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The role of new technology in deciding strategic direction

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The Role of New Technology in Deciding Strategic Direction

LIBER 34th Annual Conference 2005

Netherlands

Tuesday 5 - Saturday 9 July 2005

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Delivering a Good Customer Service

- Books and journals account for the majority of library material
    - Databases for catalogue and search have significantly improved
    - Automation of materials handling remains in the stone age

- Demand for library services is increasing but staffing levels remain static
    - More stress injuries while gambling that those new DVDs don't disappear
    - More strain injuries from grasping, reaching, and lifting

- The dilemma – how can librarians spend more time with students when they spend most of their day coping with the avalanche of materials in transit?

- We need one of those mythical solutions, where technology actually buys time and productivity

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Is Technology The Saviour We Need

- The main reasons for considering new technologies are the potential for cost savings and the management of material flows

- Bar codes
  - Provide the coupling between the information system and the physical flow of library material
  - Are robust, reliable, and efficient
  - Limitation is no signal feed for anti-theft systems
  - Generally work with electromagnetic (EM) based anti-theft systems
  - Bar codes and EM solutions have many limitations but are tried and tested

- RFID (Radio Frequency Identification)
  - The new method for controlling inventory, offering self-check, and using automated materials handling
  - Seen as a way forward for library inventory management
  - Technology still developing rapidly
  - Concerns about RFID deployment.

- What is RFID anyway and how do we establish a balanced view of its usefulness and value

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RFID – The Basics 1

- RFID
  - Been used to manage inventory and theft in libraries since late 90s
  - Systems comprises three components; a tag, a reader and an antenna.

- RFID Tag
  - Paper thin and approximately 2"x 2" (50mm x 50mm) in size
  - Placed inconspicuously on the inside cover of each book in a library's collection
  - Consists of an etched antenna and a tiny chip which stores vital bibliographic data including a unique ID number to identify each item
  - Compare this to a barcode label which does not store any information and only points to a database

RFID – The Basics 2

- RFID Reader & Antenna
  - Wide range of shapes and sizes to suit respective applications within the library
  - Reader powers the antenna to generate an RF field
  - When a tag passes through this RF field, the information stored on the chip is decoded by the reader, and sent to the central server that in turn, communicates to the Library Information System

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RFID – Key Attributes

- Tags for libraries need to last for the lifetime of the books or other material to which it is attached

- Retail or warehouse applications only require to last for the storage or transit period

- Unlike barcodes, RFID tags can be read;-
  - Through desktops and book covers (no line of sight is required)
  - In any orientation to the reader/antenna
  - While moving (i.e. while being deposited through a return chute)
  - Several at a time
  - From distances of several inches to the antenna

- RFID improves library workflow, staff productivity and customer service with these attributes

- Ability to conduct inventory counts without removing books from the shelves, is what really separates RFID from preceding technologies such as barcodes

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The Role of New Technology in Deciding Strategic Direction

RFID – Positive Aspects 1

- Returns and Check-In
  - Improves productivity as scanners read multiple items simultaneously Eugene Public Library, "*students think it's pretty darn cool that they can place items on a desk and see the titles appear on a screen, touch the screen, and leave the library*."

- **Automated Check-in and Sorting**
  - RFID return bins can be configured to work with automated sorting bins

- **Faster and More Accurate Reshelving**
  - Automated sorters can work with RFID to reduce the time and labour involved in rough-sorting returns
  - Fine-sorting can be improved with hand held readers, which can indicate books that are out of order

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RFID – Positive Aspects 2

- Inventory Management
  - Inventory is time-consuming and costly but once automated with an inventory wand, it can be done more frequently.
  California State University, *"We had never performed an extensive inventory prior to having RFID"*
  Now they inventory 5,000 books per hour

- Collection Development
  - In-house usage is more easily monitored with the magic wands and in-house usage is available for electronic report generation

- Don't Forget the Staff – a significant advantage is staff safety
  - According to a report commissioned by the San Francisco Public Library, *"RFID will substantially reduce the number of risky motions (from grasping, reaching, and lifting) and mitigate worker compensation expenses"*

