Barcode Based Library Footfall Analysis

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ABSTRACT

The application of barcode technology in library entry register can be very effective and efficient due to its reliability, speed and accuracy. The proposed system integrates technologies such as Barcode Scanner, Raspberry pi and RabbitMQ. Visitor footfall analysis plays important role in the accreditation of colleges. So barcode based library footfall analysis reduces hectic job of keeping log of visitors and generating report manually. This review paper provides a description of overall system architecture and how proposed system overcomes disadvantages of existing systems.

KEYWORDS

Barcode Scanner, Raspberry Pi, Library Register

INTRODUCTION

Every Library maintains a register to keep track of visitors who visit library. The names, date and entry-exit time are recorded in register. This record is helpful to analyze the footfall. Especially in colleges or universities footfall analysis is important to know how many students and faculty members visited library, which section is most preferred by visitors. This information is one of the factor considered at the time of accreditation of colleges.

The system for Barcode based library footfall analysis uses barcode scanner to record the entry and exit of visitors. It also counts number of visitors who visited different sections of library like internet, journals, newspaper, etc. It generates section wise summary and daily report. Currently entry registration as well as report generation is done manually. All this work can be done automatically with the help of system consisting barcode technology, raspberry pi and cloud server.

EXISTING SYSTEM

1) Handwritten Entry Register

A main entry register for all visitors is available at entrance of the library; visitors are requested to make their entry in the register along with date and time while entering and departing from library.

Advantages

- Less expensive to set up.
- In manual system, correcting entries may be easier, than computerized ones that leave complicated audit trails.
- The risk of corrupted data is much less.
- Simple to handle. [3]

Disadvantages

- Inconsistency in data entry, room for errors.
- Time consuming and costly to produce reports.
- Lack of security.
- Duplication of data entry.[3]

2) Web Based Visitor Management:

Visitor gate-pass management system (VGMS) is a Web application, which has all the information about visitors to the organization. Every visitor has a mandatory host who is an employee. [4] Unique visitor ID is associated with visitor. System logs and tracks each visitor and visit and also assists the processing of visit. It is the reliable record for security staff on visitors to the institute.

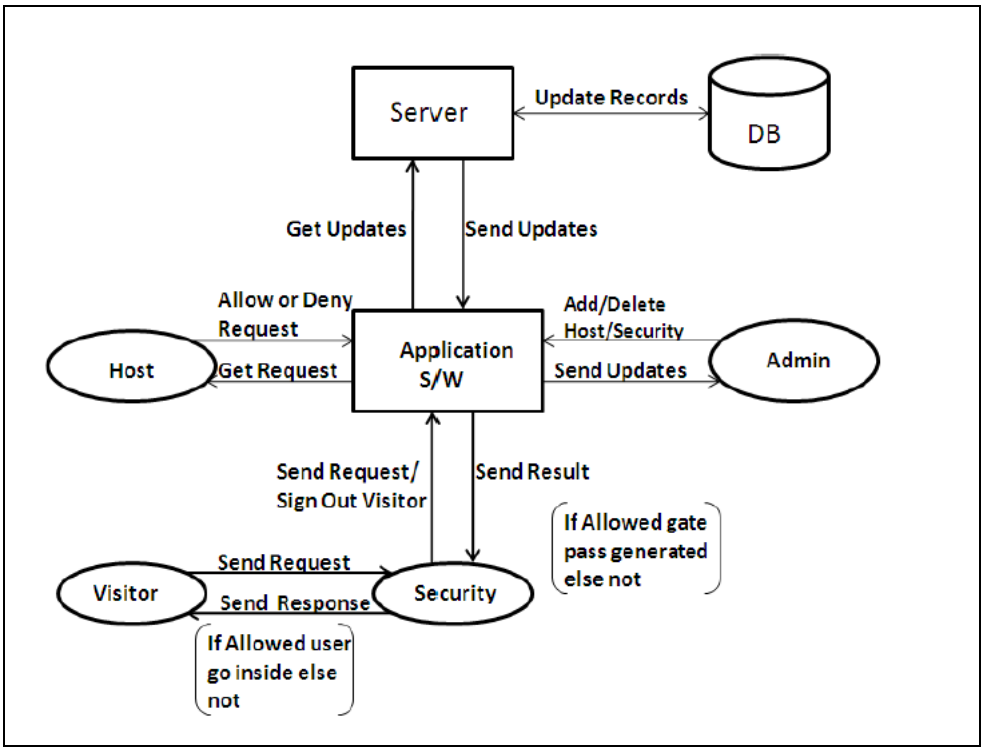

Fig: System architecture of web based visitor management [4]

Advantages:

- Faster than handwritten register.
- No data inconsistency.
- Efficient production of reports, retrieve or inquiry past records.

