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Automatic Speech-Speech Translation System from English to Tamil Language

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ABSTRACT: Nowadays in most of the places people face problems while speaking with other people, who does not know their languages or other languages, in existing system and technique they record the interaction and translate into another language using manual transaction, in order to avoid the difficulties, In this paper we are going to automatically recognize the speech in the form of English language and translate into Tamil language. In this device it consists of three parts namely speech recognition device, English to Tamil machine translation and Tamil speech generation, it first recognize the speech (in English) using speech reorganization device and it displayed it on the screen in English (text) then translate into Tamil language (text) and displayed it, after that it convert into Tamil speech and it should be heard at the other end of the device.

KEYWORDS: Speech Recognition, Manual Translation, Machine Translation, Speech Generation, Interaction.

I. INTRODUCTION

Speech-to-speech translation technology represents a technology which automatically translates one language to another language in order to enable communication between two parties with different native tongues. To translate a voice in one language to another voice in a different language, speech-to-speech translation technology is comprised of three core technologies that had been previously mentioned: speech recognition technology, which recognizes the utterance of a human and converts it into a text; machine translation technology, which translates the text in a certain language into a text in another language; and speech synthesis technology, which converts the translated text into a speech. Additionally, the technology to understand the natural language and the user interface-related technology integrated with the UI also play an important role in this speech-to-speech translation system.

Research on speech translation has shown that it is possible to build systems that translate spontaneously spoken utterances from one language to another. To handle the challenge of ambiguity introduced by spontaneous speech, most systems introduce semantic constraints by limiting the domain of discourse, thereby reducing the number of suitable interpretations. For many applications, constraining the domain (hotel reservation, scheduling, travel planning, etc.) is quite acceptable and can provide practical translation devices. Over the years, we have developed a large number of such systems for many languages, domains, and platforms. These efforts have shown that acceptable performance can be obtained for spontaneous speech input, but also that practical concerns such as portability and reconfigurability become increasingly important. The two main challenges are in maintaining the existing system and obtaining enough data for each new language and domain.

II. RELATED WORK

Seung Yun et al [1] established a massive language and speech database closest to the environment where speech-to-speech translation device actually is being used after mobilizing plenty of people based on the survey on users' demands. Through this study, it was made possible to secure excellent basic performance under the environment

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similar to speech-to-speech translation environment, rather than just under the experimental environment. Moreover, with the speech-to-speech translation UI, a user-friendly UI has been designed; and at the same time, errors were reduced during the process of translation as many measures to enhance user satisfaction were employed. After implementing the actual services, the massive database collected through the service was additionally applied to the system following a filtering process in order to procure the best-possible robustness toward both the details and the environment of the users' utterances. By applying these measures, this study is to unveil the procedures where multi-language speech-to-speech translation system has been successfully developed for mobile devices.

Thomas Meyer et al[2] shows that the automatic labeling of discourse connectives with the relations they signal, prior to machine translation (MT), can be used by phrase-based statistical MT systems to improve their translations. This improvement is demonstrated here when translating from English to four target languages—French, German, Italian and Arabic—using several test sets from recent MT evaluation campaigns. Using automatically labeled data for training, tuning and testing MT systems is beneficial on condition that labels are sufficiently accurate, typically above 70%. To reach such an accuracy, a large array of features for discourse connective labeling (morpho-syntactic, semantic and discursive) are extracted using state-of-the-art tools and exploited in factored MT models.

Sangmi Shin et al [3] proposed system is a one-way translation that is designed to help English speaking patients describe their symptoms to Korean doctors or nurses. A humanoid robot is useful because it can be extended to reach out to people in need first and may substitute the role of human workers, unlike laptops or tablets. The system consists of three main parts - speech recognition, English-Korean translation, and Korean speech generation.

M.D. Faizullah Ansari et al [4] proposed Voice Translator is speech to speech translation application for android mobile phone, which translates English speech to Hindi speech and vice versa. Voice Translator includes three modules, Voice Recognition, Machine Translation and Speech Synthesis. Voice Recognition module captures the voice or speech from the mobile user through speaker, identifies then converts the speech into text and then the text send to Machine Translation for further process. Machine Translation module does the process of translation i.e. this module consists of library for both language and when text is received by this module, it converts the text of one language to another as per user choice and thus it sends the translated text to last module. Speech Synthesis module acts as the text to speech translator i.e. when it gets the translated text. This module processes on translated text which converts it into speech and then makes it as user output.

