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Academic Performance Assessment and Career Guidance System

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Abstract: *In today's data-driven educational landscape, the ability to monitor student performance and offer meaningful guidance is essential for holistic development.*
This project offers the Academic Performance Assessment and future Guidance System, an intelligent and interactive system intended to assess academic achievement, pinpoint subject specific difficulties, and help students make well-informed future decisions.
To provide individualized insights, the system uses performance measures like grades, skill sets, attendance, and project scores.

Keywords: Academic Performance Evaluation, Student Analytics, Career Guidance System, Adaptive Learning Path, Educational Dashboard Skill-Based Recommendation, Mentor Support Platform, Future Career Planning, Data-Driven Education

I. INTRODUCTION

In the age of outcome-based education, keeping an eye on students' progress and helping them choose the best career route has become essential to their academic growth. Personalized insights and the capacity to match academic results with practical career chances are frequently lacking in traditional systems. Our initiative fills that gap by introducing the Academic Performance Assessment and Career Guidance System, an intelligent platform that uses student data analysis to offer career and academic recommendations that are specifically tailored to each individual.
The system provides a thorough assessment of a student's academic path by utilizing academic scores, skill profiles, attendance records, and project performance. Along with suggesting appropriate learning materials and job fields, it helps students recognize their areas of strength and growth. The platform can also be used by mentors to monitor progress, provide customized guidance, and assist with the student's overall development. This method acts as a link between academic achievement and future preparedness, assisting students in making wise choices and being Ready for professions that are in line with industry standards.

OBJECTIVES:

The primary objectives of the system are:

- To analyse student performance comprehensively using historical data such as grades, course records, and projects.
- To provide personalized career and academic guidance based on data-driven insights.
- To enable mentors to monitor and understand student progress through intuitive dashboards.
- To enhance the mentor-student collaboration using predictive analytics and visualization techniques

II. LITERATURE SURVEY

Using a well-established approach and procedure, the study [1] provides research that considers the diversity arising from different high school backgrounds when evaluating university students' performance throughout their first

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academic year. The findings of this study demonstrate that by recognizing and addressing issue areas, it is feasible to improve student performance when undesirable indicators occur in a number of high school settings.

Enhancing pupils' knowledge and abilities is the main goal of this study []. To bridge this gap, machine learning is used to analyse academic success and rank models are used to assess learning potential. The incorporation of image sensors enables the study of multimedia data. These results demonstrate the importance of students' growth and the cumulative impact of courses, which ultimately results in more effective and individualized teaching methods.

The primary objective of this study is to improve students' knowledge and skills [3]. In order to close this gap, learning potential is evaluated using rank models, and academic achievement is analysed using machine learning. Multimedia data analysis is made possible by the integration of picture sensors. These findings highlight the significance of students' development and the cumulative effect of courses, which eventually leads to more specialized and successful teaching strategies.

While examining the SWOT (Strengths, Weaknesses, Opportunities, and Threats) factors related to this change, the research [4] focuses on improvement strategies. The Analytic Hierarchy Process (AHP) approach was used to determine the SWOT criteria's magnitude based on the questionnaire, and a fuzzy MARCOS methodology was used to choose the best answers. The research recommends employing innovative teaching techniques, capturing students' attention, and improving the learning environment in order to increase online education and learner satisfaction.

According to the research [5], source code analysis is still mostly done by hand and is therefore prone to errors, whereas multiple-choice tests are easy to analyse using automated techniques. As such, it presents a methodology for evaluating C# student work in the context of OE-NIK SzTF2. Both analysing syntactic code and executing code to compare input-output pairs are capabilities of this model-based software.

III. PROPOSED SYSTEM

A. Login and User Authentication Module

For mentors and students alike, the system has a safe login process. A distinct ID and password are given to each user, which they must input in order to access the portal. This guarantees allowed access and safeguards student data confidentiality.

B. The student dashboard section

A customized dashboard that shows academic success over semesters, courses, and tests is given to students. Bar charts and line graphs are examples of visual analytics that are used to illustrate academic patterns over time. The dashboard enables students to track their development and conduct a thorough assessment of their academic career.

C. Evaluation of Continuous Assessment (CAT Analysis)

Students can examine their performance on a subject- and semester-by-subject basis using the platform, which tracks the results of internal exams like Continuous Assessment Tests (CATs). Comparative reports assist in identifying areas that need scholarly attention as well as trends of improvement.

D. Module for GPA and CGPA Visualization

Students can monitor their total CGPA over time as well as their GPA by semester using an interactive visualization component. Graphs assist students see how their performance fits with their academic objectives by offering insights into consistency and academic improvement.

