

IoT based Smart Library Management System

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Abstract: Library management refers to the use of system to manage the typical operations of libraries such as cataloging and maintaining the records. Management is a process of using the machinery and software for easily working and saving the human power time. The project is based on Library Management. The user will command the System to issue a particular book which is required. The System will fetch for the book from the database of the library. The System will scan for the book through the database or in the mentioned bookshelf. Once a book is found it is booked by the System, and issued to the user on the counter. The project gives the most efficient way to maintain the library. Hence it will reduce the use of manpower needed in the library.

Keywords: Pressure pad, WSN, Xampp

1. Introduction

A library is a collection of books; it provides service to members. There is a need of librarian to issue the book and note down the details of the students and books. This might be an easy task in case of a small library. Also, to search the book by the human take a lot of time, many times the book gets overlooked by the human eye. The solution to this is using the Android application by which the user can issue and return the book. Management is a process of using the machinery and software to keep records easily and saving human power and time. The main purpose of library management is to free the librarians and library staff and allow them to contribute more meaningfully to the spread of knowledge and information.

2. Literature review

- Nisha et al. designed library management system based on the Near-field Communication (NFC) technology. NFC is bound in a user cards, as well as tags on the books. The NFC readers are used to read the tags for operation control of libraries.
- Mrunal et al. introduced an RFID technology based system developing the self-service operations to improve the efficiency in the libraries.
- Chelliaha et al. focused on the consequences of the RFID implementation for three specific topics such as the people, the processes and the technology, which are related areas of the library.
- Butters mentioned on February 2008 that none of the Australian academic libraries used the RFID system, the reason why he introduces the benefits RFID system.

According to survey, they proposed a solution for smart library management using IoT and RFID. They use RFID on book to detect that book which going out of the library is issued or not. And In some research the idea is based on picking the book from book shelf and handover to the students or librarian by using robot.

3. Proposed architecture

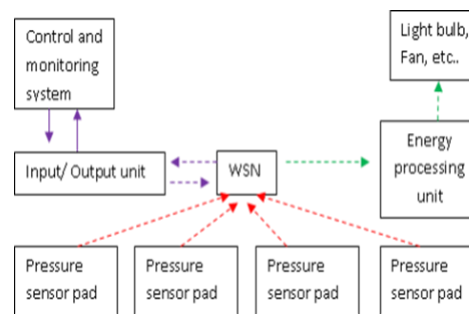


Fig. 1. System architecture

4. Implementation modules

- **Pressure Pad Sensor:** A Pressure Pad Sensor is an electronic device assembly that measures the forces exerted between any two objects. The Pressure Pad Sensor consists of bunch of sensing elements that are embedded within a cushion. It works by generating the analog signal to the receiver.
- **WSN:** A wireless sensor network (WSN) is a wireless network consisting of distributed autonomous devices using sensors to monitor physical or environmental conditions. A WSN system include a gateway that provides wireless connectivity.

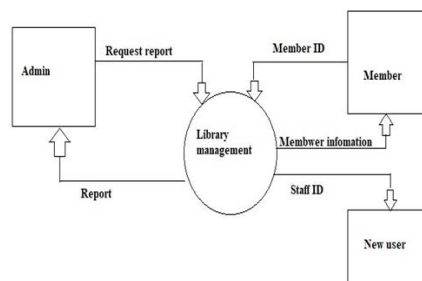


Fig. 2. Process diagram

- *Node MCU*: It is open source IoT Platform. It is 'WiFi System on Chip' which is designed to provide full internet connectivity in small package.
- *Light Sensor*: Light Sensor is a sensor which detects the density. This sensor usually used to convert light energy into electricity.

5. Conclusion

In this system, we have presented a Library Access Application, developed for Android using MySQL Database. The Library Access System Application saves users valuable time by making complete procedure online. The Management of Library will not only improving the effectiveness system but also reduces the human load thereby indirectly improve the human resource and reduce the excessive consumption of resources of the library. Indeed, helping in the process of "Library Management".

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