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Artificial Intelligence Based Career Guidance with Chatbot

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ABSTRACT - a web-based application with an integrated Chatbot that seeks to respond to the questions of post-SSC and post-HSC students who are unable to select their stream. In addition to recommending streams, it will also list colleges that fit the criteria for that stream.

KEYWORDS -Artificial Neural Networks, Machine Learning, Career Visualization, IT Sector, Technical and Non-Technical Skills Career counselling, career direction, and an expert system

I. INTRODUCTION

In India, there are more than a thousand universities, and thousands of undergraduate, graduate, and doctoral courses are offered at these institutions. In order to select the institution or course based on numerous characteristics, students applying to these universities must compare many options. For obtaining course information, comparing courses, faculties, and facilities, admission, monitoring student movement, examining outcomes, evaluating and certifying students, verifying certificates, and participating in collaborative online courses (MOOCs), a PAN India university information bank is necessary. Through comparison and imitation, this will benefit the communities of students and professors. Lack of information encourages professor and student inbreeding and self-glorification at universities and colleges. Summary: The universities in India offer a wide range of courses in numerous academic fields, and the students have to evaluate these programs in light of many factors. The courses include undergraduate, graduate, and doctoral programs. The consolidation of various facts onto a single platform would increase transparency and ease the difficulties that students are currently experiencing owing to informational gaps.

We currently lack a master data base on students at different levels, which makes it challenging to formulate policies relating to education and the improvement of the student body. A uniform platform that connects all of the data from school, higher education, and technical education will be made available, aiding the government in identifying the ambiguous areas that require real focus. Additionally, it is possible to identify the proportion of kids who drop out of school and the percentage of students who enter other fields of study. This information can be used to target reform efforts in these areas.

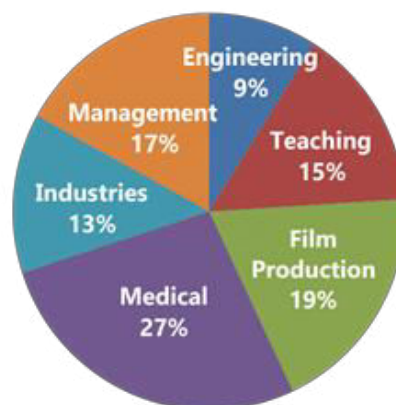


Fig.1. Students chosen their career fields based on peer or parent pressure, lack of information about another field expect one field etc.

II. LITERATURE REVIEW

1. [AI based Career Guidance - Firdosh sayyed1, Ronak Sanghani2, Abhishek Vora3, Nikita Lemos4] The solution offered by this paper has, to a certain extent, positively influenced the development of our project. This paper summarizes every feature and object between students and their career choice pattern or path.
2. "Technology in Education - Artificial Intelligence for Career Guidance - Current Requirements and Prospects for the Future" in the IAFOR Journal of Education This study examined the potential and requirements for employing AI in career counselling, outlining potential future research directions.
3. [ResearchGate - Creation of an AI Chatbot to Support University Admissions and Career Guidance] This thesis demonstrates how the topic of "Building AI Chatbot to Support Admissions and Career Guidance for Universities" has been investigated, analyzed, and comprehended in terms of the challenges, shortfalls, and issues that arise in career counselling and enrollment assistance. Besides, A structured dataset concerning enrollment orientation has been successfully created by the thesis, and identification models have been generated using machine learning and natural language processing.
4. [C3-IoC: A Career Guidance System for Assessing Student Skills Using Machine Learning and Network Visualization] International Journal of Artificial Intelligence in Education The AI-based C3-IoC solution, which enables students to see and explore the employment role space in accordance with their skill set, has been observed and comprehended in this work.
5. [ResearchGate - Tahseen Mehraj and Asifa Mehraj Baba, Scrutinizing Artificial Intelligence based Career Guidance and Counselling Systems: An Appraisal] This study, which we saw, examined a number of modern career coaching platforms that were built using AI approaches. The notable accomplishments and deficiencies of the corresponding AI-based solutions have been listed openly.
6. [Artificial intelligence-based job counselling chatbot a system for counselling by D Zaidi, S Raza, and L Sharma] This research study suggested an intelligent chatbot system for career counselling that will assist users in selecting the best career by providing pertinent answers to users' questions.

