ISSN No:-2456-2165

Microcontrollor Based IVRs System for Educational Institution

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Abstract:- As the name suggests, the Interactive Voice Response (IVR) system is a bridge for interaction between the information seeker and information giver. The Information seeker has to have a telephone from wherein he has to dial a specified number from anywhere at any time of the day; after dialing the number and establishing the connection, he has to follow the online instructions to access the information that he may seek from the pre-recorded voice responses that are stored in the computer database based on his choice of inputs as required. The caller can seek the desired information by feeding input to the IVR system through either touch pad of his telephone or through Dual Tone Multi-Frequency (DTMF) signal. The input can be chosen from the list of information stored as per the subject which is played through pre-recorded voice messages. Through the application of the IVR system, the service provider can dissipate the information for the frequently asked question /answers at any time without interruption, which is very economical in terms of cost, time and energy. This is very efficient system which can replace an operator with a machine enabled with artificial intelligence. The IVRS system can be designed with very easily available electronic components like microcontroller and some basic electronic chips that are customized with a computer, with homemade software running in the back office while the other dynamic works can be handled on the front end.

Now-a-days every institution needs automation. As a part of college automation, we have to do a project Interactive voice response system for college Automation. Our project allows the user to know our institutions overall information quickly through the telephone line without the intention of the college authority. In the hardware side embedded system has been used. This microcontroller controls the whole hardware. Mobile line is used for communication purpose. Embedded C has been used for frontend software programming. Overall information about the institution is presented and made reachable to the users by our project. It will be very helpful to the users to be acquainted with institutions information without having to spend time with the institutions authority thus saving time and resources at both ends.

Keywords:- *IVR, DTMF, Microcontrollor, etc.*

I. INTRODUCTION

In today's fast life, people do not have time to visit the college to meet the authorities to know the institutions/colleges information. Also some colleges provide the information to the users through their websites or by use of social media. But this system also requires internet facility. In fact, not every user is able to operate internet. Hence the automatic voice responding system is used. This system uses the data stored in database and the college information can be accessed through this database. College/Institutions data like all the branches/departments, transportation, college fees, placement, Infrastructure/facilities in colleges, teaching Staff etc, is stored in database. When the user calls the toll free number of the college, the users will get the overall information about the college in the form of voice. The proposed system here is especially utilized for educational institutes like school or college. The system is developed by using AT89C51 microcontroller. The goal of our proposed system is to easily get the colleges information to the users without having to leave the comfort of the home/office or from anywhere at any time without human interaction. The system is made user friendly and reliable and operates on 24/7 basis. Interactive Voice Response System provides quick information to the users by simply dialing a specified number without visiting the college.

II. PRE-RECORDED INFORMATION

IVRS is used almost by all major companies. For instance LPG gas booking system also uses IVRS. Here the consumer has to register his/her mobile number which is already associated with his consumer number. When the consumer dials the toll free number IVRS provides options for gas cylinder refill booking and thus the consumer can opt for booking the refill or go with other functionalities as per his choice.

III. MICROCONTROLLER BASED IVRS FOR COLLEGE AUTOMATION

In telephony, interactive voice response, or IVR, is a phone technology that allows a computer to detect voice and touch tones using a normal phone call. The IVR system can respond with pre-recorded or dynamically generated audio to further direct callers on how to proceed. IVR systems can be used to control almost any function where the interface can be

broken down into a series of simple menu choices. Once constructed IVR systems generally scale well to handle large call volumes

➢ *Objectives.*

A. In this project college related information is pre recorded in the microcontroller.

B. User should select respective option from the menu.

C. Selected menu is given to the DTMF which sends it further to the microcontroller.

D. According to the menu selcted by the user the system plays the respective message

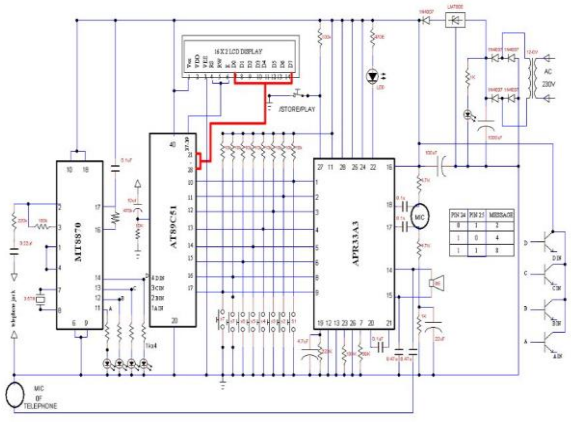
IV. EXISTING SYSTEM

Our college for which the IVRS system is build is far away from the main city geographically. In order to know the details of the college the user has to travel a long distance from the city to reach the college to get the required information. Thus, it becomes extremely tedious job for the users/parents to approach the college to get the required information. Furthermore, college has provided all the necessary information on the website but not all users are able to operate or make use of the internet facility especially from the rural region. Taking into account we decided to build an interactive voice response system to cater to the users/parents needs. In addition to this when the user/parents reaches the college the staff had to invest a lot of time and resources to provide the information. IVRS addresses all the above concerns this reducing time and energy on both the ends – user as well as the college.

