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RFID TECHNOLOGY IMPLEMENTATION IN LIBRARIES: A STUDY

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ABSTRACT

This exploration composition presents a comprehensive companion for the successful integration of Radio- frequency Identification (RFID) technology in advanced education libraries. RFID technology offers an innovative result to streamline library operations, enhance security, and ameliorate stoner gests. The paper outlines a step- by- step perpetration frame, encompassing requirements assessment, budget allocation, and selection of RFID factors, tagging procedures, software integration, staff training, and stoner education. Also, the composition highlights the significance of incorporating security measures, similar asanti-theft systems and stoner-friendly tone- checkout stations. Practical perceptivity on conservation, monitoring, and compliance with data security and sequestration regulations are also handed. This companion serves as a precious resource for librarians, directors, and stakeholders seeking to contemporize and optimize library services in the advanced education sector. The frame outlined herein offers a roadmap for using RFID technology to its fullest eventuality, eventually enhancing the effectiveness and effectiveness of library operations in the academic setting.

Keywords: RFID, Library automation, Identification, Implementation, Management

INTRODUCTION

Radio Frequency Identification (RFID) is one of the most instigative ultramodern technologies that use electromagnetic fields to automatically fete and track markers attached to objects. An RFID system consists of three main factors a bitsy radio transponder (label), a radio receiver and a transmitter (Khanna, 2014). The markers are made up of an antenna and an operation specific intertwined circuit (ASIC) chip, which contains memory where item-specific data is stored. The markers are electronically programmed with unique information about the tagged item. The size of the label depends on the size of the antenna, which increases with range of label and decreases with frequency. The receiver or anthology consists of an antenna, which is a Radio frequency (RF) electronic module and is meant to communicate with the label. The transmitter acts as a channel between RFID markers and the main data garcon or host computer. RFID systems can be read only (data is transferred in one direction, from the label to the anthology) or read- write

(two way communication). Markers can be powered by a battery (active markers) or by rectification of the radio signal transferred by the anthology (unresisting markers).

The tag sends back stored digital data or stored inventory number to the reader upon receiving an electromagnetic interrogation pulse from an RFID reader device in the vicinity (Malipatil, 2017). Since this inventory number is a virtual representation of the tagged item, it can be followed. The paper first provides an overview of the various auto-identification systems on the market before delving deeply into RFID implementation in a library setting. It goes over the various parts needed to install RFID technology in libraries as well as their crucial specifications. It also lists the technology's significant advantages over various auto-identification methods and tools.

RADIO FREQUENCY IDENTIFICATION (RFID) IN LIBRARIES

RFID technology has been used in multiple sectors as bandied in the former sections. There are further than one million RFID systems installed in storages and retail establishments around the globe. Still, this technology is fairly new in libraries. In 1998, Singapore Public Library claimed to be first library to use RFID technology for different operations and enjoyed remarkable success. The department published a detailed report about the use and effectiveness of this technology in library setup. Over the times, libraries have espoused the use of RFID technology and the use has grown multifariously. The preface and use of RFID grounded accoutrements have enabled libraries around the globe to speed up the issue- return deals and have also helped the library clienteles to check- in and check- out in a fairly smoother manner. The control over material security, library means and stock verification is an added advantage that this technology carries with itself. This technology has revolutionized library operation as well as introductory library practices. With the manufacturing of further sophisticated RFID markers, further than 90 million books have been tagged till now. In Singapore alone, further than 9 million textbook books and other library coffers have been fully tagged, while in countries like US and Britain the process has just begin, in academic as well as public setup, to cover their library coffers and means. As far as India is concern, the conception of using RFID grounded outfit in Libraries is neophyte. Still, library professional have conceded its significance and successful in perfecting the stoner acquainted services and overall resource operation. Accordingly, systems of upgrading the library setups with RFID grounded technology has been initiated and started in this part of the world as well.

RELATED WORKS

Malipatil and Nagaraj (2017) this study provides a thorough analysis of the state of library automation in the engineering college libraries located in the districts of Kalaburagi and Bidar in the state of Karnataka. The article addresses the most recent advancements and trends in the field of library science. Topics covered include the resources and services that libraries offer, the state of automation in libraries, the infrastructure of digital libraries, and strategies for enhancing these. The results of the questionnaire survey are also presented in this paper. Questions were developed and information was gathered from the sample engineering colleges in the districts of Kalaburagi and Bidar for the purpose of evaluating the study. In this paper, the survey results are presented and discussed.

Selvakamal ET…al (2022) RFID libraries are extremely important to people. RFID is a new breed of auto identification and data collection technology that helps in the transaction process of

the library, automates business processes, and allows the radio wave identification of numerous tagged objects such as books. RFID is essential in the acquisition and retention of a person's knowledge. In this paper, we propose an RFID based library management system that allows for quick transaction flow and makes problem-solving easy. It also adds properties of traceability, security, and benefits in preventing book missing and stock verification of the library books without manual bookkeeping intervention. The proposed system is built around active RFID readers, and passive RFID tags that can electrically store information that can be read by an RFID reader. The system will utilize GSM, or Global System for Mobile Communication, to convey information about the status of a book in the account and its fine associated with its absence from the library database.