Shigeki Matsuda et al [5] proposed an overview of VoiceTra, which was developed by NICT and released as the world's first network-based multilingual speech-to-speech translation system for smart phones, and describes in detail its multilingual speech recognition, its multilingual translation, and its multilingual speech synthesis in regards to field experiments. We show the effects of system updates using the data collected from field experiments to improve our acoustic and language models.

III. SYSTEM ARCHITECTURE

Mobile operating system commonly known as Android operating system based on Linux kernel. Speech recognition is used to discover words in translation language.

Voice recognition is biometric tools used to classify a exacting individual's accent. It is the method by which computer software is use to decode a text on or after one normal language to another. Speech synthesis is a procedure of generate verbal language by device on the source of printed input.

Bluetooth is a proprietary open wireless tools ordinary for exchanging records more than diminutive distances (using short-wavelength data lines transmissions in the ISM band from 2400–2480 MHz) starting fixed and portable devices, create personal area networks (PANs) with elevated level of defense. Straight by telecoms dealer Ericsson in 1994, it was first conceive as a wireless option to RS-232 data cables. It can bond several plans, overcome troubles of organization.

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Bluetooth is managing via the Bluetooth Special Interest Group, which has additional 16,000 member companies within the areas of telecommunication, compute, network, and user electronics.

The SIG oversee the advance of the arrangement, manages the condition agenda, and protects the trademarks. To be marketed as a Bluetooth gadget, it has to be qualified to values distinct by the SIG.

System of patents is necessary to realize the knowledge and are licensed only for those qualify devices thus the set of rules, even as open, may be regard as proprietary.

