This time we involved our customers in the product's design," Knowles said. "We've been working with UPS, FedEx, JC Penney, and the Post Office for several years to determine what would make their operations more efficient. The consensus

was that they needed a relatively small scanner with a depth of field of three feet. The scanner had to be able to read small bar codes ("X" dimension of .012" to .015"). It also needed to be fast, reliable and cost-competitive with hand-held units."

The scanner had to satisfy two functions: product identification and real-time sort. [Product identification simply means verifying a package has reached a particular point in the distribution channel]. Sortation, or directing the package to its next destination, had to be accomplished without human handling of the package (which has an average error rate of 3 to 15%). "We were looking for a scanner to replace the widely-used hand-held units," he related.

"We strongly considered 'body-wearables' but finally determined we needed a simple scanner that could be mounted in a fixed position and would not interfere with an employee's hand and arm movement. The holographic scanner that we introduced at ID Expo was our answer. We believe the potential for this product in industry-wide unit sales could reach seven figures."

In the market Metrologic was targeting, its principal competitor was Accu-Sort. Metrologic contacted many companies that were impressed with its new holographic product but were already locked into funded projects with Accu-Sort. However, Metrologic gained a great deal of insight about the market through its dialogue with these prospective buyers.

"At first, we thought a 95% to 96% first-pass, read rate was great," said Knowles. "Then some of the hardnoses we talked to said, 'If that's all you're going to get, we don't even want to talk to you.' We did not realize Accu-Sort was already producing a product that was accurately reading nearly 100% of everything that was being passed through."

After this rude awakening, Metrologic spent the next several months re-evaluating its holographic technology. The company revised the new scanner and emerged with an upgraded version that now achieves a successful read rate close to 100%.

"The industry has changed and there's a new set of rules that everybody must play by," concluded Knowles. "Companies must reach this level of perfection to remain competitive in these types of hypercritical situations. You better be ready for a flawless performance to an intolerant audience — or they'll throw you out of the auditorium."

For more information: **Metrologic**, Blackwood, NJ, PH (609) 228-8100, FX (609) 228-6673, E-mail: marketing@metrologic.com.

Did The World Change?

by Bert Moore

On May 13, **Bull CP8** (a division of France-based **Groupe Bull**), announced the first reprogrammable, fully-integrated contact/contactless smart card using technology developed by **Racom Systems**, of Englewood, CO.

Previous attempts to integrate contact and contactless smart cards, so-called "hybrid" cards, simply encased separate contact and contactless cards in the same piece of plastic. However, data couldn't be shared between the two "sides" of the card. That meant that money withdrawal from an ATM (a contact application) could not be used to add value to the other side of the card (for contactless applications such as mass transit fares). This incompatibility limited the cards' usefulness.

The proprietary Racom technology in the Bull card uses the same processor and memory to share data between contact and contactless applications. Racom also provides the card with its reprogrammability through the use of its proprietary Ferroelectric Random Access Memory (FRAM), rather than Electrically Erasable Programmable Read-Only Memory (EEPROM). Both FRAM and EEPROM are static memories but FRAM is infinitely reprogrammable and doesn't "age" with use the way EEPROM does.

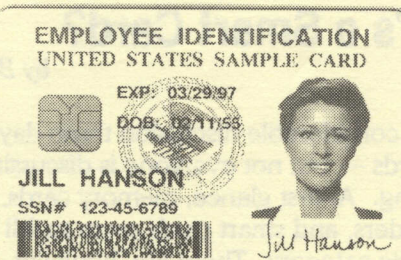
Reprogrammability addresses a security issue. Bull supplies the operating system for the Racom card and, although Bull's operating system (in use by the majority of smart cards worldwide) has never been broken, this is always a worry. Because the integrated card is completely reprogrammable, the entire operating system could be replaced should Bull's operating system ever be compromised. Reprogramming could be accomplished when the card is presented to any reader.

The development of an integrated smart card heralds the possibility of having a complete "electronic purse" for all financial transactions, from ATM and credit card transactions to vending machine and public transit purchases.

The electronic purse idea hasn't gained much momentum because of the incompatibilities of the two smart card types. However, according to John Shoemaker, vp sales and marketing for Racom Systems, Inc., the two types of smart cards address different needs.

Contact smart cards address the security concerns of banks and other financial institutions. Contact

Graphic furnished by DataCard.



Contactless smart cards use a form of radio frequency (inductive coupling) to communicate with a reader. For high-throughput applications, such as public transit fare collection, contactless smart cards speed access at peak times.

smart cards must be inserted into a reader for physical contact between a reading probe and the card's contact "port," much like using a standard ATM. Because the card is inserted into the reader, financial data or access codes can't be monitored by an outside source.

Contactless smart cards, on the other hand, use a form of radio frequency (inductive coupling) to communicate with a reader. For high-throughput applications, such as public transit fare collection, contactless smart cards speed access at peak times. A number of European cities have already implemented contactless smart card systems.

According to Shoemaker, the reprogrammable, integrated card clears away the major roadblock for the wide-scale use of smart cards by providing "a multi-function card for multiple applications that is reloadable [value can be added] by the user and reprogrammable by the issuer."

With upwards of 8K of memory currently available, a considerable amount of data can be stored on the card. The next generation will have 16K or more, allowing inclusion of biometric information to replace PIN codes or other security measures.

Bull's integrated smart card is the first step in the development of consumer-oriented electronic commerce. A major electronic infrastructure will have to be developed to make full use of the card's potential. Initial user reluctance will also have to be overcome.

Did the world change?

Probably. But we won't notice it for a little while yet.

For more information: **Bull CP8**, (France), PH +33-1-3966-4479; **Racom Systems, Inc.**, Englewood, CO, PH (303) 771-2077, FX (303) 771-4708, E-mail: marcom@racom.com

What's a Smart Card?

by Bert Moore

There's considerable discussion these days about smart cards — but not everyone is discussing the same thing. At first glance, memory cards, RFID transponders, and smart cards seem to fall into the same basic category. There are, however, real differences between smart cards and other devices.

What is a smart card?

The basic feature of every true smart card is on-board intelligence. Smart cards have an internal microprocessor that runs its own operating system. The internal processor handles data storage and data processing tasks. This feature sets smart cards apart from all other devices.

Smart cards typically resemble credit cards but can also be produced as tags, key fobs, and other shapes. Some smart cards are contact devices, others are non-contact (contactless). All smart cards are read/write.

What smart cards are not.

Memory cards (cards that contain integrated circuit memory chips) are sometimes wrongly called "smart cards." Memory cards do not contain internal processors, they rely on external operating systems to process and parse data. They are, as the name suggests, simply storage devices in a card format.

Memory cards are contact-read devices. Non-credit card shaped devices could also fall into this category (e.g. contact memory from Dallas Semiconductor, MacSema, and ValGay).

RFID tags are not smart cards. Contactless smart cards communicate the same way some RFID tags do, but again, RFID tags do not contain microprocessors. RFID tags can be viewed as contactless memory cards. Some RFID tags resemble credit cards but more typically come in a wide range of shapes and sizes.

To write data to a memory card or RFID tag, all data on the device is typically read out to an external processor, data is added or modified, then rewritten to the device. Smart cards, on the other hand, handle data processing and memory management internally.

Another way to look at smart cards is as the ultimate extension of distributed processing. Not just portable databases, smart cards are PCs on a piece of plastic.

Correction:

Our apologies to Dr. James Fales and all our readers who are Ohio University fans. In the last issue we mistakenly listed the city for the University as: Akron, OH. It should have read: Athens, OH.

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