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AI Driven Chatbot for Student Performance Analysis

Mayuri Shejwal¹, Rutuja Shinde², Aishwarya Wakchaure³, Shifa Shaikh⁴,
Y.R.Chikane⁵

Department of Information Technology, Amrutvahini College of Engineering, Sangamner, SPPU, India¹⁻⁴
Associate Professor, Department of Information Technology, Amrutvahini College of Engineering, SPPU, India⁵

ABSTRACT: In recent times, the design and implementation of chatbots have received great attention from developers and researchers. Chatbots are Artificial Intelligence (AI) based conversational systems which are able to process human language through various techniques including Natural Language Processing (NLP) and Neural Network (NN). The proposed methodology is to develop a state-of-the-art chatbot application that can be used in colleges and institute as medium of communication between Teacher Guardian and parent of students. The proposed chatbot can be implemented using a couple of tools such as Dialog Flow, TensorFlow, Android Studio and Firebase, followed by Machine Learning (ML) techniques to provide information about ward to parents through use of Chatbot. The parents can know about attendance of their ward as well the performance at exams.

KEYWORDS: Chatbot, Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL)

I. INTRODUCTION

Nowadays, we see the chat bots everywhere Chat bots are the source of answers to the users questions in any particular domain where it is operating. Chat bots are the source of answers to the users questions in any particular domain where it is operating. The most popular example today is the Amazon's Alexa. Chat bots are at almost every place, one can see it at every second website they visit. A bot is helpful in answering queries related to information which might be unreachable at that website easily. Most of the websites avail users with chat bots to aid them to go through what the websites facilitate. They are turning out to be our virtual assistants in everyday lives.

- Basics of chat bot : A chatbot is an artificially intelligent creature which can converse with hu-mans. This could be text-based, or a spoken conversation (in case of voice-based queries). Chat bots are basically used for information acquisition. It can run on the local PCs and mobile phones, though most of the time it is accessed through the internet. It can be compelling, captivating and spell-bounding. It is a conversational agent which interacts with users in a certain domain or on a particular topic with input in natural language sentences. Mainly a chatbot works by a user asking some question or initiating a new topic of discussion. Chat bots can be referred as software agents that pretend as human entity. These are the agents with AI embedded and using NLP they can answer to user questions. Predefined knowledge base helps develop a response to the query.

- Chatbot for College : The need for college inquiry system arises due to various reasons which include: the slow nature of college website, an outsider would not know where to search for a particular piece of information, difficult for the person out-side college's domain to extract information. The smart solution for all the drawbacks leads to the need of the system. The college inquiry system will provide the response by summarizing the query and then output answers, it also provides selective information what the user wants. A college system will dispense all answers relating to domains such as admission, examination cell, notice board, attendance, placement cell and other miscellaneous domains.



II. RELATED WORK

1) Development of a chatbot for informing students of the schedule

The article describes the process of developing a chatbot to provide students with information about schedules using the Telegram mobile messenger. During the research, the following tasks have been performed: the analysis of notification systems for their use in the educational process, identification of problems of notifying students about the schedule (dynamic environment, traditional presentation of information, lack of round-the-clock access), substantiation of the choice of mobile technologies and Telegram messenger, determination of the requirements to the software, generalization of the chatbot functioning features, description of the structure, functionality of the program to get information about the schedule using a chatbot.

2) Developing Chatbot For Academic Record Monitoring in Higher Education Institution

The information to be served is information about students' attendance at lectures, grades, and financial records. With this application, a college can provide facilities for students or parents of students to view academic records easily, cheaply, and can be accessed anytime. With this application, a college can provide facilities for students or parents of students to view academic records easily, cheaply, and can be accessed anytime.

3) Automating Student Management System Using ChatBot and RPA Technology

These Robotic Process Automation (RPA) is a technology that is being increasingly used as a tool that allows users to automate, manage, analyze and update existing databases efficiently and without any error. This paper highlights how RPA is being used to integrate repetitive tasks within an ERP system and automate many of the processes that exist when managing a Student Management System. The solution is designed in a way that allows students, Faculty and Group Admin to access records and databases from a platform free web-based solution - using both desktops and mobile phones. It allows Faculty and Admin to post Student related notifications, post and assign assignments, class schedules, examination dates, amongst many others both singularly for an individual student as well as a group of students. A ChatBot Module has also been integrated within the solution that allows users to retrieve important information using a GUI.

4) Using chatbots to aid transition

The purpose of this paper is to examine how chatbots can be used to address two key struggles that students face in first year – a sense of being disconnected from the instructor, and information overload. The authors propose that chatbots can be a useful tool for helping students navigate the volumes of information that confront them as they begin attending university, while at the same time feeling somewhat personally connected with the instructor. This is achieved without increasing instructor time commitment, and perhaps reducing it in large classes. The paper reveals the results of applying this tool in a large first year class and proposes improvements for future iterations.

