CONTACTLESS COMES TO CAMPUS

New technology to revolutionize campus cards

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O f the estimated 2,500 campus-wide higher education campus card systems in North America, not including all the single application systems, 95 percent are currently utilizing magnetic stripe technology as their primary credential and card transaction system technology. Although institutions have invested $100,000 to more than $2 million in their current campus card infrastructure, all educational institutions in the next five years can be expected to reassess the long-term efficacy of magnetic stripe technology at their institutions—with significant long-term customer, marketing, operations, technological, speed of service and financial implications. Institutions are now on the doorstep of discerning whether contactless chip technology (13.56 MHz) will be the new standard for future campus card systems.

A student at Morehead State University uses a contactless chip card at a vending machine.

INNER TUBE TECHNOLOGY

Nearly 25 years ago, the higher education industry led most other market segments with multiple campus-wide applications and its rapid migration to high coercivity magnetic stripe technology. Although more costly compared to traditional low energy magnetic stripes, proactive adoption yielded increased data integrity and speed of service, longer card life, reduced production labor, and greater customer satisfaction.

Just as classic car tires with inner tubes no longer populate our highways, antiquated magnetic stripe "tire inner tube technology" of the past century appears to be rapidly reaching its technical obsolescence. Data security, weather, reader life and increasing maintenance costs of traditional "mechanical" design magnetic stripe readers are becoming problematic. Simultaneously, institutions continue to escalate the number of access readers for greater customer convenience and comprehensive enterprise security.

Although most institution budgets remain constricted, now is the time for administrators to strategically assess their current and future campus card needs and system requirements. The latest generation of "contactless" smart chip technology, with its 10-year successful internship on college campuses, is now well-positioned to replace the time-honored magnetic stripe as the new "primary" technology for campus card systems.

CARD TECHNOLOGY 101

Magnetic Stripe – Typically referred to as "Mag," this 50-year-old technology can facilitate either read only or read/write functionality. High coercivity (HiCo) magnetic stripes provide higher data erasure resistance than LoCo. Its width, length and position are specified by the International Standards Organization (ISO) and the American National Standards Institute (ANSI). Magnetic stripe technology requires "mechanical" readers which are inevitably vulnerable to weather, grime, perspiration and card usage. Cards and readers degrade with each transaction. Although non-printed cards are relatively inexpensive, card susceptibility to fraud, data erasure and scratching, as well as increased reader maintenance have reduced the popularity of this once universal technology.

Proximity – Often referred to as "Prox," this 40-year-old "contactless" card technology consists of a non-visible micro computer chip and antenna embedded inside a plastic carrier (usually a card). The chip receives power for its operation when in close contact (proximity) with a reader. It communicates at a low frequency (125 kHz) and is not encrypted, therefore it is vulnerable to open capture, cloning and replay. The embedded chip

typically has no memory, no batteries and was heralded for its "Tap & Enter" close-range wireless feature. Its thinner redesign (CR80) a decade ago enabled its co-existence with magnetic stripe readers. Prox technology utilizes "motionless" readers (non-mechanical) which are resistant to weather, grime, perspiration and provide a longer-life than mechanical readers. A variety of chip carriers (e.g., cards, keyfobs, tags) can provide multiple credentials per patron. Credentials and readers are essentially impervious to transaction usage. Its traditional single-application restriction (access control), relatively high cost per application, and increasing data vulnerability have reduced the magnetism of this once popular access control technology. Prox is frequently confused with newer generation contactless smart chip technology (13.56 MHz).

Contact Chip – Often referred to as a "Smart Card," this 25-year-old "contact" smart chip technology consists of a visible metal contact plate and a non-visible micro computer chip and antenna embedded inside a plastic carrier (usually a card). The chip receives power for its operation when in physical contact with a reader. The chip has no batteries, read/write functionality, large memory and is considered a high-security technology. Its thin design (CR80) enables its co-existence with magnetic stripe readers. Contact chip technology requires "mechanical" readers which are inevitably vulnerable to weather, grime, perspiration and card usage. Cards and readers degrade with each transaction. Although designed as a futuristic multi-application technology, it has been primarily limited to banking applications. Card susceptibility to scratching, increased reader maintenance, continual debate over international standards, and ongoing market and technological challenges have reduced the charisma of this advanced technology.

