Career Guidance Chatbot

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ABSTRACT - The purpose of career guidance bot is to conduct a counseling conversation between a human and a machine. This project plans to revolutionize the world from traditional career counseling to digital career counseling. The bot helps the users/students who will opt for SSC, HSC and Undergraduate to select their field of interest that would be best for them in order to build up their future. The system uses personality assessments to help the user/student evaluate their career preferences. The system enables the user to explore various existing career options and their scope. It also enables the user to get a detailed report about the suitable careers in order of preference that the student has selected. The student/user can also ask about general queries such as information about a stream, sub-stream and various courses. The chatbot will also provide the recent trends in the education sector. The average salary of the suggested courses will also be displayed after the assessment test. The detailed results and statistics after the personality assessment test will help the user/student to make wise and fruitful decisions.

I. INTRODUCTION

Chatbots are not a new turn of events. They are recreations that can comprehend human language, measure it, and collaborate with people while performing explicit assignments. For instance, a chatbot can be utilized as a helpdesk leader. The first chatbot was made by Joseph Weizenbaum in 1966, named Eliza. Everything began when Alan Turing distributed an article named “PCHardware and Knowledge”, and brought up the issue, “Can machine think?”, and from that point forward, we have seen different chatbots outperforming with overwhelming smart performance to be all the more normally acquainted and mechanically progressed. Nowadays, human association with computerized gadgets has become normal which prompted the improvement of a chatbot. Chatbots assist people to speak with PCs. AI gives frameworks the capacity to consequently take in and improve as a matter of fact without being expressly customized. Because of modernization in record keeping, immense information bases and information age happens which could assista bot with improving its productivity and precision. Bots, we are very well acquainted with this term nowadays. CareerBot is your personal career counseling bot. Be it a student or a parent, your queries are just a click away. The bot is as interactive as human and infact more intelligent than human. CareerBot aims to provide end-to-end virtual counseling environment with effective and accurate outcomes where the student/user can get guidance for their future.

II. LITERATURE SURVEY

[1] The Role of Chatbots in Formal Education
Chatbots appeared in large numbers at the beginning of the current decade. Interactive technology, often combined with artificial intelligence, has rapidly invaded and occupied the world of online chat. Chatbots are not just elements of virtual assistants, but are used by organizations and governments on websites, applications, and instant messaging platforms to promote products, ideas, or services. In this paper, the author first presents the theoretical and historical background, then discusses the issues of using chatbots as educational assistants, and finally, describes the basic steps and challenges of programming a bot.

[2] Adoption of AI-Chatbots to Enhance Student Learning Experience in Higher Education in India
In the era of AI, the Chatbot market is witnessing extraordinary growth with the increased demand for smartphones and increased use of messaging applications. In the past few years, the food delivery business, finance, and the E-commerce industry have embraced Chatbot technology. One of the industries which can really benefit from using this technology is the educational sector. Education can benefit from Chatbot development. It can improve productivity, communication, learning, efficient teaching assistance, and minimize ambiguity from interaction. A new education platform can solve even-level problems in education using this technology as the engagement tool. The aim of this research paper is to find out the factors which affect the adoption of Chatbot technology in order to enhance the student learning experience in the Indian higher education sector. In this research, a Quantitative method is used through data collection from surveys of some of the prominent higher education institutions using Chatbot technology in India. It is expected that the research outcome will help Chatbot developers and higher education providers to better understand the requirements of students while providing an interactive learning and communication platform for them.


