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Interactive Interview Chatbot

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Abstract – Interview process is generally associated with screening candidate suitable for available post. This process varies from company to company. However in general there two major methods remain same which are technical interview and human resource interview. Traditional process of interview is complicated and resource intensive. We can automate this process by replacing human interviewer with chatbot .Chatbot will ease the process to certain extent. Our idea is to provide an interactive chatbot which will conduct interview and generate report and base on this result candidate will be shortlisted. System is based on Natural Language Processing (NLP), Google- Text-to-speech.

Keywords—: Machine Learning (ML), Natural Language processing (NLP), Sentiment analysis, Google-text-to-speech (gtts)

1. INTRODUCTION

Most of the companies rely on their employee for communication part but this may result into reduced output of company. Human interviewer may be biased or tired of interview process so it will affect the entire selection process. Using chatbot we can overcome these problems.

Chatbots are being introduced to ease the difficulties that the industries are facing today. The purpose of chatbots is to support and scale business teams in their relations with customers. It could live in any major chat applications like Facebook Messenger, Slack, Telegram, Text Messages, etc.

A chatbot also referred to as talkbot, is a computer program which carries out human like conversations with users via text or audio formats. It understands what the user is trying to do and send appropriate responses which will help the user's needs. Scope of Chatbot can be limited to business function or it can be as generic as possible.

Natural language processing (NLP) is a branch of AI .It can be defined as the ability of a machine to analyze, understand, and generate human speech. The main purpose of NLP and for which it is high on demand is, it give your bot a personality, it bridges the gap between human communication and computer understanding. Its major objective is to let your chatbot understand conversation in a better way.

2. LITERATURE SURVEY

In recent days there have been a number of studies related to chatbot, NLP and sentiment analysis. Most of the papers are focusing on the improvement of customer feedback and business oriented chatbots. Many papers have enlightened the text classification based on naïve Bayes algorithm and phrase reinforcement learning. This paper work uses a simple approach of keyword extraction from answers using spacy framework.

Sentiment analysis is also used in our system. Sentiment analysis is one of the fastest growing research fields. Different frameworks are available to perform sentiment analysis. Process includes many phases, starting from part-of-speech tagging, sentiment orientation, and average sentiment analysis. Sentiment analysis can be done using Naïve Bayes. Natural Language Processing and text classification are performed in this process. The classifier assumes independence between each feature. In the chatbot the features are words which are considered independent from each other.

Fig. Key Attributes of a Chatbot

3. METHODOLOGY

In this proposed work we want to build a chatbot for conducting an interview which can overcome some of the problems in current system. Consider an organization wants to conduct an interview, and to do this they have to select an interview panel members, location of interview. During this process organizations spend lot of money. This problem can be solved by using chatbot.

First we will feed candidate's personal, academics details in database (knowledgebase). Then system will assign unique ID to each candidate. When candidate enters his unique ID, he will be authenticated and interview session will be started. Chatbot will begin interview by greeting candidate just like human interviewer. Now, based on the candidate's details bot will start asking questions. Questions can be multiple choice, finding output of given program, questions based on current technology etc. All responses will be checked and result will be stored in database. This will be performed for all candidates. On the basis of results and statistics classification of candidates will be done. In this way suitable candidate for particular post in IT company can be selected.

Fig. 1 Our Working Model

Agile development process can be used which is simple and flexible, allowing us to be creative in achieving your goals. In order to hit the ground running there are a few things we need to figure out scope and limitations of system. System will be implemented on local machine and it will be connected to centralized database.

1) Verification of the assigned candidateID

As the user begins the interview a photograph of the candidate is to taken and stored in the database. The next step involves the user giving the input i.e. the uniqueID provided to him which is different for each candidate. The ID is the verified with the back end database and the candidate is authenticated. The result of the authentication is sent back to the computer and the further process can be continued.

2) Interview Phase

This phase includes the actual interview process which is similar to the orthodox interview method. The only difference is that the interviewer will be an Artificial Intelligence powered Chatbot instead of a human. The answers provided by the user are stored and analyzed and finally the result is generated.

3) Assessment Phase

The answers given by the users are crossed checked with the datasets specially designed for each position. The chatbot is trained against the dataset and the keywords are matched. After the assessment, each candidate is given a score according to his or her performance.

