

A Native Approach to Improve Subjective Answer Evaluation

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Abstract:

From the last decade, internet users are increasing day by day. In Question Answering, different queries are provided by the user in aim of getting accurate answers in Question Answering Systems. Question Answering provides perfect solution to retrieve valid and accurate answers to user question asked in natural language instead of query. This system is mainly designed for users those are comfortable with the natural language they use in their daily life. Automation of English question answer is a form of computer-human interface. In these types of systems user enters the question in the natural language and gets the output result in the same language.

Keywords: Question, Answer, SQL, NLP, Machine learning.

I. INTRODUCTION

In the digital era amount of data is increasing day by day. The data are easily accessible if it is stored in a structured way or stored in a database. Databases Management and technologies of database are having a major impact on the increasing use of computer. Database Management has been rapidly growing these years, as every business module use database for data storing. A database management system (DBMS) is a module in the form of software which is used to manipulate, retrieve and manage the data stored in a database. DBMS are developed to manage large bodies of information. To manage this information, we should have the complete knowledge of Structured Query Language (SQL). SQL [1] is a special language where the query statements are given against a DBMS for insertion, deletion, and updating of information. Only those users who have complete command of these languages can manage the data or information. SQL, however, is difficult to understand for non-technical users. The simple approach used to access data from the database even for casual users is the use of natural language interfaces (NLI) for databases. These allow non-technical users to access and manage data stored in databases by typing questions in natural language.

In current information retrieval systems [2][14], the general method is to specify some keywords to obtain necessary information on the Internet. Given a query, an Information Retrieval (IR) system returns a list of potentially relevant documents which the user must then scan to search for pertinent information. This method could not satisfy the user's needs to extract the adequate information efficiently from a huge set of electronic documents, even though the construction of the retrieval service is easy. Question Answering (QA) is a technology that aims at retrieving the answer to a question written in natural language in large collections of documents. QA systems are presented with natural language questions and the expected output is either the exact answer identified in a text or small text fragments containing the answer [13][16].

The process of measuring student achievement through evaluation is important in a learning process. These measurements will determine the student's ability in absorbing information during the learning process. Type of assessment for measuring the student's ability can be objective or subjective test. The example of objective test is multiple choices, while short or long is the example of subjective test. The advantages of applying subjective test during the evaluation are being able to measure the ability of students in higher order thinking levels [1][15].

1.1 Natural Language Processing

Natural Language processing (NLP) [3] is a field of computer science and linguistics concerned with the interactions between computers and natural languages. In theory, NLP is a very attractive method of human-computer interaction. Natural-language understanding is sometimes referred to as an AI-complete problem, because natural-language recognition seems to require extensive knowledge about the outside world and the ability to manipulate it. NLP has significant overlap with the field of computational linguistics, and is often considered a sub-field of artificial intelligence [12].

1.2 AES and NLP

NLP have major tasks such as discourse analysis, morphological segmentation, parsing, word sense disambiguation and information extraction etc. Automated Scoring can choose some tasks from NLP for scoring process. Automated Scoring systems(AES) are a combination of various techniques such as – NLP (Natural Language Processing) along with, Statistics, Artificial Intelligence (Machine Learning), Linguistics and Web Technologies, etc. Today, Automated Scoring is still a difficult, intricate and interesting issue for researchers in artificial intelligence and natural language processing though many English Automated Scoring systems have been proposed and developed but with little success. Automatic essay-scoring techniques are inappropriate for scoring the content of an essay because they either rely on grammatical measures of quality or machine learning techniques, neither of which identifies statements of meaning (propositions) in the text.

1.3 Question

Question [4], the word has never a dictionary to know, but the response needs not only a dictionary, but the whole universe sometimes to be searched for just a response. The question is a noun a sentence recorded or expressed so as the elicit information.

1.4 Answer

Answer is a noun, a thing that is said written or done to deal with or as a reaction, statement or situation. An answer to a particular question may use more than one way of expression. Thus tends the responses to the unique aspect relevant to each single user.

II.LITERATURE REVIEW

Mathew et al. [5] presented Online Subjective Answer Checker that will ease out the process of checking of answer papers with accuracy. The system will let students give exam online, calculate the results automatically as well as produce a record for the administrator. The paper will focus on correcting on the basis of certain keywords that every answer will contain and give marks to the students according to the presence of the keywords in the answers. This system will help reduce all human errors thereby making the system more efficient.

