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THE DIGITAL LIBRARIAN

A DIGITAL ASSISTANCE FOR THE LIBRARIAN USING VISUAL BASIC AND GSM TECHNOLOGY.

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Abstract: **The Digital librarian is a system which can be used to reduce the work load of a librarian to bare minimum. The proposed consists of various sections which helps the librarian in carrying out the tasks. A GSM module is used in this system, all the communications between the librarian and the students are done by the GSM module. The database stored on the PC is accessed by a VB program. The Students send an SMS to the GSM module requesting the desired book, the VB program verifies the authentication of the student and checks the availability of the book. If the book is available, the book is issued to the respective student, the student will receive a confirmation SMS and request to collect the book from the librarian. In case the book is not available the student will be kept on HOLD and when a book is submitted, the system will respond to the waiting student and wait for the reply from the student to send an acknowledging message.**

Keywords: Library Management, GSM Module, Digitalization, SMS.

I. INTRODUCTION

A library is not a luxury but it's a necessity. According to our survey in a library, some hard facts revealed upon us. In any institute there are approximate more than thousands of members. Each of the members has to have a library card. Approximately to create a library card many manually it takes a time of around 5 minutes, so to create card's of thousands of member's is a very time consuming job. With the help of these system these time consuming process can be eliminated by making the Data and the process completely digital [1].

In a library there are various types of books with various authors are available. And to keep track of all of them is bit difficult job. This is system is used to keep a record of them. Also it provides many features for students or user such as, checking the status of particular book with the help of just SMS, also secure the same book with the help of single SMS. At the same time library person gets the intimation on the LCD display provided on the module with book name and mobile number. In order to get compatibility with current library records, database is made in MS Access. User interface software is designed in Visual Basics 6 language. There is standard serial communication between module and computer. Microcontroller and LCD are used for visual indication for librarian. Aim of the system is to simplify the daily hectic work of the librarians of issuing books to the students. The paper work which piles up on daily basis will also be eliminated by our proposed Digital Librarian. The main objective of designing this system is to make the process of issuing a book in library extremely simple as well as completely transparent. It will also give the librarian ability to track a book as well check the availability of the book [1] [2].

II. SYSTEM DESICRIPTION

In order to understand the system let us first have a look at the block diagram of The Digital Librarian in the figure.1. As seen from the block diagram the system has been divided into two sections, The Hardware

and software. The hardware requirement for the system is minimum and therefore is also quite economical. The Hardware required for the system includes a GSM modem, a power supply section to power the modem and the computer, a microcontroller and a LCD for the Display. The Microcontroller used in the system is to drive the LCD display [4]. It also can be replaced by using serial LCD's which are available. The LCD is used to display the details of the students and the details of the book to be handed over. Another power supply is designed for the GSM modem as per requirements. In the system a SIM900A modem is used which requires a 12V power supply [5].