III. ARTIFICIAL INTELLIGENCE SYSTEM

When recommending individuals to a certain university, one of the major hurdles is accurately evaluating their skill sets.

The candidates are frequently transferred immediately to the institutes without taking into account their aptitude and domain-related skills and knowledge when they are first screened based on their prior performances or during telephone interviews.

Both the time involved and the misfit ratio rise as a result. The lengthy process might additionally contribute to professional failure.

Our distinctive collection of evaluation resources can be utilized for all stages of career advising, including for freshmen and those in grades 10 and 12.

Cognitive abilities are just as crucial to choosing the best institutions as subject-matter competence.

These abilities will indicate a candidate's capacity for success in demanding circumstances and problem-solving on the spot.

A. Components used in the system

HTML –

We employed techniques for mining content from websites and social networks in our study. In order to process HTML texts and pages and obtain data, we employed the computer language. To extract the text from the webpage, we can utilize some straightforward string splitting techniques by determining the partial layout and tag structure.

We gathered information by examining HTML sites as we built the dataset for Chatbot. To finish and create the database for the Chatbot, rely on the data analyzed from the HTML page.

CSS –

CSS is used to provide the styles for web pages. It describes the appearance and formatting of a document written in a markup language. It adds a new functionality to HTML. Usually, it works with HTML to change the appearance and feel of internet pages and user interfaces. Presenting web pages is made easier via CSS. It is simple to learn and understand and may be used to control how an HTML content is presented. CSS gives us the ability to manage a wide

range of components, including text color, font style, paragraph spacing, column size, layout styles, and more. It is not reliant on HTML and may be used with any XML-based markup language.

JAVASCRIPT-

Web pages are created using the scripting language JavaScript. JS, which was created in Netscape, enables programmers to construct dynamic and interactive web pages that interact with users and carry out complicated tasks. Additionally, it allows users to insert material into a document without refreshing the page.

PYTHON-

We used Python to develop using the object-oriented programming paradigm (Max Leuthäuser 2010 [13]). Code, properties, execution methods, and data are all combined to make up the objects in the chatbot model. Every item has a distinct name, and references to that object are handled according to that name. Each object in OOP can therefore receive messages, handle data internally, and send or respond to other objects or the environment.

B. Database used in the system

MySQL –

The information is kept in tables, which are smaller storage spaces used in relational databases. with addition to making, it simpler to find the information you require, this also aids with data organization.

Consider storing both the most recent purchases a consumer made and their contact details. The items you would be asked to store are rather simple. Each of these components would be kept in its own table in MySQL.

Neural Language Processing –

Preprocessing, model learning, prediction, analysis, and result reporting are some of the fundamental steps in text mining. In this work, preprocessing instruments and techniques from text extraction procedures were applied. We also used machine learning techniques to develop a dataset that can recognize and process languages from the user to the Chatbot and vice versa. Text Mining and Natural Language Processing, to which we mention the procedures of Hoanh-Su Le et al. (2017) [8].