The application can be used by students and parents as it provides all details of colleges like tuition and accommodation fees, eligibility criteria, campus placements, accommodation facilities, scholarship schemes, campus support services, rules and regulations, etc. It helps students to select colleges in engineering and management fields in India and abroad based on the factors like qualifying exam details, technical expertise and other details. The application prepares the college list as per the enrollment examination marks and the eligibility criteria of colleges and the courses chosen. The college list is filtered based on parameters like institution ranking, fees, limits, and location chosen. Aptitude Test (AT) The Aptitude Test is multiple-choice question (MCQ) based and includes verbal section, quantitative section and general knowledge. The application will help the students to get the information about various fields and career choices. They will also help the students to get the information about various fields and career choices. The system provides a mechanism to perform a search for responses to the user's message. The user can put forth any career-related query through Techie.ai's user interface that is built for interacting with the bot. The user queries are analyzed and then answered as if it is given by the career counselor. This system guides the students to choose the right career that best fits their interests and capabilities.

[5] **Techie.ai**

Techie.ai is such a Chatbot that aims to provide guidance to the job seekers. It has its basis in AI to provide mechanisms to perform a search for responses to the user's message. It provides some valid result to the user by analyzing the user query and understanding user's message. The user can put forth any career-related query through Techie.ai's user interface that is built for interacting with the bot. The user queries are analyzed and then answered as if it is given by the career counselor. This system guides the students to choose the right career that best fits their interests and capabilities.

**III. PROPOSED SYSTEM**

The proposed system aims to address the problem of traditional counseling and bringing a end to end solution by creating a virtual counseling environment through Chatbot. We have created a Career Guidance Chatbot called CareerBot that will help the students to take better decisions regarding their career. It will also help the students to get the information about various fields and career choices. We have used Artificial Intelligence (AI) which will train the bot to provide the best advice to the students regarding their career options based on factors such as performance and area of interest. We have used Natural Language Processing (NLP) for better understanding of the user's questions. The developed system gives the top 5 suggestions for career choices along with the short summary of each domain. In addition to the pie chart analysis, the system also provides current trends in each field along with the average annual salary.
IV. METHODOLOGY

Algorithms proved to be the foundation for implementing the system functionalities. The proposed system is a Chatbot implementation of the bot named CareerBot. For any bot to be effective and optimal it is necessary to understand the human query. The Chatbot can understand the human statements through Text Classification. In our system we have implemented Multinomial Naive Bayes Algorithm for doing so. This Chatbot is developed in Python Language along with the Stream Lit framework of Python. It uses TensorFlow framework and is trained by linking the dataset with database for faster operations. The Chatbot also uses Keras Framework for training purposes. Wordnet lemmatizer is used to consider the context and convert the word to the meaningful base form. LabelEncoder from SciKitLearn library is used to convert the text or categorize data into numerical data which the model expects and performs better with.

A. Multinomial Naive Bayes Algorithm

Naive Bayes is the clearest and quick classification calculation, which is reasonable for an enormous lump of information. Whenever classification is performed the first step is to understand the problem and identify its label and features. Features are those attributes that have a great effect on the results of the label. The classification consists of two-phase first is a learning phase and the other is the evaluation phase. In the learning phase, classifier is used to train the model on the dataset and in the evaluation phase, the performance of the classifier is tested. Performance is calculated on the basis of various factors such as error, precision, recall, and accuracy.

Naive Bayes

Naive Bayes is a classification technique that is based on the Bayes theorem. Naive Bayes classifier is one of the fastest, accurate, and reliable algorithms. The naive Bayes classification algorithm has great accuracy and high speed on a large dataset. The naive Bayes algorithm assumes that the effect of an individual feature present in the class is independent of the other features. The Multinomial Naive Bayes Algorithm also holds the capability to calculate probability across multiple features. All the features are computed through probabilistic approach where the tag values are computed for each textual appearance. Multinomial Naive Bayes Algorithm belongs to the category of probabilistic algorithm where the bayes theorem is applied with the “naive” assumption. On the naive assumption madethereisconditional independence associated between each pair that exist for a feature. In Bayes theorem probability is calculated as $P(c=x)$ where $c$ denotes the existence of class for the possible outcomes and $x$ represents the instance that has been representing a feature and has been classified. $P(c=x) = P(x=c) \times P(c) / P(x)$ is the formula used for the probabilistic calculation. Multinomial Naive Bayes Algorithm improves to be the ideal for text classification as it has the probabilistic capability to predict the tag of the text. The algorithm calculates the probability value for each given tag. Later after computing all the tag values, the text is classified in the tagging the highest probability value. The tag values calculated always ranges from 0 to 1 as it is a probabilistic approach for computations. Multinomial Naive Bayes Algorithm is most prominent and comprehensive for text classification thus it is most often used by the chatbot systems.