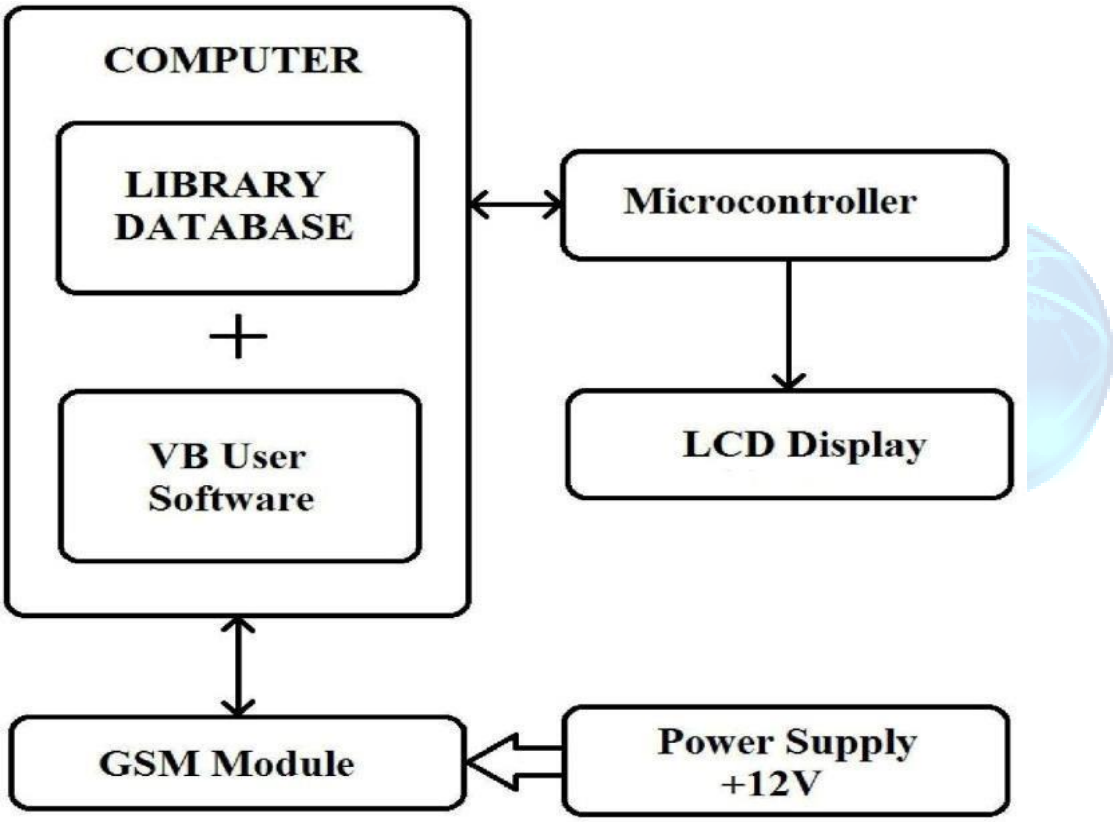


Figure 1

The circuit diagram for the same is shown in figure 2. The Power supply section consists of a Step Down transformer which steps down 230V A.C supply to 12V AC supply. The device requires a DC power source so a Full wave bridge rectifier is connected to the transformer converting the 12V AC supply to DC. After

the conversion the voltage of the DC supply is increased but still it contains some AC ripples in the signal so a Capacitor filter is used to remove the AC ripples from the DC signal. The DC signal which is acquired from the filter is regulated to a constant 12V for the GSM modem. A voltage regulator 7812 is used to keep the output voltage steady at +12V. Further a capacitor (C5) is added to provide any reverse current. The LED is an indicator for ON/OFF of the power section.

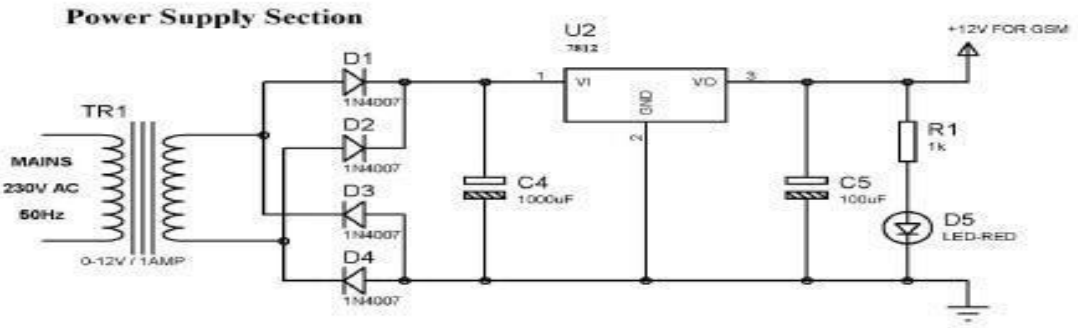


Figure 2

The software which is used in the system is Visual Basic 6 and Microsoft Access Database. With the help of these two software the complete system is designed. The Visual Basic is a object oriented application therefore it is quite easy to design the system visually. The Graphic User Interface (GUI) is shown in figure3.

