



INTERACTIVE VOICE RESPONSE SYSTEM FOR AGRICULTURE

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Abstract: We have come across many areas in which the "IVRS-Interactive voice response system" being used so, we thought of exploring its use in the field of Agriculture, we mean to say that to employ this voice system to be interfaced between our agri-motives with its owner. This would help him to control systems in field just by calling to a mobile irrespective of his location. This intend to help him very much giving him/her a power to access to control devices (Irrigation motor) being present at remote locations which is far better than using BT or WIFI technology, where he can also expect a response from the same represents its status. This method involves use of 'DTMF-Dual tone multi frequency technique which involves giving different frequency for different key on pressing, this signal is processed to get the required work done, this is done by using a simple, cost effective 'AURDUINO 'modules, the response is obtained from these devices using sensors which is connected to the same board. Making calls uses calling facilities provided by any network provider, by placing a 'SIM' card inserted onto 'GSM' board which acts a call making module and provides required control signal to processor. "So, implementing this system, anyone can hold on to his device with or without knowing the internal working. Implementation and working is also simple and cost effective, just if u ask to turn ON just make a 'CALL'.

Index Terms - Component, formatting, style, styling, inserts.

I. INTRODUCTION

- 1.1 INTRODUCTION TO IVR SYSTEMS In telephony, Interactive Voice Response, or IVR, is a phone technology that allows 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 call volume. Taking advantages of IVRS we are developing the system for agriculture automation using voice over internet protocol (VOIP). A caller dials a telephone number that is answered by an IVR system. The IVR system executes an application as part of the application, pre-recorded audio files or dynamically generated Text to Speech (TTS) audio explain the options available to the caller. The caller is given the choice to select options using DTMF tones or spoken word. Speech recognition is normally used to carry out more

complex transactions and simplifies the application menu structure. Interactive voice response, or IVR, is an automated telephone system that combines pre-recorded messages or text-to-speech technology with a dual-tone multi-frequency (DTMF) interface to engage callers, allowing them to provide and access information without a live agent. If the IVR system cannot retrieve the information that the caller is looking for, the programmed menu options can provide assistance in routing callers to the appropriate representative for help. By integrating computer and telephony technologies, IVR software can improve call flow and reduce wait times, leading higher overall customer satisfaction. Movie one was one of the most famous and successful uses of IVR technology in the 1990s. Since the internet wasn't as accessible then as it is today, movie-goers would call in and provide their zip code to get a list of available movie theatres near them with their respective movies and show times. While Movie one is a product of the past, its underlying technology is still leveraged, primarily within call centres, to provide customer support and reduced call volume for customer service representatives. Today, IVR software is also evolving. The development of natural language processing technology expands the range of ways that callers can now interact with computers on the phone. Instead of using a touch tone system, more advanced IVR software enables callers to verbalize their needs on the phone.

Then, through speech recognition, IVR system can understand and respond to their inquiries in real-time. IVR systems improve the customer experience by providing a self-service method for customers to access the information that they need without the assistance of customer support. It also reduces the call volume for contact centres, lowering wait times and operation for business. How interactive voice response works Interactive voice response phone system typically consists of the following components: A TCP/IP network to provide internet and intranet connectivity. Databases to supply IVR applications with relevant data A web/application server where the IVR software applications will live. This server can host multiple applications, which are all written in Voice XML. For example, there could be applications for contact centres, outgoing sales calls and speech-to-text transcription. From here, one of three types of IVR systems is typically constructed. Touch-tone replacement: This system prompts callers to use a touch-tone keypad selection to access information. For example, a pre-recorded message may say, "Press one for store hour information," and the caller would respond with "one." Directed dialogue: This type of IVR provides specific verbal prompts to callers depending on their inquiry. For example, the recording may ask, "Are you looking for store hours or location information?" The caller may respond with "store hours." Natural language: This advanced IVR system uses speech recognition to better understand user requests. For example, the system prompt may ask, "what information are you looking for today?" and the caller may reply with "I'm looking for store hour information" or other similar phrases.

