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(71)**Name of Applicant :**
1)Dr. Meghna Jitendrbhai Vyas
Address of Applicant :Head & Associate Professor P.G. Department of Library and Information Science, Sardar Patel University, Vallabh Vidyanagar, Pin: 388120 Gujarat India ---------- ----------
2)Mr. A. Sheik Maideen
3)Dr. Jaydeep Mehta
4)Dr. Mayank Trivedi
5)Dr. S.Aravind
6)Mr.Sagarkumar N. Mali
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)Dr. Meghna Jitendrbhai Vyas
Address of Applicant :Head & Associate Professor P.G. Department of Library and Information Science, Sardar Patel University, Vallabh Vidyanagar, Pin: 388120 Gujarat India ---------- ----------
2)Mr. A. Sheik Maideen
Address of Applicant :Chief Librarian Thiagarajar School of Management (Autonomous) Thirupparankundram Madurai Pin: 625005 Tamil Nadu India ---------- ----------
3)Dr. Jaydeep Mehta
Address of Applicant :University Librarian Navrachana University, Vasna-Bhayli Road, Vadodara Pin: 391410 Gujarat India ---------- ----------
4)Dr. Mayank Trivedi
Address of Applicant :University Librarian Smt. Hansa Mehta Library, The M S University of Baroda Sayaji Ganj, Nr. Kadak Bazar, Vadodara Pin: 390002 Gujarat India ---------- ----------
5)Dr. S.Aravind
Address of Applicant :College Librarian & Head Central Library & Department of Library and Information Science. G.T.N. Arts College (Autonomous), Dindigul Pin: 624005 Tamilnadu India ---------- ----------
6)Mr.Sagarkumar N. Mali
Address of Applicant :Programmer (IT) Smt. Hansa Mehta Library, The M S University of Baroda, Station Road, Vadodara Pin : 390002 Gujarat India ---------- ----------

(57) Abstract :
Abstract The objective of the above-described project is to create a solution for finding misplaced books in a library using IoT technology. The solution aims to improve the efficiency of the library's operations by automating the process of detecting misplaced books. The end goal is to make it easier for library staff to locate misplaced books and provide a better experience for patrons. The project utilizes RFID technology and IOT connectivity to log the location of each book as it is checked in or out, allowing for real-time updates on the location of books within the library. The solution also enables library staff to access information about the location of books from mobile devices, providing greater flexibility and on-the-go access. Additionally, the data collected through the system can be analyzed to gain insights into the borrowing patterns of patrons, helping the library to make informed decisions about future acquisitions and resource allocation. The objective of the project is to provide a comprehensive solution that not only helps the library find misplaced books but also helps improve the overall operations and user experience.

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FORM 2

THE PATENTS ACT 1970

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THE PATENT RULES 2003

COMPLETE SPECIFICATION

(SEE SECTIONS 10 & RULE 13)

1. TITLE OF THE INVENTION

Smart Book Tracker: An IoT-Based Solution for Misplaced Books in Libraries

2. APPLICANTS (S)

NAME	NATIONALITY	ADDRESS
Dr. Meghna Jitendrbhai Vyas	Indian	Head & Associate Professor P.G. Department of Library and Information Science, Sardar Patel University, Vallabh Vidyanagar, Pin: 388120 Gujarat India
Mr. A. Sheik Maideen	Indian	Chief Librarian Thiagarajar School of Management (Autonomous) Thirupparankundram Madurai Pin: 625005 Tamil Nadu India
Dr. Jaydeep Mehta	Indian	University Librarian Navrachana University, Vasna-Bhayli Road, Vadodara Pin: 391410 Gujarat India

Dr. Mayank Trivedi	Indian	University Librarian Smt. Hansa Mehta Library, The M S University of Baroda Sayaji Ganj, Nr. Kadak Bazar, Vadodara Pin: 390002 Gujarat India
Dr. S.Aravind	Indian	College Librarian & Head Central Library & Department of Library and Information Science. G.T.N. Arts College (Autonomous), Dindigul Pin: 624005 Tamilnadu India
Mr.Sagarkumar N. Mali	Indian	Programmer (IT) Smt. Hansa Mehta Library, The M S University of Baroda, Station Road, Vadodara Pin : 390002 Gujarat India

