Migrate, Upgrade or Outsource?



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Migrate, Upgrade or Outsource?

Agenda

Welcome

Introductions
Audience Survey

Environment

Historical Perspective Campus Card Market Expanding Applications

System Development

Traditional Planning Strategic Planning System Planning Tips

Credential Technologies

Technical Comparisons Paradigm Shift Demo

- Industry Resources Guide
- Questions





Migrate, Upgrade or Outsource?

<u>Overview</u>

Synopsis

Over the past 40 years, campus card systems have been on the forefront and early adopters of new technology, customer-focused applications and innovative campus services. Now new students seem to be "going steady" with their cell phones, divergent card systems are fragmenting campuses, and mag stripe and prox technologies are now costly and vulnerable.

How should an institution position itself for the future? Will new technology remedy or exasperate security issues and escalating labor costs? Should administrators upgrade, consolidate or outsource their antiquated card systems? An independent business consultant will provide his distinctive insight on what options institutions might consider to make informed business and technology decisions for their campus card systems.

Speaker

Over Robert C. Huber, CMC, has been a pioneer and leader in the campus card industry for over 30 years as an innovator, vendor, developer, consultant and futurist.

As a vendor independent Campus Card Business Consultant, he has overseen the implementation and assessment of over 200 campus card systems throughout North America. He was responsible for many revolutionary industry innovations, including 4-year campus cards, HiCo magnetic stripes, student laundry controllers, first college smart card systems and is the publisher of the "Campus Card Industry Forecast".

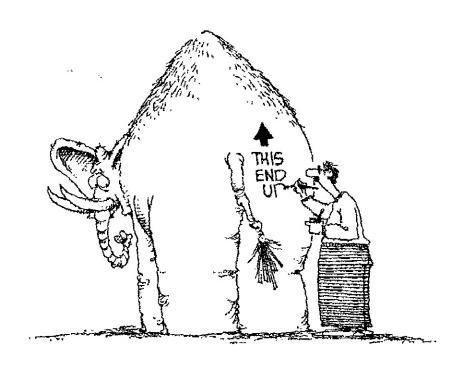
Mr. Huber is an vendor independent certified business consultant, author, media resource, adjunct college instructor, Hall of Fame recipient, card technology expert and frequent business workshop and national conference speaker.





Migrate, Upgrade or Outsource?

Environment







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Historical Snippets

1968

R.D. Products (Rochester, NY) develops and installs the first electronic card access system at the **Rochester Institute of Technology**.

The "VALI-DINE" system (i.e., Validation of Dining) mechanically punched holes in the meal plan card as it was read to signify authorized access to the dining hall. Mechanical counters were automatically triggered for customer counts.

1971

The "VALI-DINE/Series 2" system is installed at the Rochester Institute of Technology. This system not only mechanically punched holes in the meal plan card (i.e., to signify access to the dining hall), but electronically read previously punched holes in order to validate "one-time only" access per meal period.

1972

R.D Amsec, founded by **Gary Lorenz** and **John Darjany**, develops and installs the first known card-based campus electronic card access system using magnetic stripe technology (i.e., low coercivity) at **California State Polytechnic University** (Pomona, CA).

R.D. Products (Rochester, NY) and **Amsec** (Pomona, CA) jointly develop a patented one-piece card production system containing a camera, timer, and laminator – in a suitcase.

1975

The CBORD Group Inc. (Ithaca, NY) is founded by **John Alexander** to develop and market campus food service systems (i.e., food production management control system, meal plan access system).

Source: Robert Huber Associates





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Early Campus Card Readers









Photos Courtesy: NACCU Campus Card History Museum





Migrate, Upgrade or Outsource?

Higher Education Market

2-Year Institutions

Public	960	60 %	
Private (NFP)	85	5 %	
Private (FP)	635	35 %	1,700

4-Year Institutions

Public	670	25 %	
Private (NFP)	1,540	55 %	
Private (FP)	560	20 %	2,800

Totals 4,500

Source: U.S. Department of Education





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Campus Card Market

Multi-Application Systems

2-Year IHEs 100 5 % 4-Year IHEs 2,500 95 %

2,600

Single Applications Systems

2-Year IHEs 7,000 30 % 4-Year IHEs 17,000 70 %

24,000

Average Number Systems

Per Campus 6

Campus Card / Bank Affiliations

1993 - 2011 **150** 6 %

Off-Campus Merchant Programs

Estimated **1,000** 40 %

Source: Robert Huber Associates





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Campus Card Applications

(On-Campus)

Financial Services

Debit Accounts, Meal Plans, Charge Accounts, Day Care Center, Food Service, Dining Hall, Cafeteria, Snack Bar, Mobile Carts, Convenience Store, Bookstore, Snack & Beverage Vending, Copiers, Laundry Machines, Campus Post Office, Concessions, Cultural & Special Event Tickets, Athletics, Fees, Transcripts, Passport Photos, Parking Fees, Shuttle, Library (Services), Printing Services, Student RSO Organizations, Financial Aid Disbursement, Summer Campus, Conferences, etc.

