

Student Authentication and Verification System using Barcode Scanner

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Abstract In this paper, we are introducing a web application to enable students to access the college facilities through a barcode reader. In today's world, technology is growing at a very fast pace and transformation has become a necessity in every field to make productive use of technology. Barcode technology is a replacement for the traditional keyboard data entry. This is a web based application which integrates all the services of the library and central computer center of the college, which also enable the students to access the library and central computer center in most advanced way. This application aims at reducing the manual work and eases the work of the student in the most efficient way. This application reduces paper work and minimizes the work pressure of the library staff and central computer center management.

Keywords Barcode scanner, Central computer center (CCC), ID card, Library

1. Introduction

College provides various facilities like access to the central computer center and library for the student. At Present students maintain separate cards namely the student ID card for the central computer center and a library card for the library facility. Also the entries like in-time and out-time for the library and central computer center are manually entered. This web application is developed in view to eliminate use of multiple cards to access college facilities like central computer center and library and also to minimize the manual work. Barcode Based Student Authentication and Verification System is an application which utilizes a barcode scanner to record and maintain the arrival and departure time of the students to the library and central computer center. This application has a user friendly interface and the student is only allowed to scan the card and not permitted to use the application. The main hardware that is to be used is the barcode scanner. This barcode scanner is used in order to read a barcode.

A Barcode is a machine readable representation of information in a visual format. A barcode consists of a series of parallel, adjacent bars and spaces. The bars and spaces are designed with different widths and consist of numbers, characters and symbols such as dot, colon and others. Different combinations of these alphanumeric characters are used to represent information. The success of barcode technology has been constantly improving in order to

accommodate more information in the minimum possible space. Today barcodes are widely used on books and at retail stores in order to keep track of the products available and easy checkout of the products. The barcodes are normally read using scanners using laser beams or cameras. Generally, barcodes are symbols shaped in the form of rectangles which consist of thin or thick parallel lines parallel to each other. Barcodes provide means for automatic rapid data input into the computer. Since the last decade, barcodes are being used in many areas such as market products and electronic devices. The lines on barcodes contain the reference number of the product. There are several types of barcode that being used within the industrial field nowadays. A barcode symbology defines the technical details of a particular type of barcode which includes width of bars, character set, method of encoding and checksum specifications. Barcode types can be classified into four categories namely numeric-only barcodes, alpha-numeric barcodes, 2D barcode and industry standard for barcode and labels. There are three basic types of barcode readers: fixed, portable batch, and portable RF. Fixed readers remain attached to their computer and transmit one data item along with data time as the data is scanned. Portable batch readers are battery operated and store data in to memory for later batch transfer to a computer. Some advanced portable readers can operate in non-portable mode too, often eliminating the need for a separate fixed reader.

A student can access the both facilities only through a single card which is a college ID card. She/he can scan his/her card which is embedded with a unique barcode. Barcode Based Student Authentication and Verification System is a web application which utilizes barcode scanner to record and maintain the arrival and departure of the students to the library and central computer center. The main hardware that

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is to be used is the barcode scanner. This barcode scanner is used in order to read a barcode. The barcode simply provides a reference number that tells a computer to access information. It is developed to manage the library and central computer center, so that student can access the college facilities quickly and easily as and when required, thereby improving its operational efficiency and effectiveness. Computerization of the official work will help in doing a lot of manual work quickly. It will help in easy storage and access of all information, in short period of time. This application reduces the amount of work the library and computer center staff are required to do.

2. Existing System

College provides various facilities i.e. central computer center and library for the student. In Existing system students maintain a separate ID card and library card, and separate database is maintained for library and computer center. A login registry is kept at the library and computer centre for students to enter the arrival and departure time while they accessed the facilities. If there were many students accessing these facilities, then during their departure they need to manually search the registry to find out their record. Due to this system the students were supposed to stand in a long queue.

3. Proposed System

The proposed system overcomes various disadvantages of the existing system. The application developed helps our college to avoid maintaining register books. It also eliminates the use of multiple databases to store the information. This application uses the barcode scanner to store the transaction information of the library and central computer center. Each student ID card has a barcode. This barcode contains information about the student such as USN, name, branch etc.

