Design and implementation of voice message controller system for secured communication

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Abstracts- Mobile devices are becoming an indispensable part of daily lives. This system has been developed interactive android application to assist and provide the support helps people such as blind and other physically limited people who face. They will be done for outgoing calling to his family and also the area around them.Voice-message (also known as voice mail, or voice bank) is a computer based system that allows and to process transactions relating to individual, organization, products and services, using an ordinary telephone. The term is also more broadly to denote any system of conveying a stored telecommunications voice messages, including using an answering machine. Most cell phone services offer voice-message as a basic feature and many landline phones and corporate PBXs include voice –messages services.

Voice-message systems are designed to convey a caller's recorded audio message to a recipient. To do so they contain a user interface to select, play, record, repeat, save, send, address and erase. Most systems use phone-networks, either cellular or land-line. Simple voice-message systems functions as a remote answering machine using touch-tones as the user interface. Simple systems may not provide active notifications at all, instead requiring the recipient to check with the systems, while others may provide an indication that message are waiting. Voice message are essentially digital recordings of outgoing and incoming voice messages that are managed either by an on-site or off-site system.

Todays, Security is the most important issue for communication. Therefore, to reduce their problems of security we implement a secured voice message controller. By implementing high security voice message controller, we can prevent unauthorized access to the location, confidentiality of data. It also provides disaster recovery system and prevention of malicious damage. It is very important to resolve the security issues by implementing some that type of projects, which helps the people to secure the data from the unauthorized access. To reduce the problem of security, implementation of high security voicemail system is done by using Xilinx software and that prototype is can be implemented on FPGA development kit.

Keywords: Voice Message Controller System, VHDL (Very High Integrated Chip Hardware Description Language), FSM (Finite State Machine), FPGA (Field Programmable Gate Array), and Xilinx software.

1. Introduction-

Technologies are closely related to the modern way of life, but exception for Childhood Blindness (CB). They aren't independently move, especially blind and motion-impaired peoples. [7-8], [11] As our society farther expands, there have been many supports for second class citizens, disabled. One of many supports that are urgent is the guarantee of mobility for blind people [1-3], [4-6]. With the rapid growth of wireless communications, the need for voice recognition techniques has increased greatly. Voice applications based on voice interfaces, voice recognition, and voice dialogue management can help users to be focused on their current work without extra effort for hands or eyes. Speech recognition is technology that uses desired equipment and a service which can be controlled through voice by blind, but other people also often face this problem, Sighted users often find them inevitably placed under situations where non-visual interaction is required [7],[10-11]. We aim purposed an android application which supports voice commands and application is developed for the children aged from 4 to 15 years and visually impaired peoples. After unlocking the mobile phone the application will be launched without any voice command. Computational technique based classification of speech recognition deals with determining the identity of a given voice segment using a predefined set of samples. The systems application consists of the data

train, list command, testing, help. It's accepted voice command and perform the operations according is it. It's accepted voice command and perform the operations according and to translate the voice-to-text and then produces output in the form of voice. The objective of this paper is to design a specialized text-to-speech system, which would convert text input into speech. The text input is in the form of short messages as in any E-mail or *short messaging services (SMS)* [6]. The TTS system would automate E-Mail reading thus enabling the user to listen to his mails. Most Email's do not extensively use all the vocabulary in English and hence the design of the TTS system is limited to a few optimum words.

2. Voicemail

Voicemail is a computer-based system that allows users and subscribes to exchange personal voice messages. Voicemail is a conversational interaction between a human and a machine with no feedback from the machine. These systems are typically widget by computers and can be communicate via telephone networks. Voicemail systems can record and store voice messages digitally while the user is away or simply unavailable and can be reviewed when the user returns. Voicemail messages are typically short; convey the reason for the call and a return telephone number. The message should contain the information about the requirement of the caller and the voicemail recipient. The voicemail system allows us to receive the message, listening to the message and manage voicemail either by phone or by computer. Both computer and phone can also manage it. When you listen to your message, which is stored in your computer, is the same when it was delivered to you.

