Library Automation: An Emerging Technology for Kuvempu University

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ABSTRACT

The significance of this research influences the development of library technologies. The library is one of the most crucial locations in every academic establishment and is still the go-to site for knowledge for many people, including students, instructors, and others. The researcher wants to offer the public colleges and universities in the Kuvempu University a choice about technology advancements in managing libraries. The development of technologies can benefit the library in a number of ways. The adoption of new technology by libraries will enable them to operate and function effectively, boosting productivity and enhancing user services without adding staff. The main objective is to show that an automated library system using the latest technology is more beneficial. The present scenario demands an updated technology for faster, affordable, and user-friendly in providing various library services. Fortunately, new technologies have developed Barcode, Digital libraries, Quick Response codes, and RFID systems. Consequently, applying these technologies provides an end-to-end solution for easy library operation, such as borrowing and returning books, finding and locating books, and maintaining book records. The need to develop and enhance library services to meet users' demands is necessary.

1. INTRODUCTION

One of the primary functions of libraries is to encourage the reading habits of the general public, particularly those in academia.

According to a 2010 study, traditional methods of library maintenance are no longer dynamic and efficient. The explanation accurately describes the library operations of the State University and Colleges of Kuvempu University, where none of the institutions have adopted or sourced new technology for their libraries. The school does not have the resources to implement high-tech library solutions. However, with this emerging technology that can be used in the library, students would benefit greatly from being able to experience library operation by using the so-called technology to find what they need and want and to complete the tasks quickly and efficiently.

The library's information, including user data, staff data, book records, and purchase ledgers, is manually documented. Furthermore, charging and discharging books is done manually, resulting in a waste of time and resources on the part of both users and the library authority. After thoroughly observing the existing manual library system, it has many challenges that indicate it is time to innovate into automation.

The advancement of technology has altered the nature of library transactions (check-in and check-out). Users most want extensive information available in the digital system. As the application of modern technology in the library system has emerged, it is necessary to adopt new technology rather than continuing to use an old-fashioned and no longer dynamic and efficient method of managing and operating a library. It is a waste of time, and data and library materials are missing. With this situation, it is necessary to use modern technologies in library operations to provide quick data retrieval and efficient services to library users.

The researcher believes that it is beneficial/helpful to automate the school or institution library using technology such as Barcode technology, QR codes technology, Digital Library, or RFID for the library's operation because of the users' need to quickly and quickly locate and retrieve library materials, including missing information. However, it may be outdated technology in some other institutions. However, in the Kuvempu University, where libraries are still operated manually, this technology is required. Introducing this technology can play a critical role in automating the library's functions and processes. This emerging technology will assist library users and library management in minimizing data and library material losses.

2. Review of Literature Automation of libraries

Library automation is the process of converting manual library methods to computerised methods, or a manual card catalogue to an integrated library system. Automation is the use of technological advancement to save time while performing a task efficiently. The main goal of library automation is to free librarians and library staff to make more significant contributions to knowledge and information dissemination. It is also an application or system that improves the library's services and operations. In this context, new technology can improve library procedures, increasing the efficiency and effectiveness of library transactions while reducing library staff workloads and improving services for library users.

Library automation is the use of software in information and communication technologies to automate library operations and services such as acquisition, cataloguing, and circulation.

Serials management, inventory verification, and other library-related tasks it is the most effective method for reducing human involvement in providing better library services to its users. It also provides comprehensive services in the shortest amount of time and at the lowest possible cost.

THE TECHNOLOGY OF BARCODES

A barcode is information encoded in bars that is scanned by a specific image scanner (barcode scanner). By flashing light and sensing the patterns of printed bars on the barcode labels pasted on the books, an image scanner, also known as a scanner, converts any printed image into electronic form. The barcode identifies the books by recognising bars using a barcode reader/scanner, which emits a beam of light - frequently a laser beam - that is

reflected by the barcode image. The white spaces, according to Singh et al., reflect light, which is then translated into relevant signals for the computer to read. It converts the individual bar patterns into numeric digit-code so that the computer can understand what is in the code at the database without the risk of human error.

