

Web App Based Interactive Library Management System

¹Tushar Gawhale, ²Hemangee Joshi, ³Sayali Ramane, ⁴Sonali Yewale,
⁵Prof. Reena Somani

¹(Information Technology, Atharva College of Engineering/Mumbai University, India)

²(Information Technology, Atharva College of Engineering/Mumbai University, India)

³(Information Technology, Atharva College of Engineering/Mumbai University, India)

⁴(Information Technology, Atharva College of Engineering/Mumbai University, India)

⁵(Information Technology, Atharva College of Engineering/Mumbai University, India)

Corresponding Author: Tushar Gawhale

Abstract: As the number of documents in digital library grows, it becomes increasingly difficult to store, manage the large amount of documents and find requested relevant documents by users. A Web App based Library management System helps to create unlimited quantity of digital information and make it available to the world in parallel. The scope of this software application is to generate the automatic process of manual handling of Library records and to handle the stock as well as book issues related information. Maintaining records of application for estates, the annual system is too complex and cumbersome. Since time and resources available we have been proposed to develop an inventory system. The development platform and software tool were identified as Visual Studio 17 and access of database.

Keywords- LMS, Web App, Mobile App, Web API, Chatbot, OPAC, Barcode Scanner

I. Introduction

Library Management System is software that has been developed to handle basic housekeeping functions of library. As we see in today's library management system most of the work is done manually. Maintaining records of application for estates, the annual system is too complex and cumbersome. Any library software needs installation which takes time and requires lots of storage which should not happen. In Current library management system all work is handled manually which is not good as we compare to today's technological world. The software used in libraries need lots of storage, speed and installations issues. The speed of work is very important factor if we consider school or college libraries. As the number of documents in digital library grows, it becomes increasingly difficult to store, manage the large amount of documents and find requested relevant documents by users. To fulfill the need of automation in libraries we are developing a web app. A web application is a computer program that utilizes web browsers and web technology to perform tasks over the Internet.

The current software is not sufficiently use in the college and other resources. It requires installation on computer which consumes too much memory and storage. A library management system which was designed and implemented earlier projects was based on the web service, android and GPS system. There were some limitations in those projects like problem of dependencies, high costs and manual handling was required. The solution to the problem of inefficiency is providing a web app that will work through browser. The application will have cross platform compatibility. As it does not require installation, it can be accessed from any computer which saves time. It helps in collecting perfect library management details in very short time. It utilizes resources in an efficient manner by increasing productivity through automation. The system generates types of information that can be used for various purposes like analyzing data from bot. So this project will be helpful for the library systems in different colleges and schools. This app is open source so that it will provide flexibility to the syst

II. Implementation Details

To resolve the problems of existing work we propose a new approach, which would be helpful to remove the manual handling and the cost of the project will be reduced. The proposed system is to create a dynamic, scalable library management system with Angular 4 as front-end, Web API using ASP.Net core & SQL for database.

Fig. 1 shows the block diagram of library management system.

