

SMS Public Access Catalog (SPAC)

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Abstract— The main objective of this project is to build a library management system with Short Message Service (SMS) and android application basically for college which can be used from anywhere and anytime. This system provides SMS facility for checking availability and reservation of books in library and also an android application which shows all the books available in the library and has a facility for checking availability and reservation of books. This reduces the travelling time to the library and makes the working simple.

Index Terms— Android application, Book code, GSM modem, Library, SMS, SPAC.

1 INTRODUCTION

As we know, today the world is moving fast, people have become very time precious. They want easiness and simplicity within the bit of time in each routine activity. With a fast growing number of mobile phones and end-users, high-tech men at work have come across SMS System technique. In order to obtain attention of customers on the move or strengthen the customer relationship, SMS System is considered as one of the best techniques to promote a product and it is the most popular communication method in the world today. Our system is for college or any private library where we provide SMS facility for checking availability and reservation of books in library. The main objective behind implementing this system is to overcome the drawbacks of the existing system where we manually have to be present to reserve a book or get the information of book. Also there is online system but that too needs a continuous internet connection, but this system is totally based on SMS and a feasible Android application. In current system if we want to issue a book we need to go in library, after entering in library we need to wait in queue for checking availability of book this process is time consuming. We have overcome this process through SMS facility. Sending SMS will be restricted only to those users who have been issued library id and registered their mobile number to the library system.

2 PROPOSED SYSTEM

After survey of library, we understood that there are some drawbacks in the existing system. So we decided to overcome drawbacks of the existing system in our proposed system name as 'SPAC'. In this system user can access the huge database of books or we can also term it as the catalog of books via Short Message Service (SMS), therefore we have named it as

'SMS Public Access Catalog'.

2.1 Project scope

The scope of this project is vast. The most important points are listed below.

- After taking admission to school/college user will be given library id that will remain same for throughout completion of the course. Even though if the user remains absent for long period or a student fails then he can be temporarily disabled from the system.
- User can check availability and reserve books from remote location. No need to waste time in visiting library for this sake.
- Through SMS user can even know new arrivals of books in library.
- User will get SMS as fine alert prior to book submission date.
- An android application is provided to every one, the application internally uses the sms to do reservation of book, check availability etc.
- Android application will also have a detailed list of available books in library.
- This project can be used in college, schools and private libraries.

2.2 User Classes and Characteristics

There are different users of this system, their types and their role as follows.

Admin:-

Role: Admin is the central controller of this system (front end) and has all the rights and authorities to view as well as to modify and update the system whenever required

Workers/Employee: -

Role: Through frontend/website, workers can just view and update student's book issued information i.e. who has issued which book, date of issued, fine calculation, new arrivals of books, etc.

Student/Staff/User:-

Role: User must register their mobile number in library from which they are going to send SMS. Student can reserve and check availability of book, check information of books. They can check unique book code for a book on Library's website or in the android application.

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3 IMPLEMENTATION

3.1 Requirements

The required hardwares and softwares for implementing this system are as follows:-

- GSM Modem.
- SIM card.
- Computer Server Machine.
- Android Mobile phone.
- JRE, JDK and Eclipse IDE.
- Java Communication API.
- DynamicReports (Report generation tool).
- Apache TOMCAT Web Server.
- RDBMS.
- Google APIs for android development.

3.2 Working

The main module of this system deals with sending and receiving SMS to and from the user. The Java Communication API is used for the SMS sending and receiving. This API internally uses the AT Commands. The Application which will handle the SMS request will be a daemon process, which will be continuously running. There are some pre defined keywords which has to be used while sending SMS. For each book a unique code has been defined, using this code user can find his/her book. Once the user sends the SMS his mobile number will be checked from the database and if he/she is an authorized user then will get an appropriate reply. At backend Database is used which has the record of all books. There is a library website which is maintained by admin. All the detail entries of new books are done through this website by the workers/employee. The SMS module interacts with the database to give appropriate reply to the request.

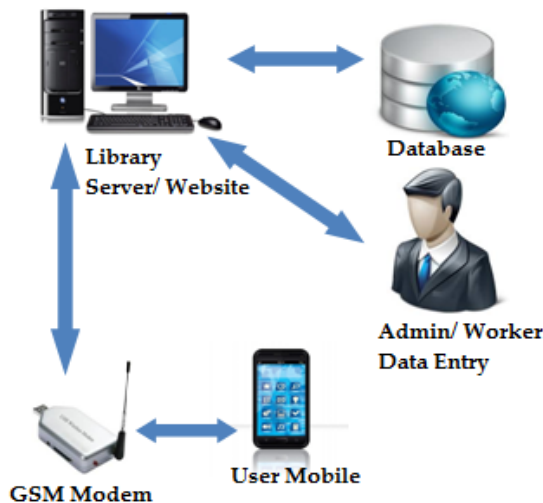


Fig 1. Basic flow of the system.

Fig. (1) Shows the basic working of the system. When the user sends an SMS it is handled by the GSM modem which is connected to the library server and works on AT Commands. The

user is authenticated and a reply SMS is given with a detail menu. The phone number of the user is verified from the database. The worker/admin enters the data i.e the new arrived books, new users etc in the database via the website.