THE TECHNOLOGY OF BARCODES

The library's barcode technology can easily and quickly process requests from students, teachers, and visitors. This type of technology can also be used in the circulation system to quickly, accurately, and reliably locate library materials. It chooses to reduce the possibility of human errors while also ensuring the effectiveness and efficiency of services provided. The library inventory is more effective and efficient with the help of Barcode technology. The procedure involves the library staff scanning the barcode on the clients' or students' identification cards to determine their borrowing status. The library staff can quickly check the document's accession number (Barcode) and provide it to the user. 19,20

DIGITAL LIBRARY

A digital library is a system that is stored on computers and computer networks. This type of library provides access to a wide range of content and potentially an infinite number of resources. It is comparable to what is known. as the e-library or electronic library It can convert published books into digital forms, such as an e-book, and modify them into the following digital formats: PDF, HTML, audio, video, and services, all through the use of a computer and its network. Ebooks are easily accessible to students. Because everything is digitalized, it is also easier to find specific library materials.

THE TECHNOLOGY OF QUICK RESPONSE (QR) CODES

The trademark name for two-dimensional barcode systems is QR (quick response) code. It was developed in Japan for the automotive industry in 1994. The barcode is a machine-readable optical label that contains information about the item to which it is attached. It is a machine that reads data for locators, identifiers, or trackers that point to a website or application. To store data efficiently, it employs four standardised coding modes: numeric, alphanumeric, byte/binary, and kanji. It may also make use of extensions. A QR code is made up of black squares arranged in a square grid on a white background. The imaging device, such as a camera, can read and interpret the data using Reed Solomon error correction. To interpret the image, the imaging device, such as a camera, can read and process it using Reed Solomon error correction. The required data is then read from patterns present in the picture's horizontal and vertical components.

IDENTIFICATION BASED ON RADIO FREQUENCY

RFID, or radio frequency identification, is an automatic contactless data capture technique. It is also an electronic technology in which digital data is stored in an RFID tag and can be retrieved using a reader. RFID tags

and sensors are used as part of the library system. When students walk into or out of the library, the sensor scans and displays the actions that are possible or required. RFID can now directly provide book information and library member or user information to the library system, eliminating the need for manual input. The RFID tag contains unique information, such as the title and code of a book, without the need for a separate database. The RFID reader will read the data, which will take the place of the standard barcode. A reader who is frequently found at a library's circulation desk.

LIBRARY MANAGEMENT SOFTWARE

A library management system is software designed to keep track of the library's records. The data in the system includes the number of books available in the library, the number of books issued, returned, renewing a book status or late, fines and charge records, and so on. It is also a system that assists in the maintenance of a database for entering new books and recording the books borrowed by library members with their respective due dates. Furthermore, it alleviates the Librarian's burden of manual record processing.

The library management system evolved over time in response to problems and to improve the services provided to library users. The developed software is the library management system, which was created in 2014 with the goal of saving money and time. Many features are available in the systems that are not available in most library management systems, such as the option of an online notice board about a specific workshop. Among other features, the librarian can quickly provide a detailed description of workshops taking place at the college and nearby colleges, a teacher login page where the teacher can add any events organized at the college, and essential book suggestions.

In 2014, a library management system called "An Android cloud-based library management and authentication system" was created. The design is user-friendly, but it is platform-dependent, as the name implies. As the name implies, it is only compatible with mobile phones. 9 In 2017, another library management system, titled "A Web-based E-Library System for Tertiary Institutions," with multimedia capabilities, was developed. The system, however, is not cost-effective. In 2013, another library management system titled "Cloud Computing Development in Integrated Library Management and Retrieval System" was created. The designed system is dependable and secure, but it is expensive to manage due to the infrastructure required to set up a cloud database.

In 2016, the title "Automated Library Management System" was designed for an automatic library management system. Although the design facilitates the quick processing of books and other library transactions, it is not cost effective. 14 There is also cost-effective open-source library management system software that was developed in 2011. The K-leg of the design is that it relies solely on open source, which allows anyone to contribute, whether relevant or not. Furthermore, the system is platform-dependent and can only be used on personal computers.

3. CONCLUSION

A library is a vital component of the academic community, serving as the "heart of the educational institution." It is a learning resource centre that contains all types of information. Libraries offer information and

communication technology-based library services to expand the options for quick and user-friendly services. The best solution is to use emerging technology to increase the value of libraries in academia. Currently, various emerging technologies used to automate libraries, such as barcode technology, QR codes, RFID, and digital libraries, have the potential to provide enrichment and efficient library services to their clients.

Automating the library with new technology is the best option for making the library function to its full capacity in rendering services in the shortest amount of time. The need to apply new technology to develop existing methods into emerging technologies must be a priority for the province's state universities and colleges. It saves time, reduces errors, increases circulation desk efficiency, and lowers operational costs by eliminating book cards and book pockets. As a result, library automation using cutting-edge technology is essential.

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