



Auto-Identification Technologies in Academic Libraries: An Overview

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The study focuses on the importance and advantages of various auto-identification technology which are used in academic libraries. Libraries are not safe and secure and facing many problems, like theft, mutilation of library materials and other unethical losses. Auto-identification technologies are useful for libraries to solve those problems. There are various Auto-identification technologies which are used in libraries, like bar codes, smart cards, bio-metric, GPRS, and radio frequency identification (RFID). In this paper, studied some auto-id technology and benefits and challenges of these technologies.

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Auto-Identification Technologies in Academic Libraries:

An Overview

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ABSTRACT

The study focuses on the importance and advantages of various auto-identification technology which are used in academic libraries. Libraries are not safe and secure and facing many problems, like theft, mutilation of library materials and other unethical losses. Auto-identification technologies are useful for libraries to solve those problems. There are various Auto-identification technologies which are used in libraries, like bar codes, smart cards, bio-metric, GPRS, and radio frequency identification (RFID). In this paper, studied some auto-id technology and benefits and challenges of these technologies.

Keywords: Auto-identification technology, Barcode, RFID, Bio-metric, GPRS, Smart card

INTRODUCTION

A Library is a 'temple of learning' which plays an essential role in the development of a society. But libraries are not safe and secure and libraries are facing various problems like theft, mutilation of library materials and other unethical losses. The Library and Information professionals are now handling huge database, provide access to online journals and web-enabled online public access catalogues in the networked digital environment where there are a lot of scope for compute /cyber crimes. Therefore, it is important to provide a safe and secure environment for library staff, library resources and equipment, and library users. (Rathinasabapathy, Sundari & Rajendran, 2008). In this regard auto-identification is a boon for library and library professionals.

Auto identification technology is also known as automated data collection technology. identification technologies that are used to help machines identify objects. Auto identification is often together with automatic data capture. The aim of most auto identification systems is to increase efficiency, reduce data entry errors, and free up staff to perform more value-added functions, such as providing customer service. There are various technologies that fall under the auto identification umbrella. These include bar codes, smart cards, bio-metric, sensors, magnetic card/chip, GPRS, location tracking technology and radio frequency identification (RFID).

Computer and information technology represent a fundamental change in the way libraries do business, libraries must make an ongoing commitment to keeping pace with change.

REVIEW OF LITERATURE

Hanifa (2004), described benefits of wireless technologies in the libraries. GPRS technology improved the database access, quick connectivity to the network, simplified network configuration etc. he also described about the SMS service in libraries.

Shafagat (2016), described information about biometric technology in all types of libraries like- traditional and electronic library. Biometric technology is mainly used to stop illegal entry in a building or in a library. Biometric technology is secure than passwords, pin-code, smart card etc.

Rahaman (2016), explained three automated technologies used in the libraries that are Barcode, QR code and RFID technology and these technologies are mostly helpful in circulation section, acquisition section, processing section and so on.

OVERVIEW OF AUTO IDENTIFICATION TECHNOLOGIES

RFID :

RFID is an acronym for “radio-frequency identification”. RFID, is a broad term for technologies that use radio waves to automatically identify objects. This technology refers of a small chip and an antenna. This chip is capable for carrying 2,000 bytes of data. RFID is an advanced technology than other technologies for libraries. The RFID tag does not have to be visible to be read, it can be read even when it is fixed in an item, such as cardboard cover of a book. The chip is a part of RFID tag, this chip carry not only the item number but also information about title of the book or its call number.

Components of RFID technology:

The following hardware and software (figure 1) are-

Tag: This tag contains a silicon chip. This tag holds a unique identification and connected to the database for data transmit.

Reader- Reader holds the database and connected to the chip and send out/receive data through radio wave technology.

A Computer- is necessary for interface and deal with the users'. It may be connected to a server for maintaining the bigger amount of data.

LMS - LMS is required for maintaining the databases of materials as well as users.

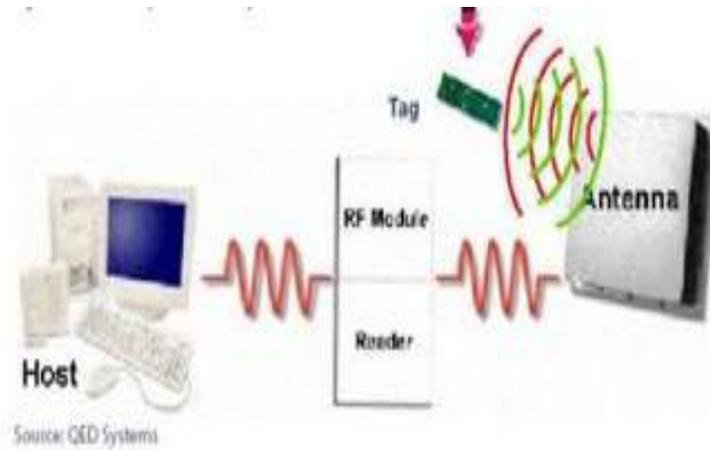


Figure 1: Components of RFID

Advantages of RFID

- It is fast than other auto identification technology.
- In a library nobody is need for issue/return policy.
- Levels of use come out to be more deeply influenced by the library's assurance to self-service rather than by the actual devices used.
- Finding lost and missing items and identifying miss shelved stock. Some RFID solutions can help with these problems although libraries will want to see this function at work in an offered library to verify its use.
- Maintaining of RFID system is very easy and fully automated.
- Setting up the RFID system is easy and it is one time job.

