DESIGN AND DEVELOPMENT OF AN INTEGRATED PLATFORM FOR GSM, WEB AND IVR BASED DEVICE CONTROLLING SYSTEM WITH REFERENCE TO IOT

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FUTURE SCOPE AND CONCLUSION

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CHAPTER 6

FUTURE SCOPE AND CONCLUSION

Along with the present features that are be implemented in this work in future, further enhancement can be made to the work so that the whole system will become an ideal one in an easy and efficient manner in the field of home automation. Artificial intelligence is one of the most recent and emerging opportunity that can be implemented in the present system. Using the application of Artificial Intelligence with this system can adopt the behaviour of the home appliances controlled by the user and able to acquire some knowledge regarding the performance of the entire system about their operation. As a result, from that knowledge which is achieved from the previous operations occurred in the present system so that the system can be controlled itself.

The present System describes the design, development and the implementation of an effective home automation system with the GSM, the Internet accessibility. The Internet provides access the full features of the system through an interactive Web interface. As the mobility in the world increases, the need to control home from remote locations also increases. The GSM is an excellent choice for this due to its extensive coverage. Since SMS is a text based protocol, even the most basic GSM systems can have an access to the status of the devices or make changes on these states. The whole system is secured through a login password based authentication. The design is completely wireless and integrated with the software to form a low-cost, robust and easily operable system.

In this work we design and develop a spoken dialog system for controlling household electrical devices from a remote place. The integration of Asterisk server, HTK module using with Bluetooth communication is also described. Finally we evaluate the performance of the system in terms of WER [54]. The development of a speaker independent spoken query system for accessing the household electronic devices is described in detail in this work. In this system, we use speech as the main communicating media between the machine and the human beings. It has been discovered that there are many people who have a computer phobia. The reasons why many people fear to use speech recognition tools have been due to the inadequate user interfaces. The HTK was used for the implementation of the

recognizer. HTKwas used because it is open source, more accruable and has been used by many researchers all over the world. A limited grammar and dictionary were constructed to be used by the recognizer. The Speech data was recorded and labeled from 200 different speakers making the training and the testing corpus. We have also explored a set of data to make the system more speaker independent with a gradual improvement of accuracy from more than 50% of present time.

This IoT based system is very useful in automation as it provides the option of introducing different sensors based on the requirements of the user and automating the control of power supply of the load accordingly with respect to the sensory data. This system also provides some facilities as follows

- Remotely control the power supply of the load.
- Introduce automation on the basis of the parameters that are sensed by the sensor.
- Introduce other sensors in the system which automates the control of the power supply of the load depending upon the value of the sensory data, thereby making the device support modularity and generality.

It also leaves the control to override the flow of automation to the user and remotely control the device according to his or her will. Moving forward, when study is focused on improving the different aspects of the system, it has come to know that the device can be connected to the internet in the following four ways like on the home / business network, connects to a local / remote server, Internet using a Static Public IP Address, Internet using a Dynamic Public IP Address. As of now, this device is used only on the home / business network but it can be also tried to connect the device to the internet by using the rest of the three ways by making uses of Static Public IP Addresses and Dynamic DNS Services [57]. The way for integrating database is more efficient so as to facilitate storing of the value of the parameters and analysis of it. With this implementation finished, there is much to reflect on, in terms of what the hardware was able to achieve, areas that could be improved upon, highlighting the strengths and weaknesses of the presented solution and limitations surrounding the device. One of the first realizations was an appreciation for how much work goes into doing a real, live project in the field. Furthermore, programming embedded microcontrollers in C is an involved task. This project leave with a deeper appreciation for what teams of dozens of computer scientists and hardware and software engineers do when

they work on a single project to bring a product to market, and despite the developments in recent years that make engaging in programming and manufacturing IoT devices/dabbling in the space much easier, why that kind of manpower is required. The key point regarding the entire present work is concluded as follows -

a) An Integrated Platform is designed for the four different types of communication mechanism based device controlling system through a database.
b) The general SMS service through GSM network is used for the communication between the users and the Household appliances. Also used the web services.
c) A Speaker Independent speech recognition system is designed to recognize the voice commands spoken by the users. The main work is to develop interface using relevant speech technologies so that the most noise of users is able to get the relevant information with minimum human intervention.
d) An Interactive Voice Response system is generated for communicating with the server where the devices are connected through a Telephony data acquisition setup.
e) An ASR engines is designed which is a Sub-word Hidden Markov Model (HMM) based ASR engines for recognition of device names, responses(yes/no) and the action command(on/off)
f) The main tasks regarding the speech communication are Integration of speech interface, ASR engine and computer telephony interface: Integration of speech interface, ASR engine, computer telephony interface
g) An IoT based interface is designed in terms of a web page through the IP address of a Wi-Fi module to control the appliances from the range of Wi-Fi locally.
h) This IoT based communication technique is most efficient with respect to time and when the users are locally present, it is very easy to use rather than go through the other communication mechanisms.
i) The performance and efficiency of the integrated system is a task to be measured at execution time as no parameter is used to measure it except the speech communication technique.