E. Subject-Specific Evaluation of Performance

Individual subject scores can be broken down in detail thanks to this module. By comparing their performance on various tests and disciplines over the course of a semester, students can more easily see which subjects need more attention or assistance.

F. Domain-Based Assessment of Skills

Performance is categorized by the system into pertinent categories including databases, cloud computing, and programming based on the academic topics and their scores. It helps the student find their academic interests and strengths by determining the domain they thrive in.

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G. Dashboard of Mentors

A thorough dashboard that gives mentors access to all allocated students' academic information is provided. Subject-wise insights, domain analysis, GPA/CGPA trends, and graphic summaries of CAT scores are all included in this. This module allows mentors to keep track of students' progress and offer tailored academic assistance.

H. Form for Career Aspiration and Planning

Students specify their future intentions on a guided form, such as choosing to attend college or be placed on campus. If the student selects placements, the system suggests companies and role requirements based on their skill set and current job profiles. If the student decides to pursue higher education, the system recommends appropriate universities, tests (such as the GATE and CAT), and requirements for entrance.

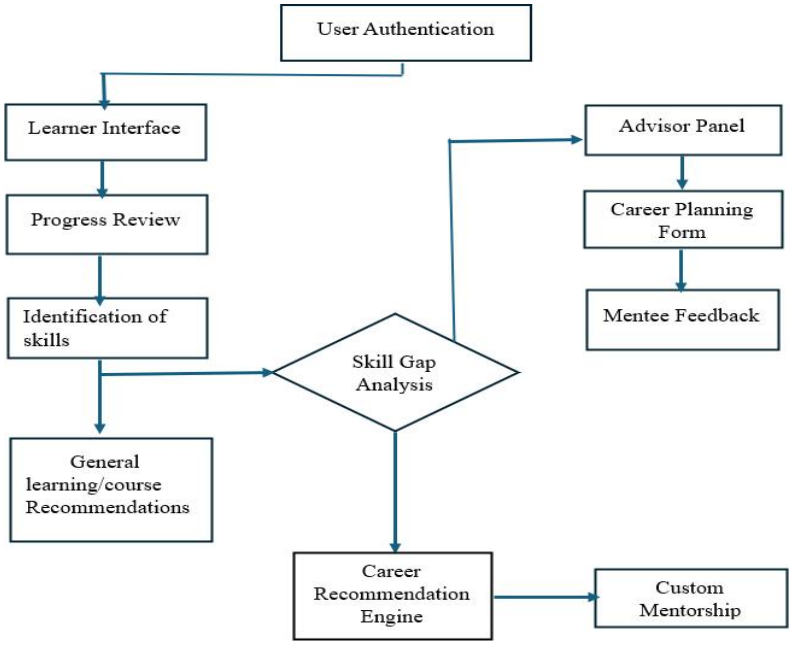

Fig 1: System Flow

IV. IMPLEMENTATION

The implementation of the proposed Academic Performance Assessment and Career Guidance System involves the integration of multiple components that work together to offer students insightful academic support and future planning guidance. This section outlines the key modules involved in the practical deployment of the system.

The front and back ends

Streamlit, a Python-based framework, is used in the system's development, offering an interactive and user- friendly front-end interface. Dashboards and individualized insights are easily navigable by anyone, including mentors and students. On the backend, Scikit-learn, Pandas, and visualization tools like Matplotlib and Seaborn are used for data processing, model training, and skill mapping. Real-time data rendering and seamless user interactions are guaranteed by the interface's connection to the logic.

Secure Authentication of the System

A secure login mechanism is put in place to guarantee that only authorized users can access the site. Every mentor and student must use a different ID and password to log in. This preserves privacy and guarantees that only the intended users can access sensitive academic data. For external academic reviewers or admin- level control, role-based access can be expanded.

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Visualizations and Performance Dashboard

The system's capacity to display academic data through dynamic dashboards is one of its key features. These consist of domain-based assessments, division analysis, GPA/CGPA trend lines, and subject-wise performance graphs. Visual aids make it easier for mentors and students to evaluate academic progress, analyze data, and pinpoint areas of strength or concern.

Career Planning and Feedback Form

Students can indicate preferences like choosing higher education, placements, or entrepreneurial options using a standardized career planning form. The algorithm makes recommendations for study and careers based on their feedback and talent profile. Using an integrated response form, mentors can also offer input, completing the circle with individualized direction and one-on-one mentoring.