Benefits of interactive voice response

IVR technology offers competitive advantages to businesses and advances their automation efforts. Some key benefits include: Efficient call routing: After obtaining relevant information from a given caller, IVR solutions route calls to the appropriate call-center agent, reducing wait times and increasing first contact resolutions. Lower operational costs: IVR systems are incredibly cost-effective. They not only reduce high call volumes for customer service representatives, but they can extend access to information during off-peak hours of the day, such as nights, weekends, and holidays. Error Reduction: When deployed effectively, IVR systems can reduce errors within the customer service process as it does not depend on a human customer service representative to take notes and route incoming calls appropriately. Increased security: Some IVR systems incorporate voice recognition technology to verify the identity of an individual, adding an extra layer of security. This can be helpful for highly sensitive personal information, like social security and phone numbers, checking and savings account information, and lab results from doctor's appointments.

1.2 PROBLEM ANALYSIS AND MOTIVATION

India is a land of Agriculture and it is very important sector that the majority (70%) of the rural population depending on it. Every morning about 50 million farmers travel for hours to reach the field from the home facing many challenges. Sometimes the scorch sun leaves the farmer tired and fatigue, while at times of pierce rain fall leaves the farmer completely drenched. Even they need to go field late at night through many difficulties and they take all of these pain and troubles only to do one thing, that is manually turn On Irrigation pump. But again hard Luck strikes and he finds at that there is no electricity available on his fields. So all the hard work and effort simply goes to vain. Is there any real solution for the poor farmer? Well there is, Introducing INTERACTIVE VOICE RESPONSE (IVR) SYSTEM, a revolution in Agriculture!!

1.2 LITERATURE SURVEY This documents provides literature survey of papers published in the area of IVR systems, mainly focus on state of technology that has or will have major influence on the future direction of our proposed system, Through a glimpse of what the technical achievements are done and what the future might hold, It becomes clear that advanced IVR begin to converge, IMR devices will combine functionality, new levels of sensor fusion will be created, and all this for one purpose to bring intelligent machine closure to the human(farmer). IVR place a key role to be used in general public who have no knowledge of both software and hardware and in particular it brings benefit to the farmer. IVR System are capable of decoding the DTMF signals in real time and they allow them to irrigation pumps to be controlled directly by the normal mobile phones irrespective of his location.

1)Title: Designing of Mobile Controlled Automatic Interactive Voice Response Irrigation System Authors:Jaypal J. Baviskar Department of EE,VeermataJijabai• Technological Institute, Mumbai A fshan Y. Mulla Department of EE, VeermataJijabai Technological• Institute,Mumbai. Arnol J. Baviskar Department of ECE, RamraoAdik Institute of• Technology, Navi Mumbai. Kevin Dsouza Department of Electronics Engineering, Sardar Patel• Institute of Technology, Mumbai. Masiyuddin Khan Department of Electronics Engineering, Universal• College of Engineering, Thane. Published at: IEEE International Conference on Recent Advances and• Innovations in Engineering (ICRAIE-2014), May 09-11, 2014, Jaipur, India. Summary of the paper: Agriculture is a dominant sector in India, which contributes to 13.7% GDP growth and provides employment to 65% of the population. These figures indicate that technological amendments should be made in order to improve productivity and sustainability. This paper proposes an Automated Irrigation system based on IVRS (Interactive Voice Response System) for remote controlling and monitoring of irrigation loads. It guarantees the farmer to perform his job efficient with ease. The proposed system continuously monitors the soil moisture level and provides the necessary control signals for controlling the water flow to a particular farm sector. This is possible by controlling the switching operation of the solenoid valves, motors or pumps. Further, the designing, hardware development and implementation of the system is illustrated in detail. The paper also evaluates the latency involved in executing the complete process of control operation. Keywords - GSM; Mobile Control; Remote Control- ling; IVRS (Interactive Voice Response System).

2)Title: IVRS FOR COLLEGE AUTOMATION Authors: Santosh A. Kulkarni, Dr. A.R.Karwankar Published at: International Journal of Advanced Research in Computer and Communication Engineering Vol. 1, Issue 6, August 2012.