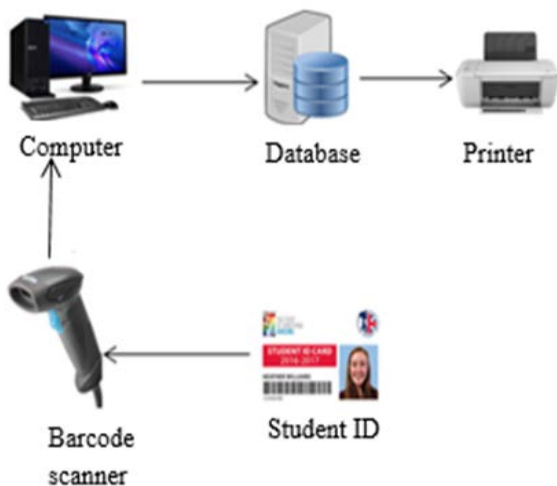


Figure 1. Block diagram of the system

The student has to scan ID card before entering the library and computer center. By this, the student can access the college facilities quickly and easily there by improving its operational efficiency and effectiveness. Computerized software system with hardware interaction help to fulfill this goal. Computerization of the official work will help in doing work quickly, it will help in easy storage and access of all information in a short period of time. The development of this software project also facilitates the administrator to manage the student information as well as to view the report of library and computer center. This application reduces the time required for the transactions in library and CCC.

At present the transaction information in these two facilities are paper based which may sometimes cause problems. While entering the registry book there could be times where student would not be able to find their names in the book, this could cost more time. So the proposed system uses the barcode scanner to store the transaction information. In the system each student is issued a card with the unique barcode embedded in it. The student scans this card during the entry and departure of the library and CCC and the entire detail will be stored in the database. In general, the barcode scanner scans the black and white elements, of a barcode by eliminating the code with the red light which is then converted into matching text. More specifically, the sensor in the barcode scanner detects the reflected light from the elimination system and generates an analog signal to the decoder. The decoder integrates that signal, validates the barcode using the check digit and converts it into a text. The text that has been converted is then stored at a particular place. The barcode reader that is being used directly converts barcode into character and this character is shown on the computer where the cursor pointed at the particular moment. The data that is read from the barcode is usually the card number.

All the information such as student details, library and central computer center information are stored in the database. There is also privilege to print some of the information.

4. Working of the System

This system has four users namely admin, librarian, CCC admin and student. The admin is the default user. The admin creates the librarian and the central computer center admin through the user creation page. The admin has been provided with various functionalities such as, adding the details of the student to the database, viewing the library and the central computer center timing report and also has the privilege of deactivating the student. Librarian logs in using valid user name and password through the login page. Adding the book to the database and viewing the information of the library transaction are the functions of the librarian. The other user of this system is the CCC admin. The CCC admin has the privilege to view the computer center timing report. The student maintains the card and is required to scan the card to

access these facilities of the college. When the student scans the card the information is verified.

This application can be used in the library so that when the student scans the card during the arrival the in-time is stored and during the departure the student is again required to scan the card during which the out-time is stored. If the student

takes any book then even the book has to be scanned so that the book id will be stored. This enables easy monitoring of each student transaction in the library.

This application can also be implemented in the central computer center. The process is same as in the library but only the in-time and out-time is recorded.