B. System Implementation

There are two main interaction modules for User/Student. The first one is the general query and the second one is the personality test. User/Student has the functionality to ask a query to the Chatbot. The Query asked by the User/Student is first Lemmatized and tokenized to identify the true sense of the question being asked. The analyzed statements on which text classification is performed is further matched with the most relevant answer in the knowledge base. In this system text classification is applied through Multinomial Naive Bayes Algorithm. After an answer is generated, it is returned to the User/Student. The second part of the counseling is assessment test where the user has
toselect the desired stream for the questionnaire. Based on the selection, there is a quiz of 15 questions which evaluates their area of interest. There is a logic adaptor that actually analyzes the quiz results based on the selection right from strongly agree to strongly disagree. Based on the logic adaptor’s result, the CareerBot suggests the top 5 most preferred fields they should opt for. Once the fields are suggested, the bot displays the additional information such as field summary, trend over years, average annual salary, and experts contact details foreach suggested field. Apart from this, the CareerBot is also capable to give answers to personalized questions asked by User/Students.

Implementation involves the following main steps:
1) User/Student asking a query to Chatbot.
2) Chatbot answers to the query asked by the User/Student.
3) User/Student agrees for giving the Personality Test.
4) User/Student selects the stream, i.e., SSC, HSC or Undergraduate.
5) User/Student attempts the personality test displayed by the CareerBot.
6) Chatbot generates the result by suggesting top 5 most related fields.
7) Chatbot gives a short summary about all the suggested streams.
8) Chatbot displays the trends for each suggested field.
9) Chatbot displays the approximate annual salary for each stream.
10) Chatbot shows the contact details for experts in the respective field.
V. CONCLUSION

Career selection is one of the most crucial decisions in an individual’s life. Choosing a wrong career can leave a negative impact on our life. To overcome such problems, “Career Guidance Chatbot Using AI” is the need of the hour in this technology-driven era. Due to chatbot’s well-assessed answers and impactful suggestions, it would help individuals to make a correct and fruitful decision for their career. Personality test statistics and smart answers from chatbots will strongly help users/students to analyze their interests and thus decide wisely. The Chatbot also shows the recent trends for choosing a career. There are lots of details that the chatbot can provide such as streams, sub-streams, courses, and the average salary packages. The project could increase its scope by providing various other details such as diploma and specialized courses. Due to the boom of internet and increasing trust of Artificial Intelligence, Chatbot the CareerBot will definitely excel based on its smart answers and impactful results and statistics. This project plans to revolutionize the world from traditional career counseling to digital career counseling.

VI. ACKNOWLEDGMENT

We are thankful to all those who have contributed towards achieving this project and without whose help it would not have been possible. We would like to express our deep sense of gratitude to our Principal, Dr. Uttam Kolekar for his valuable guidance in this endeavor. We are also highly grateful to our Head of Department, Dr. Sachin Malave for his thought-provoking comments, valuable suggestions, constant motivation, encouragement, and support. We offer our sincerest thanks to our Project guide, Dr. Rahul Ambekar for his constant support and timely help and guidance throughout preparation. His involvement right from conceptualization of the study through its execution and meticulous perusal of the manuscript ensured its timely completion. We wish to take this opportunity to render our heartfelt thanks to all the Computer Department faculty at A.P. Shah Institute of Technology for their help and encouragement towards making this project successful. Heartfelt thanks to our family for their unconditional support and last but not the least, our friends and colleagues for their help and co-operation.

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