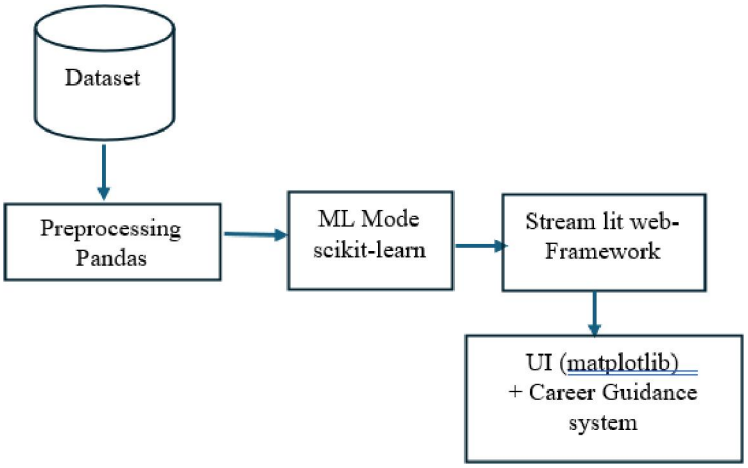

Fig 2: Working Architecture

V. EXPERIMENTAL RESULT

Fig 1. Login Page

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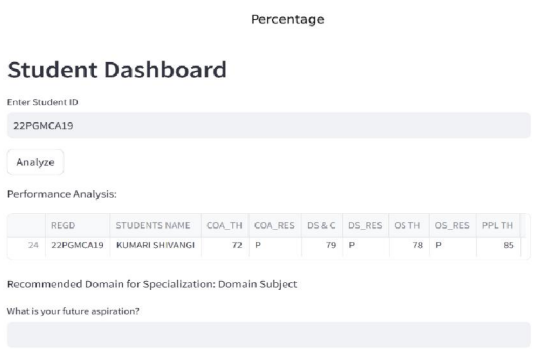

Fig 2 Student Dashboard

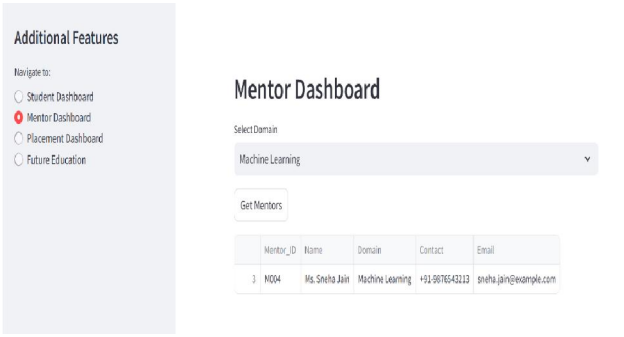

Fig 3. Mentor Dashboard

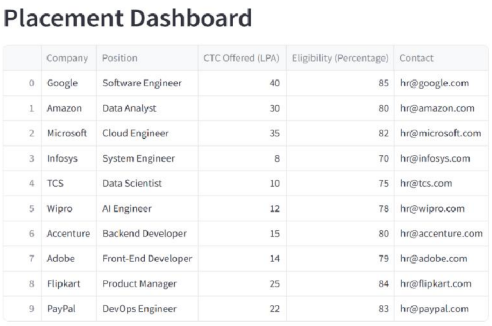

Fig 4. Placement Dashboard

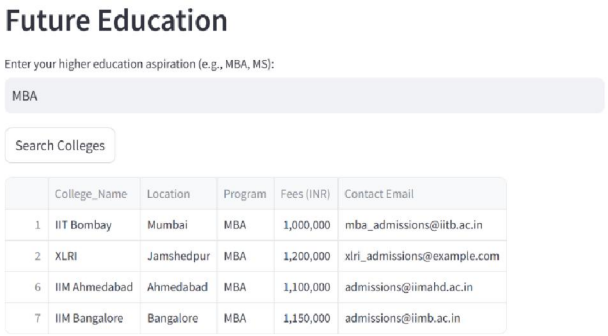

Fig 5. Future Education

VI. CONCLUSION

A tool that analyzes students' academic achievement via data analysis and categorization is essential in today's educational environment. This tool responds to this need by providing students with the capacity to assess themselves through visual representations of the findings of an investigation of their academic achievement. In addition to identifying a student's preferred area, it offers helpful guidance on how to go forward with their long-term learning objectives. Essentially, this application is crucial for helping students find their passions, align their academic objectives with their hobbies, and provide the required direction by providing them with the tools they need to clearly accomplish their goals.

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