Interactive Voice Response System for Educational Institution

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Abstract— The interactive voice response system (IVRS) is an automatic communication system and code That allows a private to conduct transactions by phone while not the help of alive worker. usually a private caller can act with this method by making selection from voice menus. The menu picks square measure created mistreatment touchtone phone data input device entries or twin Tone Multi Frequency (DTMF) signal, that produces voice-band tones once a button is ironed on a phone. This interaction permits the individual to conduct transactions with the communication system as well because the ADPS that is connected with phone. The phone system plays recorded voice prompts and therefore the person usually presses variety on a phonephone data input device to pick the choice related to the voice prompt.

Key words: Educational Institution, ADPS, DTMF

I. INTRODUCTION

In today's quick life folks don't have time to go to the faculty for professor to know the student performance. it's troublesome for fogeys to go to the faculty daily to induce the daily group action of student. conjointly some schools offer user name and parole to the oldsters to visualize their student performance. however this method conjointly needs net facility. thus the automated voice responding system is employed. This system uses the coed knowledge keep in pc and oldsters range register within the pc. Student's knowledge like roll range, name, branch, year and overall share group action is keep in school information. conjointly parent's mobile range is registered to the faculty information. once the oldsters decision from the registered mobile range to the required school range, the oldsters can get the coed overall group action in share in voice kind. The system is very planned for faculty automation. The system is predicated on ARM eleven microcontroller i.e Raspberry Pi and GSM module. GSM is most generally used among the digital wireless telecom technologies. The GSM module instrumentation incorporates a Subscriber Identity Module (SIM) security and authentication. The SIM could be a knowledge base open-end credit containing the user's subscription info and phone book. The advantage of the GSM is its international roaming capability in over one hundred countries, improved battery life, economical use of spectrum, advance options like short electronic communication and display, a large style of telephone set and accessories, high stability mobile fax and knowledge upto 9600 information measure The goal of our system is to simply get the coed performance in school weather their kid is attending lectures properly or not. And by victimization this method folks will simply get the coed group action from anyplace at any time while not human interface.

II. SEQUENCE FOLLOWED IN IVRS SYSTEM

1) Caller dials the IVRS service range.
2) the pc waits for a specific range of ringing tones at the top of that, the association is established.
3) The association is established by lifting the French {telephone|telephone|phone|telephone set} of telephone base from ONHOOK condition.
4) Now, a pre-recorded voice greets the caller orthodox that the quantity dialled appreciate the actual service. 5728

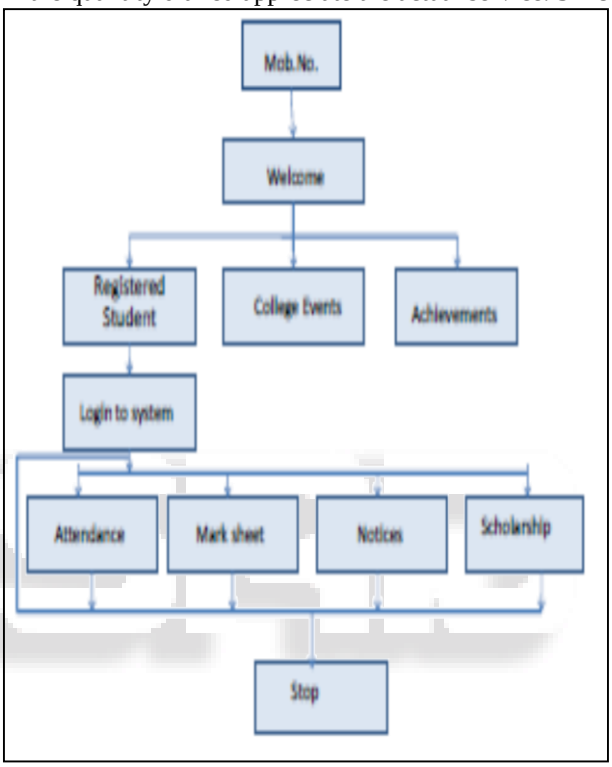

Fig.1: Flow chart of call.

5) Next, the menu is bestowed to the caller once more within the voice kind, giving him then varied choices to decide on from.
6) If the data to be relayed back is confidential, then the system could even raise the dialer, to insert a word range.
7) The info is consequently documented and therefore the necessary info is obtained.
8) Next, constant info is pass on to the user in voice.
9) The caller usually given the choice to :

– Repeat no matter info was voiced to him.
– Repeat the alternatives.
– Break the decision by restarting ON-HOOK condition