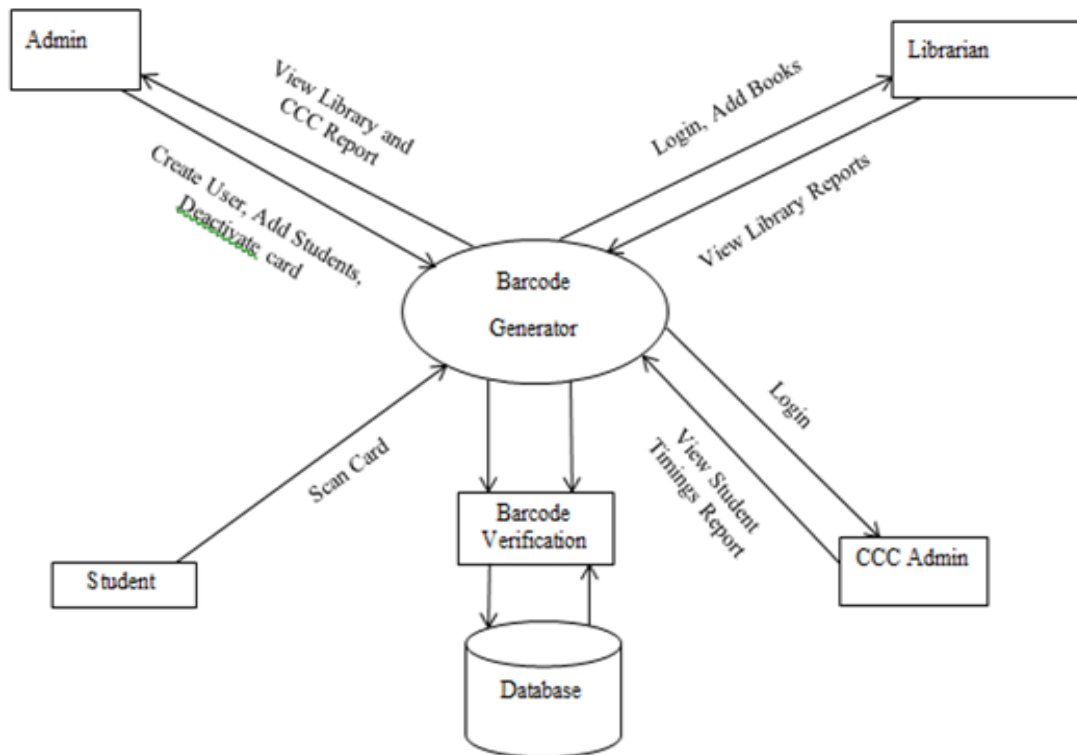


Figure 2. Architectural design

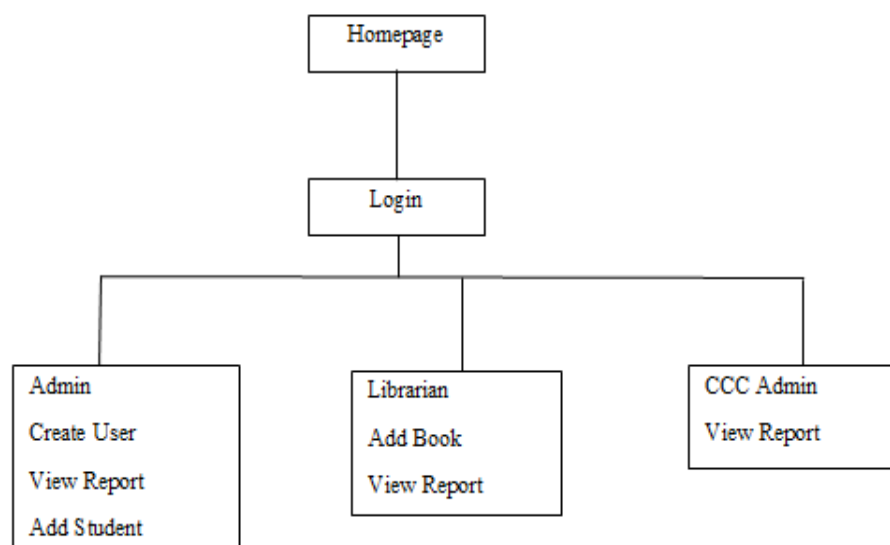


Figure 3. User Interface Flow Diagram

5. Conclusions

“Student Authentication and Verification System using Barcode Scanner” allows the students to obtain access to the facilities of the college such as library and central computer centre more easily but only to those with authorized ID cards. It was also aimed at reducing the manual work and eliminating the use of multiple ID cards. At the backend this system has the database which stores all information about the students, the various users and the transactions in the library and central computer centre. Thus this application is built to ease the access to the library and computer centre. This reduces the manual work and also eliminates the cumbersome task of making entry in the registry book thus makes the access to the library and computer center quick.

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