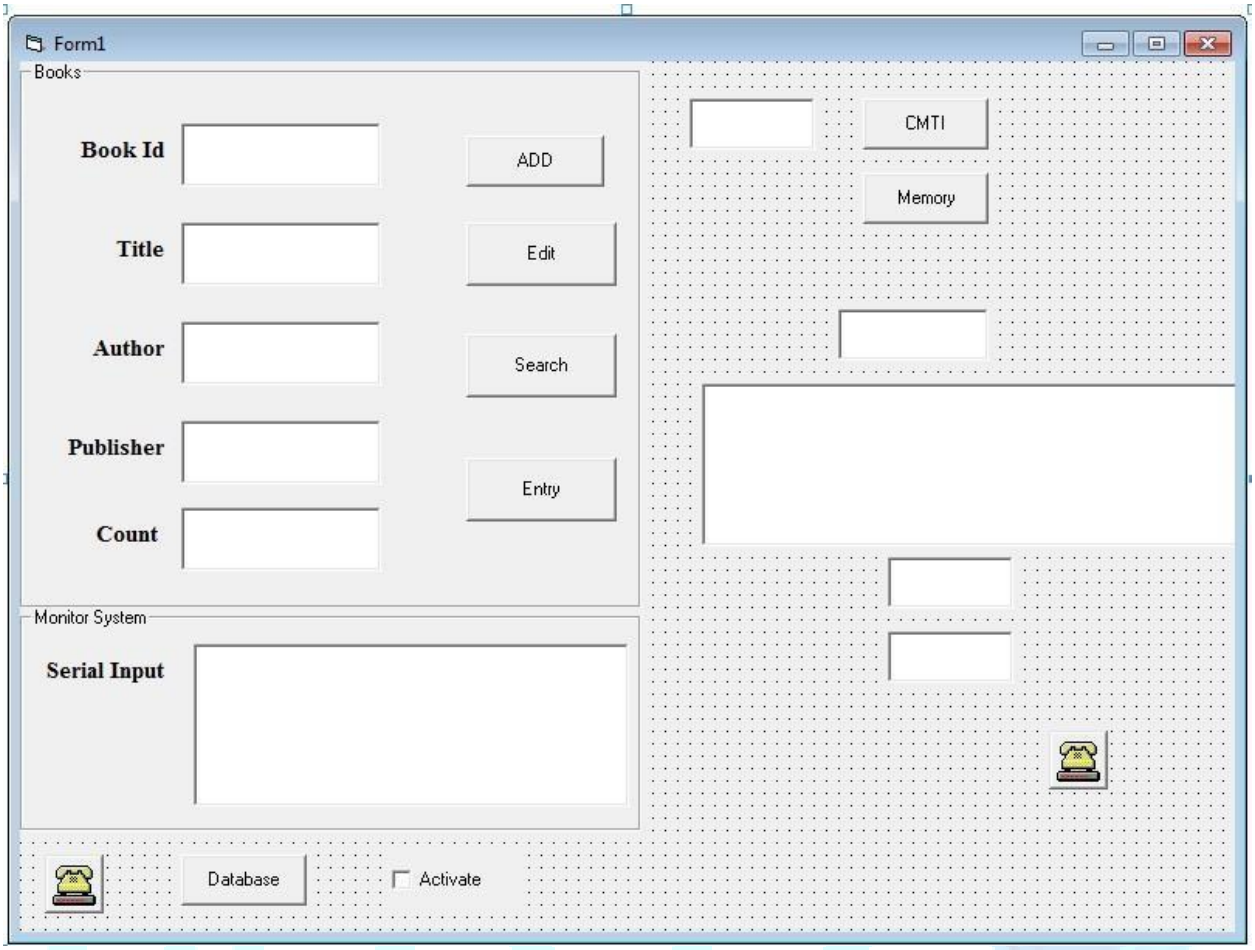


Figure 3

The above image is of the user interface. Many of the text boxes in the GUI are only for stings and do not have any use to the user and Hence once the system is Calibrated can be made invisible.

The GSM sends one single string to the computer. All the data is sent in one string, so we cut the string in many parts as required by our system. Example is shown in the figure4.

```
Dim fmob As String

fmob = Trim$(Mid$(Left$(txtMessage.Text, 50), 38, 13))
txtMobile.Text = fmob
```

Figure 4

As shown in the figure 4 the string is cut from the middle at 50th character and 13 characters towards the left are taken and saved into the mobile string. These thirteen characters are the sender's mobile number. Similarly we take all the data required from the GSM modem.

By using Microsoft Office Access Data base, two different data bases have been created. A database consists of the names and Mobile numbers of the user. Another database is created for the book's database. All the relevant data regarding books is stored in these data base.

