**Intelligent Telecommunication**

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**ABSTRACT**

In today’s technology, the current telephony system provides a feature of recording a voice call, but it has no processing capability to analyze a phone phone-call. In our project, we introduce an **intelligent agent into telephone system**. An unattended phone call is recorded and a recognizer converts the analog signal into digital signal for speech processing. The analyzer consists of a database which hold some important pre-processed keywords and the intelligent agent can formulate the state of situation. In the case of urgency, the message is examined by the parser to identifier the time of the incident and the sentiment analyzer has been used to avoid **prank calls**. Thus, an epistle would be sent to the user in case of exigency or the voice message is stored by default method.

**INTRODUCTION**

Artificial Intelligence ability is to interact with real world to perceive, understand and act. Its important application is speech recognition, understanding and synthesis, image understanding, ability to take actions and have an effect. Reasoning and Planning is for studying about the external world, solving problems based on the given input, ability to deal with unexpected problems and uncertainties, planning and making decisions. The internal models are always being “updated”. Artificial Intelligence involves the study of

* Automatic recognition and understanding of signals
* Reasoning, planning and decision making
* Learning and adaptation

In current telephony system, if a user does not attends a phone call, it may be left unattended or voice recorder may record the call may become un-noticed during the right time. This may become obsolete in case of emergency messages that must be delivered during the certain period.

**SERVICES USED IN IBM BLUEMIX**

In this project, there are two services of IBM Bluemix used, they are:

* MYSQL database
* Speech to text converter

**SOLUTION**

**PROPOSED WORK**

The newly proposed system of intelligent telecommunication is to provide an intelligent path to get the acknowledgement of **un-attended calls** through an Intelligent Agent. This agent takes the input from voice calls through **Semantic Analyzer, Parser and Sentiment Analyzer** and processes it through **knowledge base**. The knowledge base of the agent is fed with keywords and scenarios which denotes the state of emergency, thus getting aware of the state of situation. In case of emergency, a pulse is sent to user’s personal communicator, but stores the voice note by default.

***WORKING:***

Consider a Telecommunication network in which {A} and {B} are the two people trying to interact with each other. {A} is the person who calls {B}, and {B} is unavailable to attend the call at the moment. Thus an instance is created and the call is directed to automate voice mail box and the call is recorder **NLP- based approaches** are domain independent but use **parse trees of sentences, pos taggers, chunk parsing, anaphora resolution,** etc. in order to extract information. The term **Natural Language Interfaces (NLI)** is used when a system can be accessed using (written) natural language. Such a system mostly operates on structured information and it tries to find the correct answer. An Intelligent agent is activated and it subjects the voice clip through a series of recognition tests. These tests are as follows, first the voice clip is analyzed by the semantic analyzer. The semantic analyzer consists of a knowledge-base which is loaded with words which symbolizes emergency in any form.

  
**Fig: Voice-To-Text conversion using Natural Language Processing**

A **Natural Language Interfaces to Databases (NLIDB)** system holds information on a relational database. The principles of NLDIB have been adapted to the Semantic Web resulting into the **Natural Language Interfaces to Knowledge Bases (NLIKB)**. It is self-leaning and gets updated on each process. **Relational database** is queried such that the inferences about the objects stored in the database are performed. To check the consistencies, the results are sent to KBMS to perform deductions. These deductions cannot be computed by DBMS. Thus database objects are given as input into the reasoned in KBMS. If the voice note is found to have such word, then it is sent to next level of analysis or the process is stopped and the voice is saved to the storage. After passing the semantic analysis the voice note is sent into the Parser analyzer. The Parser checks the **grammatical sense of the sentence** and it consists of a unique knowledge-base to identify the past, present and future tense of the voice message which is recorded. Thus enabling the Agent to estimate the approximate time (tense) of the message.

  
**Fig: Parsing Methodology to read and Parse the data characters**

Finally, it is run through the **Sentiment analyzer**, thus finding the mood of the caller. This analysis is done to avoid disturbing the privacy of the user due to any **prank or hoax calls**. If all of these checks are passed by the voice note, the agent sends the voice note to the user’s personal number. But in case of cellular phones, the override of the phone’s silent mode takes place, thus ensuring the deliverance of the message.

**ROLE OF AGENTS:**

Agents included in the system dynamically works on the message provided. An agent acts upon the message, to pass it down to the various analyzers. The agent ALPHA, resides in the Natural Language Processor so as to study the user’s choice of words and meanings. The agent BETA, implemented at the parser and the semantic analyzer works on the study of the words stored and the meanings specified in the database and relates it to the voice message. This agent works with the Ontology tree of the words retrieved from the text data.

The agent COBRA, works with the Sentiment analyzing of the voice data thus studying the mood of the caller. It can predict the caller’s psychological mind set by studying the pitch and the surrounding noise of the caller.

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**Fig: Architecture Diagram for Semantic based Information Retrieval through Intelligent agents**

**CONCLUSION**

Artificial intelligence is a combination of both **analytical and logical intelligence** at the reductive embodying levels of neural cognitive, functional and logical from the bottom up. One of the main benefits of speech recognition system is that it lets user do other works simultaneously. Speaker identity correlates with the physiological and behavioral characteristics of the speaker.

Current telephony system has **no process so as to analyze a phone-call**. In our project, we introduced an intelligent agent into the telephone system. An un-attended phone call is recorded and converted into digital signal for the speech processing. Thus the voice message was analyzed by **Semantic analyzer, Parser and Sentiment analyzer** to formulate the importance and condition of speaker’s situation. Thus sending an epistle to the user in case of exigency or the voice message is stored by default method.