Application of RFID Technology in Libraries and Role of Librarian

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Abstract

A library is a growing organism. As it grows in size the problems associated with the conservation and security of the documents also grows. There are several styles of identification, but the most common is to store a periodical number that identifies a person or object, and maybe other information, on a microchip that's attached to an antenna. Rotation and shelving of the reading material in a library is quite a clumsy work which takes utmost of the time of the library staff. Library correspond intellectual capital it might be scholarly journals, books, reports, theses etc. For security purpose, the thing of the security system should be to give a safe and secure installation for library workers, library coffers and outfit and library patrons. At the same time due to operation of security system, that pledge to increase effectiveness, productivity and enhance stoner satisfaction. To automate the counter conditioning they gave us bar- canons. Bar- canons have served the librarians and libraries for a long time, and now it's sluggishly getting replaced by RFID. Radio Frequence Identification (RFID) provides for "eyeless" or no line-of-sight identification of particulars. It includes the capability to grease rotation,re-shelving, and theft discovery, and it has several other important advantages.

Keywords: *RFID, Library Security, Use of RFID, Library Services*

Introduction

This technology helps librarians reduce precious staff time spent surveying barcodes while charging and discharging particulars. RFID is a combination of radio frequence- grounded technology and microchip technology. Barcodes simplify the identification of particulars for library rotation and libraries. Still, due to low data capacity and the incapability to program barcodes, the compass of barcode operation is limited to information access of collections and patron cards. A better result for the storehouse of recognizable information and deals is to use intertwined circuit memory cards or smart cards to convey data. Still, this kind of contact- type IC card must work through a anthology contact to have power and to transmit accoutrements. The failing of usage includes lower processing speed and bruise of an electronic contact. The RFID anthology sends out electromagnetic swells and the label antenna is enabled to admit these swells. "When the label antenna enters the radio frequency field, the label's microchip circuits are powered by signals from this radio frequency field created by the anthology. The chip also modulates the swells and the label sends them back to the anthology. The anthology converts the signals entered from the label into digital data and sends it to a computer." There are colorful types of markers available for library kind of terrain like standard markers for books, CD-DVD markers, and Magazine markers.

RFID Way forward in Post Covid-19 Era

- · No Mortal Contact library Deals
- · Social distancing can be followed by avoid in long ranges at Rotation Counter
- · Stoner's Smart Card need not to be touched at RFID compendiums but can only be shown within range of 5 to 7 CMs and stoner can be linked by RFID anthology
- · Handheld Compendiums can be useful in force/ searching a particular book without any need to touch the racks/ books in the library

- Bespeak drop can be used to avoid any contact with mortal and return deals can be performed
- Library staff and choose not to touch returned books and let them stay in Book drop for 1-2 days time
- No need to physically check any library stoner, RFID gate can descry any unauthorized book going outdoors library.

Technology

Radio Frequence Identification or RFID is a combination of radio frequence grounded technology and microchip technology. The microchip that's attached to an antenna, in the label fixed to library accoutrements contain information regarding the identify of that particular particulars. To read this information we use radio frequence technology. This technology doesn't bear line of sight or fixed aeroplane to read markers. This system consists of an antenna and a transceiver, which read the radio frequence and transfer the information to anthology, and a mean for the intend a transponder, which contain the Radio Frequence circuitry and information to be transmitted. The antenna provides the mean for the intertwined circuit to its information to the compendiums that convert the radio swells reflected back from the RFID label into the digital information that can be passed into computers that can reuse and use this information.

Factors of an RFID System

RFID system has substantially nine factors

- RFID markers/ transponder that are electronically programmed with unique information
- Compendiums or Detectors to query the markers.
- Antenna.
- Garçon on which the software that interfaces with the integrated library software is loaded.
- RFID Marker Printer
- Handheld Anthology
- Tone Check Unit
- External Book Return
- Staff and Conversion Station

Markers :RFID label is the heart of the system is the RFID label, which can be fixed inside a book's back cover or directly onto CDs and vids. This label is equipped with a programmable chip and an antenna. Each paper thin label contains an engraved antenna and a microchip with a capacity of at least 64 bits. These are three types of markers' read only','WORM', and'read/ write'. Markers are read only if the identification is decoded at the time of manufacture and not rewritable'WORM' (write formerly read numerous) markers are programmed by the using association, but without the capability to rewrite them latterly' Read/ Write markers'which are chosen by utmost libraries, can have information changed or added. In libraries using RFID is common to have part of the read/ write label secured against rewriting e.g. the identification number of the item.