4) *Session Termination*

After the results are calculated and the candidates are graded, the session needed to be ended. Message from the backend is received to terminate the session and the user is informed .Candidates can later be conveyed their success/failure through Email, after all the candidates are evaluated.

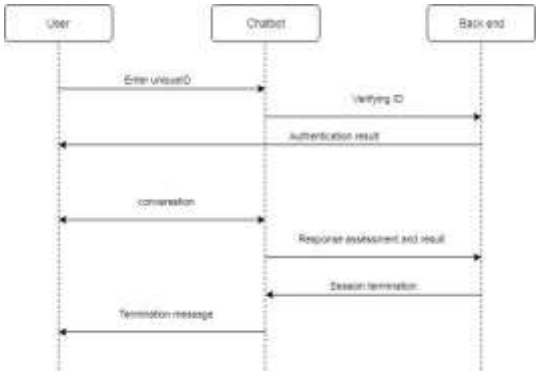
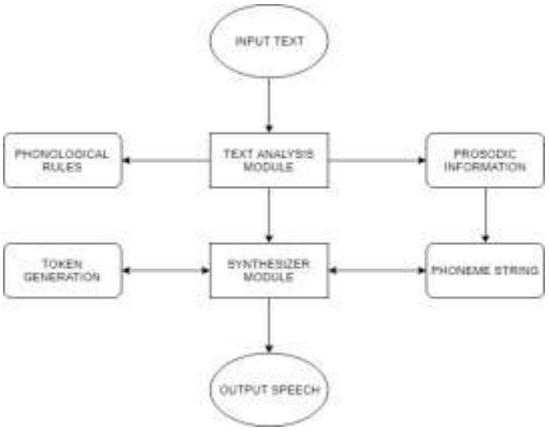


Fig. Sequence Diagram for the Chatbot

Natural Language Processing (NLP) is a process through which human speech can be understood as it is spoken by a computer program. Our main goal is tokenization. Tokens are usually individual words and tokenization is taken a text or set of texts and breaking it up into its individual words. The tokens created now are used as input for parsing.

The NLP framework spaCy is used which is very coded and documented. The two data structures in spaCy are the Doc and the Vocab. spaCy's tokenizer has to assume that there will be no multi-word tokens. In this way our expression is simplified and we deal with only a small chunk of data at a time.

Keyword Extraction is the process of choosing specifically declared words. This is used to match the answers with keywords and to calculate the accuracy of the candidate's answer.



Text to Speech module is used to convert the text inputs to speech which includes two main stages –

1. Text Analysis
2. Synthesizer Working

Phonological Rules and Exception words are the inputs alongside prosodic and intonation information into to G2P processor.

The synthesizer module receives the process input and generates tokens. Phoneme strings are generated with the help of prosodic data. Finally speech is generated which can be accessed through a hardware devices like speakers.

4. RESULT

Currently we are designing system for hiring candidate related to IT sector. We can broaden our horizon by making chatbot usable for conducting all kind of interview.

Chatbot will be deployed on local machine in order to keep the architecture of system simple .Here we are taking user's data manually before interview and giving candidate a unique ID. This process is time consuming. In future we can deploy it using web client services. Which will make it available 24*7.And candidates data will be taken by using html form and this data will be given to Chatbot knowledge base. This will improve assessment process as more relevant questions would be asked to candidate .In the future we can also develop a feature to detect the candidate's state of mind to see if he is nervous or not using webcam.

Chatbot will assess the candidate's resume, marksheets and other related documents using image processing. User interaction session then begins and the chatbot begins the interview. User's answers are matched with the keywords and final outcome of the selection process is calculated. If a candidate has a specialization in any field the system may ask questions based on those specific topics.

5. CONCLUSION

Although traditional human interviewing method is accepted worldwide, it can be replaced to some extent by using AI powered chatbot. System is developed to use in IT companies as of now. Companies would definitely select this system to overcome the drawbacks in existing systems and procedures. Furthermore system will bring transparency and in candidate selection process. Chatbot will generate results within minutes as compared to traditional method. As knowledge-base is connected to internet, it can be easily updated and changes would take place immediately.

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