Disadvantages:

- **Security:** Data is compromised due to breach of security.
- **Cross browser compatibility:** When used on different web browsers may face difficulties in using some of its features and functions.
- **Internet connectivity**: Speed of the Internet connection can be the limiting factor.
- **External dependency:** There is an inherent dependency on the features and functions supported by the popular web browsers

PROPOSED SYSTEM

This system overcomes disadvantages of the existing system as mentioned above. The system helps college to avoid maintaining register books. Visitors can access the library facilities quickly and easily there by improving its operational efficiency and effectiveness. It provides easy storage and access of all information in a short period of time. Use of cloud service offers reliability, flexible routing, availability and efficient resource management.

ARCHITECTURE

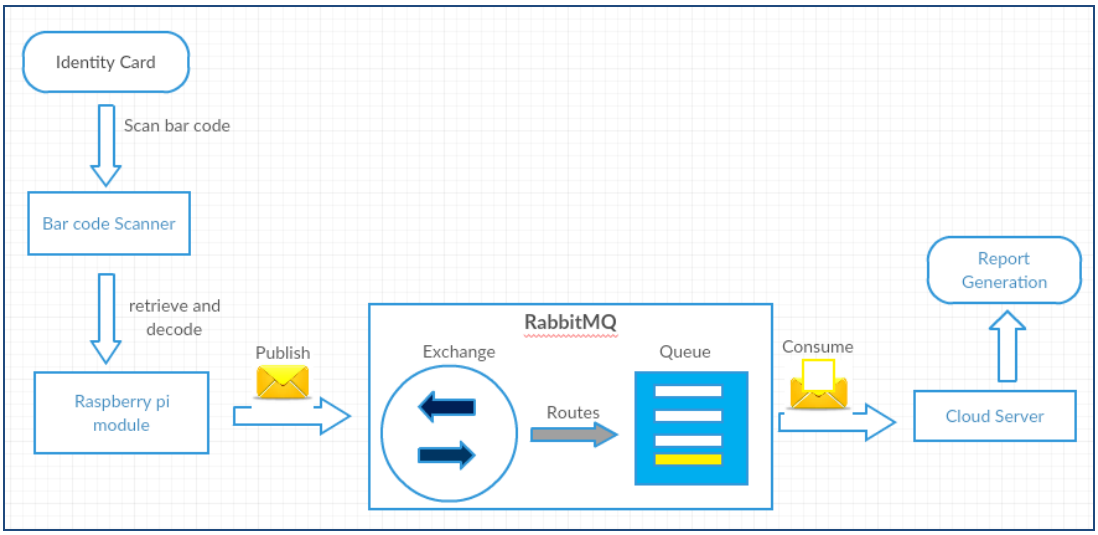

Fig: Architecture of Barcode based Library Footfall Analysis

In this system first visitor has to scan identity card with the help of barcode scanner. The data from barcode is retrieved and decoded. [5] Python language is used to interface barcode scanner with raspberry pi. Visitors' personal information and entry-exit time is recorded. Data is published on RabbitMQ through raspberry pi. System generates section vise summery and daily report. The modules in this system are:

Barcode Scanner:

Barcode scanner is a tool which is used to read a barcode. Barcode is applied to item or object for unique and fast identification. [5] A barcode is a square or rectangular image consisting of a series of parallel black lines and white spaces of varying widths that can be read by a scanner. [2]

Raspberry Pi:

The Raspberry Pi is a powerful, low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. Raspberry pi don't require much processing power, saves space, keep the cost low and make system portable.

RabbitMQ:

RabbitMQ is open-source enterprise messaging system modelled on the Advanced Message Queuing Protocol (AMQP) standard. It acts as an intermediary platform to process communication between two applications to meet high-scale, high-availability requirements. [6]

CONCLUSION

The Proposed barcode based library register can be used for recording and analyzing footfall count in library efficiently. This system combines advantages of different technologies to overcome limitations of existing systems. This reduces the manual work and eliminates the chances of human error while making entry in the registry book thus makes the access to the library quick.

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