3. Voicemail versus Answering Machine

Voicemail offers many advantages over answering machines in communications. Traditional answering machines are the system, which needed the user, must be in the same place for retrieving message. On the other hand, Voicemail is the system in which user can retrieve the message from anywhere. It can be retrieved by any phone, landline or cell. Answering machines have lack of security because one should have only to press button to receive the message. That means anyone can retrieve your personal message. However, in case of the voicemail system, one should have to enter the code and that code is personal. The person can only retrieve the message if they enter the code. It provides the security to your personal information that sometimes contain in your messages. Voicemail offers more option for managing the message by using only simple keys. The keys are relating to different functions for managing the messages. Example to store message, delete message, forwarding message etc. Therefore, the voicemail user can easily store the message, forwarding message using simple keypad entries. Voicemail also contains the information about the caller and the calling person for example, time of the call, number of the caller and ID of the caller. Not this all features come in the traditional answering machines.

4. Voicemail Controller System

Voicemail controller is a system that allows the user to send messages, review messages, save messages, and delete messages. Normally the starting state is named as main. From main, the user can select any option according to their needs. The options are to save messages, read messages, forward messages, delete messages etc. Every option is related to any key from 1 to 9. The user is free to choose any option by just pressing a key relating to that function.
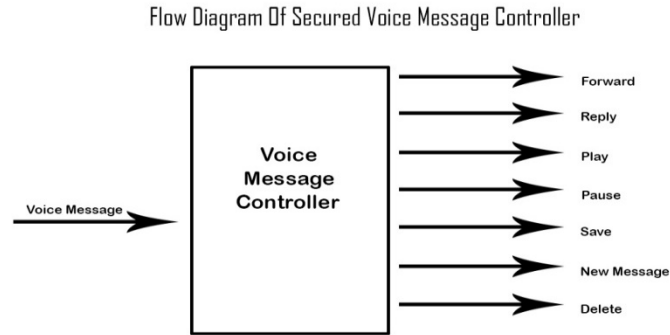
Flow Diagram Of Secured Voice Message Controller

Fig.1 Flow diagram hierarchy of Voice Message Controller for Secured Communication

The Figure No. 1 shows the flow diagram of voicemail controller system. It shows that the main is the central and initial point of the voicemail system. From that initial point the user can choose any option from the above which they want to use.

5. VHDL

VHDL is an industry standard language, which is widely used for designing hardware systems. VHDL is abbreviation of VHSIC Hardware Description Language. The acronym VHSIC refers to the Very High Speed Integrated Circuit Programs. VHDL emerged out of the United State Government's (VHSIC) Very High Speed Integrated Circuits Program (Amy Poh Ai Ling et al.2011). Hardware description language overcomes some of the limitations of algorithmic languages, where the referencing time is not required [Zhang et al.2012]. A VHDL model is basically a text based description of the system. The different model can be created with same system at different level of abstraction. The model with particular level of abstraction represents the detailed information related with it but leaves all information that is not necessary. VHDL is use for the purpose of buildings precise model of complex digital system.

6. Finite State Machines

Finite State Machine is the basic component in the designing of the hardware. Finite State Machine theory deals with the transition and behaviour between input and output states for sequential circuits, which can be apply to any specific object. The specific object can be cite as a device that stores the status of something at a given time and can operate on input to change the status and/or cause an action or output to take place for any given change [Amr T. Abdel-Hamid et al, 2004]. For example, a computer is a state machine, with each instruction acting as input, causing the state transition from present state to a new state. The FSM model has been widely applied to fields such as electrical engineering, computer science, etc. FPGA appeared in the 1980's. FSM are also called as finite state automata or simply automata. A sequential system is also known as finite state machines. A generic approach allows any sequential systems to be designed. Generally, sequential systems consist of three parts. Registers represent the states of the system. Both next state logic and output logic are entirely combinational logic.
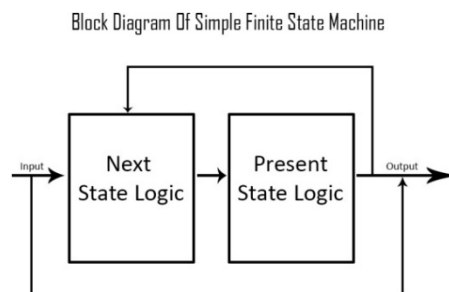
Block Diagram Of Simple Finite State Machine

Fig.2 Simple Finite State Machine

A simple block diagram for a state machine is shown in Figure No.2, which contains a Present State Logic section, Next State logic section and an Output Logic section. Present state logic section provides all the information about its past which helps to determine its current state and next state. The basic function of this is to assign the next state to the present state at the active clock edge [Lee,D et al. 1994]. The present state is stored in a binary value in state register. Next state logic section computes the function to establish the next state of the system using FSM's inputs and present state. This section is implementing with sequential VHDL code with a process. Output Logic Section is used to generate the output of the system and this is implementing with concurrent VHDL code with conditional assignment statements.

