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To Propose Automated Help Desk System

Samartha Agrawal[1], Sanket Shingate[2], Kaushik Yadav[3]

Student, Information Technology, Vidyalankar Institute of Technology, Mumbai, India[1,2,3]

Abstract: Working along with traditional help desk requires manpower. In traditional help desk, there is an interaction between two humans, one with the query and the other responsible for giving an appropriate response to the query. Traditional help desk is thoroughly dependent on human. Traditional system works in a structured predefined format which puts constraints on the user's activities. Our proposed system focuses on removing the structured middleware approach by introducing a fully automated help desk which would be responsible for the processing and answering of the user query in an appropriate manner; thus, making it a human-technology based interaction. Our proposed system allows user to interact with the database with the help of Natural Language Processing (NLP). User query is taken in its natural form and is converted into a SQL (Structured Query Language) query with the help of NLP, which is then executed in order to retrieve data from the database. Our system acts an interface between the database and the user; also, it is flexible in its working due to the use of NLP allowing users to interact with the database in their own way.

Keywords: Speech-to-text; Text-to-Speech; NLP (Natural Language Processing); Morphological Analysis; Lexical Analysis; Syntactic Analysis; Semantic Analysis.

I. INTRODUCTION

A help desk is a resource intended to provide the customer or end user with information and support. The purpose of a help desk is usually to solve queries or provide any sort of guidance. The help desks of today are usually handled by an employee of the organization. He or she must interact with database to help solve any user query.
The traditional help desks will make it mandatory for organizations to have one or more employees located behind the help desk to help customers.
The helpdesk can be modified per the industry need and features and be altered accordingly.

II. LITERARTURE SURVEY

A help desk is a resource intended to provide the customer or end user with information and support. The purpose of a help desk is usually to solve queries or provide any sort of guidance. The help desks of today are usually handled by an employee of the organization. He or she must interact with database to help solve any user query.
The traditional help desks will make it mandatory for organizations to have one or more employees located behind the help desk to help customers.

This becomes a cost for the organization in two ways:

1. Training the employees to solve any query. Employees must know about the entire working of the organization, which might become impractical sometimes.
2. Low productivity of employees.

Internet or more specifically, search engines automate the searching or querying process.

Search engines navigate the web through crawling. That means, they follow pages from one link to another. [1]
They sort the pages and its content (by indexing them) and keep track of it all in the index which requires lots of memory. As per Google's record, its over 10 million gigabytes!

Delivery of the search results is done by the programs and formulas written by search engines. Algorithms are used to get a clue and to get an understanding of what the user meant. Based on the values generated by the programs and algorithms, the relevant document is pulled from the index. Ranking of the pages are done considering 200 factors.
As efficient these search engines may be, they cannot be used to browse through database for any organization. There were quite many instances which led to this project. Firstly, we saw our receptionist ma'am overburdened with work and solving student queries at the same time. [4]
Secondly, when we recently visited a pharmaceutical market, we saw the use of software wherein the vendor had to click 4 to 5 times to find whether a medicine was present with them or not. [5]
Thirdly, when we went to a grocery shop owner, he was maintaining a diary in which he had kept the track of all the sold items. This made his transactions tough to manage. [6]
These issues ignited an idea in our mind- it was such a simple task of interacting with the database; why not use our natural language to formulate a SQL query for the same!

This will have the following benefits:

1. Ease of interacting with the database.
2. Reducing unnecessary cost in maintaining the software.
3. For small scale industries, moving away from the offline mode of file storage to online mode in a cost-efficient manner.