As the backend is executing the code the database is constantly being checked.

```
Dim dt, tm As Date
dt = DateValue(Now)
tm = TimeValue(Now)
DataEnvironment2.rsSearch.Close
If check = "Yes" Then
    DataEnvironment2.SearchHistory txtMobile.Text
```

Figure 5

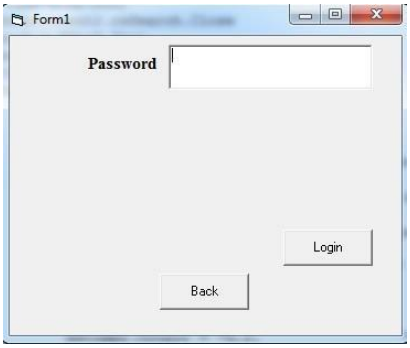
Figure 5 shows the code how the library is checked in the back end.

library

BookID	Title	Author	Publisher	Counter
1	The Engineering	ghhgchc	cghhc	0
2	The Destroyed World	hghffh	vcghc	2
3	Digital Communication	vgvjv	fbdskhcfb	7

Figure 6

Figure 6 indicates the actual Microsoft Access database file. It shows the format of the data being stored in the library. These data can be edited by the person also by an official person by directly accessing the data base. The Student database on the other hand has a password protection for the obvious reasons of security which is indicated in figure 7 & figure 8.



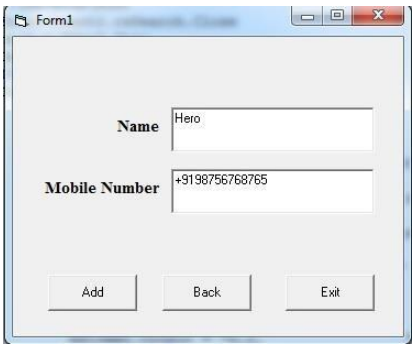


Figure 7 **Figure 8**

III. WORKING

The flow chart of the system helps us understand how the system behaves in when the system inputs and circumstances are changed. The Flow chart is shown in figure 9[1].

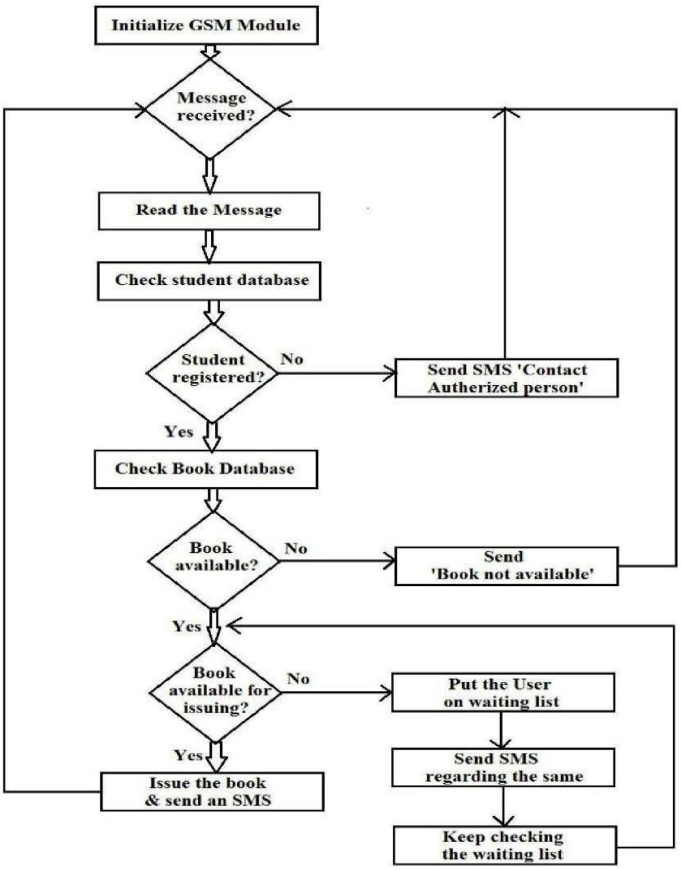


Figure 9

The flow chart shows different condition from the system goes when the input is given. Initially the system needs to be calibrated with the GSM module. After Calibration is done the system can be activated. The figure 10 show's an activated system.