7. Xilinx 14.2 Tools used

Xilinx 14.2 is a software tool produced by Xilinx. Its main purpose of existence for synthesis and analysis of HDL design. It enable the developers to synthesize their designs performing timing analysis examine RTL diagrams simulate a design's reaction to different stimuli and configure the target device with the programmer. This edition is fully support the low cost Spartan family of FPGA and family of CPLDs. Xilinx is basically used for enter a design through schematic capture, perform circuit simulation, assign pin locations, implement the design, generate FPGA configuration data.

8. Implementation Results of Secured Voice Message Controller System

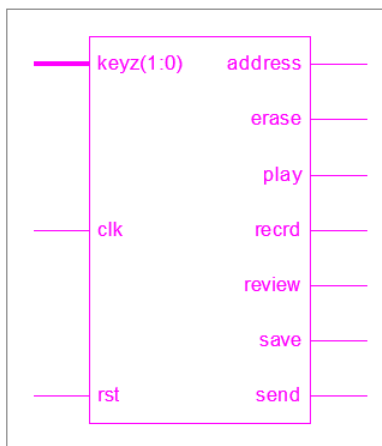This section of paper includes the resultant diagrams of the implementation of our project.

Fig.3. Technological Schematic of Voice Message Controller System for Secured Communication

This is the summary of the results in which every status and step of the project is given below in the figures. It also adds the description of the each diagram, which is the result of the implementation. Every figure tells about the different results while implementing prototype. By testing the prototype before final implementing on FPGA Development Board, time and money can be save. It also reduces the wastage of the components. It also increases the productivity. It reduces the cost of the project by reducing damage of the hardware components. Therefore, it is very necessary to testing prototype before final implementation with all hardware components. The figure no. 4 shows that the technology schematic of optical shaft encoder. It shows the input and output used for Voice message system. It is the schematic view of the project.
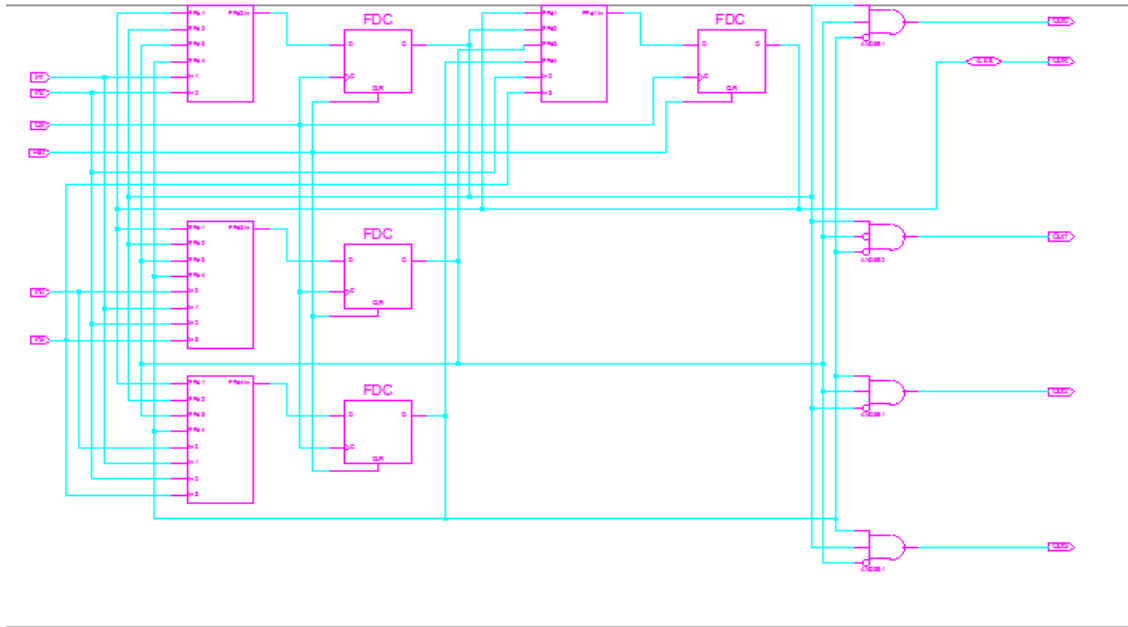
Fig-4. RTL Floor planning of Voice Message Controller for Secured Communication