IV. MODULE

Administration Module--

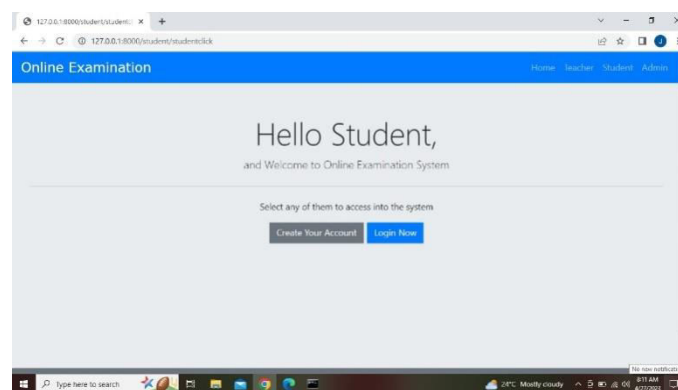


Fig.2. The website home page

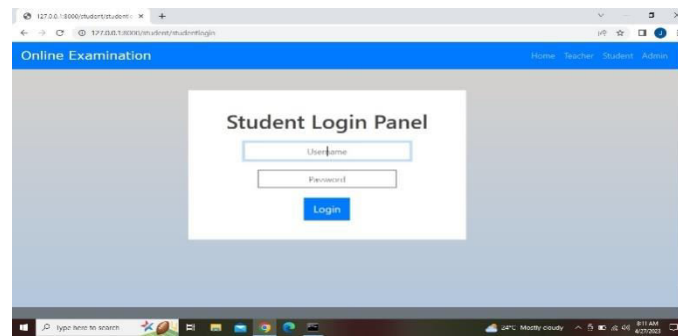


Fig.3. The student login page

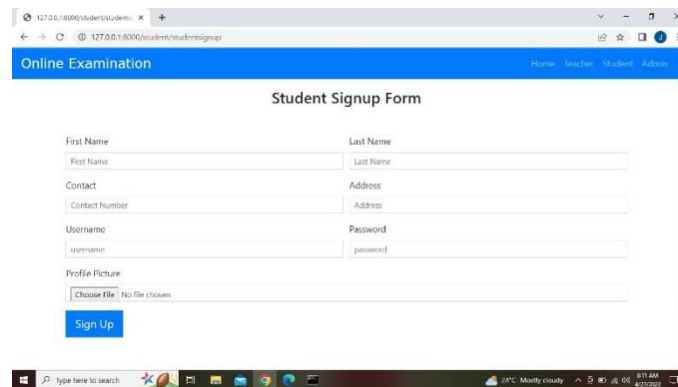


Fig.4. The page for students to sign up

Aptitude Test module--

Additionally, on-project training and succession planning is done via aptitude assessments. Coding tests can be created based on the needs of the project. The test findings will assist instructors in locating skill and knowledge gaps so that a training program can be developed.

Psychometric Test Module--

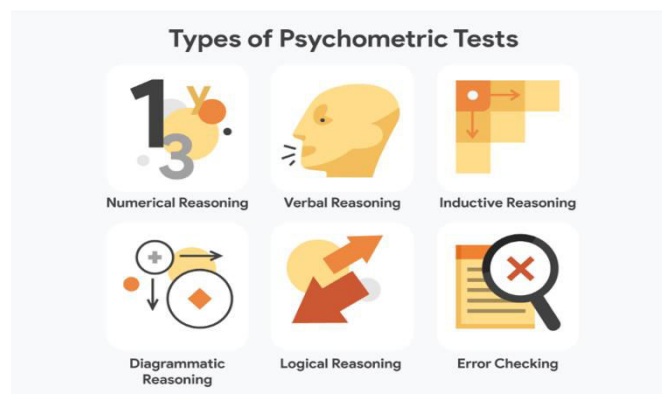


Fig.5. The types of psychometric tests

An accepted and scientific way for assessing people's mental talents and behavioral preferences is the use of psychometric tests. In order to determine a candidate's fitness for a position based on the necessary personality traits and aptitude (or cognitive abilities), psychometric tests are used.

Result Module--

The below shown below are the result web application page, we created as module for students to test and evaluate themselves with provided tool which will be given in the below web application page.

The web application page contains various tools for students.