Security Access

Photo Identification, Door Access, Parking Access, Elevator, Storage, Auto Lock/Unlock, Alarm Monitoring, Emergency Messages, Computer & Science Labs Access, Fitness Center Restricted Areas (pool), etc.

Special Privileges

Library Checkout, Recreation / Fitness Center Special Classes, Student Health Center, Campus & Merchant Discounts, Ticket Distribution, Convocation Tracking, etc.





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Merchant Applications

(Off-Campus)

- Food / Restaurants
- Grocery Stores
- Gasoline Stations
- Automotive Repair Stores
- Pharmacies
- Health & Beauty Shops
- Tanning Salons
- Physicians & Veterinarians
- Retail & Specialty Stores
- Entertainment
- Video & Media Stores
- Shuttles & Taxi Services
- Tourist Attractions





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System Development







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System Planning Options

(Design by Committee)

Monday:

Do Nothing / Status Quo!

Tuesday:

Switch Some Technology.

• Wednesday:

Switch All Technology & Vendor.

Thursday:

Switch Vendor Only.

Friday:

Switch System & Technology.

Monday:

Go Back To Previous Monday...





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Strategic Planning 101







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Sausage Planning 301

Shared Vision

(Administration, Task Force)

Mission

Objectives

Campus Needs Assessment Study

(Applications, Off-Campus Merchants, Systems, Infrastructure, Culture, Organization, Resources)
(Systems / Consolidation: Multi-Application, Door/Parking Access, University, Departments, Off-Campus Merchants)
(Card Production System, Service Center / Office Design, Virtual Office, Staffing, Policies, Marketing)
(Phase I, Phase I – Pilots, Phase II, Future, Off-Campus, Virtual)

(Credential Technologies)

Strategies

(Procurement:: Approvals, Funding, RFP Process, **Vendor Evaluation, Vendor Negotiations**, Approvals) (**Phased System Migration, New Card Design**, Recarding, Education)

Tactics

Technology (ies)

Vendor (s)

Customer





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System Planning Tips

- 1. Don't Panic!
- 2. Don't Rely On Your Neighbors.
- 3. Get Administrative Approval Up Front.
- 4. Confer With Purchasing A Year In Advance.
- 5. Appoint A Small & Committed Task Force.
- 6. Educate Your Task Force.
- 7. Be Resolute & Efficient But Realistic.
- 8. Develop A Customized RFP Document.
- 9. Visit A Variety of Other Institutions.
- 10. Go To Multiple Educational Conferences.
- 11. Secure Professional Advice.
- 12. Plan, Educate, Inform, Plan...





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Strategic Planning

If You
Don't Know Where
You're Going,



You'll
Probably End Up
Somewhere Else.

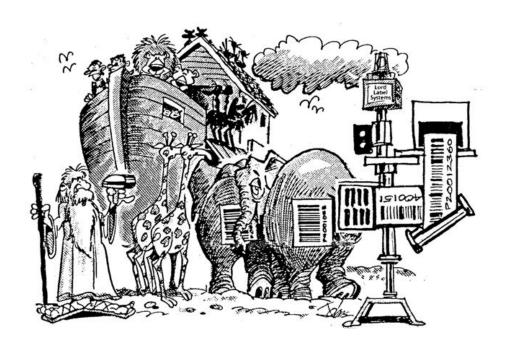
Yogi Berra





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Credential Technologies







Migrate, Upgrade or Outsource?

KeysCredential Technology



Mechanical Technology



Mechanical



Memory



Read/Write



Security



R.O.I.





Migrate, Upgrade or Outsource?

Optical Character Recognition

Credential Technology

1234567890

Optical Technology



Optical



Memory



Read/Write



Security



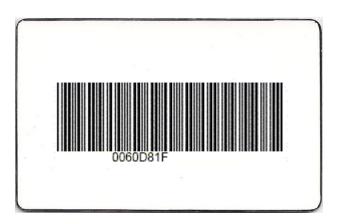
R.O.I.





Migrate, Upgrade or Outsource?

Bar CodeCredential Technology



Optical Technology



Optical



Memory



Read/Write



Security



R.O.I.