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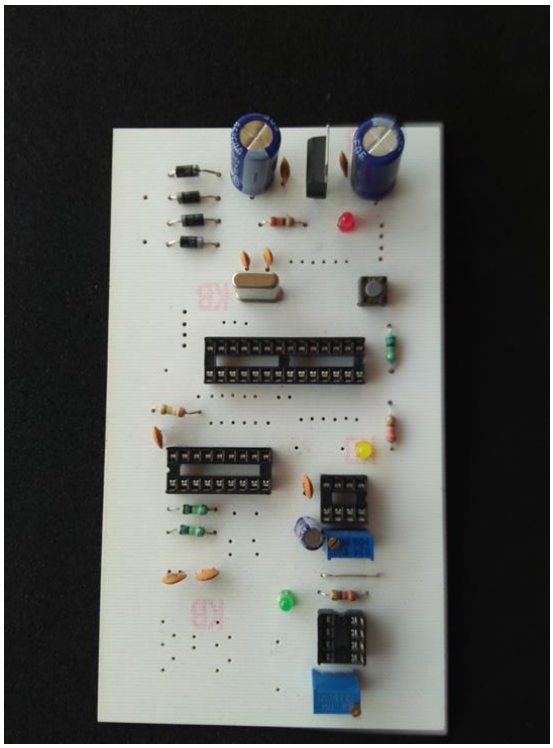

Fig. 2: IVRS microcontroller.

This project is associate degree Interactive Voice Response System supported a private pc. the information of an establishment or firm is keep during a pc as a MS Access info, the world's most well-liked open supply info. oldsters or students will then access and retrieve knowledge from this info simply by creating a decision to a planned mobile variety. The user ought to give the coed details like admission variety, semester variety, communication code etc. once requested by the pc. The pc can then speak back the information requested, employing a speech synthesizer.The hardwire facet consists of associate degree embedded system that interfaces a GSM portable to the port of the pc. This explicit example is meant for our school and uses the tutorial knowledge of the scholars because the info. computer facet programming is completed dot internet with MS Access and therefore the embedded system is programmed in C. The text to speech conversion is completed victimisation speech synthesizer and therefore the audio output of the sound-card is routed to the portable.When there's associate degree incoming decision, the decision detector detects the decision and attends it mechanically. Then the decision detector can send a symptom to modify the micro-controller. it'll then signal the computer through the virtual port created by the USB to serial device. On receiving the signal, the program running within the computer greets the user by oral communication a welcome message, and prompts the user to enter student details like admission variety. once the user presses the keys on his phone, DTMF tones square measure generated, that square measure received by the portable and decoded victimisation the favored DTMF decoder. The Decoder outputs BCD code of the key ironed. The micro-controller can then scan the BCD code and send it to the computer. The STD pin of decoder can go high only if the decoder receives a legitimate DTMF tone. it's accustomed signal the micro-controller to scan the information. The decision detector is constructed around a general purpose Op amp LM324 wired as a comparator associate degreed a 555 wired as an a monostable. throughout associate degree incoming decision the voltage level of the electro-acoustic transducer output goes high and remains high for a few time. additionally throughout every key press, the voltage goes high and remains high for a number of seconds. throughout that point, the output of Op amp are low and it'll trigger the monostable. The fundamental measure of the monostable is about to more or less twenty five seconds. If the user doesn't presses any key inside this point amount, the monostable output can go low and it'll trigger the micro-controller to travel signal to hold up the decision.

III. METHODOLOGY

We area unit developing the school automation system employing a text-to speech (TTS) system that the key a part of the system software system style. The system software system development includes the technologies Goertzel formula, Dual-tone multi-frequency sign (DTMF), speech synthesizer etc. once caller dial the quantity then the technique used for distinctive frequency parts of a sign is Goertzel formula. that's for twin Tone Multi- Frequency (DTMF) detection or decipherment. A text-tospeech (TTS) system converts traditional language text into speech. For that Speech synthesis is employed.

A. Goertzel Algorithm:

The Goertzel formula could be a digital signal process (DSP) technique for distinctive frequency parts of a sign. The Goertzel formula implementation examines the energy of 1 of the 2 tones from associate degree incoming signal at eight completely different DTMF frequencies to work out that DTMF frequency is gift. to try and do this analysis, the signal is reworked to the DTMF frequencies, that area unit computed by the changed Goertzel formula.The matched filter construct is employed for every DTMF frequency to work out the frequency at that the incoming signal has most energy. Since most energy corresponds to DTMF frequency, this procedure allows United States to observe the DTMF frequency. it's vital to decide on the correct formula for detection to save lots of memory and computation time.The Goertzel formula is that the optimum alternative for this application as a result of it doesn't use several constants, that saves a good deal of memory area. Also, solely eight DTMF frequencies have to be compelled to be calculated for this application, and therefore the Goertzel formula will calculate designated frequencies. this protects computation time. The DTMF frequency is reworked to a separate Fourier rework (DFT) constant.

IV. IMPLEMENTATION

Since the phonephone trade has planned the frequence to eight kilocycle and therefore the DTMF frequencies to 697, 770, 852, 941, 1209, 1336, 1477 and 1633 cycle the filter length should be massive enough to search out the specified worth that corresponds to the DTMF frequencies. Therefore, there's a trade off to be thought-about between the computation burden and higher resolution. For this application report, the Filter length N was chosen as a hundred and five that is that the smallest worth which will fulfill DTMF detection.