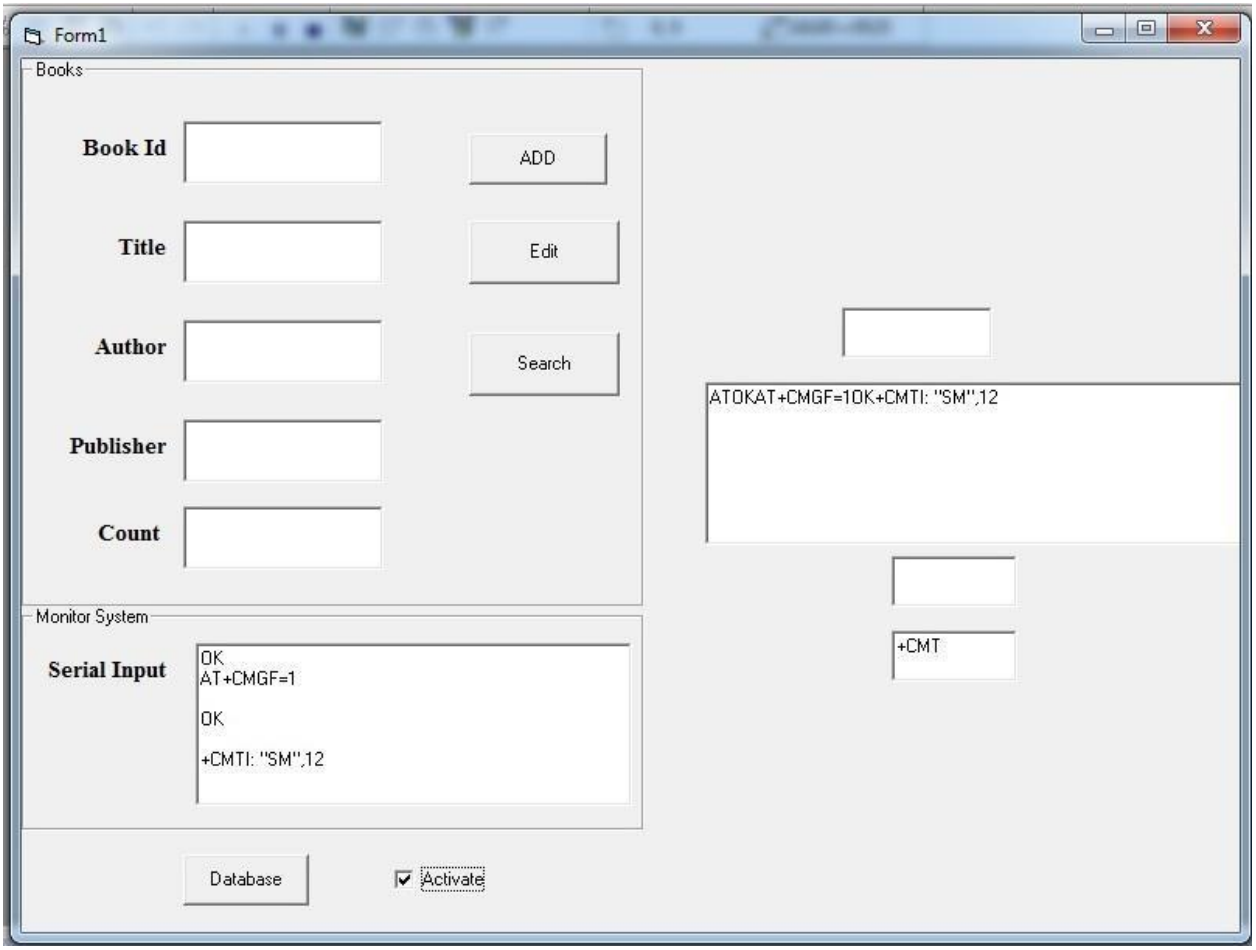


Figure 10

Now the system is ready for execution. The figures11, 12, 13 shows the system behaves when a student whose is a registered in the student sends a text message to the system & the how a reply is sent to the user. Figure 14 show while the movement and current stages of execution while the back end code is being executed.