3.2.1 AT Commands

AT commands are instructions used to communicate with the GSM modem. AT is the abbreviation of Attention. Every command line starts with "AT" or "at". There are two types of AT commands:

1) Basic AT commands are commands that do not include the "+" operator in the syntax. For example, AT followed by D (Dial), A (Answer), H (Hook control), and O (Return to online data state) are the basic commands.

2) Extended AT commands are commands that include a "+" operator in the syntax. All GSM AT commands are extended commands. For example, AT+CMGS (Send SMS message), AT+CMGL (List SMS messages), and AT+CMGR (Read SMS messages) are extended commands. The software proposed in this paper uses extended AT commands to send instructions to the GSM modem.

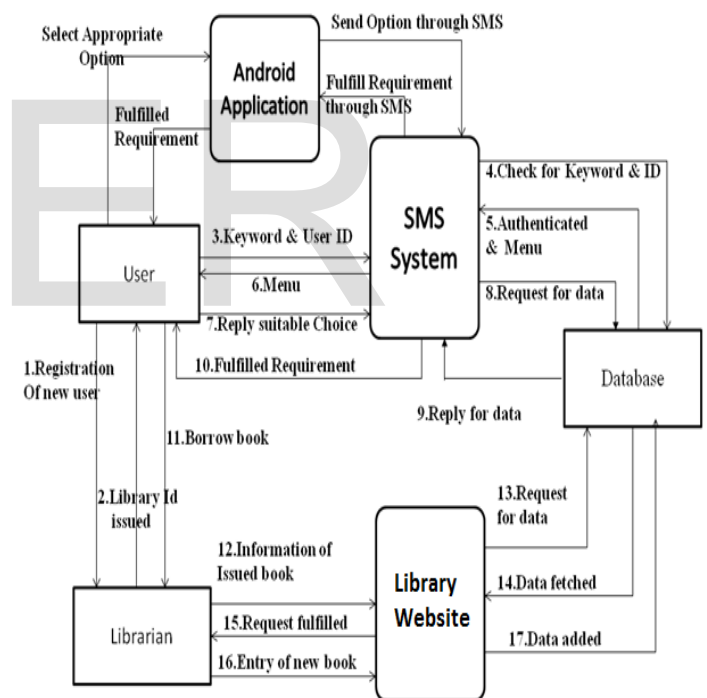


Fig 2. Detail System Architecture

Fig. (2) Shows the detailed working architecture of the system. Initially the new user gets registered to this system via the librarian. After registration he/she will get a unique id, which will be used for further communication. Now the user can use this system. User sends as SMS which contains keyword 'LIB' and his library id in the format as shown in the Fig. (3) And gets a reply with a menu as shown in the Fig. (4).

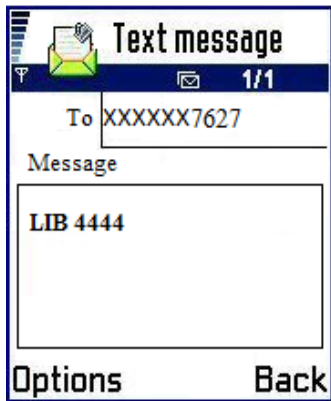


Fig 3.

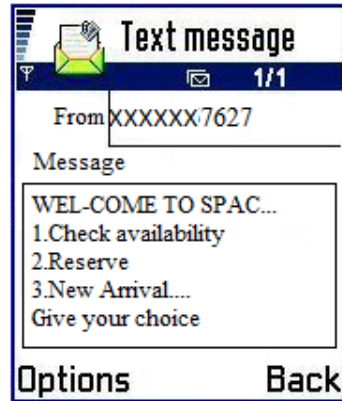


Fig 4.

The user can choose the option it want and reply with the book code, for example if user wants to check the availability of the book XYZ which has a unique code as RA00012 (Each book has been given unique code according to the 'Library Code and Regulations') then he/she can send a SMS in format '1 RA00012'. If the book is available then user will get a reply as 'This book is available'.

Similarly if user wants to reserve the book then the reply should be as '2 RA00012'. If that book is available it will get a reply as 'this book is available and it has been reserved for LIB id 4444'.

If the user selects the new arrival option then he/she has to reply as '3', then a reply will come with different book codes of newly entered books in the department of the users.

The android application does the same above work, but this application gives easiness to the user as it does all the SMS typing work at the back only the user has to enter the book code. Also the android application shows the list of all the books in library so the books can be choosen from there. Once the reservation is done then no other user can take that book. So the person who has reserved can go to library and take that book or ask for a courier. Once the book is given then the worker will make entry against the book browser in the data-base through the website, hence when another user asks for this book via SMS or manually the reply will be that 'this book is not available'.

Some times the user forgets to submit the book in library in such case he/she is fined with some amount. This system provides a solution to this also as it has a 'Fine Alert' facility where the user will get a message on his mobile number prior to the date of submission of the book.

DynamicReports is a report generation tool used for generating the detailed reports of this system. The list of books in the library, issued book, reserved book, also who has reserved through SMS, etc all reports are generated using this tool. This tool is free and Open Source tool.

4 CONCLUSION

As we know Library is a most important part in our life. We make use of library almost everyday in our life. So to save our valueable time we have come up with this system. If the Library doesn't have a book which we want then in such situa-

tion if we visit library and we get to know that the book is not available it is very frustrating. So using this system will save lot of time. Also this system is built using free and open source softwares/tools hence it is cost effective. This SPAC software can be used in any School, college and private libraries.

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