5) Towards a chatbot for digital counselling

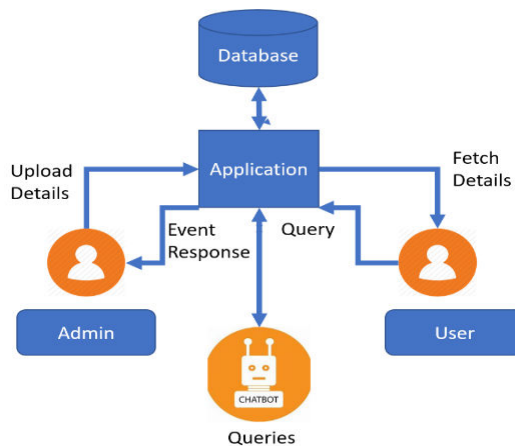
Chatbots can be a more interactive experience for the user to receive information, or complete diagnostic tools, or to even be used for counselling. A demo chatbot was created using interactive emoji's and GIFs to improve the user experience when searching for online self-help tips. This chatbot will be further developed and incorporated into a full web based programme for mental health in the workplace. It is envisaged that the chatbot will be able to provide initial counselling, and lead users into the correct services or self-help information.

III. PROPOSED METHODOLOGY

The system is developed to design Chatbot Application where parents will be able to askqueries related to his ward about attendance and performance study.



System Architecture:



Algorithm:

SVM:

The support vector machine (SVM) is a predictive analysis data-classification algorithm that assigns new data elements to one of labeled categories. SVM is, in most cases, a binary classifier; it assumes that the data in question contains two possible target values.

Support Vector Machine (SVM) is supervised learning technique used for prediction of student performance basis of student's attendance, each subject marks, grade etc. This application is helpful to assist students by offering them proper advice through which they can improve their performance in upcoming tests.

SVM steps:

- Finding the Closest Pair of Points
- Adding a Point to the Support Vector Set
- Pruning

Pseudo Code:

```

candidateSV = {closest pair from opposite classes}
while there are violating points do
Find a violator
CandidateSV = CandidateSV U violator
If any  $\alpha p < 0$  due to addition of c to S then
CandidateSV = CandidateSV \ p
Repeat till all such points are pruned
End if
    
```

Technology:

AIML:

If the user is trying to make a normal conversation with the bot, the input is mapped to an appropriate pattern in Artificial Intelligence Modeling Language(AIML) files. If the response is available, it is sent to the user. Other data provided to the chatbot such as username, gender, etc. are also saved. If the pattern is not available in AIML files, a random response is sent suggesting "Invalid Input"

Database:

FIREBASE:

Firestore is a platform developed by Google for creating mobile and web applications. It was originally an independent company founded in 2011. In 2014, Google acquired the platform and it is now their flagship offering for app



development. The Firebase Realtime Database is a cloud-hosted NoSQL database that lets you store and sync data between your users in real-time.

Modules:

[1] Personal Query Response System (Module-1):

Upon receiving personal queries like Marks, attendance, etc., the authenticity of the user is checked through user-id and password. If the user detail is in-valid, an appropriate response is sent. If the user authenticates successfully, the input text is processed to extract keywords. Based on the keywords, in-formation required by the user is understood and the information is provided from the database.

[2] AIML Response System (Module-2):

If the user is trying to make a normal conversation with the bot, the input is mapped to an appropriate pattern in Artificial Intelligence Modeling Language(AIML) files. If the response is available, it is sent to the user. Other data provided to the chatbot such as username, gender, etc. are also saved. If the pattern is not available in AIML files, a random response is sent suggesting "Invalid Input".

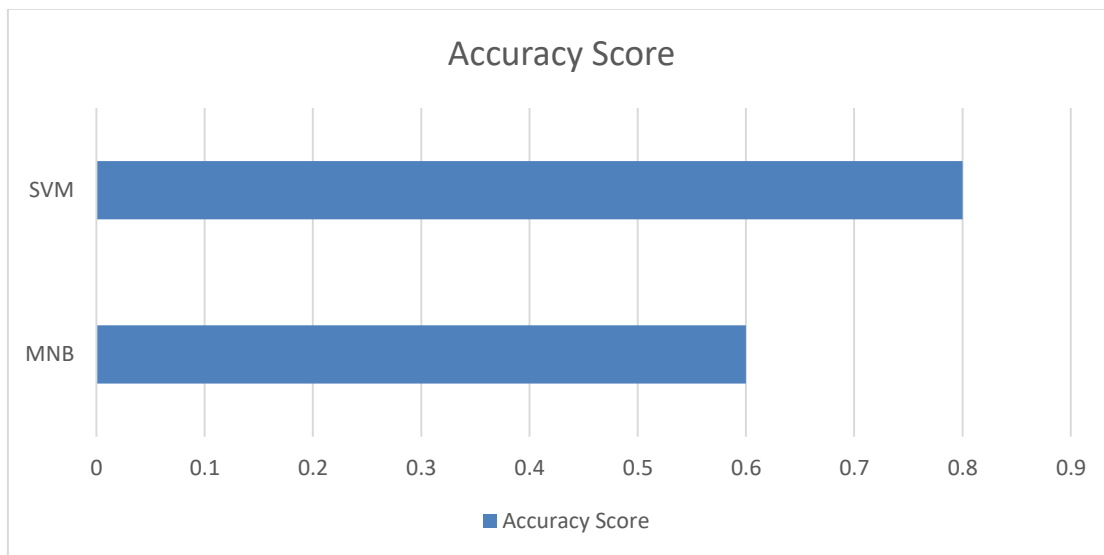
[3] Query Analysis and Response System (Module-3):