Figure 15 indicates how the system responds when an unregistered number request any services.

Figure 16 indicates when a requested book in not available at the time of request but after some time is available and sends back an acknowledgment of the book availability.

Figure 17 indicates an event when the book is not available in the library.

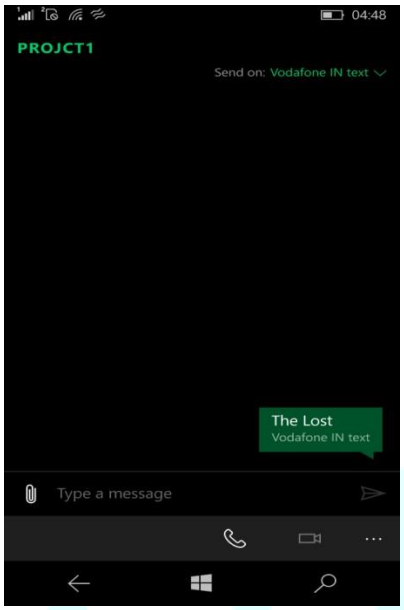


Figure 11

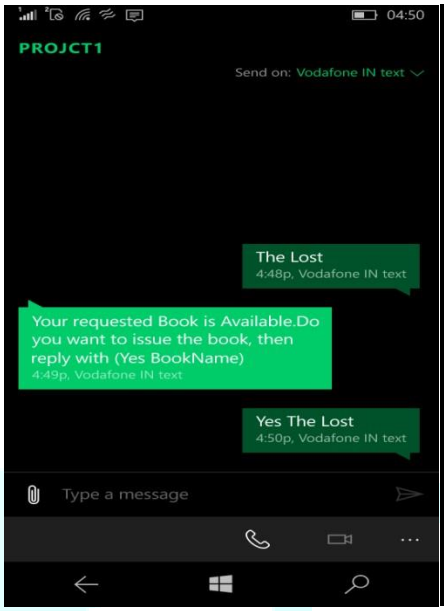


Figure 12

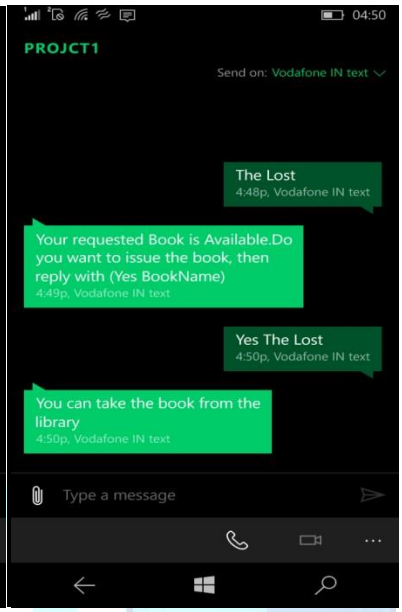


Figure 13

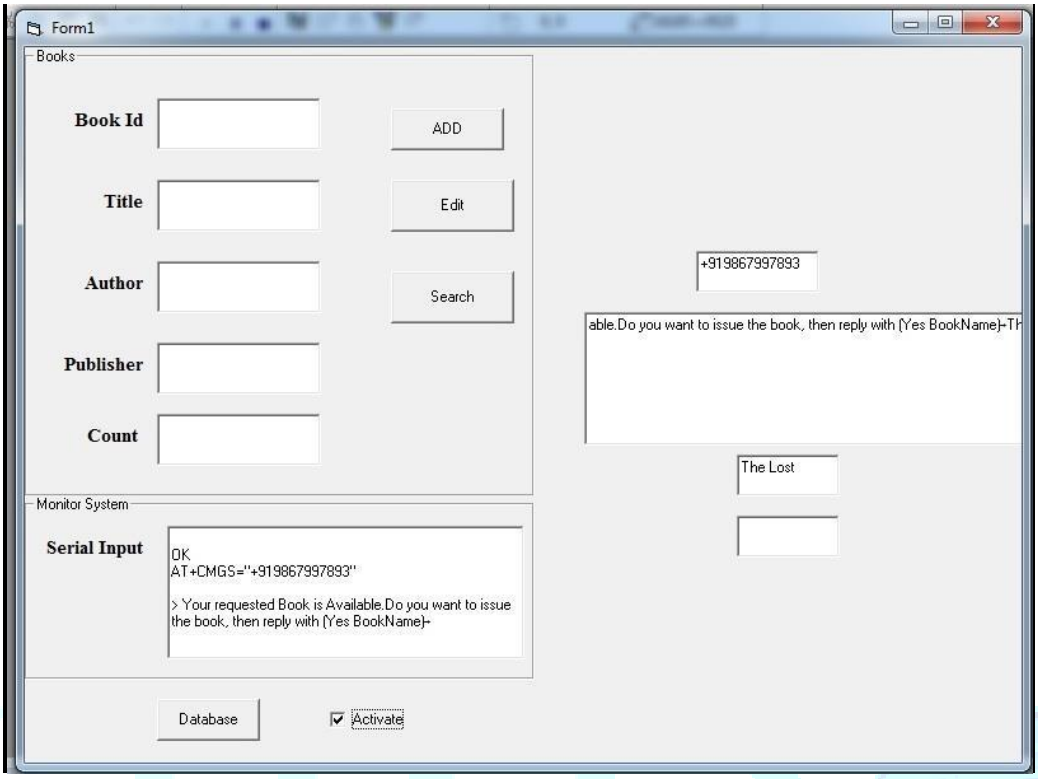