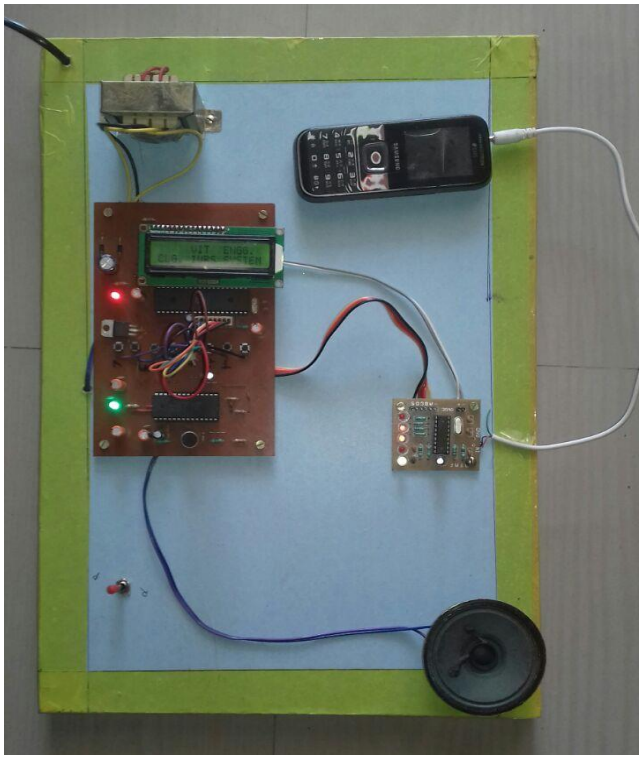
V. TECHNOLOGIES USED

In this system mobile line is connected to DTMF decoder. This decoder converts decimal language to binary language. Then this DTMF decoder message is sent to microcontroller. In this system DTMF decoder MT8870 is the main part of this system. The information stored in the form of voice playback in IC APR33A3 is retrieved through the microcontroller. This system uses Data Interrupt pin which enables to skip the sequence in which the information is provided to the user

VI. CIRCUIT DIAGRAM



VII. IVRS SYTEM



VIII. ADVANTAGES

The advantages of this system are as follows.

A. Saves time and resources at both the ends (users as well as clerical side)
B. Operates 24/7 so no need of manual intervention and information is available to the users irrespective of college working hours
C. Easy and reliable
D. Multi Language support
E. Cost Effective
F. Security
G. Does not require any internet connection

➢ *Disadvantages*

A. GPRS and GSM could not be used in this system which is one of the limitations of this system
B. Above limitation does not provide the facility to change/record the information remotely or automatically.
C. Does not work if mobile network is not available.

IX. APPLICATIONS

A. Medical unit (Health care) unit
B. Farmacy and weather station
C. Banking and Finance
D. Government
E. Telecommunications
F. Utility bills paymernts System

X. FUTURE SCOPE

Current IVRS System is based on Microcontroller Base which makes use of a mobile phone attached with system. So future of this system is inbuilt gsm base system that doesn't need any mobile phone. Here sim card is directly inserted to Microcontroller and works with gsm module. The gsm module sends the HTTP request to server and stores logs to sever. This methodology could also be used to customize the IVR recordings and options through server.

The greatest benefit of this system is that college/Institution can easily access the information/data collected by system. This information could be beneficial to the institution/college as this information/data could be analyzed and used to identify customer/user or parents/students requirements. For instance, institution/college could know and identify which stream is booming this year and accordingly further strategies and policies could be drafted based on this analysis of this valuable data

XI. CONCLUSION

Interactive Voice Response System is very cost effective system that can work for 24x7 unlike the human workforce. With the use of this system, the end user can access information at will, at any time, at as many times as to his satisfaction without being troubled for repetition unlike the human operators. This increases the overall impression of the system user in terms of information dissipation with use of advanced and latest technologies with use of artificial intelligence that in return enhances his ROI and further strengthens his market presence 24x7. All the components used in an IVRS system are very robust, rigid and compact that can easily fit into a computer in form of a PCB card. Further advancements into the IVRS system can be integrated with the internet which then makes possible to tap the information from any part of the world. With proper use of artificial intelligence the user can access precise information by navigating through the database that has user-friendly interface with pre-recorded messages and option for selection through touch pad of the telephone. Because of its versatility and 24x7 availability and with accurate response and accountability for the correct information shared this system becomes one of the must have's for large scale organization setup's. Therefore we have decided to use this system for our institute for disseminating information related to the college activities for educational purpose.

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