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A. Twin Tone Multi-Frequency (DTMF):

Dual-tone multi-frequency communication (DTMF) is employed for telecommunication communication over analog phonephone lines within the voice-frequency band between phonephone handsets and different communications devices and therefore the switch center. The version of DTMF that's utilized in pushbutton telephones for tone dialing is thought as Touch-Tone. before the event of DTMF, automatic phonephone systems used pulse dialing or loop disconnect (LD) communication to dial numbers. It functions by chop-chop disconnecting and re-connecting the occupation party's phonephone line, almost like flicking a light-weight start and off. The continual interruptions of the road, because the dial spins, appears like a series of clicks. The exchange instrumentation interprets these dial pulses to work out the dialed variety. Loop disconnect vary was restricted by telegraphic distortion and different technical issues, ANd inserting calls over longer distances needed either operator help (operators used an earlier quite multi-frequency dial) or the supply of subscriber trunk dialing instrumentation.

Fig. 3: DTMF Keypad Layout.

The higher than figure shows DTMF input device that is explained below. The DTMF input device is set call at a 4×4 matrix, with every row representing a coffee frequency, and every column representing a high frequency. Pressing one key (such as '1') can send a curved tone for every of the 2 frequencies (697 and 1209 hertz (Hz)). the initial keypads had levers within, therefore every button activated 2 contacts. The multiple tones area unit the rationale for occupation the system multi frequency. These tones area unit then decoded by the shift center to see that key was ironed.

DTMF Keypad Frequencies (with sound clips)				
	1209 Hz	1336 Hz	1477 Hz	1633 Hz
697 Hz	1	2	3	A
770 Hz	4	5	6	B
852 Hz	7	8	9	C
941 Hz	*	0	#	D

Fig. 4:

The tone frequencies, as outlined by the Precise Tone arrange, square measure selected such harmonics and inter modulation product won't cause Associate in Nursing unreliable signal. No frequency could be a multiple of another, the distinction between any 2 frequencies doesn't equal any of the frequencies, and therefore the total of any 2 frequencies doesn't equal any of the frequencies. The frequencies were ab initio designed with a magnitude relation of 21/19, that is slightly but a full tone. The frequencies may not vary quite ±1.8% from their nominal frequency, or the switch center can ignore the signal. The high frequencies is also identical volume as – or louder than – the low frequencies once sent across the road. The loudness distinction between the high and low frequencies is as giant as three decibels (dB) and is observed as "Twist". The length of the tone ought to be a minimum of seventy ms, though in some countries and applications DTMF receivers should be able to faithfully observe DTMF tones as short as 45ms.

V. SPEECH SYNTHESIZER

Speech synthesis is that the artificial production of human speech. A ADP system used for this purpose is termed a speech synthesizer, and might be enforced in software package or hardware. A text-to-speech (TTS) system converts traditional language text into speech; different systems render symbolic linguistic representations like phonetic transcriptions into speech. Synthesized speech may be created by concatenating items of recorded speech that square measure keep in an exceedingly info. Systems disagree within the size of the keep speech units; a system that stores phones provides the most important output vary, however could lack clarity. For specific usage domains, the storage of entire words or sentences permits for high-quality output. instead, a synthesizer will incorporate a model of the vocal tract and different human voice characteristics to make a very "Synthetic" voice output. the standard of a speech synthesizer is judged by its similarity to the human voice and by its ability to be understood. AN intelligible text-to-speech program permits individuals with visual impairments or reading disabilities to concentrate to written works on a information processing system.

A. Objectives:

Interactive Voice Response systems will play a big role in providing economical customer service. Properly enforced, they will increase client satisfaction, lower costs and provide new services. The come on investment (ROI) on these systems is additionally quite wonderful, creating them the foremost widespread pc telecom systems within the world. Compare them to a call centre. the value for the additional "human touch" interprets into an enormous running price within the variety of Agents, Supervisors, infrastructure maintenance, training, call centre performance & discipline reviews, etc. World over, the primary systems that any company deploys with a read towards enhancing client satisfaction ar IVR's. decision centers return a lot of later.

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B. Result:

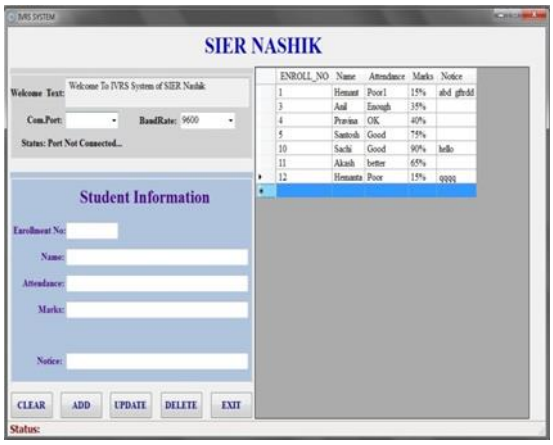

Fig. 5:

This is a final result of our project. In left side there is a five buttons like, clear, add, updte ,delete and exit. the left side window is student information window. we can add ,delete ,update the information and this information stored in right hand side window i.e database window.

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