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RFID - Concerns 1

- Privacy at the Tag Level
  - The introduction of sensible processes appears the current solution to offset these issues.
  - In January 2004 six steps were suggested for best practice - Privacy policy, Notice / Openness, Purpose specification, Collection limitation, Security safeguards, Accountability

- Price
  - Book tags cost about €0.55 per tag and media tags €1.20 each.
  - We need to see the volumes increase to enable the manufacturing economies of scale to reduce the costs.
  - Hardware and maintenance costs are also significant
  - The real issue here is how do we measure ROI, which is address later

- Vulnerability
  - Tags are exposed to vandalism and some students may attempt to remove them

- DVD Protection Difficult
  - The metal on metal contact make tags difficult to read
  - Tag needs to be applied to the outside of the package as well as the disc itself to ensure the integrity of the check out or check in operation

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RFID - Concerns 2

- Reader Response
  - Security gates read every tag in the field and performance can suffer if there are too many tags in the field

- Concerns Over Health and Safety
  - The products emit low levels of magnetic fields to induce a specific response from a marker or to interact with an RFID tag
  - Products need to be designed to meet European Norm EN50364 that limits human exposure to electromagnetic fields
  - EN50364 was published in October 2001 and is the most stringent EMF/human exposure standard in the world

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RFID - Concerns 3, Systems Working Together

- The main standards pertaining to library RFID are SIP2 and ISO 15693 and 18000-3

- SIP2 manages the communication between the RFID system and the automated library system

- All RFID vendors are SIP2 compliant, but some tweaking may be needed for things to work smoothly

- ISO 15693 defines the physical characteristics, air interface, and communication protocol but doesn't "account for what data is on the chip, how that data is formatted, or the read/write requirements of the RFID equipment

- The ISO 18000 series of standards establishes RFID-specific communication protocols and will be employed with the 13.56 MHz RFID tags used in libraries

- While all of the RFID vendors are ISO15693 compliant, there is no interoperability among them because proprietary protocols are added to the tags and some standardisation work is happening around ISO15693-3

- ISO 18000-3 was approved and published in 2004 and should improve the ability to read a variety of vendor tags with one reader

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RFID - Evaluating, Installing and Maintaining

- Evaluation
  - Deciding to implement RFID raises a new set of tasks: setting goals, evaluating other installations, selecting a vendor, planning conversion, managing the actual conversion, and assessing the results

- Installation
  - The physical retrofitting of library materials is generally simple as existing barcodes are scanned into a conversion station and programmed RFID tags result
  - Choosing a conversion workflow process is less simple
  - Between 250-400+ items tagged per hour is a realistic number

- Maintenance
  - Equipment needs to be maintained after installation
  - Any updates should be included in vendor maintenance contracts
  - Other maintenance tasks include setting up a workflow for new items received by the library and performing evaluations of the RFID systems' effectiveness

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RFID - ROI

- No published studies yet exist presenting quantifiable evidence that RFID provides greater gains than expenditures

- The decision to move forward with RFID is a complex business decision which involves an investment in time and money, and libraries need to examine the business case before moving forward

- The ROI for RFID in libraries is calculated by subtracting the costs of implementing RFID from the savings of implementing RFID, and then measuring how long it takes for that investment in RFID to pay for itself

- There is no simple one-size-fits-all RFID calculator that will enable libraries to plug in a couple of values and reach a conclusion

- Key variables include circulation growth rate, circulation policies and processes, "pain points," staffing levels, construction plans, and library layout

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RFID - The Future

- RFID Publisher Tagging
  - The publishing industry needs to standardise on a tag
  - Publishers need to incorporate the tagging process into their book assembly process
  - Publishers need to absorb the added costs associated with installing the tag
  - This scenario is expected roughly six years from now

- Open source for RFID
  - Open source may play an important part in library RFID in the future
  - Several forces seem poised to erode closed systems:-
    - Book publishers as discussed above
    - Major retailers like Wal-Mart sell books and want suppliers to use RFIDs.
    - Exploiting mass-production scale economies is a key major business goal of the RFID industry