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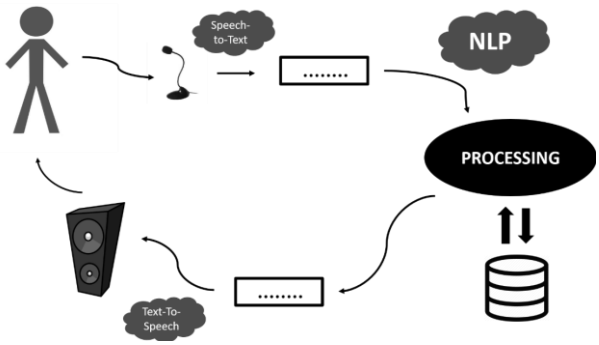
III. PROBLEM

The traditional methods employed by the organizations have the following limitations:

1. Database knowledge required to retrieve data from the database.
2. Manpower required which comes at an effective cost.
3. Can't be afforded by every shop owner and so the burden of managing records without database knowledge becomes an issue.
4. To setup the database querying software in a shop and maintaining it increases the overall cost, thus making it difficult for small scale industries to use the software product.

Response depends on human behaviour. Example, suppose the person sitting at the reception is not in a cheerful mood or busy talking on the phone, then the response time to user requests increase. [2]

IV. PROPOSED SYSTEM



1. The proposed system will accept input command in voice.
2. Any change in the database will not affect the user. It aims for seem-less database querying.
3. Natural Language is concept based which means it returns search hits on documents that are "about" the subject you're exploring, even if the words in the document don't match at all the words you enter the query which makes it better than keyword based searching.

V. ADVANTAGES AND DISADVANTAGES

A. ADVANTAGES:
1. To replace traditional manual Helpdesk with automated system.
2. To economize the Industries.
3. To reduce the Human-error in giving information.
4. To increase the efficiency of the work and make it available 24*7.
5. Make it affordable and efficient for all sectors and all size of industries.
6. Reduce unnecessary cost in maintaining the software database to interact with the database.

B. DISADVANTAGES:
1. More time for complex queries.
2. Efficiency decreases in noisy surroundings.
3. System cannot work without Internet service.

VI. NLP INSTANCES

A. MACHINE TRANSLATION [7]
As the world's information is online, the task of making that data accessible becomes increasingly important. The challenge of making the world's information accessible to everyone, across language barriers, has simply outgrown the capacity for human translation. Innovative companies like Duolingo are looking to recruit large amounts of people to contribute, by coinciding translation efforts with learning a new language.

But machine translation offers an even more scalable alternative to harmonizing the world's information. Google is a company at the forefront of machine translation, using a proprietary statistical engine for its Google translate service. The challenge with machine translation technologies is not in translating words, but in preserving the meaning of sentences, a complex technological issue that is at the heart of NLP.

B. INFORMATION EXTRACTION [7]
Many important decisions in financial markets are increasingly moving away from human oversight and control. Algorithmic trading is becoming more popular, a form of financial investing that is entirely controlled by technology. But many of these financial decisions are impacted by news, by journalism which is still presented predominantly in English.

A major task, then, of NLP has become taking these plain text announcements, and extracting the pertinent info in a format that can be factored into algorithmic trading decisions. For example, news of a merger between companies can have a big impact on trading decisions, and the speed at which the particulars of the merger, players, prices, who acquires who, can be incorporated into a trading algorithm can have profit implications in the millions of dollars.

C. QUESTION ANSWERING [7]
Search engines put the world's wealth of information at our fingertips, but are still generally quite primitive when it comes to actually answering specific questions posed by humans. Google has seen the frustration this has caused in users, who often need to try a number of different search results to find the answer they are looking for. A big focus of Google's efforts in NLP has been to recognize natural language questions, extract the meaning, and provide the answer, and the evolution of Google's results page has shown this focus. Though certainly improving, this remains a major challenge for search engines, and one of the main applications of natural language processing research.

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VII. CONCLUSION

This system allows users to interact with the system even without the knowledge of SQL and moving ahead from the restrictions of structured form of data inputs.
Our system can be developed for all the scenarios wherein a receptionist is present and add new features to it. It also requires regular update of its data dictionary making it more user-friendly. We can add more tables to the database at any point of time allowing the system to execute more number of queries. This system can be made to work along with a real-time database in future.

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