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CAREER GUIDANCE CHATBOT

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ABSTRACT
The paper presents details about an AI-driven Career Guidance Chatbot that assists Indian students in their decision-making process for college branches and careers. The chatbot system offers users a straightforward interface to obtain college information as well as in-depth specifications of engineering disciplines. The system helps students grasp all the risks alongside advantages of each branch along with their career possibilities. The AI system has built-in functionalities that enable users to perform risk evaluations along with career research and salary information retrieval and historical chat preserving. The research demonstrates how the chatbot solution enables students to obtain clear useful information for better decision-making while decreasing their confusion and assisting them in selecting optimal academic and career choices.

Keywords:-
Career Guidance AI Chatbot , Risk Assessment , , Personalized Decision-Making , Career Path , Risk-Based Analysis .

I. Introduction
Students face a crucial decision while selecting their academic stream as well as career path because India presents numerous career options and tough admission tests. Students together with their parents face difficulties in handling the broad education system directions and occupational pathways because they do not have access to dependable and current fully tailored advice. Students make confusing and wrong choices due to their inadequate understanding of available career options together with their respective skill sets and potential earnings potential as well as entry requirements for higher education institutions. Our investigation presents an AI-characteristic Career Guidance Chatbot that gives tailored aid to students requiring help with its primary career choice. Students can use this virtual counselor to receive precise information regarding educational institutions along with their branches and entrance examinations and career opportunities and salary prospects. A system uses an interactive conversation method and user analysis based on preferences and academic background and interests to produce appropriate career recommendations. The strategic system provides students with well-informed decisions through a process that enhances their career development confidence and makes counseling accessible on a larger scale using modern technological methods.

II. Literature
Many researchers have looked into how artificial intelligence (AI) can be incorporated to improve student support service, including the area of career guidance and academic advising. Another of the prevailing methods is exemplified by Jadhav et al. [7], who presented a data-driven approach employing NLP and machine learning methods to generate personalized career advice. Their systems effectively closes the gap from the student to the huge reservoir of information about jobs, thus allowing a more informed, and tailored decision making. In the research discussed in [2] authors investigated career counseling chatbot aimed at providing more access to individualized career education. Built on top of the chatbot, it was specifically built to make recommendations to students based on what they are doing, what they want to accomplish, and how they are doing. While the

system showed a considerable improvement on accessibility and user engagement, the research also points out the major room for improvement. Specifically, users said they wanted the chatbot information accuracy and reliability levels to be higher. The authors explained that the reliability of AI- powered guidance tools depends on the range and diversity of sources included within the system. To make this tool as effective as possible, they suggested providing continuous updates to the system, then validating the information on a regular basis along with expanding the knowledge base to encompass more careers and even more selection of education. This study shows that as promising a tool AI chatbots have the potential to be for democratizing career support, actually delivering those benefits require continued work in quality assurance and data transparency. In addition, researchers in [3] investigated the use of chatbot technology in a smart educational environment. It delivers real-time, personalized support by making use of the AI- Driven system, processes the student queries with greater accuracy. This way not only increases user engagement on one hand and contributes to the majority of digitally literate, better-informed learners on the other hand. Entirely, these results point out exactly how wonderful AI-driven advice systems, when specially developed and continuously enhanced, could greatly enhance the difference and quality of career and academic advising services. In another study, a text-based chatbot was introduced to assist university students in resolving frequently asked questions [4]. This system promotes efficient dissemination of information across the campus, increasing overall communication speed and accessibility. However, the study stresses the need for ongoing response verification and continuous system improvement to ensure long-term effectiveness and user satisfaction. At the University of Namibia, a virtual agency (rule-based chatbot) system known as: UNAM Assistant has also been successfully implemented for answering routine during busiest of times like registration [5]. The chatbot features a proprietary matching algorithm which matches student questions most exactly matching corresponding answers.Therefore, it eases administrative tasks, facilitates access to institutional documents and accelerates the processing period. User feedback shows that the chatbot is prized for its reliability and responses, with high numbers of student inquiries, and it provided evidence of its usefulness, handle. Also, the creation of “SupportBot” by the authors of [6]demonstrates the practical use of AI-Powered chatbot engines in helping college students to obtain college-related information. This system is created for the ease of communication and eases the process to access relevant academic information. Through continuous updates and user feedback facilities, SupportBot stays up-to-date and relevant to the students plan through maintaining accuracy and that enables them to make more confident decisions regarding their educational path.

Methodology

The Methodology which is required to make Career Guidance Chatbot has the following clear and simple steps. These steps helps to building and testing chatbot :-

1. Problem Identification :- The primary goal of the chatbot is to assist students in making informed decisions about their careers by providing personalized information about the college branches, career paths, and college list according to the students percentiles . Many students face problems to select the right college , right career path . They don't know about all the different jobs or what skills they need . To overcome this , our chatbot will talk to students and give them information about different careers, college courses .
2. Data Collection and Processing :- To help students, we collected information from many sources: College Information: We gathered details about colleges, the courses they offer, and the exams students need to take to get in. Job Information: We found out about different jobs, what skills are needed, and how much they pay. Salary Information: We researched how much people earn in different jobs, considering things like where they live.
3. Technology Selection :- The Career Guidance Chatbot uses modern technologies . For the frontend , frontend is built with React and styled using Tailwind CSS and data fetching is managed by Axios. The backend is developed by using Node.js at runtime and uses Express js for the server and we use MongoDB

for the database .