Disadvantages of RFID

- RFID technology is very costly to apply as well as maintain.
- Lack of knowledge for proper maintenance.
- If someone removes the tag then it becomes very big security problem.

Barcode

Barcode is a technology auto identification and data collection method that stores all data. Pulliam and Landry (2011) in a study titled "Tag, You're It! Using QR Codes to Promote Library Services" suggested implementing QR code in library marketing. They studied that a modification was very important in the connections between users and librarian and QR code technology could be applied when users training is provided.



Figure 2: Barcode

Advantages of Barcode:

1. Barcode can store large amount of data. The size of the data is ten digits.
2. The size is very small. Small label of printed code can be attached back side of the book.
3. Ranganathan's fourth law "save the time of the reader", barcode can fulfill.
4. Improve the staff efficiency.
5. Cost-efficiency. The cost of construction and use of the codes in libraries is quite small.

Disadvantages of Barcode:

1. Barcode technology is not possible without skilled staff.
2. It is not possible without proper machinery.
3. If the label of barcode is damaged

Smart card

Smart card is a type of chip card. It is like a chip card, it contains a fixed computer chip either memory or microprocessor. It can store and transacts data.



Figure 3: Smart card

Advantages of Smart Card:

1. Smart Cards use magnetic strips. It can carry photo, text and computer chip. It can quickly and easily verify the user.
2. Smart cards are made from long-lasting materials these protected cards can last the entire term of a student's education.
3. Smart card can store large amount of data. It can also separate the data in a file system. Different activities can safely store on a card.
4. For security purpose smart card is also being used in Bio-metric.

5. Smart card can provide accommodation and improve all technologies which are available.

Disadvantages of Smart card:

1. Smart cards are can be easily lost, if the library user or the student is irresponsible because smart card is very small and light weight.
2. It gives accountability issues if stolen or lost.
3. Lack of technology to support users.

GPRS

General Packet Radio Services (GPRS) is a packet based wireless communication service. GPRS is based on Global Service for Mobile communication. It is a non-voice, high-speed and useful packet-switching technology planned for GSM networks. GPRS can be used to allow links depending on Internet protocols that support a large range of enterprises, as well as profitable applications.

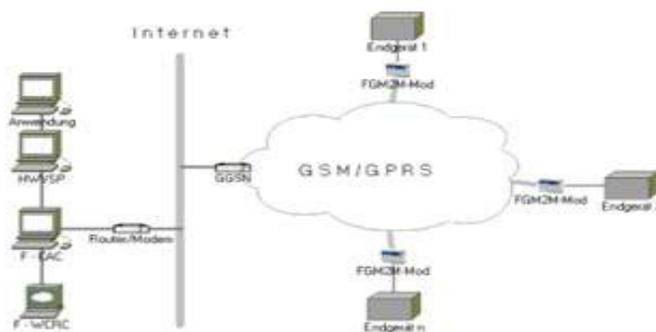


Figure 4: GPRS technology

Advantages of GPRS technology

1. GPRS has a great backup option.
2. GPRS can provide transfer rate up to 115kbit/s (the maximum is 171.2kbit/s, excluding FEC).
3. It can access to the mailbox without protocol.

Disadvantages of GPRS technology

1. The cost of the GPRS technology is very high.
2. Staffs need more training while using this technology in a library.

Bio-metric

Bio-metric technology includes physical or behavioral characteristics to identify a human. It includes fingerprints, voice recognition, facial pattern, hand geometry identification, retinal and iris scans etc. Application of this technology is limitless.

According to a recent Ping Identity survey, 92 percent of enterprises rank biometric authentication as an "effective" or "very effective" to secure identity data stored on premises, and 86 percent say it is effective for protecting data stored in a public cloud.



Figure 5: Examples of Bio-metric technology

Advantages of Bio-metric technology in libraries:

1. Easy identification;
2. Increase security level
3. Avoid of theft and damage
4. Avoid illegal use of library materials
5. High accuracy of identification

Disadvantages of Bio-metric:

1. Biometric systems are useless without a well-considered threat model.
2. Biometric technologies are biased.

CONCLUSION

Computer and information technology represent a fundamental change in the way libraries do business, libraries must make an ongoing commitment to keeping pace with change. Automated technology means the application of machines to perform the different routines, repetitive and clerical jobs involved in functions and services of the library. In manual system records are maintained by hand, without using a computer system. These systems suffer from a high error rate, and are much slower than computerized systems. Manual systems are most commonly found in small libraries that have few transactions.

New advances in computer technology have pointed to a significantly improved information processing facility for given cost in libraries. Auto identification technologies are used in a wide range of applications. The applications vary from process automation to security control. Auto identification technologies are magnetic card/chip, barcode, radio frequency identification, Voice recognition, smart card, GPRS, location tracking technology, optical character recognition.

The main aim of these technologies are to accurately and rapidly capture data, but the difference of these technologies is the method used to capture and process the data in the libraries. Most of the libraries are using these technologies to reduce.

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About the author

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