Summary of the paper: The interactive voice response (IVR) system serves as a bridge between people & computer by connecting the telephone network with instructions. The telephone user can access the information from anywhere at any time simply by dialling a specified number and following an automated instruction when a connection has been established. The IVR system uses pre-recorded or computer generated voice responses to provide information in response to an input from a telephone caller. The input may be given by means of touch-tone or Dual Tone Multi-Frequency (DTMF) signal, which is generated when a caller presses a key of his/her telephone set, and the sequence of messages to be played is determined dynamically according to an internal menu structure (maintained within the IVR application program) and the user input. The IVR System which will be designed to provide an ideal platform for the operation of start-ups and existing small concern. It will be a highly economical & efficient way to replace the Dialogic card which is very costly and requires a high maintenance and regular up gradation. The IVRS system which will be designed will consist of simple components like microcontroller and some basic application chips interfaced to a PC which will have small software running in the backend while the other jobs are performed on the front end. Keyword:- Dual Tone Multi-Frequency (DTMF), Gentzel algorithm, Speech synthesis, Voice Over Internet Protocol.

2.2 METHODOLOGY We are developing the college automation system using voice over internet protocol (VOIP). Which the major part of the system software design. The system software development includes the technologies Gentzel algorithm, dualtone multi-frequency signalling (DTMF), speech synthesizer etc. When caller dial the number then the technique used for identifying frequency components of a signal is Gentzel algorithm. That is for Dual Tone Multi- Frequency (DTMF) detection or decoding. A text-to- speech (TTS) system converts normal language text into speech. For that Speech synthesis is used. A Gentzel algorithm. The Gentzel algorithm is a digital signal processing (DSP) technique for identifying frequency components

of a signal. The Gentzel algorithm implementation examines the energy of one of the two tones from an incoming signal at eight different DTMF frequencies to determine which DTMF frequency is present. To do this evaluation, the input signal is transformed to the DTMF frequencies, which are computed by the modified Gentzel algorithm. The matched filter concept is used for each DTMF frequency to determine the frequency at which the incoming signal has maximum energy. Since maximum energy corresponds to DTMF frequency, this procedure enables us to detect the DTMF frequency. It is important to choose the right algorithm for detection to save memory and computation time. The Gentzel algorithm is the optimal choice for this application because it does not use many constants, which saves a great deal of memory space. Also, only eight DTMF frequencies need to be calculated for this application, and the Gentzel algorithm can calculate selected frequencies. This saves computation time. The DTMF frequency is transformed to a Discrete Fourier Transform (DFT) coefficient. Since the telephone industry has present the sampling frequency to 8 kHz and the DTMF frequencies to 697, 770, 852, 941, 1209, 1336, 1477 and 1633 Hz the filter length must be large enough to find the desired value that corresponds to the DTMF frequencies. Therefore, there is a trade-off to be considered between the computation burden and better resolution. For this application report, the Filter Length N was chosen as 105 which is the smallest value that can full fill DTMF detection.

RESULTS We have successfully implemented the working model of IVR system in the field of agriculture for the purpose of irrigational pump control by calling on to the specified mobile IMSI number. Upon power up the system is made to call the stored number and this help the farmer to either to turn on or off based on his convenience by pressing the corresponding number on the keypad of the phone on hearing the options mentioned through the voice, the mobile terminal uses DTMF based processing to generate corresponding signal for the command made Using this the microcontroller will perform the operation required. It also makes provision for the farmer to call to the mobile number of the IVR system to know the status of the IVS system power, else if, the IVR system is powered down then response is indicated with "switched off".

CONCLUSION The system makes efficient use of the latest technology, to aid the farmers in their daily chore of farming. It can be contemplated as an incredible solution to the woes faced by the farmers now-a-days, since it provides a real-time automation in agricultural environment. It has a centralized unit, having a subscriber number which forms a link between the user and the system. Hence, the system configures the watering of the plants depending on the environmental factors and can automatically irrigate the field. The GSM technology is used because of its main features which can be listed as, complete accessibility, simplicity, smaller amount of signal deterioration, large coverage area etc. All these factors make this technology a better option for sending control signals and receiving updates from a remote place. Further the performance analysis of the system is evaluated by calculating the latency. Hence, it can be concluded that the designed system is cost effective and involves minimum latency.

FUTURE SCOPE Adding some more technologies, programmability in future, our IVR systems should make a call to the farmer indicating there is power in the farming field. The proposed system should continuously monitor the soil moisture level and provides the necessary control signals for controlling the water flow to a particular farm sector. Use of ZigBee wireless technology to transmit soil moisture sensor data to the central system. Let us hope to reach all these goals as soon as possible!!