Figure No.4 shows the floor planning of the Voicemail system. It shows how register transistor logic is shown in the Xilinx, which is very helpful for planning the input and output.
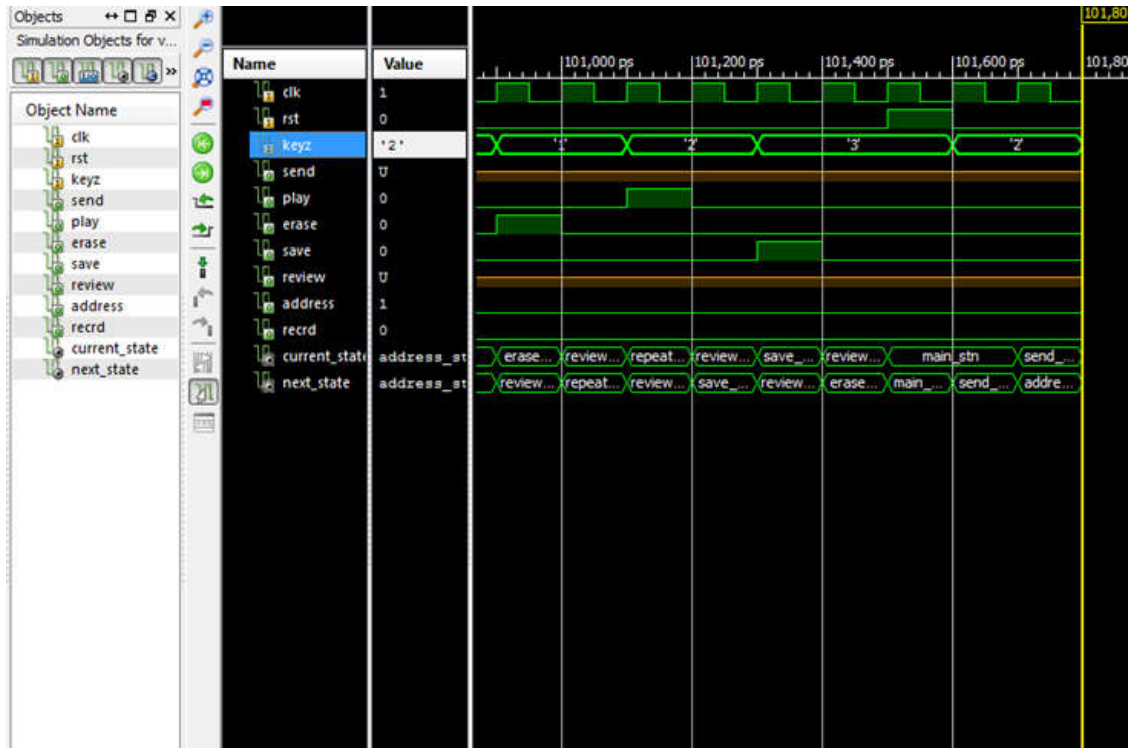
9. Simulation Results

Fig.5. Simulation Result of Voice Message Controller for Secured Communication

Figure No.5 shows that the waveform of Voicemail system. It shows how output is change in accordance with the input.

10. Conclusions and Future Scope

This paper presents implementation can be done on FPGA. In this project, implementation of voicemail controller system for secured communication is done successfully on using Xilinx software. Now days, Security is very important and it is an art of restricting admittance to certain entries. So in this work we are reduces the security issues of the rucks (people) by implementing a high security password for voicemail system. In future, voicemail one day read a caller's emotions. Voice mail frameworks as of now are getting included in politics, giving individuals the alternative of setting a crusade commercial on their voice mail welcoming so at whatever point guests go to voice mail they're requested to vote in favor of a hopeful. The welcome could be set to play for select companions or anybody from the collector's location book who calls. Numerous voice messages administration suppliers are focused on binding together the different electronic correspondences frameworks into coordinated frameworks. Voice mail - office voice mail, mobile phone voice mail and private voice mail will assume an enormous part in that future without a doubt.

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