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Career Connect: A Smart Platform For Bridging Students And Career Opportunities

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Abstract: Career Connect is an intelligent educational platform designed to guide students in their academic and career paths using AI-driven tools. The system predicts suitable academic streams— such as Science, Commerce, or Arts—based on parameters like aptitude scores, subject-wise academic performance, and areas of interest. It also facilitates online examinations with instant result generation, streamlining the evaluation process. Additionally, Career Connect features a university recommendation system that suggests institutions based on CGPA, university ratings, and other key metrics using machine learning algorithms. The platform further supports student university interaction through integrated web and mobile applications, enabling course management, attendance tracking, and faculty-student communication, thus creating a centralized, efficient educational ecosystem**.**

I.INTRODUCTION

The increasing complexity of educational choices and career decisions has made it challenging for students to identify the right academic paths and institutions. Career Connect aims to address this challenge by providing an intelligent platform that helps students make informed decisions about their education and career journey. The system leverages advanced machine learning algorithms to predict suitable academic streams for SSC pass-out students based on key parameters such as academic performance, area of interest, aptitude test scores, and more.

The platform also assists students in selecting the right universities by considering a variety of factors, including CGPA, university ratings, and other relevant data. By analyzing student profiles and preferences, Career Connect uses data mining techniques to recommend the most suitable educational paths and institutions, streamlining the decision-making process for students.

In addition to its predictive capabilities, Career Connect integrates academic management tools such as course material management, timetable scheduling, and attendance tracking, offering a comprehensive solution for students, teachers, and academic institutions. The platform's user-friendly interface, available through both Android and web applications, ensures accessibility and ease of use, providing a seamless experience that automates and simplifies academic tasks while improving overall educational efficiency.

II.LITERATURE SURVEY

In the development of the Career Connect platform, a thorough review of existing research and systems was conducted to understand the current trends in higher education access prediction, student performance prediction, and automated academic management. The following research papers provided valuable insights into the system’s architecture and design.

1. Development Management of Cloud Systems Learning for Higher Education Institutions (IEEE, 2019): This paper explores the benefits of Cloud Learning Management Systems (CLMS) in higher education, highlighting how cloud platforms can The platform also assists students in selecting the right universities by considering a variety of factors, including CGPA, university ratings, and other relevant data. By analysing student profiles and preferences, Career Connect uses data mining enhance learning experiences and improve

accessibility for students. The study discusses various cloud-based tools like Google Classroom, which integrates features for assignment management, course materials, and online lectures, making it easier for students and faculty to interact. It also examines how systems like WhatsApp groups are being used in universities for announcements and resource sharing.

2. Models of Behaviour of Agents in the Learning Management System (IEEE, 2019): This paper focuses on the use of agent based modelling to analyse the behaviour of students within a learning management system. By understanding the interactions between students, courses, and faculty, this paper provides insights into how personalized recommendations can be made based on student profiles, thus contributing to the design of Career Connects recommendation algorithms.

3. Smart Mobile Attendance Using Bluetooth Technology (Ankit B Dubey et al., 2019): The paper discusses the application of Bluetooth technology in tracking employee attendance within an organization, showcasing the potential of IoT-based solutions in educational settings for student attendance and presence tracking. This concept can be applied within Career Connect for automating attendance management in educational institutions.

4. Higher Education Access Prediction: Several papers have focused on using machine learning algorithms to predict student performance and academic paths. Key studies reviewed include those employing classification techniques (e.g., Naive Bayes, decision trees) to predict student divisions based on prior academic performance. This approach is directly relevant to Career Connect, which uses similar techniques to predict suitable academic streams for students based on their academic records, aptitude test scores, and personal interests.

5. Data Mining for Higher Education Systems: Various studies have explored the application of data mining techniques to address educational challenges, such as predicting student performance and improving course evaluations. These techniques have been shown to provide valuable insights that help in refining the educational experience and making more accurate predictions for students, which is a core feature of the Career Connect platform. The use of data mining will also help improve the accuracy of university recommendations within the system.