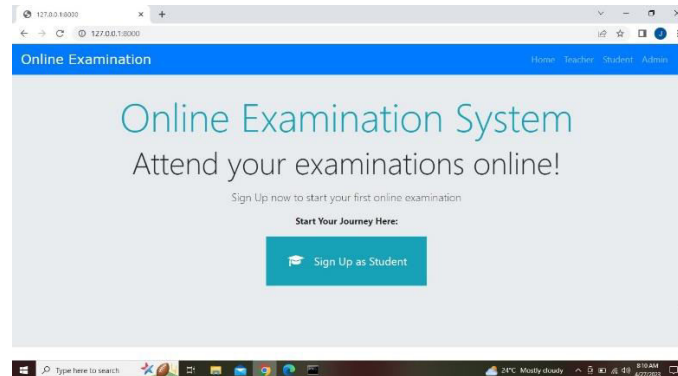


Fig.6. The welcome page of Examination system

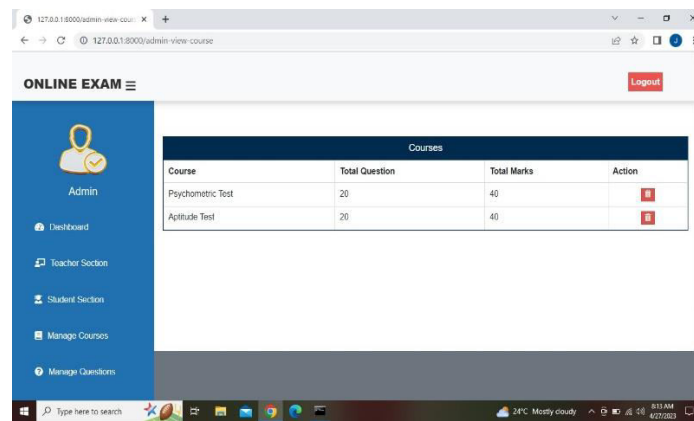


Fig.7. The Results of attempted tests will be on this page

Admin Module--

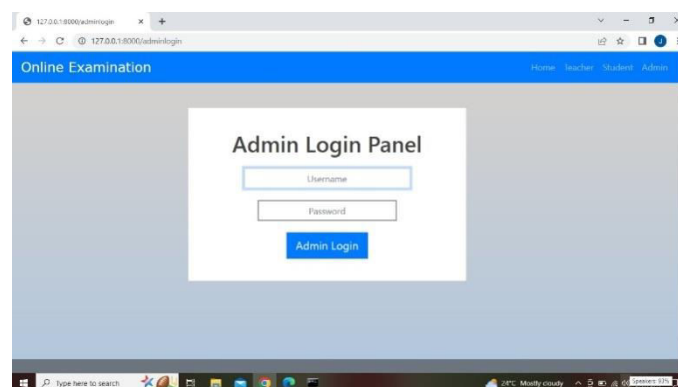


Fig.8. The admin's login page

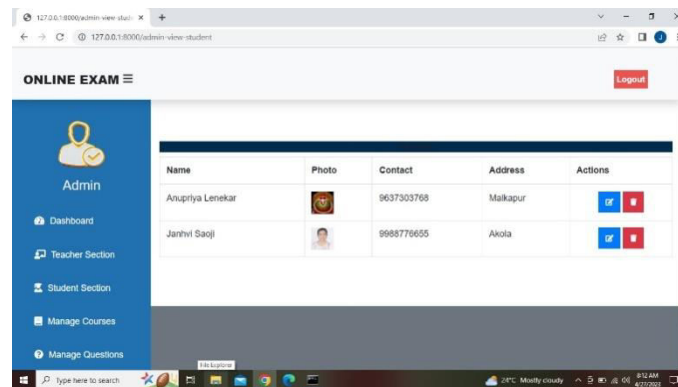


Fig.9. The page for admin to monitor student activities

V. CHATBOT

The advancement of artificial intelligence is exceeding people's expectations, and chatbots are increasingly expressing their importance in many sectors of life. Chatbots are being explored and created at breakneck speed. According to Weiyu Wang et al. (2018) chatbots have been utilized to improve and advance a variety of professions and industries, including finance, healthcare, education, transportation, and others.

