**SPEECH RECOGNITION in Customer Support**

Machines, that mimics human behavior, particularly the capability of speaking naturally and responding to spoken language has been a great challenge in the field of today's Artificial Intelligence world. This is what we call as Speech Recognition. Machines understanding human and responding according to that takes a lot to process. Although there are different applications in this field that were started from the very beginning of 2000's, this has not developed fully to it's potential. There's still a lot to do. There has been lot of development of Speech recognition in English language. They are more or less accurate.

Being a Nepali citizen with computer science major, I am intrigued about this technology and how we can use this technology in our country to help people make their life easier in our country. Natural Language Understanding and Natural Language Processing is still a challenge in case of our language. We are much backwards in this field compared to other countries due to which there has not been much development in our language. If we could be able to solve this issue, it could help us in a lot of ways.

The one intelligent system that I am going to talk about is based on Speech Recognition.

**Problem**

If we talk about our country's business and it's customer support, it is very poor. Nepal's business lacks customer support and assistance. If I have some problem with something, there's no way I can be able to fix that in time. Let me give you an example, I have a problem with my Internet, I try to call my ISP regarding the problem. But those who pick up the phone cannot help me to solve this. They only know about restarting the system(router) if any type of problem occurs. There is no any availability of technical people when I want one. Such problem occurs to different people in different areas. If the business could be able to solve such problems, the business will grow rapidly. Everyone can deliver the product but what people really wants is a good support after they get the product which we don't see in our country. They don't care once they deal with the customers.

**Solution**

What if the business uses intelligent system to resolve this issue. What if they can provide good customer support to the people using intelligent systems? This can be possible with not much of a problem. Why are apple products considered best among all other devices? Apart from having good products, they have good customer support. They do not leave any customers behind without solving their problem if they have one. People love this about apple.

There are many people in the customer support. Using the system that can listen the problem of the customer, understands the problem and generates some solution based on that problem, business can have a great profit with less expenses than before. Highly trained system can help to address the problem. I don't think this type of system in common till date, but it will be in the near future.

The system doesn't have to understand every details. We know, company deals in certain domain. In the same way we can train the system only in that domain. Lets again take an example of ISP. If we are to build such system for ISP, we can only focus on the part of Internet. We can feed details about the Internet to the system, most of the problem that occurs and the ways to solve them. If we are able to do such we don't need many people as an employee in a customer support. Few of them will do. We can implement such systems in many places. Lets talk about an institution. If someone wants to know about the institution, the system will be able to provide basic informations about the system. There is no need to some person answering the phone, we can make system do that.

**Algorithm**

To address this problem, various types of computer algorithms is required. In this paper, I am not going to provide details of the algorithms used, but only the high level view of the algorithms required to resolve this issue.

There's two parts in Natural Language Processing, 1) Natural Language Understanding 2) Natural Language Generation. Language Understanding deals with the part in which computer converts the spoken language into its machine form accurately. According to its understanding it applies other algorithms to generate the output based on input which is Natural Language Generation.

The process required is given below:

**Acoustic Modeling – Feature Selection**

Short-time spectral analysis

Scale Selection

(Cepstral smoothing)

Refinements

Non-fourier analysis

Vector quantization

**Training**

Classification is needed to be done after system understand the language. There are various classification algorithms based on which system will provide the solution to the customer. The system can use **Decision Trees** to classify.

**Conclusion**

High level view of the example of how AI can help people solve the problem of people is presented in this paper.