Migrate, Upgrade or Outsource?

Magnetic Stripe

Credential Technology



Mechanical Technology











Mechanical

Memory

Read/Write

Security

R.O.I.

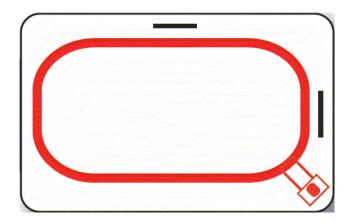




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Proximity Chip – Contactless

Credential Technology



Wireless Technology

(125 kHz)



Wireless



Memory



Read/Write



te Security



R.O.I.





Migrate, Upgrade or Outsource?

Smart Chip – Contact

Credential Technology



Mechanical Technology



Mechanical



Memory



Read/Write



Security



R.O.I.

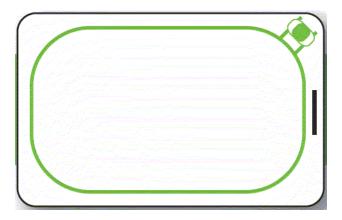




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Smart Chip – Contactless

Credential Technology



Wireless Technology

(13.56 MHz)



Wireless



Memory



Read/Write



Security



R.O.I.

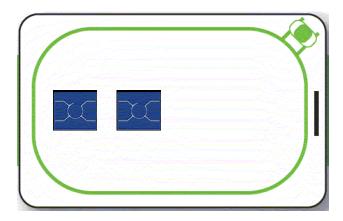




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Smart Chip - Contactless / NFC

Credential Technology



Near Field Communications (NFC) **Wireless Technology**

(13.56 MHz)



Wireless



Memory



Read/Write



Security



R.O.I.





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Final Thoughts

"Technology Is Great ... When It Works!"

All of Us

 "Technology Can Be A Great Servant, But Can Also Be A Terrible Master."

Stephen Covey

 Be Sure To Always Know Where The "Off" Switch Is For Your Personal Technology.

Robert Huber

 Technology Is 90% Physical While The Other Half Is Mental.

Yogi Berra





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Industry Resources







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Campus Cards, College and University Identification and Security

Campus card industry forecast



BY ROBERT C. HUBER, CAMPUS CARD INDUSTRY
BUSINESS CONSULTANT

Prediction #1-Contactless Becomes Preferred Campus Card Technology

After magnetic stripes have dominated campus card systems for 40 years, contactless smart chip technology-high frequency 13.56 MHz-rapidly ascends as the preferred identity and reader technology due to its high-data security, read/write storage capability, non-mechanical reader design, expansion scalability, extended reader life,

increased communications security, and rapid customer appeal with "Tap & Go" functionality via a variety of credentials, for example cards, badges, keyfobs and tags.

Prediction #2-Wireless & Contactless Propel Door Access Expansion

Parallel contactless and wireless innovations surpass early low-frequency prox technology with advanced data security, faster installations, reduced wiring and maintenance costs, twice the reader life because of non-mechanical design, emergence of multiple host shared readers, Power over Ethernet, phase out of building controllers and costly home run wiring, and increased Web-assisted facility and perimeter security.

Prediction #3-Merchant Programs Achieve Core Application Status

Increased consumer mobility, student proclivity for endless variety and convenience, incremental revenue-sharing opportunities and outsourced merchant management services, will escalate merchant applications as an expected element of all diversified and contemporary campus card programs.

Prediction #4-Virtual, Virtual, Virtual

Except for initial security verification, most campus card patron management services will increasingly be customer managed via 24/7, on-line and imaginative kiosk devices.

Prediction #5-Social Sizzle ... Instead Of Substance?

The failure to preserve and promote brand continuity, obscured by the excessive use of on line graphics, without an applied correlation to a structured, academic and strategic marketing plan, may result in many tactic-based campus card

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marketing programs that fail to achieve enduring and affirmative results expected by administrators.

Prediction #6-Which Credential Would You Like Today?

One of the benefits of contactless technology is the convenience of several simultaneous credentials per patron–cards, badges, keyfobs, tags–and already built-in to most campus card systems.

Prediction #7-Biometric Access Applications Go To Graduate School

A pronounced increase of contactless memory-enabled patron credentials and concurrent development of third-party biometric readers, fused with government research site requirements, health care privacy, costly laboratory equipment, sensitive animal research labs and protection of vital data centers will see a rapid increase in biometric facilitated multi-factor authentication for facility access.

Prediction #8-Community Colleges Become Major League Market

Potential new off-campus merchant revenues, increased campus safety and identification issues with a highly-fluctuating population, and verified access to buildings, doors, labs, restricted areas, and parking facilities in a more traditional open public campus environment will drive accelerated interest and corresponding government funding assistance for campus card systems at community colleges throughout the U.S.

