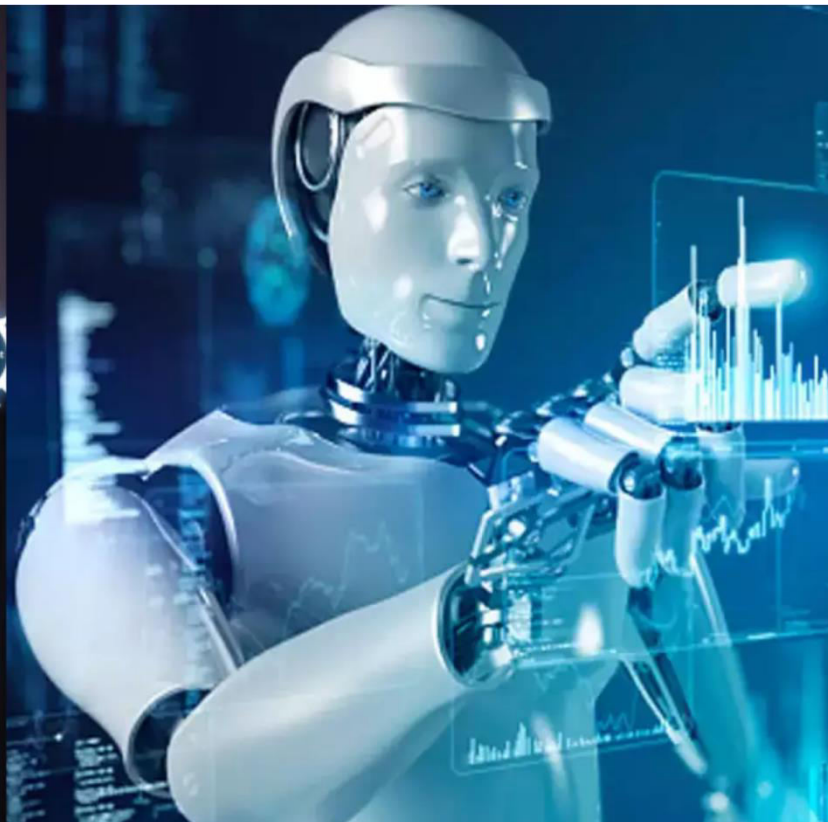




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Career Navigator Web Application

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ABSTRACT: We have developed a career guidance system that helps those students who are about to begin their higher education. Most of the time, students are not aware of what career path to follow or which academic major is in accordance with their interests. At the age of 16 to 18, the students don't have adequate maturity to accurately know about what an individual has to follow in order to choose a congenial career path. As we pass through the stages, we realize that every student undergoes a series of doubts or thought processes on what to pursue after 10th or 12th which is the single tallest question. Then comes the next agony whether they have essential skills for the stream they've chosen. Our computerized career counselling system is used to predict the suitable department for an individual based on their skills and interests. If one fills all the input data correctly such as their skills, favourite subject, hobby, etc, then automatically they will end up in choosing an appropriate course which will also reduce the failure rate by choosing a wrong career path. The system analyses students skills, abilities, and interests and recommends the fields which are most suitable for them. Smart Career Guidance System is a web-based application built on the node and express js. We have deployed various techniques and algorithms. A Career Guidance Web Application leveraging Random Forest and an AI Chatbot aims to provide personalized career recommendations based on user inputs such as skills, interests, qualifications, and market trends.

KEYWORDS: Career Path, Online Assessment, Random Forest, Skill based recommendation, Data Collection, AI chatbot

I. INTRODUCTION

The choice of a suitable graduate degree is often considered tough, Students who lack a clear vision regarding their future, tend to get distracted by various factors including their parents expectations, Friends influence and society pressure ,being uncertain of consequences and their choices. Students choose a career path that results in unsuccessful academic and professional life. The core reason behind such a failure is the mismatch between there academic field of study and their area of a interest. When it comes to choosing a career its not only on what course you choose, its more than what you want to become. Career counselling is more about knowing and understanding about yourself about your abilities and capabilities. Many times, students choose a course or stream based on societal expectations, misconceptions, or limited exposure to career options, only to later regret their decision. A common myth is that a student who excels in a particular subject in high school should automatically pursue a career related to that subject. In today's rapidly evolving job market, choosing the right career path is one of the most significant and challenging decisions facing college students. To overcome these problem of choosing a right career path we made a career navigator system which analyzes students skills, abilities, and interests and recommends the fields which are most suitable for them