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RFID - Conclusions

- Librarians wish to deliver a good service but are hampered by the need to cope with the avalanche of books and AV being processed

- New technologies are of interest both for the potential for cost savings and the management of material flows

- RFID is now the hot favorite for controlling inventory, offering self-check, and using automated materials handling

- The benefits of RFID are improved returns productivity, reduced thefts, full self service functionality, elimination of manual sorting by working with automated sorting bins, improved inventory management, improved staff safety and higher customer satisfaction

- The main concerns with RFID are privacy, price, exposure of tags to vandalism, reading DVD tags, reader response with high tag density, Standard Interchange Protocols have been established but all RFID solutions are still proprietary, magnetic fields induced have raised health and safety concerns

- Evaluating RFID is a complex business decision however, once proven, the benefits in terms of higher service levels, improved staff performance, staff safety and personal satisfaction are impressive

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The Role of New Technology to Support an Increase in Service Delivery

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Demand for services

Resources

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Delivering a Good Customer Service

- Demand for library services is increasing but staffing levels remain static
  - Managing the physical collection becomes increasingly difficult
  - More stress and Strain injuries.
  - Databases for catalogue and search have significantly improved
  - Automation of materials handling remains in the stone age

- The dilemma – how can librarians spend more time with students when they spend most of their day coping with the avalanche of materials in transit?

- We need one of those mythical solutions, where technology actually buys time and productivity

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Is Technology The Saviour We Need

- New technologies can increase the quality of service and improve the efficiency operations

- Established solutions - Bar codes
  - Provide the coupling between the information system and the physical flow of library material
  - Are robust, reliable, and efficient
  - Limitation is no signal feed for anti-theft systems
  - Generally work with electromagnetic (EM) based anti-theft systems
  - Bar codes and EM solutions have many limitations but are the tried and tested solution security and self-service

- RFID (Radio Frequency IDentification)
  - The new method for controlling inventory, offering self-service, and automating materials handling processes.
  - Seen as a way forward for library inventory management
  - Technology still developing rapidly.
  - Concerns about RFID deployment.

  - Can work hand in hand with EM security systems

- What is RFID anyway and how do we establish a balanced view of its usefulness and value
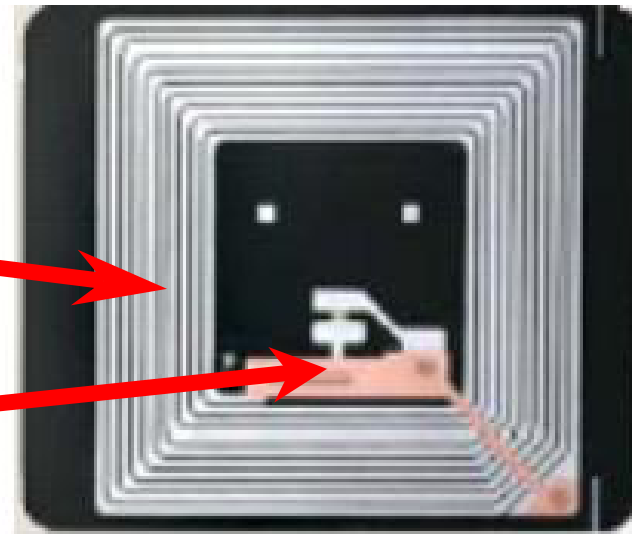
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At its simplest …

We replace this:

With this:

Antenna

## Integrated Circuit

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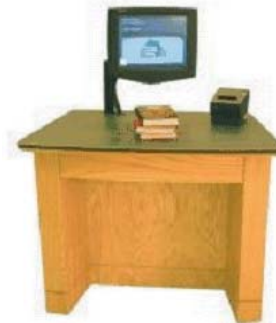
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RFID – Positive Aspects 2

- Inventory Management
    - Inventory is time-consuming and costly but once automated with a handheld device it can be done more frequently.