When a user wants some information pertaining to college, the response will be provided through this module. If the input matches a pattern in the AIML files, the appropriate response will be sent to the user. If the AIML files have no entry for that particular query pattern, keywords are fetched from the input. An algorithm to check sentence similarity is applied to the modified input to check its similarity with the questions of a predefined question-set, whose answers are available

IV. RESULT

[1] Analysis:

For predictive algorithm to be used for application. We had taken SVM and Naïve Bayes for consideration. Accuracy for same has been calculated.



[2] Experimental Results

The Chatbot developed as a communicator between Teacher guardian and parent. Initial steps of parent login and verification is done.

Figure shows the query asked by parent about attendance of ward whose Roll Number is 3. The next figure shows the attendance of ward for same month.

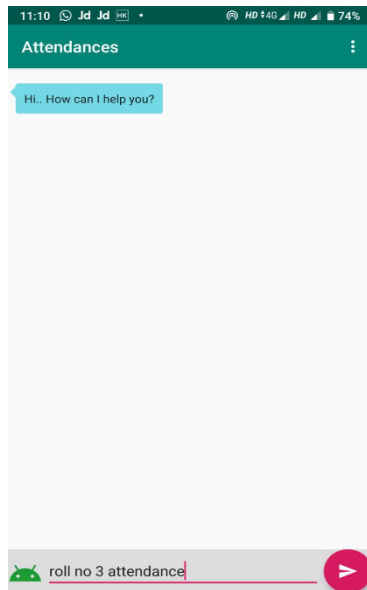


Fig.1: ChatBot Input Screen

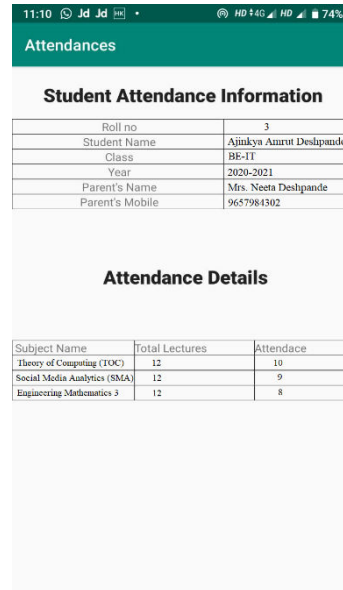
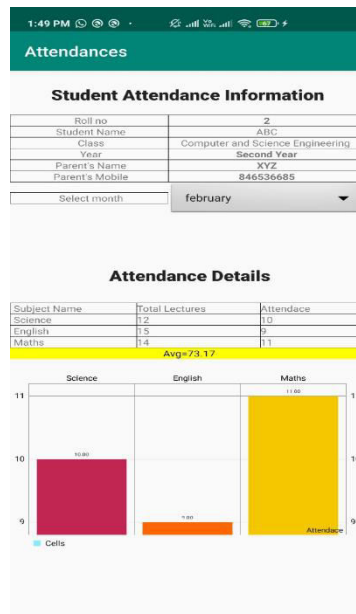


Fig.2: ChatBot Output Screen



V. CONCLUSION

It is often impossible to get all the data on a single interface without the complications of going through multiple forms and windows. The college chatbot aims to remove this difficulty by providing a common and user-friendly interface to solve queries of college students and teachers. The purpose of a chatbot system is to simulate a human conversation. Its architecture integrates a language model and computational algorithm to emulate information online communication between a human and a computer using natural language. The college student and employees can freely upload their queries. The chatbot provides fast and efficient search for answers to the queries and gets the relevant links to their question. A background research took place, which included an overview of the conversation procedure and tries to find out the relevant keywords related to that query to provide the proper link. The database storage includes information about questions, answers, keywords, and logs. We have also developed an interface. The interface developed will have two parts, one for users and the other for the administrator



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