Interactive Voice Response based College Automation System

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Abstract:- **Interactive voice response system (IVRS) acts as a bridge between the computer database and people by connecting through a telephone network. When the connection is established between the computer database and the caller, an automated voice instruction is played that directs the caller to give dual tone multi frequency (DTMF) signals through the telephone keypad. Based on the entered DTMF signal appropriate information is fetched from database and played to the caller. The system is highly efficient and cost effective. The design consists of arduino microcontroller board, Global System for Mobile Communication (GSM) module and PC in which application is developed and the necessary data required is stored.**

Keywords:- IVRS, GSM, DTMF, arduino, PC, automation

1. INTRODUCTION

Automation is a method of performing tasks using systems or computers that were usually performed by people. Interactive Voice Response System (IVRS) is a technology that builds bridge between user and computer database where user communicates with the computer through dual tone multi frequency (DTMF) signals that are given as input through their telephone keypad when connection is established.
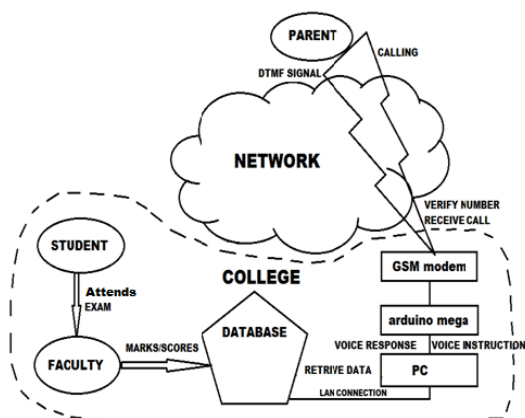

Figure.1 Basic working of IVRS system

IVRS is a phone technology that allows computer to detect voice and DTMF tones using a normal phone call [3] [4]. It enables user to receive information or data stored in database from anywhere at any time over a telephone line [1].

In IVRS based college Automation system the information regarding internal marks and attendance status of each student is stored in database. The system enables ease of handling documents by reducing paper work, time consumption and allows parents to know their wards performance from anywhere at any time through telephone line. It also has the capacity to increases staff efficiency as performing of task and analyzing of data can be done more quickly than it can be done manually.

2. SYSTEM DESCRIPTION

The basic block diagram of IVRS based college automation is as shown in fig 2. It consists of an arduino mega which is a microcontroller board based on ATmega2560, a GSM modem with processor IC SIM900 for wireless communication, a PC that acts as a server or database which stores data related to marks and attendance of students by the faculty members and a regulated power supply to power up the components.
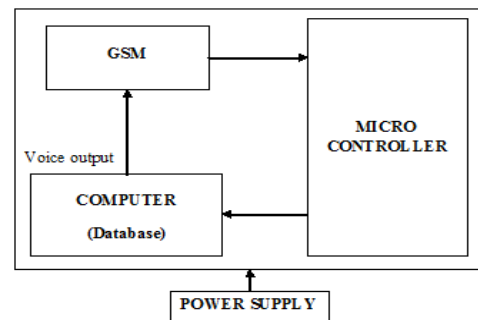

Figure.2 Block diagram of IVRS based College Automation

IVRS allows parent to call to the toll-free number which will be provided to them at the time of admission of their ward. Once the connection is established between the telephone line and computer database a computer generated voice message is played to the parent which directs the parent to enter the student registration number. After entering student registration number the system directs caller to enter DTMF signals through his/her telephone keypad. The given DTMF signal is received and decoded

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by GSM modem. This decoded signal is sent to the microcontroller and based on this signal appropriate data from database is fetched and is given to the parent in the form of voice through GSM modem.

2.1. Hardware components used

The operation performed by the hardware components used in the above system is shown in Table 1.

Table 1. Operations of hardware components

Components	Input	Output
GSM modem	Voice call Receive DTMF signals	Voice response Decoded DTMF signal
Arduino mega	Receive decoded DTMF signal	Query to PC
PC	Database	Records fetching Text to speech

2.2. Softwares used

The various softwares used in developing the above system are listed in the Table 2.

Table 2. Softwares used

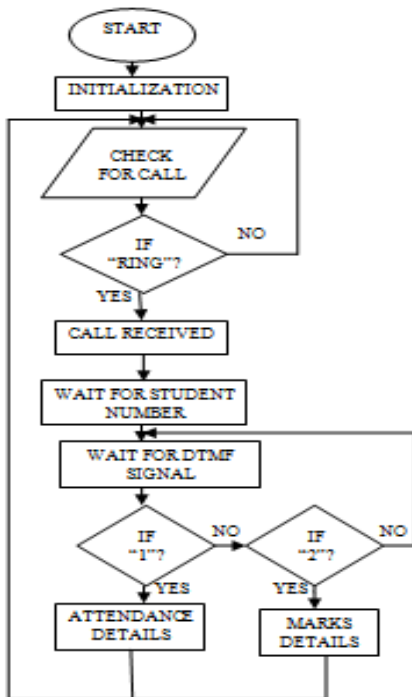| Softwares	Uses
Arduino IDE	Program microcontroller
Microsoft Hyperterminal	Analysing AT commands
Microsoft Office Access	Create Database to store student data
Microsoft Visual Studio	Create a windows application

2.3. Flow chart

Figure.3 Flow chart of IVRS based College Automation

3. RESULT

An application developed allows faculty members to add student details, marks scored in internals and attendance

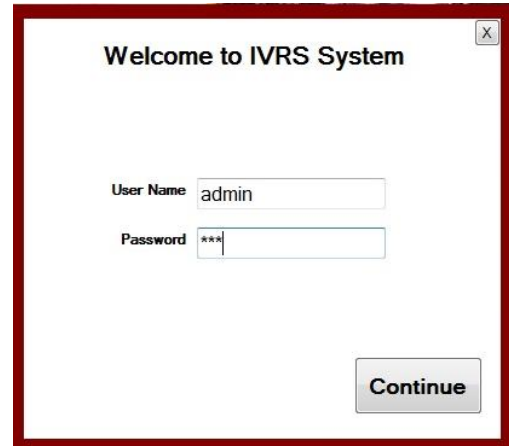status of the students into database. This database information is received by the parent through telephone line.