The insights gained from these papers have shaped the development of the Career Connect platform, guiding the integration of machine learning algorithms for student performance prediction, university recommendations, and automating academic processes. By utilizing existing research, Career Connect aims to enhance the decision-making process for students and educational institutions, making comprehensive, data-driven platform.

III. PROPOSED SYSTEM

It a The Career Connect platform is designed to provide an intuitive, data-driven solution for students seeking guidance on their academic streams and university selection. The system integrates machine learning algorithms, data mining techniques, and an automated academic management interface to simplify decision making and streamline the academic journey.

3.1 Key Features of the System:

1. Student Stream Prediction: The system analyses key parameters such as SSC exam scores, subject-wise proficiency (Maths and Science), aptitude test results, and personal preferences to predict the most suitable academic stream (Science, Commerce, or Arts) for the student. It uses machine learning algorithms like Naïve Bayes and decision trees for accurate predictions.

2. University Recommendation System: Once a student's academic stream is predicted, the system suggests top universities based on factors such as CGPA, university ratings, location, and course offerings. The recommendation is personalized to match the student's profile and preferences.

3. Automated Academic Management: The platform offers features to manage academic activities such as course material distribution, timetable management, attendance tracking, and communication between students and faculty. By automating these tasks, the system helps reduce administrative overheads and ensures efficient management.

4. User-friendly Interface: Career Connect provides both web and mobile applications (Android) to ensure accessibility for all users. The UI is designed to be intuitive, with easy navigation and a clean layout to enhance the user experience. Below is the architecture for our proposed system.

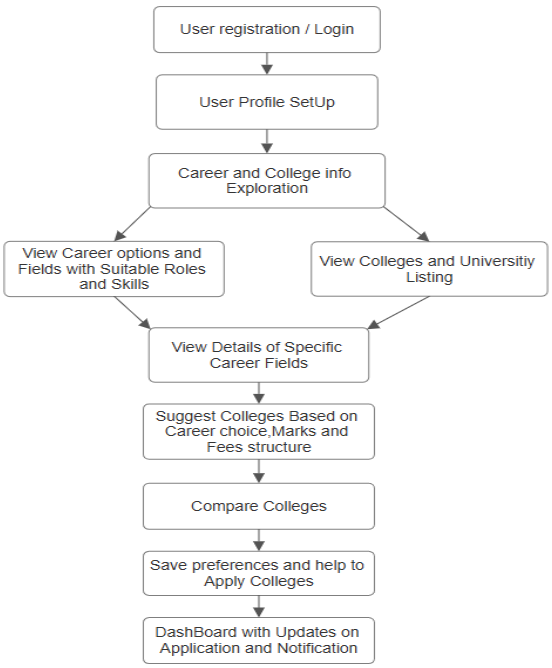

FIGURE 1. SYSTEM ARCHITECTURE

3.2 UI Flow:

The UI flow will be as follows.

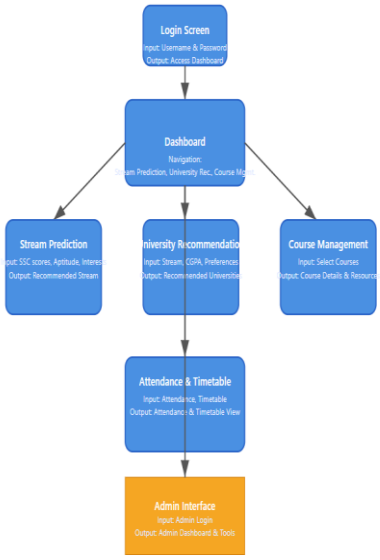

FIGURE 2. UI FLOW OF SYSTEM

IV. ALGORITHM USED

1. Naïve Bayes Classifier

The Naïve Bayes Classifier is used in the Career Connect platform to predict the most suitable academic stream for students—Science, Commerce, or Arts. It takes into account multiple parameters such as SSC exam scores, subject-wise proficiency (especially in Maths and Science), aptitude test scores, and personal interests. This probabilistic algorithm works well for classification problems, particularly when dealing with categorical data. It's fast processing and minimal training requirements make it ideal for large educational datasets.