Khanna (2014) the library is an ever-evolving entity. Librarians have always been interested in using new technologies to improve the quality and efficiency of their operations. Today, RFID has revolutionised the working practices of librarians by improving efficiency. RFID has individual serial numbers at a distance. In this article, we will discuss RFID, RFID tags/labels, RFID security gate, RFID Self Service Units, RFID Shelf Management, RFID Automated Check in/Checkout, RFID Theft Detection, RFID Stock Verification, and many more. We will also provide information on RFID technology, how it works, and how it can be used in the library. We will also share with you the implementation of the RFID technology at A.K. Joshi Library, Panjab University. This article is based on a study conducted among students of AK Joshi Library.

Suhaimi, Mohamed and Khusaini (2023) In order to enhance library use and administration, a radio frequency identification and detection (RFID)-based library management system was created in this study. It will use the RFID reader to easily identify and manage the books. Because the database shows whether a book is available at the library, students can use it to search for it and, if it is, pick it up there. The project's primary benefits for libraries are the reduction of manual errors, speedy book access, and time savings.

Singh (2022) The use of Radio Frequency Identification (RFID) technology in library services and service providers is having a significant impact on various aspects of the library, such as self checkout, material theft prevention, reading material divide, and much more. The use of RFID in Indian libraries is increasing with the growing awareness of the technology. RFID plays an important role in the essential aspects of the libraries, especially for the users and the library professionals, as it saves manual labour and provides quick access to the resources. RFID, is a long-lasting system that offers software innovation in libraries and enhances the trustworthiness of organizations all over the country. RFID impacts the main component of the library, especially for the user and the library professional, as it reduces labor work and provides quick access of the resources. In this paper, we discuss the impact, benefits, components, and use of RFID within Indian institutions.

NEEDS ASSESSMENT AND PLANNING

Conduct a thorough assessment of the library's needs, including the number of books, user traffic, security concerns, and existing systems.

BUDGET ALLOCATION

Allocate a budget for the RFID implementation, considering costs for RFID tags, readers, software, and installation.

SELECTING RFID COMPONENTS

- RFID Tags: Choose appropriate tags (labels) that can be affixed to books. Consider options like adhesive tags or embeddable tags within the book cover.
- RFID Readers: Select readers that are compatible with the chosen tags. They should be strategically placed to cover all areas of the library.
- Software: Acquire library management software that integrates with the RFID system. Ensure it supports features like inventory management, circulation control, and security monitoring.

TAGGING BOOKS

- Apply RFID tags to each book in the collection. This process may be done manually or through an automated tagging system.
- Integration with Library Management System:
- Integrate the RFID system with the existing library management software to ensure seamless data flow between the two systems.

STAFF TRAINING

Train library staff on how to use the RFID system. This includes tagging books, using RFID readers, and troubleshooting common issues.

CIRCULATION AND INVENTORY MANAGEMENT

- Implement RFID-enabled self-checkout and self-return stations. This empowers users to perform these tasks independently, reducing staff workload.
- Conduct an initial inventory to ensure all books are properly tagged and accounted for in the system.
- Security and Anti-Theft Measures:
- Implement security gates equipped with RFID readers at library exits to prevent unauthorized removal of books.
- Configure the system to trigger alarms if a book hasn't been properly checked out before leaving the library.

ACCESSIBILITY AND USER EDUCATION

- Provide user education on how to use the RFID system for self-checkout and return.
- Ensure that the system is user-friendly and accessible to all library patrons, including those with disabilities.

REGULAR MAINTENANCE AND UPKEEP

- Establish a maintenance schedule for RFID equipment to ensure it remains in good working condition.
- Have a plan for replacing or re-tagging damaged or worn-out RFID tags.

MONITORING AND EVALUATION

Continuously monitor the system's performance and gather feedback from both staff and users. Make necessary adjustments to improve efficiency and user experience.

DATA SECURITY AND PRIVACY COMPLIANCE

Ensure that the RFID system complies with data security and privacy regulations. Protect user information and library records.

SCALE AND EXPANSION

- Consider future expansion or integration with other systems, such as electronic resource management or digital content platforms.
- Remember to consult with RFID vendors or experts for specific recommendations and best practices based on the unique needs and infrastructure of your higher education library.

CONCLUSION

RFID-based libraries have a high initial cost, but they also have lower maintenance costs and require less time to operate. RFID adoption is anticipated to happen in libraries at an ever-accelerating rate. RFID tag power will increase, costs should drop, and the tag's efficiency and security will significantly improve. A well-stocked library with all the amenities of contemporary infrastructures and technologies could withstand the changing environment and necessitate constant improvement based on new developments in technological innovations. Automation in libraries is becoming increasingly important in the rapidly advancing field of technology. Employees, management, and resources are all critical to the success of this endeavor. In actuality, the moment has come for technological innovation and the adoption of new technologies. Only accurate and up-to-date library automation would make this feasible.

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