Figure 14

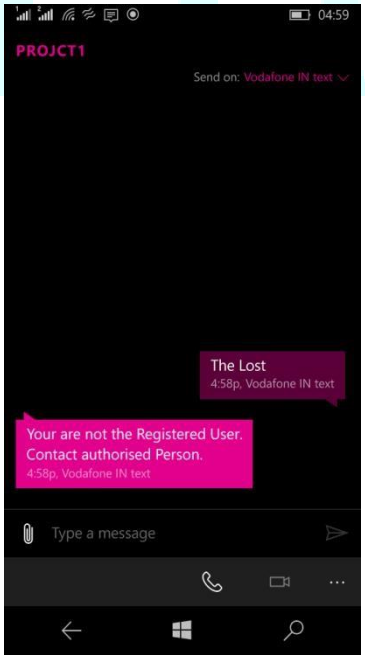


Figure 15

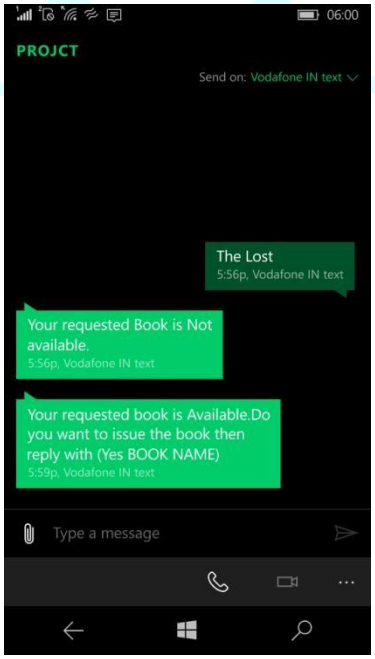


Figure 16

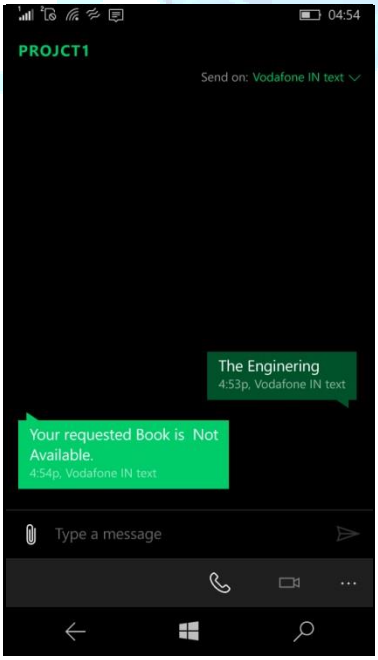


Figure 17

IV. CONCLUSION

The system is most effective where numbers of books are less and the numbers of user are in very huge. The system enables the user to to know the availability of the books before hand and therefore saves a lot of time for the user. These helps in critical situation when time is of most importance.

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