2. K-Means Clustering

K-Means Clustering is employed to group students into clusters based on similarities in their academic profiles and interests. This unsupervised learning algorithm helps the system identify patterns and segments within the student population, enabling more personalized and relevant recommendations.

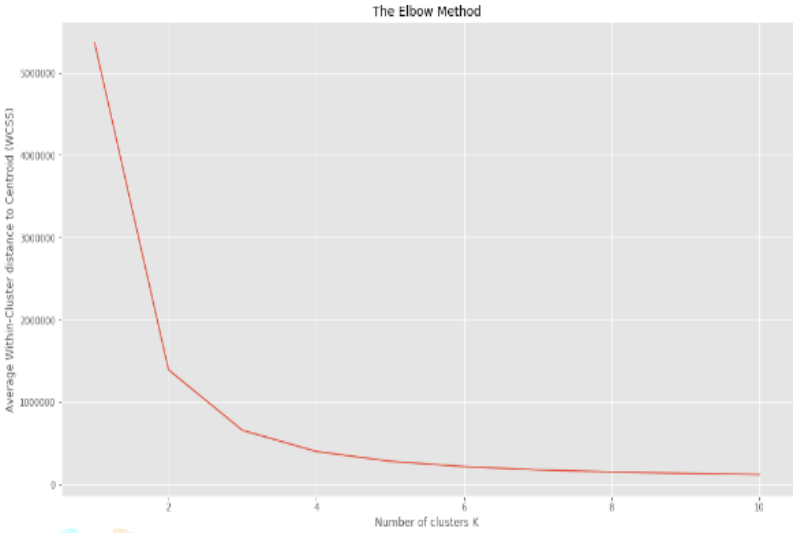

FIGURE 3. ELBOW METHOD

By organizing users with similar behaviours and attributes, Career Connect can enhance the accuracy and relevance of both stream prediction and university recommendations.

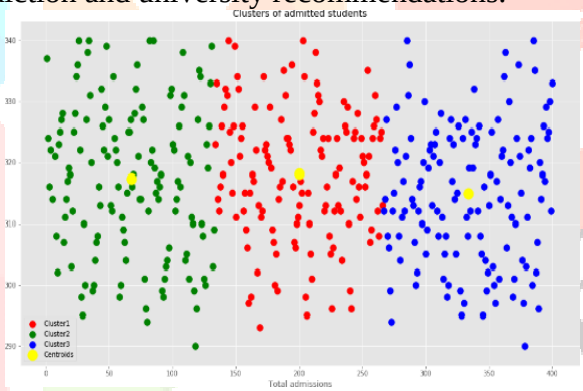

FIGURE 4. CLUSTERS OF ADMITTED STUDENTS

3. Decision Trees

Decision Trees are utilized for stream prediction and performance analysis within the system. This algorithm models decisions based on input data such as grades, test scores, and preferences. It is highly interpretable, allowing users and administrators to visualize how input variables lead to specific outcomes. Decision trees are effective in handling both categorical and numerical data, making them suitable for educational applications where mixed data types are common.

4. Logistic Regression

Logistic Regression is applied to estimate the probability of academic success or compatibility with a particular university or course. It is particularly useful for binary or multiclass classification problems, such as determining whether a student is a good fit for a certain stream or program. The algorithm analyses variables like CGPA, exam performance, and preferences to output a confidence score or likelihood for each option, supporting more informed decision-making.

5. Content-Based Filtering

Content-Based Filtering is used in the university recommendation system of Career Connect. It matches student profiles—comprising academic background, chosen stream, location preferences, and performance metrics—with university databases. This algorithm recommends universities that closely align with a student's specific profile, offering a highly personalized experience. Unlike collaborative filtering, content-based filtering focuses on individual data rather than relying on group behaviour patterns.