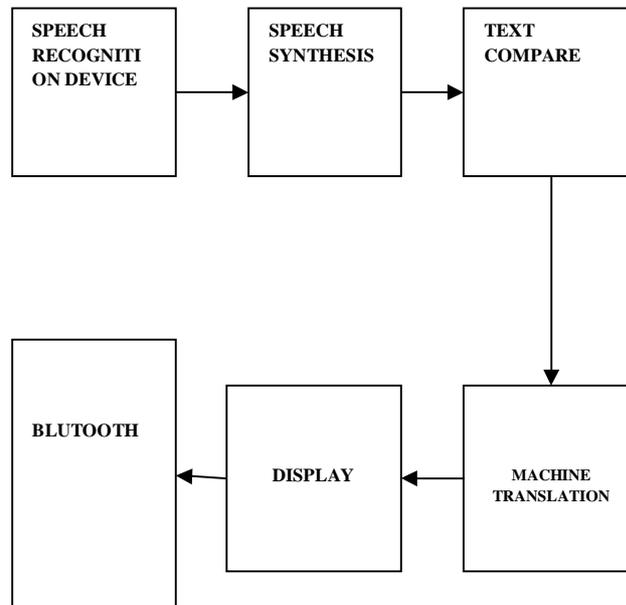


Fig: System architecture for android

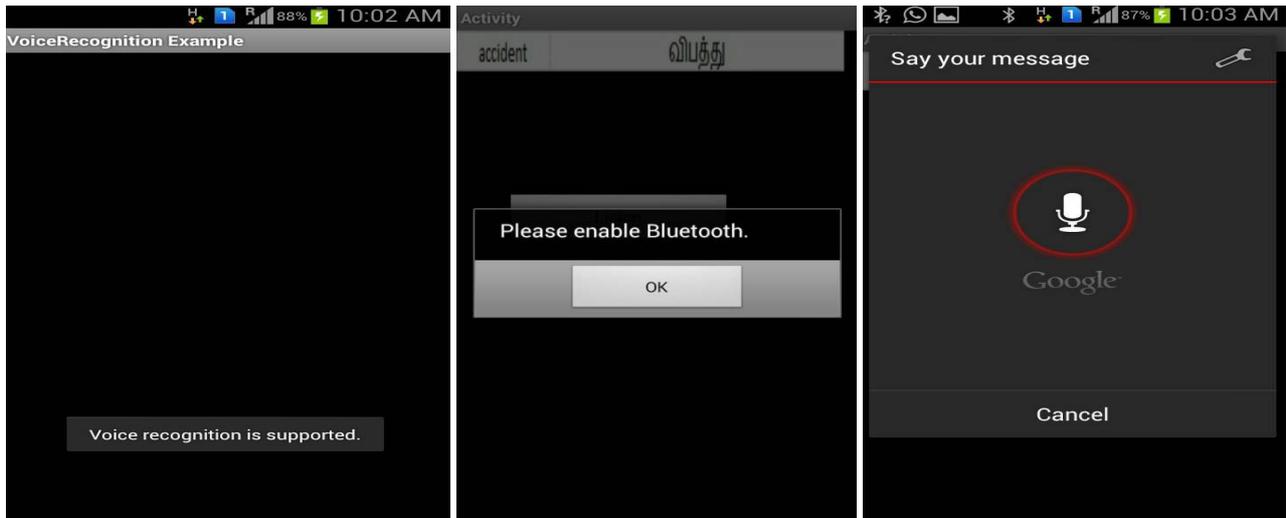
IV. EXPERIMENTAL RESULTS

Figures shows the result of speech translation using HMM algorithm (a) Android App for voice recognition supported. (b) Enable Bluetooth pop up window. (c) Google voice recognition. (d) Processing of voice. (e) Not match found speak again. (f) Displayed English recognized voice.

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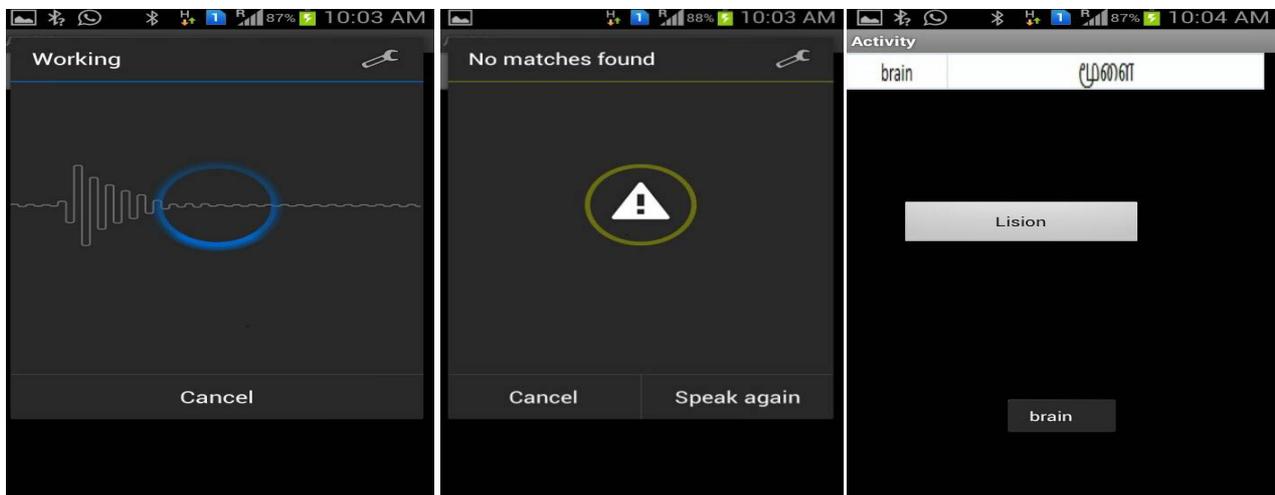
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(a)

(b)

(c)



(d)

(e)

(f)

V. CONCLUSION

Speech recognition system that recognize the English speech via speech recognition device .English speech is then translate into English text using speech synthesis, after converting into text format it compare with the words stored in the database if it match with the Tamil text stored in the database. English text is converted into Tamil text is done by the machine translation system and then the text will be displayed on the screen. Now it is designed to translate up to 60 words in android application.

As future enhancement converteds text is send via Bluetooth to Arduino board using Uart, which collects the data in a serial form by calling certain pin in the Arduino that voice is generated by voice board and it is played using speaker.

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Voice board is used for play output voice. It is designed to translate up to 60 words in android application and voice play up to 20 words using embedded system.

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