    - Some libraries now inventory up to 5,000 books per hour

- Collection Development
    - In-house usage is more easily monitored with the handheld units and in-house usage is available for electronic report generation

- Don't Forget the Staff – a significant advantage is staff safety
    - According to a report commissioned by the San Francisco Public Library, *"RFID will substantially reduce the number of risky motions (from grasping, reaching, and lifting) and mitigate worker compensation expenses"*

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RFID - Concerns

- Privacy at the Tag Level
  - The introduction of sensible processes appears the current solution to offset these issues.
  - 3M supports library privacy best practices. In January 2004 (U.S) six steps were suggested for best practice - Privacy policy, Notice / Openness, Purpose specification, Collection limitation, Security safeguards, Accountability

  - RFID typically store only barcode numbers

  - Information held is unchanged with RFID

  - Security system uses items status rather than item details

  - Short read range

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RFID Concerns

- Security
  - Am I compromising security?
  - Tags are exposed to vandalism
  - Traditional EM investment safe

- DVD Protection difficult
  - Metal on metal contact makes tags difficult to read

- Reader response
  - Do security gates need to read all tag information?

- Interoperability
  - ISO standards

- Price
 - The real issue here is how do we measure ROI?

RFID - Concerns Systems Working Together

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RFID – ROI What am I looking for?

- Satisfied customers?
- Circulation staff productivity?
- Job satisfaction?
- Reduce repetitive motions?
- Reduce Item losses?
- Increased collection accuracy?
- Future service capacity with same number of staff?

- There is no simple one-size-fits-all RFID calculator that will enable libraries to plug in a couple of values and reach a conclusion

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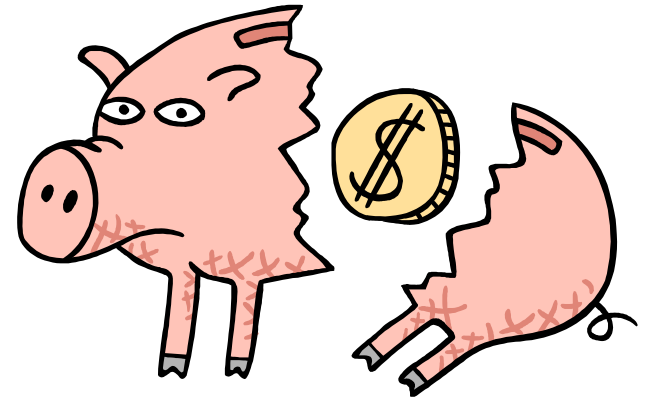
RFID - Evaluating, Installing and Maintaining

- Evaluation
  - Deciding to implement RFID raises a new set of tasks: setting goals, evaluating other installations, selecting a vendor, planning conversion, managing the actual conversion, and assessing the results

  - Talk to your colleagues, visit sites, do your research

- Installation
  - The physical retrofitting of library materials is generally simple as existing barcodes are scanned into a conversion station and programmed RFID tags result
  - Choosing a conversion workflow process is also simple
  - Between 250-400+ items tagged per hour is a realistic number

  - Plan the process

- Maintenance
  - Equipment needs to be maintained after installation
  - Any updates should be included in vendor maintenance contracts
  - Work with the right supplier

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RFID - Conclusions

- Librarians wish to deliver a good service but are hampered by the need to cope with the avalanche of books and AV being processed

- RFID is now the hot favorite for controlling inventory, offering self-check, and using automated materials handling

- The benefits of RFID are improved returns productivity, maintain security levels, full self service functionality, elimination of manual sorting by working with automated sorting bins, improved inventory management, improved staff safety and higher customer satisfaction

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• Evaluating RFID is a complex business decision however, once proven, the benefits in terms of higher service levels, improved staff performance, staff safety and personal satisfaction are impressive

•ROI can be as short as 2-3 years.

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Roadmap for RFID success

- Start with your goals – what do you want RFID to do for you?

- Conduct ROI analysis to measure the value RFID will deliver to your library

- Plan conversion process

- Ready your organization for change

Thankyou

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