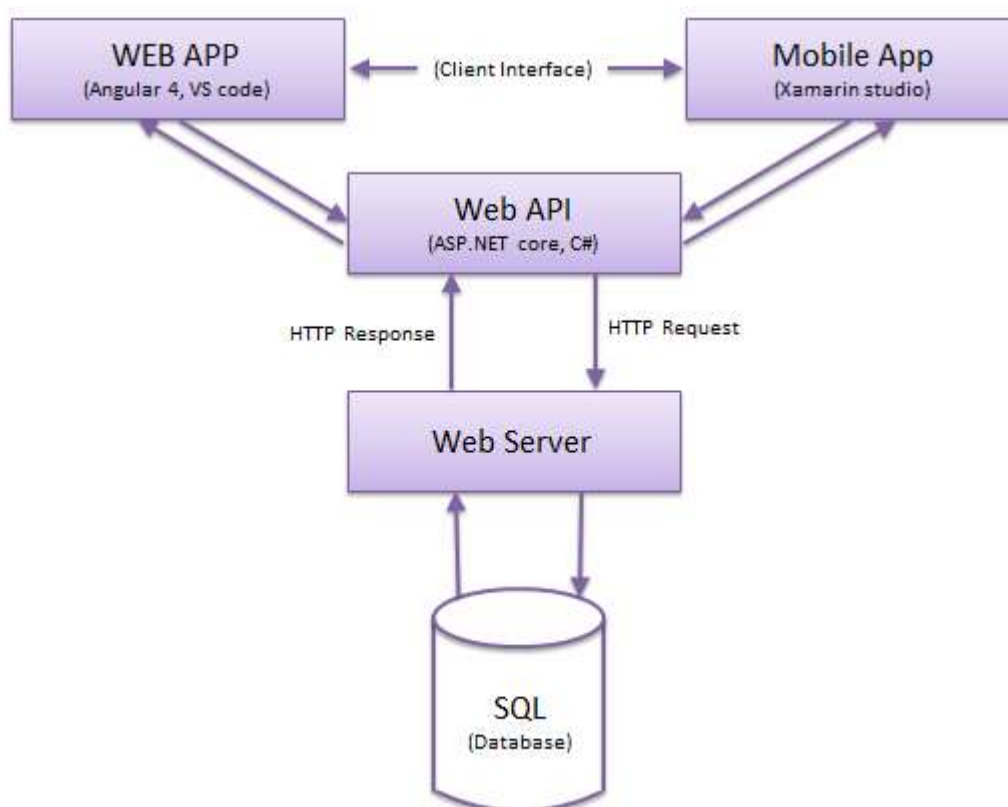


Fig. 1: System Block Diagram

In this system web app is the main module of interaction where the library staff can do their basic operations regarding books. It will also contain portal for students where they can update their data and enquire about books. This app will be having cross platform compatibility so can be access on any machine and no need of installations. An android app will be having barcode scanning facility which will help staff of the library to do basic operations on books like issue, return, renew etc. in emergency situations if the internet connectivity is lost or in case of power cut.

ASP.NET Core MVC is a rich framework for building web apps and APIs using the Model-View-Controller design pattern. The Model-View-Controller (MVC) architectural pattern separates an application into three main groups of components: Models, Views, and Controllers. This pattern helps to achieve separation of concerns. Using this pattern, user requests are routed to a Controller which is responsible for working with the Model to perform user actions and/or retrieve results of queries. The Controller chooses the View to display to the user, and provides it with any Model data it requires. SQL is used for entire database library.

The proposed tool contains the following modules:

A. Web App

A website is defined by its content, while a web application is defined by its interaction with the user. A web application depends on interaction and requires programmatic user input and data processing. Web applications primarily allow the user to perform actions. In this project web app is the main module of interaction where the library staff can do their basic operations regarding books. It will also contain portal for students where they can update their data and enquire about books. This app will be having cross platform compatibility so can be access on any machine and no need of installations. Angular 4 and Visual Studio code will be used to develop this app.

B. Mobile App

A mobile app is a software program you can download and access directly using your phone or another mobile device, like a tablet. You need a smart phone or another mobile device with internet access. This android app will be having barcode scanning facility which will help staff of the library to do basic operations on books like issue, return, renew etc. in emergency situations if the internet connectivity is lost or in case of power cut.

Xamarin Studio will be used for the development of android app.

C. Web API

ASP.NET Web API is a framework that makes it easy to build HTTP services that reach a broad range of clients, including browsers and mobile devices. We are using ASP.NET Core and C# language. ASP.NET Core MVC is a rich framework for building web apps and APIs using the Model-View-Controller design pattern. The Model-View-Controller (MVC) architectural pattern separates an application into three main groups of components: Models, Views, and Controllers. This pattern helps to achieve separation of concerns. Using this pattern, user requests are routed to a Controller which is responsible for working with the Model to perform user actions and/or retrieve results of queries. The Controller chooses the View to display to the user, and provides it with any Model data it requires.

D. Web Server

A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Microsoft Azure, formerly known as Windows Azure, is Microsoft's public cloud computing platform. It provides a range of cloud services, including those for compute, analytics, storage and networking. Users can pick and choose from these services to develop and scale new applications, or run existing applications, in the public cloud.

E. SQL

SQL stand for Structured Query Language is a fast, easy-to-use RDBMS being used for many small and big businesses. SQL is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database. Some common relational database management systems that use SQL are: Oracle, Sybase, Microsoft SQL Server, Access, Ingres, etc. Although most database systems use SQL, most of them also have their own additional proprietary extensions that are usually only used on their system. We are using SQL for the entire database of our library.

III. Expected Result

With the approach to LMS, the user will be allowed to use the system with less manual work and saving cost and time as well. It will control online issuing and returning activities regarding the books. It will also keep track of every transactions made and implementing barcode technology into the system.

Along with all these features, the overall results which are expected from the system are as follows:

- A dashboard for library staff where they can manage all the library transactions of books.
- An android app where they can scan barcode using android phone camera.
- A chatbot for OPAC where students can query about books availability in a conversational way.

IV. Conclusion and Future Scope

In this project, we proposed a Web Application for a Library Management System. This Web App will be able to easily process and update database with more ease. It will be helped in developing a totally integrated system. Thus the project can be altered in accordance to the future requirements of organization. An Android App with barcode scanner will help library staff to scan books in emergency situations and also help students for remote renewal of books.

It can also be useful in large library systems. For future work, we can introduce other useful features easily.

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