Gunjal et al. [6] describes that An automatic answer sheet checker checks the answer sheet and written mark as similar to human being .This software is built to check the subjective answer.The system consist of in

build artificial sensor that verify answer and allocate marks according as good as human being accessing large number of handwritten answer sheet is relatively time consuming task there is an intense need of speed up and enhance a process of rating handwritten words while maintaining cost effectiveness .It is relatively inexpensive answer written by hand.The primary means of testing the student on state assessment of reading comprehension motivation of these system is mainly always we have seen the online OMR sheet checker or objective answersheet checker but the main goal is to develop subjective answer checker. An automating the task of scoring subjective answer is considered. The goal is to assign score which are comparable to those of human score by coupling AI technologies .In this process involves many image level operation i.e. removal of pre printed matter, extraction and segmentation of words. Scoring is based on machine learning of parameter and natural language processing. System checks answer and score as good as human being.

Sahu et al. [7] presents an approach to extract answers from Hindi text for a given question. It is based on understanding the meaning of the given question and expressing them in query logic language. The Hindi text is analyzed to understand the semantic of each sentence and relevant answer is extracted for the given question. The answers are extracted for the questions of type when, where, how many and what time. The developed Question-Answering system in Hindi uses Hindi Shallow Parser which is developed by IIT Hyderabad. The shallow parser gives the analysis of a sentence in terms of morphological analysis, POS tagging, Chunking, etc. Apart from the final output, intermediate output of individual modules is also available. All outputs are in Shakti Standard Format (SSF).

Kaur et al. [8] discussed that as there is increasingly high advancement in technology, so Question Answering is becoming major area of research for the researchers. Different queries are provided by the user in aim of getting accurate answers in Question Answering Systems. Question Answering provides perfect solution to retrieve valid and accurate answers to user question asked in natural language instead of query. Hindi, Telugu, Bengali etc are popular languages that are spoken in India. Currently these languages are taken into consideration by the researchers and a lot of work is being done in these and other Indian languages. In this paper we compare Question Answering Systems performance for different Indian languages. We discuss the best features of Question Answering systems built in different Indian languages and compare their performances.

Garg et al. [9] introduced a system for generating questions automatically for Punjabi. The System transforms a declarative sentence into its interrogative counterpart. It accepts sentences as an input and produces a possible set of questions for the given input. Not much work has been done in the field of Question Generation for Indian Languages. The current paper represents the Question Generation System for Punjabi language to generate questions for the given input in Gurmukhi script. Proposed system cannot generate questions with "kuon", "kive" etc. words.

Lin [10] proposed automatic generation of questions from queries as a shared task. With large amount of cQA data available online, together with real world query logs, and interests from both academics and industry, author believe that the time is ripe for such endeavor. The results would change ways that people interact with information and provide new perspectives in natural language generation, information retrieval, and other related fields.

Liu et al. [11] presented a novel Automatic Question Generation (AQG) system, called G-Asks, which generates specific trigger questions as a form of support for students' learning through writing. We conducted a large-scale case study, including 24 human supervisors and 33 research students, in an Engineering

Research Method course and compared questions generated by G-Asks with human generated questions. The results indicate that G-Asks can generate questions as useful as human supervisors ('useful' is one of five question quality measures) while significantly outperforming Human Peer and Generic Questions in most quality measures after filtering out questions with grammatical and semantic errors. Furthermore, authors identified the most frequent question types, derived from the human supervisors' questions and discussed how the human supervisors generate such questions from the source text.

III RESULTS

In this paper, natural language is used as a mean for providing inputs. In this system, we consider a database SQL Server and user created tables are used. A system is developed that eliminates the problem of normal user to interact with database with rigid language SQL. The users are able to access information's by issuing query in simple natural language. The system is proposed in .NET.

3.1 Question/Answer Form

By clicking on the 'Question/Answer' option on the main form, the 'Question/Answer' form is displayed which shown in the figure 1. In this we can enter any question. The answer is entered in the answer box. Then click on the 'Check Result' button. It will show the score of the given answer for the question. Figure 1 shows the example 1 of short descriptive QA1 in English. As the student filled the complete and correct answer, he got the total score as 5.

Questions/Answers

Question

Answer

5

Figure1. Example 1 of short descriptive QA1

If the student did not fill the complete answer (one word is missing in the answer), he got the total score as 4. If the two words are missing in the answer, then he got the total score as 3. Similarly, if the student given the incorrect answer, then he got the total score as 0.

IV. CONCLUSION

Large number of e-governance applications like agriculture, weather forecasting, railways, legacy matters etc use databases. Through this system a user can access information stored in a database without having the knowledge of any Formal query language such as SQL. In this paper, we found the results of proposed algorithm by mapping the answers, with their comparing keywords and their synonyms with the help of database maintained.

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