Compendiums: A receiver device called as anthology detects the signal as soon it enters into its Radio range and decodes the number for interpretation; Anthology interrogates the markers and offers optimum reading performance enabling instant data prisoner when passed alongside the particulars in a continuance movement. The bias used within the structure are generally called' compendiums'while the bones used at structure exits are generally called' detectors'.

Antenna: An antenna is connected to the anthology to help to reuse identification of the Particulars and spark/ kill the label antitheft function contemporaneously. Fresh antenna can be added to increase the number of item reused in case of larger deals.

Garçon: The garçon is the heart of some comprehensive RFID systems. It's the communication gateway among the colorful factors. It receives the information from one or further of the compendiums and exchange information with the rotation database. Its software includes the Draft/ SIP2 (session inauguration protocol), APIs (Operation Programming Interface) NCIP or SLNP necessary to affiliate it with the integrated library software.

RFID Marker Printer : Used to print the markers

Handheld anthology: It can be moved along the particulars on the shelves without touching them. It used in stock verification, used in hunt for book-miss helved, search for individual book on request.

Shelf Check Unit : Druggies identification is done with an RFID-ID card. Druggies can put item onto the anthology face in front of the tone check unit to be registered under particular stoner's name. Multiple particulars can be checked out at the same time.

External Book Return/ book Drop Station: Libraries can offer a distinct service, similar as capability to return the books when library is closed. It's machine with a niche with a chip RFID Anthology integrated into a wall. Stoner identifies him or she also puts the Books into the Niche. Upon Completion of return, stoner gets a Damage showing how numerous and which books are returned.

Staff and Conversion Station: Staff station consists of antenna, electronic Module and power force. There are fresh software windows Integrated into library operation Systems.

RFID in Library: RFID has the potential to speed up library services and streamline time consuming operations such as check in – check out, sorting, stock management and inventory RFID Technology provides number of advantages for a library kind of environment. Table below lists various feature related benefits provided by RFID deployment.

Features Advantages

1. Theft detectionIncreased the difficulty of intentionally runintentionally removing items from the library without checking out You can check out or check in multiple projects at the same time.
2. Sightless identificationItems can be placed on the reader without careful placement, which is required by the sight system
3. Integrates with automated Book Return Systems smoothly Auto return station can provide 24-hour check-in Automatic 24-hour retention of pickup and checkout units.

4. Ability to scan and 'read' item numbers on shelves quickly and without handling each physical item Faster inventory process Ability to locate specific items. Erroneously shelved report
5. Saves processing time The label is guaranteed during the entire life cycle of the item. The project life cycle is only operated once.
6. Less staff handling of each individual item

   Protect employees from many injuries related to material handling
7. Permits borrowers to self-manage standard check in and checkout processes reliably Employees can use their professional skills instead of clerical skills. Staff redeployed to customer-facing responsibilities
8. .Flexibility and modularity Multiple levels of complexity and implementation allow the library to simply start and expand the solution as funding and/or processing needs progress. Able to manage many years of expenses.

Benefits to the library

The use of RFID technology in libraries is expected to bring a wide range of benefits and has several advantages over barcodes. The following summarizes some of the benefits of this technology to these libraries.

· Combine security and item identification in one label to reduce library loss and provide an effective library security detection system.

· Help library staff to free themselves from repetitive daily and operational tasks, and instead directly perform reader services, improve work efficiency, and improve reader services, thereby providing convenience for users and library staff.

· Mark patterns and IDs of library staff to identify that they restrict or allow them to access areas and services in the library.

- Since the library database is uploaded in real life, better books are provided.
- The easy check-in and check-out at the library counter reduces the number of people in line at the checkout counter and provides more convenience for customers.
- Multiple RFID tags can be read at the same time, further accelerating all scanning activities.
- RFID tags are stronger and tamper-proof than barcodes. Labels can play a role in situations where barcodes cannot tolerate them. High humidity, dust, extreme temperature, etc. Don't affect the label.

Disadvantages of RFID in Libraries

1. High Cost
2. Frequency Block
3. Chances of removal of exposed tags exit gate sensor problems
4. User Privacy concern
5. Reader collision
6. Tag collision
7. Interoperability

Application in Libraries: The foremost functions of RFID prolonged to a range of industries, together with farm produce tracing, automobile identification, entrance guards, and change manipulate (Kern, 1999). RFID tags we bendy and may want to be pasted onto curved surfaces; however, traditional RFID tags had been too thick to exchange barcodes for collections administration and safety control. At present, the most important purposes of RFID implementation in libraries are constrained to statistics management, circulation, and inventory.