II. LITERATURE SURVEY

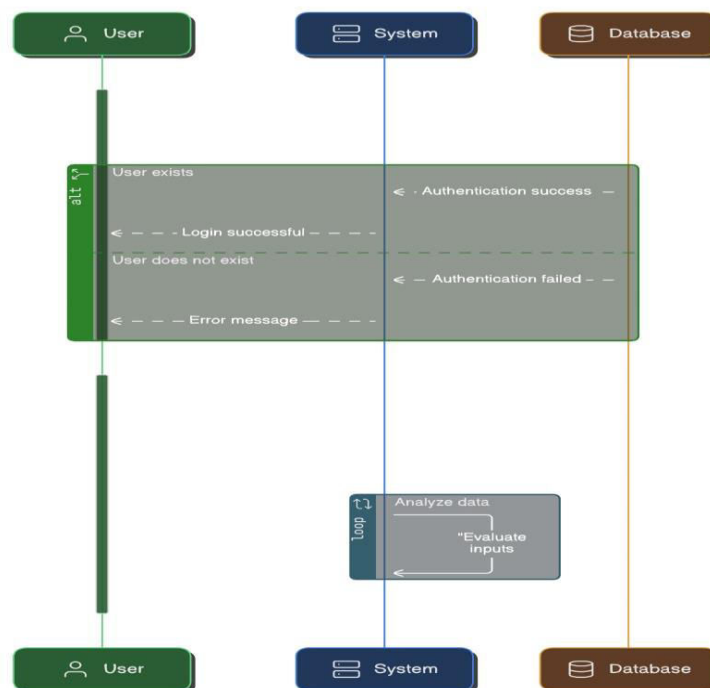
Career guidance applications have evolved significantly from traditional manual counselling methods to AI-driven, data-centric solutions. Early systems relied on static models and predefined questionnaires to suggest career paths, often lacking personalization and adaptability. The study Web-based career guidance system focuses on delivering exact information to students when they complete grades 10 and 12. With advancements in artificial intelligence and machine learning, career recommendation systems have become more sophisticated, leveraging algorithms like Random Forest to analyze multiple factors, including academic performance, interests, and industry demands. Additionally, AI-powered chatbots have revolutionized career counselling by enabling interactive and real-time guidance. The system uses a variety of data mining methods to improve career suggestions and visualization. Overall, the study presents a comprehensive strategy to help students make educated career decisions. Career recommendation

systems use machine learning algorithms to match users with suitable career paths based on skills, interests, and market trends. Random Forest, an ensemble learning method, enhances predictive accuracy by analyzing large datasets while reducing overfitting. The web application is developed using HTML, JavaScript, and CSS for a dynamic frontend, while Node.js, Express.js, and MongoDB form a scalable backend. These technologies ensure efficient data processing and interactive user experience. Future advancements may include deep learning models and real-time job market updates to improve career guidance accuracy.

III. METHODOLOGY

The methodology for developing a Career Guidance Web Application using Random Forest and AI Chatbot involves multiple stages, including data collection, preprocessing, model training, chatbot integration, and deployment. The methodology begins with data collection, where user data such as skills, educational background, interests, and market trends are gathered from reliable sources. Next, the data undergoes preprocessing, involving cleaning, handling missing values, normalizing inputs, and encoding categorical variables. The processed data is then used to train the Random Forest model, optimizing hyperparameters to improve predictive accuracy. The Random Forest algorithm is chosen due to its high accuracy and ability to handle large datasets efficiently. The methodology for Random Forest includes feature selection, data splitting, model training and evaluation metrics. An AI-powered chatbot is integrated into the system to provide interactive and real-time career guidance. The chatbot uses Natural Language Processing (NLP) to understand user queries and provide recommendations. For web development, an interactive frontend is designed using HTML, CSS, and JavaScript to allow users to input their details seamlessly. The backend is implemented using Node.js and Express.js to handle server-side logic and API endpoints, while MongoDB serves as the database for storing and retrieving user information to provide personalized career recommendations. The trained machine learning model is integrated with the backend to generate career suggestions dynamically based on user inputs. Once integrated, the system undergoes thorough testing and validation, where performance metrics are analysed and refinements are made based on user feedback. Finally, the web application is deployed, and continuous maintenance is carried out by updating the system with real-time job market data, ensuring that the recommendations remain relevant and accurate. We have also added different fields such as aptitude/IQ test, job description, trends, etc that will help students.

IV. IMPLEMENTATION DIAGRAM



V. CONCLUSION

The development of the "Career Navigator Application" was made possible through the generous support and assistance of various individuals and organizations. We sincerely thank our mentor Mrs. Komal Wani and educators for their invaluable guidance in shaping this research. We would like to express our gratitude towards Prof. Malkar Mam, HOD of Computer Department, faculty and all the lab assistants of Pimpri Chinchwad Polytechnic for their kind co-operation and encouragement which helped us in the completion of this project. We also acknowledge technological advancements that empowered our work.

VI. FUTURE SCOPE

The future scope of the "Career Navigator Web Application" includes incorporating machine learning to provide more personalized career recommendations and AI-driven tools to predict job trends. The app could expand globally by supporting multiple languages and regional preferences while offering real-time job data and integrating virtual career counselling. Additionally, it could collaborate with educational platforms to suggest relevant courses and track users' career progress, identifying skill gaps. Future developments could also include industry-specific career paths, mentorship programs, and guidance for green and remote job opportunities, aligning with the growing demand for sustainable and flexible careers.

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