

XIE Assistant

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Abstract

The purpose of XIE Assistant is to automate the existing manual system. With the help of computational equipment and computer software, fulfilling its requirements, so that the valuable data/information can be manipulated and accessed easily and stored for a longer period of time. XIE Assistant is utilized to keep details of various departments in the college, varied courses offered by the Schooler College, student details, notices, knowledge centre, day-to-day attendance; exam marks details, internal marks details, exam timetable and daily schedule. XIE Assistant can lead to error free, secure, reliable and fast management system. It will incorporate NLP Assistant and QR code access for easy usage, to input the user query and output the required data. XIE Assistant is an efficient solution for any institute to automate data management and storage process.

Keywords: Android application, NLP Assistant, QR code access

1. Introduction

XIE Assistant has been developed with NLP assistant to override the problems in the existing manual system. This software is built to reduce the problems faced by the existing system. This system is designed with a particular aim for the college to carry out operations in an effective manner. The main problem noted is that student's particulars are reported manually in separate records, which is a tedious job. Managing and updating these records manually increase the chances of mistakes. The application is designed to lead to secure, reliable and fast management system. This system eliminates the use of paper. Thus it will help institution in better utilization of resources. Every organization, whether big or small, has to maintain precise records and managing the information of Course, Schedule, Faculty, Exam, Students is of great importance to college. This system is designed to assist in strategic planning, and will help ensure that the organization is equipped with right level of information and details for future goals. This system will ultimately allow lecturers to better provide resources to students as well as aid them in easy record-keeping.

2. Literature Review

2.1. Standardization Principle

Digital campus construction should follow the principle of data standardization. In the view of management it directly affects construction of information system

among different departments whether data is standard. If various departments created their own systems without uniform standards, it will not be possible to share resources with other systems and exchange information. The sharing of resources between schools is difficult to achieve, resulting in “information island” phenomenon. So when in digital campus construction will integrate all of the data information based data processing, the standards formulated.

2.2. Principles of Intelligent

The so-called intelligent is automation; intelligent technology that can replace person's mental technology, its repetitive mental work to be replaced by computers. Digital campus make schools realize intelligent management, school administrators can promptly obtained information through various information system, and gives the correct information to make appropriate analysis, adjust timely and improve the working efficiency of the school.

2.3. Natural Language Processing

Natural language processing[1] is a field of AI that helps machines manipulate, understand and interpret human language. Computational linguistics are taken under NLP. It is done so to eliminate the difference between human spoken language and computer understanding.

2.4. Sequence to Sequence model

Machine translation which is taken as a problem area are addressed by Sequence to Sequence[2] model. In this model an input sequence in one language is converted into a sequence in another language. A basic neural translation model can be built by understanding the basics of this model. We build the encoder using RNN[3]. Input sequence is handled by RNN and then pass its final output is sent to the decoder sequence as a context variable. The decoder is also taken as an RNN. The RNN translates input sequence, and then predicts the next word in the decoder arrangement– given the current word in the sequence of the decoder and the context from the encoder sequence. After training, we need to encode the sentence to produce translations and then run the network in generation mode.

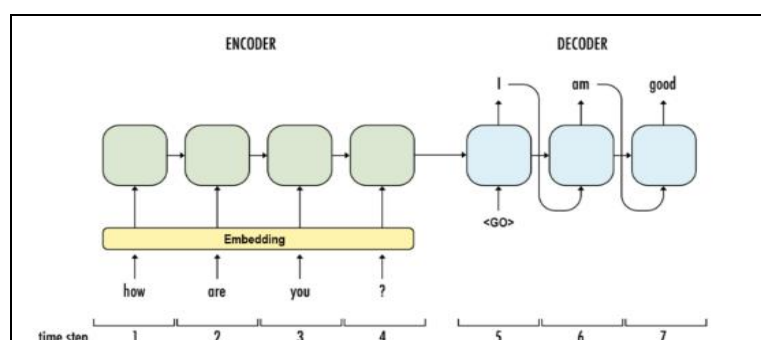


Figure 1. Encoder and Decoder in Sequence to Sequence model

3. Proposed work

The project includes analyzing the previous manual system and learning about its advantages and disadvantages. New, advanced and innovative technologies have been looked into and finally a decision to implement NLP Assistant which will make college assistant app more efficient and user-friendly has been made. Besides having a student ID and password login, an additional option of scanning respective QR code will be offered to add ease and speed. Text-based NLP chatbot assistant will be provided for automation and to keep-up with the growing technological advancements. The XIE Assistant app will be implemented with the basic goal of offering user-friendly application and it will provide a wide range of easy functionalities and an interactive GUI. A detailed note on the accuracy, efficiency and speed of the system will be made. User feedback will be conducted for the better development of the application.

4. Implementation

4.1. Natural Language Toolkit

It is used for building programs in Python that work with data recorded in human spoken language for applying in natural language processing (NLP). For tokenization, parsing, classification, and semantic reasoning, text processing libraries are used. It has graphical demonstrations. It also holds sample data sets. Natural Language Toolkit[4] is employed for building programs in Python programming language to work with data in human language.

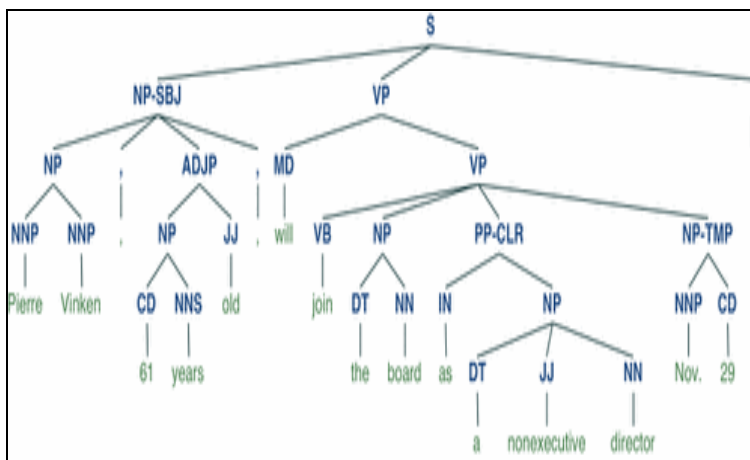


Figure 2. Tokenization Tree Structure in NLTK

4.2. Algorithm Explanation

- A. Input from the user (query or using GUI)
- B. Send the input query to the server
- C. Converts input query into a SQL query to retrieve the desired data from intent[5]

- Tokenize the sentence with NLTK library
 - Search for one of the following intents: marks, attendance, timetable, notice
 - If any additional information is required to process the query, ask the user
 - Retrieve desired output from database
- D. Return the output to the user
- E. End

5. Conclusion

This project is a humble venture to automate and ease the efforts required in managing operations of the college. User friendly GUI and text-based NLP chatbot will be offered to make the application interactive and to assist the users in an effective manner. Features and operations to provide automation will be performed. The system will be implemented and tested using test cases. The future scope of the project circles around providing additional functionalities like library management module, secure payment gateway and implementing backup mechanism.

Acknowledgment

The success and final outcome of this project required a lot of guidance and assistance from many people and the project members are extremely privileged to have got this all along the completion of the project. All that is done is only due to such supervision and assistance.

Respect and thanks to Dr.Y.D.Venkatesh, for providing with the opportunity to do the project work in Xavier Institute of Engineering and giving all support and guidance which made the completion of project duly possible.

Deep gratitude to the project guide Prof. Kirti Motwani, who took keen interest on this project work and guided all along, till the completion of the project work by providing all the necessary information for developing a good system.

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