Contactless Chip – Typically referred to as "Contactless," this 10-year old "contactless" smart card technology consists of a non-visible micro computer chip and antenna embedded inside a plastic carrier (usually a card). The chip receives power for its operation when in close contact with a reader. It communicates at a high frequency (13.56 MHz), usually in an encrypted format, and therefore provides higher security data protection. The embedded microprocessor chip has no batteries, read/write functionality, large memory and is considered a high-security technology. Its thin design (CR80) enables its co-existence with magnetic stripe readers. Contactless smart chip technology utilizes "motionless" readers (non-mechanical) which are resistant to weather, grime, perspiration and provide a longer-life than mechanical readers. A variety of chip carriers can provide multiple credentials per patron. Credentials and readers are essentially impervious to transaction usage. Designed as a

multi-application technology, it combines the best features of preceding magnetic stripe, proximity and contact smart chip technologies and its marketability to many industries throughout the world.

CONTACTLESS CONFUSION
Contactless smart chip technology is repeatedly confused with older generation "prox" technology. Although they both appear visually similar and use a form of wireless radio frequency technology, the differences between the two generations are as diverse as online and offline mag stripe technology.

Institutions have been accustomed to purchasing mag stripe cards, assumed to conform to ISO standards, from numerous card suppliers and using them with a variety of mag stripe readers. In the contactless world, chips are sold to card manufacturers, who program a Card Serial Number (CSN) in the chip primarily for anti-collision purposes and distinguishes between multiple cards presented to a reader simultaneously (especially in mass transit applications). Reader manufacturers are licensed to read the CSN in a non-secure, unencrypted zone (similar to viewing a license plate) or read a programmed card number in a secure, encrypted zone of the card, which requires a special data encryption key.

All contactless technology is designed for a specific platform, similar to a computer operating system. The current primary platforms are DESFire®, FeliCa®, iCLASS®, LEGIC® and MIFARE, which are in fact "families" of related platforms. Several card technologies and platforms can now co-exist on the same credential (e.g., mag stripe, prox, contactless/iCLASS, contactless/MIFARE).

Applications (i.e., access control, debit, transit, banking, time & attendance, loyalty, biometrics, etc.) reside on top of the platforms. Unlike "prox", contactless smart chip credentials utilize security features such as encryption and mutual authentication to protect applications.

Near Field Communications (NFC) is a wireless or mobile communications technology that co-functions with contactless chips (similar to Bluetooth®).

PASSIVE ROLE REVERSAL
Despite increasing magnetic stripe susceptibility to fraud and security issues, retail merchants and ATM providers in North America continue to resist global infrastructure advances. Nevertheless, with the increased adoption of contactless technology, the importance of the magnetic stripe can be expected to rapidly downshift to a more passive role and diminishing campus card applications. It is likely that most institutions will continue to issue ID cards and badges with magnetic stripes, but as a secondary technology to accommodate legacy systems and local retailers.

Enhanced personal security is becoming an added benefit of contactless technology. Since customers do not have to relinquish possession of their contactless cards for "attended" financial transactions, potential fraud at retail environments is reduced significantly. Utilization of biometric algorithms stored in a contactless chip provide multi-factor cardholder identification and higher security for both patrons and institutions.

BACK TO THE FUTURE
Concurrent card system advances over the past decade, including conversion to IP technology readers and expansion of databases for inclusion of multiple credentials per patron, have dramatically reduced the contactless product development cycle. Contactless patrons may optionally purchase supplementary contactless credentials (e.g., keyfobs) as a convenience rather than reaching for a clipped badge or pocketed card, especially during winter or inclement weather, thereby generating new card office revenues.

Many vendors now provide contactless readers and upgrades for most traditional debit, verification, access control and vending applications. New multi-technology door access readers (i.e., prox, mag stripe, contactless) can be strategically installed on a provisional basis for gradual credential migration without extraordinary institution installation expenditures. Most standalone campus POS transaction systems (i.e., bookstore, food service, ticket offices, library) can now accept both mag stripe and contactless technologies using relatively inexpensive plug-n-play contactless readers.

What would have been a traumatic technological transition only two years ago, can now be facilitated in a phased-in and staged manner at the convenience and within the budgetary flexibility of an institution. For the customer, its "Tap & Go" convenience, security value and e-passport functionality have now positioned contactless (13.56 MHz) to become the new card technology standard for campus card systems.

A customer-focused campus card program can become one of the most cost-effective administrative tools and marketing vehicles for recruitment and retention of students, employees and local businesses. Your campus card portrays a vital, progressive and technological image of your institution. Campus card programs are here to stay. It's now time to consider Contactless.

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