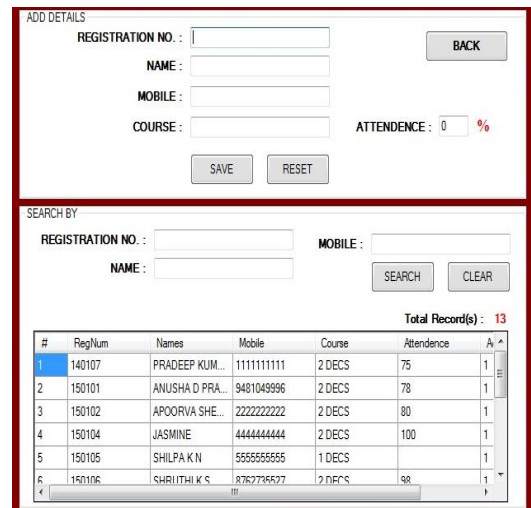
Figure.4 Login window to the application

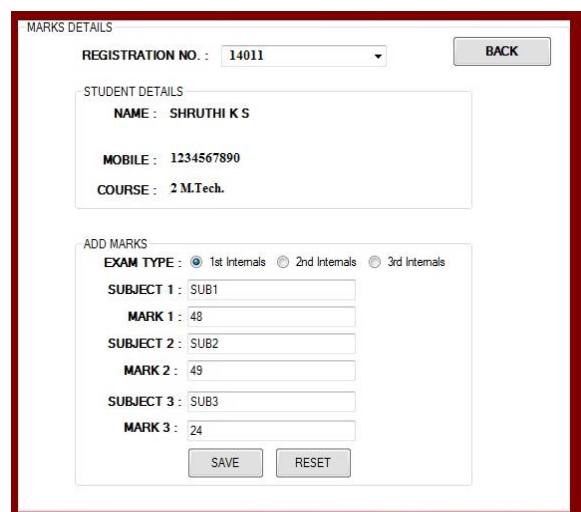Figure.5 entering student information and attendance window

Figure.6 entering student marks window

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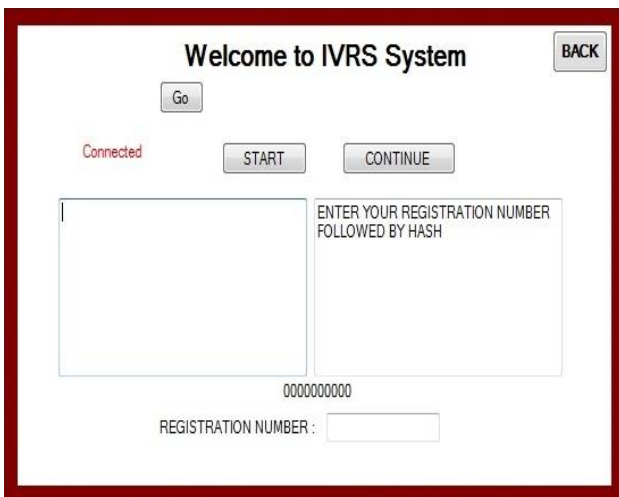Figure.7 IVRS application greeting window

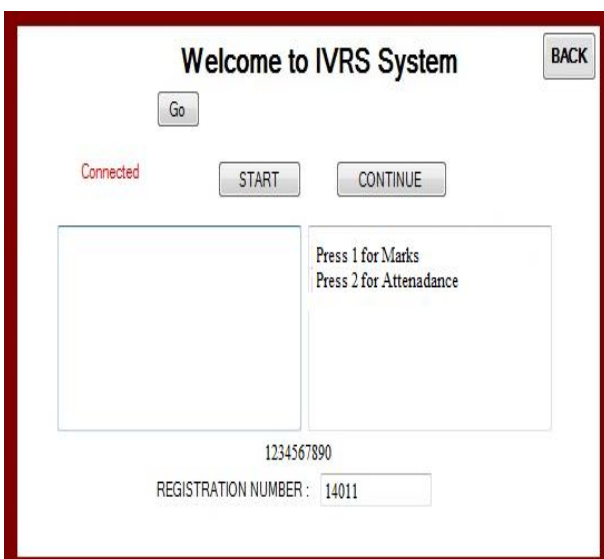Figure.8 IVRS application window to enter student registration number

Figure.9 IVRS application window to enter DTMF signals to choose appropriate options

4. CONCLUSIONS

Interactive Voice Response System is one of the latest technologies that allows caller to interact with the computer and access required information. The above system was designed, developed and successfully checked. It enables an easy way of handling documents related to student marks and attendance. It allows parents and guardians to get information of their son/ daughter studying in distant colleges without their physical presence at the college. As a future work the system can also be used to get information related to the fees pending details, exam timetable etc and SMS alerts can be enabled to the registered phone number.

5. REFERENCES

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