Information management: Barcodes, e book cards, and magnetic strips can all be built-in into one RFID tag. This kind of RFID tag offers reminiscence to report data and to grant the system. The reminiscence now not solely shops bibliographic documents and circulation status, however the device additionally traces the region of the precise series material. Depending on this service, the device can provide help in tracing carrier when searching for precise fabric in libraries.

Circulation: RFID structures supply environment friendly operation processing. Librarians do no longer want to scan barcodes one by way of one. Patrons can concurrently technique take a look at in/out, verification, and entrance protect manipulate with RFID reader equipment. Videotapes and diskettes runnable to use magnetic strips to put in force entrance defend due to the fact demagnetization will break the facts on the material. After that, the the front desk suggests loans, over dues, reserves, and different circulation repute on the display about this patron. Librarians rely on these messages to supply service.

Inventory: Batch processing can additionally practice to libraries to operate stock or shelf-reading. Take hand held readers to sweep shelves, for occasion – readers can immediately detect all of the series inside this range, which includes ordinary conditions such as books put on the incorrect shelf.

Assistance in Searching and Orientation: The utility of RFID in industrial circles (Bhuptani and Moradpour, 2005), provides material drift administration comparable to library circulation. It additionally develops offerings such as help in looking out and orientation primarily based on detectable characters of RFID. One Drawback of open-shelf libraries is that substances are effortless to put on the incorrect shelf or to be unaccounted for. Library automation structures can solely question as soon as about checkin/out situations, however now not the place cloth is if it is now not on the right shelf.

Utilization Statistics for Serials: There is no suited and correct technique to calculate the analyzing fee of magazines and that which are on

the periodical rack. Systems do now not document when they are used in open cabinets and study in libraries. Patron response is uncertain if questionnaires are pasted onto magazines. Utilizing the detection scope of RFID, it is viable to collocate materials from the periodical rack and readers. If readers continue to be undetected on one tag for a while, this suggests that the journal used to be taken off shelf and is being read.

Cost: The value is one of the essential elements influencing acceptance of RFID, even though the Production fees of RFID have decreased and Alien Technology has reduce the tag rate to much less than $US0.20 (Collins, 2004). However, the retail fee is a long way greater than this price. For library collections with over 100,000 items, it will be massively costly to put into effect RFID completely. Plus, the prices for the reader, peripheral gear and utility software program will be even extra of a burden. This will stretch the finances and the time table for implementation of an RFID answer will be difficult due to the fact libraries maintain good sized collections.

Security: The shape of RFID chips is the identical as IC clever playing cards made with complementary Metal-oxide semiconductors. Therefore, techniques of cracking smart playing cards additionally observe to RFID chips. Moreover, the personality of RFID wi-fi verbal exchange can additionally capture transmitted facts via intercepted wi-fi signals. For this reason, RFID have to encrypt records to forestall eavesdropping, modification/replacement, and misuse. Besides more than a few commercial enterprise issues, interference from wi-fi equipment, stability, global standards, size, and cloth of RFID tags nevertheless existing a number of issues that want to be solved. The key aspect for software in libraries is gadget integration, and this difficulty depends on coordination with libraries and gadget elements to accumulate greater trip and know-how.

Suggestions: As libraries are imposing RFID system, it is vital to strengthen great exercise recommendations to make use of the science in the first-rate way and to hold the privateness challenge away. The following way is the great practices guiding principle s for library to use RFID.

- The library ought to be open about its use of RFID science such as offering publicly handy files mentioning the rational for the use of RFID, goal of its use and related insurance policies and procedures.
- Signs ought to be pasted at all services the use of RFID. The symptoms must inform the public that RFID technology is in use, the kind of utilization and a declaration of safety of privateness and how this technological know-how differs from different statistics series methods.
- Only licensed personnel have to have get admission to to RFID system.
- Information describing the tagged gadgets ought to be encrypted on the tag even if the records is restricted to a serial number.
- All conversation between tag and readers have to be encrypted by means of a special encryption key.

Conclusion

RFID science is no longer solely rising however additionally greater effective, handy and price environment friendly technological know-how in library security. This science has slowly begun to exchange the normal bar-code on library items. It might also exchange or be delivered to the barcode, presenting a extraordinary skill of stock administration through the personnel and self carrier with the aid of the borrowed. It can additionally act as a protection device, taking the region of the regular electromagnetic safety strip.

And now not solely the books, however additionally the membership playing cards should be geared up with an RFID tag. The price of the technological know-how is primary constraint.

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