Conversion of Speech to Text for Hearing Impaired People

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***Abstract:* ----** Speech to text conversion is a useful tool for integrating people with hearing Impairments in oral communication settings, e.g. counselling interviews or conferences. However, the transfer of speech into written language requires special techniques as it must be very fast and almost 100% correct to be understandable. The main objective of our project is to design a conversion of speech to text for hearing impaired people. The entire system is controlled by the 8 Bit microcontroller and the speech recognition IC (HM2007) which is capable of storing speech signals, and generating good recognition performance on highly disordered speech. The speech IC consists of non-volatile memory back-up with 3V battery onboard, which will store the speech recognition data in RAM after the power off condition. Whenever a speech is given as input to the Microphone the received speech is compared against the stored data. The keypad and digital display are used to communicate and program the HM2007 chip. The keypad is made up of 12 normally open momentary contact switches. On successful matching of the speech the HM2007 IC will send the corresponding codes to the controller. From the microcontroller the data will be sent to LCD display and to the mobile through the GSM.

***Index Terms*:** Speaker recognition IC, 8-bit microcontroller, LCD display

I. INTRODUCTION

Speech is the first important primary need, and the most convenient means of communication between people. This project gives an overview of major technological perspective and appreciation of the fundamental progress of speech to text conversion. Different ideas formed in the mind of the speaker are communicated by speech in the form of words, phrases, and sentences by applying some proper grammatical rules.

This project gives an overview of major technological perspective and appreciation of the fundamental progress of speech to text conversion. The entire system is controlled by the speech recognition IC (HM 2007) is used, which is capable of storing speech signals, and generating good recognition performance on highly disordered speech. HM2007 is to convert the acoustic signal obtained from a microphone to generate a set of words. The process of speech recognition in HM2007 begins with a speaker creating an utterance which consists of the sound waves. These sound waves are then captured by a microphone and converted into electrical signals. These electrical signals are then converted into digital form to make them understandable by the speech-system. Speech signal is then converted into discrete sequence of feature vectors, which is assumed to contain only the relevant information about given utterance that is important for its correct recognition. Finally recognition component finds the best match in the knowledge base, for the incoming feature vectors. On successful matching of the speech, the HM2007 IC will send the corresponding codes to the controller. From the microcontroller the data will be send to LCD display and to the mobile through the GSM.

The accuracy of the output is depends on proper and good pronunciation of speaker. Speech-to-text-conversion is a useful tool for integrating people with hearing impairments in oral communication settings. Speech to text translation (audiovisual translation) of spoken language into written text is an upcoming field since movies on DVDs are usually sold with subtitle in various languages. While the original language is given auditory, subtitle provide a translated version in another language at the same time visually. The speech to text conversion applications are security device, household appliances, cellular phones ATM machines and computers.

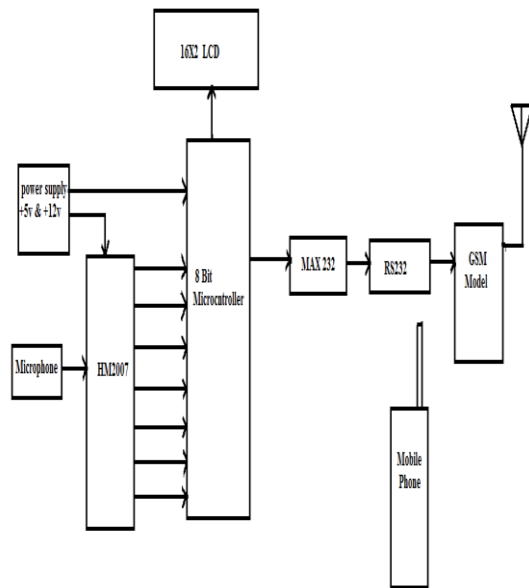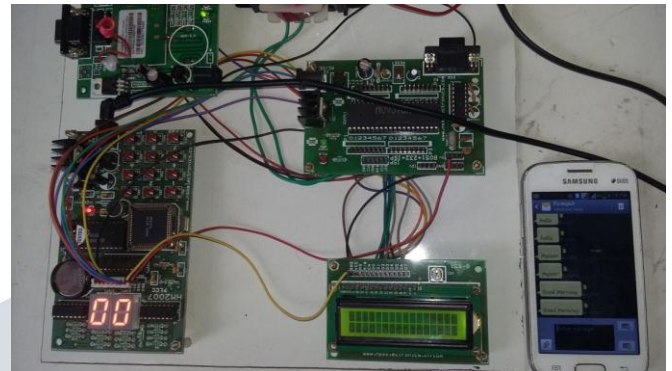## II. PROPOSED WORK

2.1: Block diagram

Fig : 2.1 Block diagram of speech to text conversion

The above Fig 2.1 shows the block diagram of speech to text conversion. Here, the input is given by using the microphone. A Microphone acts as acoustic-electric transducer or sensor that converts sound information exists as pattern of air pressure to a pattern of electrical signal.

The entire system is controlled by the speech recognition IC (HM 2007). The IC can recognize 20 words, each word a length of 1.92 seconds. . HM2007 is to convert the acoustic signal obtained from a microphone to generate a set of words. The speech IC consists of non-volatile memory back-up with 3V battery on board, which will store the speech recognition data in RAM after the power off condition. Whenever a speech is given as input in the microphone, the received speech is compared against the stored speech. On successful matching of the speech the HM2007 IC will send the corresponding codes to the controller. A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals. 8-bit microcontrollers are designed for embedded applications. From the microcontroller the data will be sent to LCD display and to the mobile through the GSM. Microcontroller sends AT commands to the GSM modem, which is then activated to perform the required operation of the GSM.

GSM modem is used to display the data stored in the internal memory of the microcontroller to the cell phone whose number is programmed into the memory of the microcontroller by the programmer.

III. RESULT

IV. DISCUSSIONS & CONCLUSION

The speech to text conversion may seem effective and efficient to its users if it produces natural speech and by making several modifications to it. This project is useful for deaf and dumb people to interact with the other people in the society. A database has been created from the various domain words. This project made a clear and simple overview of working of speech to text conversion in step by step process. The system gives the input data from microphone in the form of voice, then Pre-processed that data & converted into text format and displayed on LCD as well as in the mobile. The accuracy of the result increases with the increase in training data. In training phase, the words are spoken clearly so that it avoids general variations and confusions. This enables the recognizer to discriminate the words effectively. Further work is planned to implement the model of speech recognition for different language.

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