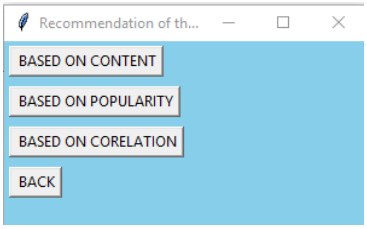

FIGURE 5. TKINTER BUTTONS

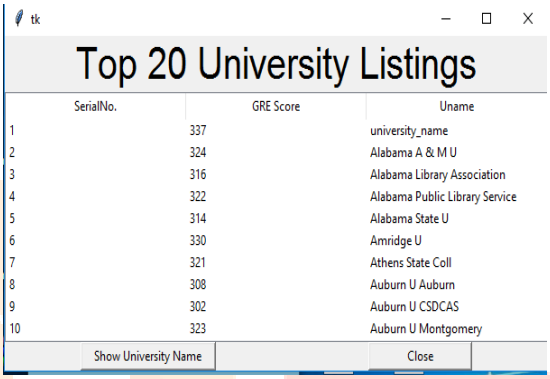

FIGURE 6. UNIVERSITY LIST

V. FUTURE SCOPE

1. Enhanced Classification Using Standardized Test Scores:
   In future updates, the system will incorporate rule-based classification based on international standardized test scores such as GRE Verbal, GRE Quantitative, TOEFL, and CGPA. This enhancement will allow the recommendation engine to cater more precisely to students aspiring for higher education abroad.
2. Inclusion of More Personalization Parameters:
   The platform aims to evolve by considering additional parameters like student's fee budget, preferred location for study, and prior job experience. These parameters will enhance personalization and allow for more accurate university and course recommendations.
3. Semantic Review Analysis:
   To further improve the recommendation system, semantic analysis will be applied to user reviews of universities and courses. This natural language processing approach will help interpret qualitative feedback and integrate sentiment analysis into decision-making.
4. Integration of Online Learning Modules:
   The platform may be expanded to support live online classes and recorded lecture videos, minimizing reliance on external meeting tools. This will allow universities to use Career Connect as a self-contained learning management system (LMS).
5. Cloud Storage Integration:
   Future enhancements include integrating cloud storage to allow seamless upload, access, and sharing of academic materials, files, and multimedia resources between students and faculty members.
6. Performance Analytics:
   The system will introduce statistical performance analysis of students based on tracked academic and activity data. This will help faculty assess learning outcomes and support data-driven academic guidance.
7. Full Admin and Student Data Management:
   A robust login/signup feature will be implemented to store and manage data for both students and administrators securely. This will lay the foundation for an institution-wide digital ecosystem.

8. Improvement in Algorithm Accuracy:
   To enhance prediction reliability, feature scaling and continuous algorithm refinement will be performed, ensuring the system adapts to new data and achieves higher accuracy in stream and university recommendations.
9. Web-Hosting and Portability:
   The Career Connect platform is planned to be deployed as a web application, allowing it to be easily hosted and accessed by any educational institution. This promotes scalability and broader implementation.

VI. CONCLUSION

The *Career Connect* platform is a comprehensive and intelligent system designed to assist students in making informed decisions regarding their academic paths and university selections. By leveraging machine learning algorithms such as Naïve Bayes, Decision Trees, Logistic Regression, and K-Means, the system effectively predicts suitable academic streams and recommends universities tailored to individual profiles. Additionally, the platform simplifies academic management through automated features like attendance tracking, timetable management, and course material sharing.

With an intuitive user interface accessible via both web and mobile applications, *Career Connect* enhances user engagement and usability. The integration of data-driven insights ensures high accuracy in recommendations while reducing the time and effort traditionally required in academic decision-making.

Overall, *Career Connect* not only bridges the gap between students and higher education opportunities but also modernizes the academic ecosystem with smart, scalable, and user-centric solutions. As the system evolves, future enhancements will continue to strengthen its predictive capabilities and expand its scope, making it a vital tool for students and educational institutions alike.

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