Prediction #9-Shared, Leased & Hosted Systems Gain Prominence

The increase of national server farms and state contracted data centers for management of many administrative database and enterprise resource planning systems will encourage CIOs at institutions to recommend use of increased vendor hosted services for labor, economies of scale, and harbored resources strategies.

Prediction #10-Vendor Shuffling In The Cards

The retirement of long-term industry professionals, increased financial scrutiny by corporate boards, and the ever increasing charisma of the campus card industry will inevitably shift market share and vendor ownership of campus card industry vendors on a continual and evolutionary basis.

Robert C. Huber, CMC is President of Robert Huber Associates, Scottsdale, Ariz.



CONTACTLESS COMES TO CAMPUS

New technology to revolutionize campus cards

By Robert C. Huber, CMC, NACAS Business Partner

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

For more Campus Card Resources, visit www. AllCampusCard.com and www.NACCU.org. 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 (nonmechanical) 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 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 cofunctions 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.

Robert C. Huber, CMC has been a pioneer and leader in the campus card industry for the past 30 years. Robert Huber Associates is not affiliated with any campus card industry vendors. Contact him at (480) 551-0520 or by e-mail at huber@AllCampusCard.com.

Card Technology Comparisons

ARCHITECTURE	Bar Code (Variety)	Magnetic Stripe (HiCo)	Proximity (125 kHz)	Smart Chip (Contact)	Contactless Chip (13.56 MHz)
Read Only	Yes	Yes	Yes	Yes	Yes
Read & Write	No	Yes	No	Yes	Yes
Cardholder ID Numbers	Single	Limited	Single	Multiple	Multiple
Memory (Data)	No	Limited	No	Yes	Yes
Data Security	Low	Low	Moderate	High	High
Data Erasure	High	Low	Low	Low	Low
Data Encryption	No	Limited	No	Yes	Yes
Mutual Authentication	No	No	No	Yes	Yes
Industry Vendors	Numerous	Numerous	Limited	Limited	Limited
Credential Standards	Open	Open	Proprietary	Proprietary	Proprietary
Reader Standards	Open	Open	Multiple	Multiple	Multiple
Non-Mechanical Readers	No	No	Yes	No	Yes
Contactless Readers	No	No	Yes	No	Yes
Customer Convenience	Moderate	Moderate	High	Moderate	High
APPLICATIONS					
Off-line Applications	Yes	Yes	Yes	Yes	Yes
On-line Applications	Yes	Yes	Yes	Yes	Yes
Authentication	Yes	Yes	Rare	Yes	Yes
Meal Plans	Rare	Yes	Rare	Yes	Yes
Door Access	Yes	Yes	Yes	Yes	Yes
Debit	Yes	Yes	Rare	Yes	Yes
Vending	Rare	Yes	Rare	Yes	Yes
Biometrics	No	Limited	No	Yes	Yes
COSTS					
Credential Cost	1¢ - 5¢	10¢ - 50¢	\$3 - \$20	\$3 - \$20	\$3 - \$20
Reader Cost	Low	Moderate	Moderate	Moderate	Moderate
Reader Installation	Low	Moderate	Low	Moderate	Low
Reader Maintenance	High	High	Low	High	Low
Cost (per Application)	Low	Low	Very High	Low	Low
Overall Costs	Low	High	Moderate	High	Moderate
		•			



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Campus Card Vendors

Blackboard, Inc.

www.blackboard.com

CardSmith

www.card-smith.com

Heartland Campus Solutions[™]

www.1card.com

• ITC Systems, Inc.

www.itcsystems.com

NuVision Networks Corporation

www.nuvisionnetworks.com

Off Campus Solutions, Inc.

www.offcampussolutions.com

The CBORD Group, Inc.

www.cbord.com





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Library

•	The Thinking Life How To Thrive In The Age Of Distraction	P.M. Forni
•	Sleeping With Your Smartphone Le How to Break the 24/7 Habit and Change the W	
•	Welcome To Your Brain Sand Why you lose your Car Keys but Never Forget F and Other Puzzles of Everyday Life	
•	Purple Cow Transform Your Business by Being Remarkable	
•	DRIVE The Surprising Truth About What Motivates Us	Daniel Pink
•	WHY WE BUY The Science of Shopping	o Underhill
•	A New Brand World Sco 8 Principles for Achieving Brand Leadership	ott Bedbury





Migrate, Upgrade or Outsource?

Speaker

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President & Senior Consultant Campus Card Business Consultant



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