2. PREAMBLE TO THE DESCRIPTION

COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed

Smart Book Tracker: An IoT-Based Solution for Misplaced Books in Libraries

Introduction

The above described project is a solution for finding misplaced books in a library using Internet of Things (IoT) technology. The solution involves attaching RFID tags to each book in the library's collection, placing RFID readers throughout the library, connecting the RFID readers to a microcontroller, programming the microcontroller to log the location of each book, and storing the book location information in a database. The solution also involves using the internet connectivity of the microcontroller to access the database and retrieve information about the location of each book. An algorithm is then used to identify when a book is likely to be misplaced, triggering an alarm when necessary. This setup offers several benefits, including the ability to quickly locate misplaced books, improved check-in/check-out process efficiency, and valuable data insights. However, privacy and security concerns must also be taken into account when implementing such a system.

Abstract

The objective of the above-described project is to create a solution for finding misplaced books in a library using IoT technology. The solution aims to improve the efficiency of the library's operations by automating the process of detecting misplaced books. The end goal is to make it easier for library staff to locate misplaced books and provide a better experience for patrons.

The project utilizes RFID technology and IOT connectivity to log the location of each book as it is checked in or out, allowing for real-time updates on the location of books within the library. The solution also enables library staff to access information about the location of books from mobile devices, providing greater flexibility and on-the-go access.

Additionally, the data collected through the system can be analyzed to gain insights into the borrowing patterns of patrons, helping the library to make informed decisions about future acquisitions and resource allocation. The objective of the project is to provide a comprehensive solution that not only helps the library find misplaced books but also helps improve the overall operations and user experience.

Design a model for the IOT project

To design the model for the IOT-based project for finding misplaced books in a library, we need to consider the following components:

1. RFID tags: These are small chips that are attached to each book in the library's collection. They store a unique identifier that can be read by RFID readers.
2. RFID readers: These are devices that are placed throughout the library and are used to read the RFID tags. They are connected to a microcontroller, such as an Arduino board.
3. Microcontroller: This is the central control unit of the system, responsible for reading the RFID tags and logging the location of each book as it is checked in or out. The microcontroller is connected to the RFID readers and is also connected to the internet to access the database.
4. Database: This is where the book location information is stored. It can be a local file or a cloud-based server. The database is accessed by the microcontroller to retrieve information about the location of each book.
5. Algorithm: This is used to identify when a book has been in the same location for an extended period of time and is therefore likely to be misplaced. The algorithm runs on the microcontroller.
6. Alarm: This is triggered when a book is identified as being misplaced. It can be an LED light or a buzzer, and its purpose is to alert library staff of the misplaced book.

The model can be further enhanced by integrating it with a library's existing cataloging and management systems and by providing a user-friendly interface for library staff to access information about the location of books. To ensure the privacy and security of sensitive information contained in the library's database, appropriate measures must also be taken to secure the system against hacking and unauthorized access.

The above components make up the basic design of the IOT-based project for finding misplaced books in a library. The model can be refined and customized to meet the specific needs and requirements of the library.

Work flow

An IOT based project for finding misplaced books in a library can be implemented using the following steps: 1. Attach RFID tags to each book in the library's collection.
2. Place RFID readers at various locations throughout the library.
3. Connect the RFID readers to a microcontroller, such as an Arduino board.
4. Program the microcontroller to read the RFID tags and log the location of each book as it is checked in or out.
5. Store the book location information in a database, such as a local file or cloud-based server.
6. Use the internet connectivity of the microcontroller to access the database and retrieve information about the location of each book.
7. Develop an algorithm to identify when a book has been in the same location for an extended period of time and is therefore likely to be misplaced.
8. Trigger an alarm, such as an LED light or buzzer, when a book is identified as being misplaced.

components are required:

1. RFID tags: These are small chips that are attached to each book in the library's collection. They store a unique identifier that can be read by RFID readers.
2. RFID readers: These are devices that are placed throughout the library and are used to read the RFID tags. They must be compatible with the RFID tags used in the library and have a suitable range for the size of the library.
3. Microcontroller: This is the central control unit of the system, responsible for reading the RFID tags and logging the location of each book as it is checked in or out. An Arduino board is commonly used as the microcontroller in this type of project, but other microcontrollers can also be used.
4. Power supply: The microcontroller and RFID readers must be powered, either by a battery or a wall-mounted power supply. The power supply must be stable and provide a consistent voltage to the components.
5. Database: This is where the book location information is stored. It can be a local file or a cloud-based server. The database must be reliable and secure, with adequate storage space for the library's collection.
6. Internet connectivity: The microcontroller must be connected to the internet in order to access the database and retrieve information about the location of each book. This can be achieved through Wi-Fi, Ethernet, or cellular connectivity, depending on the specific requirements of the library.
7. Alarm: This is triggered when a book is identified as being misplaced. It can be an LED light or a buzzer, and its purpose is to alert library staff of the misplaced book. The alarm must be visible and audible from different locations in the library.
8. Additional components: Depending on the specific requirements of the library, additional components such as a display screen or a keyboard for inputting information may be required.

These components make up the basic requirements for implementing the IOT-based project for finding misplaced books in a library. Some additional components, such as a backup power supply or a backup database, may be required to ensure the reliability and resilience of the system. The components used in the solution can be chosen based on the specific requirements of the library and the budget available for the project.

Benefits of the above study

The implementation of an IOT-based project for finding misplaced books in a library has several benefits, including:

1. Improved efficiency: The use of RFID technology and IOT connectivity makes it possible to automate the process of detecting misplaced books, reducing the time and effort required to locate them manually.
2. Improved accuracy: The system accurately tracks the location of each book as it is checked in or out, reducing the chances of books being misplaced or lost.

3. Increased organization: By having a real-time, accurate record of the location of each book in the library's collection, library staff can more easily manage and organize the collection.
4. Enhanced user experience: The automation of the check-in/check-out process, combined with the ability to quickly locate misplaced books, can improve the overall user experience for library patrons.
5. Cost savings: By reducing the time and effort required to locate misplaced books, the system can result in cost savings for the library in terms of staff time and resources.
6. Increased security: By tracking the location of each book in the library's collection, the system can enhance the security of the collection, reducing the chances of books being stolen or damaged.

The benefits of the IOT-based project for finding misplaced books in a library can have a positive impact on the overall operations of the library, improving efficiency, accuracy, and the user experience for patrons.

Further study :

To further study the IOT-based project for finding misplaced books in a library, several additional areas can be explored, including:

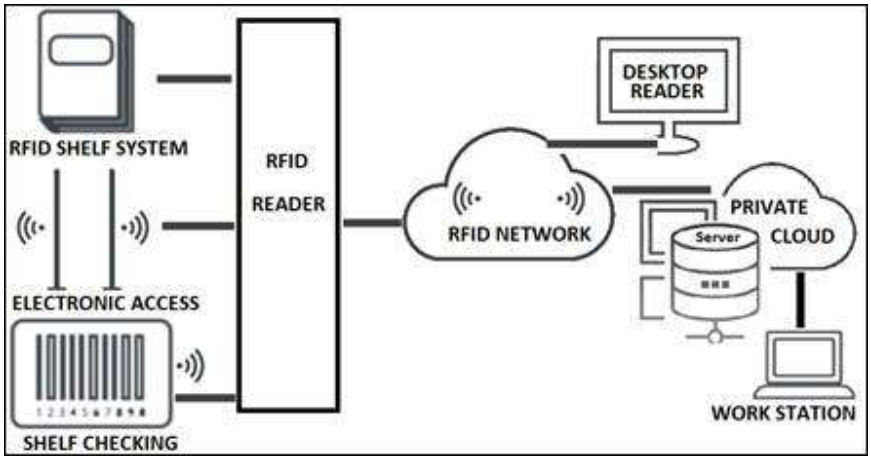
1. Integration with existing systems: The solution can be integrated with a library's existing cataloging and management systems, such as a library management software, to improve the overall efficiency of the library's operations.
2. User experience: The solution can be designed with a user-friendly interface for library staff to access information about the location of books and to manage the system.
3. Data analysis: The data collected through the system can be analyzed to gain insights into the borrowing patterns of patrons. This can help the library make informed decisions about future acquisitions and resource allocation.
4. Privacy and security: To ensure the privacy and security of sensitive information contained in the library's database, appropriate measures must be taken to secure the system against hacking and unauthorized access. This can include encryption, firewalls, and access controls.
5. Scalability: The solution can be scaled to accommodate libraries of different sizes and types, and can be customized to meet the specific needs and requirements of each library.
6. Cost-effectiveness: The cost of implementing the solution can be analyzed, and cost-effective alternatives to the components used in the solution can be explored.
7. Future improvements: The solution can be continually improved to keep up with advances in technology and changes in the library industry.