At the moment, universities and colleges are becoming increasingly interested in the use of chatbots in career counselling and admissions consulting.

The development and completion of chatbot tools based on information technology and enrollment data, as well as career counselling data, leads to successful enrollment counselling help at universities and colleges across the country. In online counselling, a chatbot can address challenging challenges.

V.1. Methodology

1. Data Collection--

The main job of the chatbot is to respond to parents' and students' questions concerning admissions counselling. As a result, the data offered needs to be precise, legitimate, and reliable. To ensure that data sets cover all potential scenarios, we must choose two separate data sources from the list below:

- The sets of questions and database are backed by many entrance test papers of various levels.
- The sets of questions are provided by students and parents from various network groups.

2. Data Sets--

After extracting a set of queries, we systematize and synthesize a list of the most popular topics and material.. We create a thorough list of question sets that include the appropriate topics as well as substance for each topic. Following that, we draught questions with similar meanings.

To begin with compiling equivalent questions based on the original question collected, we discover guidelines for creating identical questions based on sentence structure and language adjustments.

After completing the questionnaire set, the structure of the data sheets and the answer set, the research team should carry out the task of cross-checking and editing the data set to avoid unnecessary errors. Defects detected during testing will be noted, checked and corrected many times.

2. Training Model--

To develop data models for machine learning training, data sets in the form of excel sheets will be needed. Following pretreatment, the first stage is to create a bag of words based on a list of phrases that will be used to vectorize the sentences in each subject.

The chatbot will be given the input data to process before being included into the model when a session is initiated. The following stages will be used to process the supplied data:

- Replace common misspelt words with their full forms
- eliminate meaningless repeated letters in words

- eliminate icon symbols and emoji, give up laughing-related terms
- remove punctuation and special characters, and pair difficult words and phrases.

4. Processing--

After preprocessing user-provided raw text, the result of the procedure will be standardized text that can be used to input the algorithm model to determine the speaker's intent. In response to the user's input command, the system will recognize the subject and source the user is referring to throughout the processing to create results, then map with the response set to produce the results as well as run the required API or functions.

- Step 1: After identifying the outcome of the preprocess, the model will move on to identifying the topic group.
- Step 2: Use the machine learning training model that was established in the model building phase to load the content that users want to discuss.
- Step 3: Once the speaker's intent has been ascertained, obtain the Intend ID from the output of the function that executes the identification model, and then continue processing to provide a series of requests for the response process.

5. Interface--

Our team focused on the internal container communication space between the chatbot and user when designing and developing a dialogue interface with a chatbot that was nice and simple to use, based on proximity, and had a structure of simple functional areas and few symbols.

VI. CONCLUSION

The main worries among young people today are career-related issues. More people are changing careers as a result, therefore

Many people must familiarize themselves with emerging fields of work and professions that offer new career chances in addition to job openings. Consequently, there is a critical need for automated employment.

In order to protect students' futures, educational institutions employ counselling specialists. In this essay, an AI-based contemporary system for career counselling is critically analyzed. The relevant AI-based solutions' salient successes and shortcomings have been freely documented. It is determined that the suggested solution is unchallengeable and unrefusable. Additionally, understanding of the factors influencing career choice is apparent. This comprehension, which is significant and crucial, is a prerequisite for the design of a number of policies in career advising and counselling. The system also provides a reliable method for identifying a person's personality traits, which are a crucial component in the development of automated career counselling and selection processes.

This AI system can be enhanced using deep learning-based solutions to become smarter and more effective. removing the shortcomings of traditional AI methods as a result. Additionally, relevant data is chosen and examined in order to create a standard data collection and eventually provide fresh perspectives on career paths, patterns, and success factors. In addition, further unresolved issues have been identified that should be considered while developing solutions, despite efforts to draw the community's attention to them.

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