Backend: Developed with the Node.js runtime, using Express for the server and MongoDB as the database. We made our chatbot smarter by using AI. We used special tools called Gemini API keys to help the chatbot learn and understand things better. This makes the chatbot work faster, handle more users, and be easy to use.

Fig 1. Career Chatbot: Idea to Implementation

Fig. 1 outlines the organized development pipeline for the Career Guidance Chatbot; it describes the step from the idea to deployment. The process begins with Problem identification, i.e., identifying which problems are faced by students while choosing a career path and academic streams. After which comes Data Collection, where pertinent details around colleges, courses, job roles, salary data is collected. In the Technology Integration phase, the selected technologies—like the frontend, backend, database, and AI tools—are set in place to be the healthy base of the system. The following level, Risk-Primarily based Evaluation, assesses possible challenges including data privilege, system bias and facts reliability. Post msg that the chatbot is subjected to User Testing, whereby real users converse using the system to verify functionality and ease of use. The last milestone results in a functioning Career Guidance Chatbot with the ability to offer specific, live guidance to students.

4. Chatbot Development :- The development process included: -

Defining Conversation Flow :- We created a conversation guide for the chatbot. The guide enables the chatbot to ask essential questions regarding user interests and abilities and work preferences. Such information enables the chatbot to provide the most valuable advice to the user. We designed a system which enables matching between user input and appropriate college classes together with job choices. The system applies specific methods and rules to identify superior matching results.

The chatbot received training to provide helpful answers which were also interesting. The system provides direct answers and makes suggestions and asks follow-up questions which enhance user need understanding.

5. Implementation of Key Features :-These enhancements significantly elevated our chatbot's capabilities, introducing two core functionalities: The fresh system offers up university counseling by linking visitors with schools, preferred by specifics like user preferences, academics along with

individual test ratings. It guarantees that the guidance offered is actionable as well as objective focused. It now provides subtler guidance on career planning, feeding users on essential skills necessary for various jobs. It also analyzes user's fit to different industries, allowing a better and more thoughtful career decision-making.

RESULTS:-

During the testing phase the Career Guidance Chatbot succeeded at matching appropriate career advice to students according to their submitted questions. The chatbot system provided students with correct information that guided them through various competencies within engineering fields.

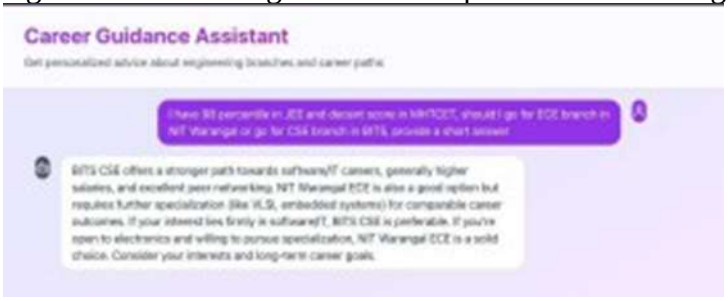

Fig. 2. AI-Based Chatbot Response to a Career Query

Fig. 2 showcases a sample interaction between the Career Guidance Chatbot and a student user. A student has to decide whether to take ECE at NIT Warangal or CSE at BITS Pilani on the basis of his JEE and MHT CET score. The chatbot asks questions in order to recommend a product with a personalized and brief description of each option. It points out that BITS CSE has better chances in software/IT with more salary prospects, and also adds that NIT Warangal ECE is a worthy alternative to consider for students looking for electronics and looking to specialise. Proactive tips from the chatbot show he is contextual and is able to consider long haul objectives, to assist users make sleek Decisions To study.

Fig 3 Question To Chatbot

Fig 4 Response From Chatbot

The image brings together a user query and the in-depth AI generated reply from a "Career Guidance Assistant" website. The Query (From Fig [3]) asos , “Which is the best branch in IIITH?”, talking about Indian Institute of Information Technology, Hyderabad. The response (from Fig [4]) highlights the best academic programs offered by IIIT H, namely Computer Science and Engineering (CSE), Electronics and Communication Engineering (ECE) and Computer Science and Data Science (CSD) and Computational Linguistics (CL) and Computational Natural Sciences (CNS). It outlines the regions of emphasis of each program, career routes, along with specialized techniques options. The assistant also advises factors to think about when selecting a branch, namely, faculty expertise, research chances and placement stats. This guide exists to support students in the selection of particular fields of study, planning chores as well as the nature of their job.

Student users communicated their requirement for both personalized guidance alongside the available recommendations. Users of the chatbot wanted it to deliver customized career recommendations which should consider individual interests alongside academic achievements and personal preference choices. User feedback suggests a particular area of improvement which could be solved through advanced AI algorithms for customizing the chatbot system.

Conclusion

Students find advantage from the Career Guidance Chatbot because it allows them to select appropriate academic and career paths. The platform provides precise information alongside professional recommendations that help users resolve their educational and professional pathway uncertainties. The chatbot provides step-by-step guidance through a structured interface that connects user preferences and educational/job choices.

The test revealed that users received suitable suggestions which stemmed from their input and predefined standards. The evaluation showed that personalized advice needs to be improved as a main concern during system assessment. The system requirements include better identification of personal student preferences and strengths and career objectives.

Routine maintenance combined with optimization work will enhance the functionality of the chatbot. User input enables the system to detect its vulnerabilities through which it can apply innovative algorithms alongside machine learning techniques for resolution. Such modifications will enhance the Chatbot's application while making it beneficial to more students across all career profiles. The career decision tool already supports students in their career selection process but stands to gain further advancement through customization and routine software improvements.

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