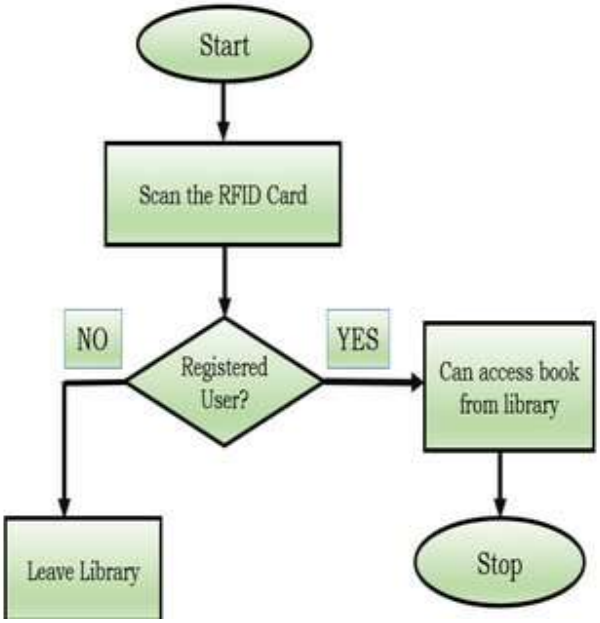
By exploring these areas in more detail, it is possible to gain a deeper understanding of the IOT-based project for finding misplaced books in a library, and to make informed decisions about its implementation and future development.

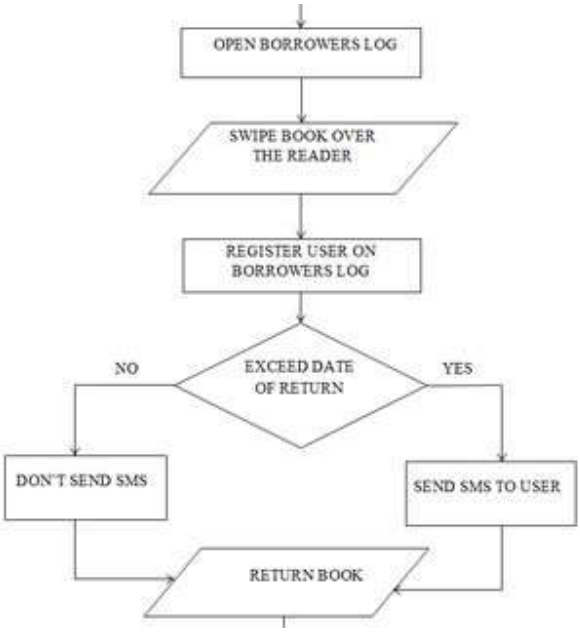
Conclusion

In conclusion, an IOT-based project for finding misplaced books in a library is a valuable solution that can greatly improve the efficiency and accuracy of the check-in/check-out process and the management of the library's collection. By using RFID technology and IOT connectivity, the project automates the process of detecting misplaced books, reducing the time and effort required to locate them manually. The system also accurately tracks the location of each book, increasing the organization of the collection and the security of the books. The implementation of this project can result in cost savings for the library, as well as an enhanced user experience for patrons. Overall, the IOT-based project for finding misplaced books in a library is a valuable investment for libraries looking to improve their operations and better serve their patrons.

Drawings:







CLAIMS

1. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said it provides a ground work for future research.

2. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that in this paper, we discussed various aspects.

3. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that in recent years, smart book tracker become a hot topic in the all sector.

4. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that it create a solution for finding misplaced books.

5. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that this research looks at all limitations and challenges.

6. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that the research findings could benefit in the design and implementation of the next phase.

7. SMART BOOK TRACKER: AN IOT-BASED SOLUTION FOR MISPLACED BOOKS IN LIBRARIES of claim 1, wherein said that additionally, research may be undertaken frequently.