

Intelligent Peer Review and Rubric-Based Assessment System

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Abstract: *Many first-year students face confusion in choosing the right career domain due to limited exposure and lack of guidance. To address this, a Smart Student Collaboration and Career Guidance Platform is proposed, which helps students identify suitable domains based on their interests and skills. The system includes features such as domain recommendation, real-time event updates, peer collaboration based on skill matching, and knowledge sharing. It also introduces a structured hackathon system to encourage innovation and project-based learning. Overall, the platform enhances student engagement, improves collaboration, and supports informed career decision-making.*

Keywords - *Career Guidance, Student Collaboration, Domain Recommendation, Event Management, Skill Matching, Hackathon System, Knowledge Sharing.*

I. INTRODUCTION

In today's rapidly evolving technological landscape, students are presented with a wide range of career opportunities across multiple domains such as Artificial Intelligence (AI), Web Development, Internet of Things (IoT), Cybersecurity, Data Science, and Cloud Computing. While this diversity creates numerous possibilities, it also leads to confusion, particularly among first-year students who lack sufficient knowledge, experience, and guidance to make informed decisions about their career paths. Without proper direction, students may choose domains that do not align with their interests or abilities, which can affect their academic performance and future career prospects.

Another major challenge faced by students is the lack of awareness about academic and technical events such as workshops, seminars, hackathons, and internship opportunities. These events play a crucial role in enhancing practical knowledge, improving technical skills, and providing industry exposure. However, due to the absence of a centralized platform, information about such opportunities is often scattered across multiple sources, making it difficult for students to stay updated and actively participate. In addition, collaboration among students is often limited due to the lack of structured networking systems. Students with innovative ideas may not have the required technical skills to implement them, while others with technical expertise may lack project ideas. This disconnect prevents effective teamwork and reduces the overall potential for innovation. Moreover, interaction between students of different departments is minimal, limiting interdisciplinary learning and knowledge exchange. To address these challenges, this paper proposes a Smart Student Collaboration and Career Guidance Platform, a centralized web-based application designed to support students in making informed career decisions, staying updated with relevant opportunities, and collaborating effectively with peers. The system provides domain recommendations based on user interests and skills, ensuring that students receive personalized guidance. It also includes an event management module that aggregates and displays information about college and nearby academic events in real time. Furthermore, the platform incorporates a smart collaboration system that connects students based on complementary skills, enabling them to form effective teams for projects, competitions, and hackathons. A knowledge-sharing module allows students to exchange resources, conduct peer learning sessions, and enhance their understanding across different domains. By integrating these features into a single platform, the proposed system aims to create a supportive and innovative academic environment.

Overall, the system seeks to reduce career confusion, improve student engagement, promote interdisciplinary collaboration, and empower students to develop the skills necessary for their future careers

II. LITERATURE SURVEY

The rapid growth of educational technology has led to the development of various platforms aimed at improving student learning, career guidance, and academic engagement. Several existing systems focus on specific functionalities such as online learning platforms, event management portals, career guidance systems, and collaboration tools. For instance, e-

learning platforms provide access to structured courses and study materials, while event portals help students stay informed about workshops, seminars, and hackathons. Similarly, some platforms offer job recommendations and internship opportunities based on user profiles.

Despite these advancements, most existing systems operate in isolation and focus on a single aspect of student development. There is a lack of integration among these platforms, which forces students to rely on multiple applications to access different types of information. This fragmentation creates inefficiency, reduces user engagement, and often leads to missed opportunities. For example, a student may use one platform to learn programming skills, another to track events, and yet another to connect with peers, resulting in a disconnected experience.

Research studies have shown that recommendation systems can play a significant role in guiding users by analyzing their interests, preferences, and behavior. In the context of education, such systems can help students identify suitable career domains and learning paths. Similarly, collaboration tools have proven effective in enhancing teamwork, enabling knowledge sharing, and fostering innovation among users. These tools allow individuals with different skill sets to work together and achieve common goals more efficiently.

However, existing collaboration systems are often limited in scope and do not provide intelligent matchmaking based on complementary skills. Moreover, they rarely support cross-department interaction, which is essential for interdisciplinary project development. In addition, most current platforms lack features such as real-time event tracking, integrated knowledge sharing, and structured project management within a single system.

Therefore, there is a clear need for a unified and comprehensive platform that integrates career guidance, event management, collaboration, and knowledge sharing into a single ecosystem. The proposed Smart Student Collaboration and Career Guidance Platform aims to bridge this gap by combining all these functionalities, thereby providing a seamless and efficient solution for student development

III. METHODOLOGY

This section describes the overall design, architecture, and working process of the proposed Smart Student Collaboration and Career Guidance Platform. The system is developed as a web-based application that integrates multiple functional modules to provide a unified solution for student development, collaboration, and career guidance.

A. System Architecture Overview

The proposed system follows a modular architecture, where each module is responsible for a specific functionality. These modules interact with each other through a centralized backend server and database. The major components of the system include:

User Authentication Module

Domain Recommendation Module

Event Management Module

Collaboration Module

Knowledge Sharing Module

Hackathon Management Module

The frontend interface allows users to interact with the system, while the backend handles data processing, storage, and logic execution.

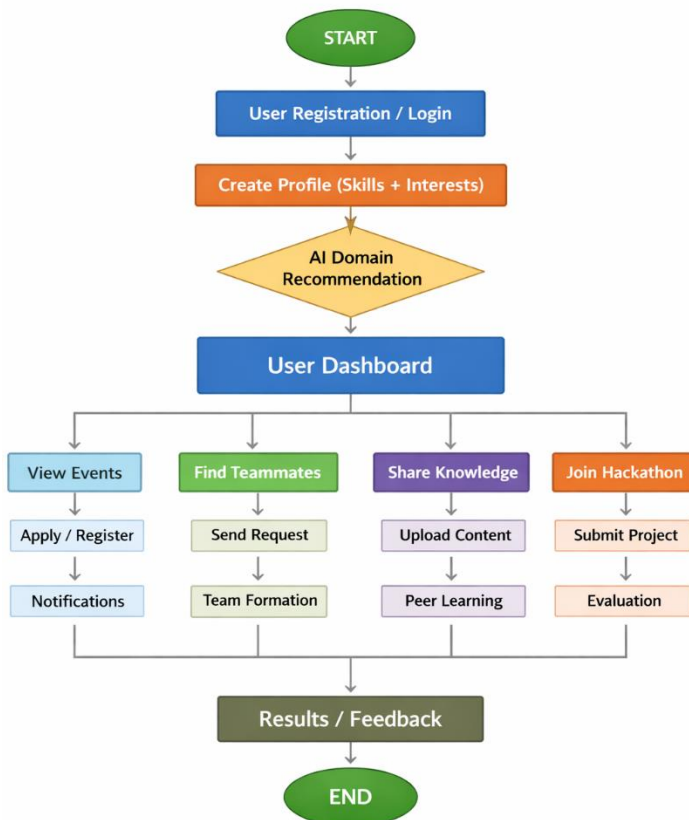


Fig. 1: System Architecture of the Smart Student Collaboration and Career Guidance Platform

B. User Authentication Module

This module handles user registration and login functionalities. Students create accounts by providing basic details such as name, department, year of study, and skill sets. Authentication ensures secure access to the platform and enables personalized user experiences.

C. Domain Recommendation Module

The domain recommendation module assists students in identifying suitable career paths based on their interests and skills. Students input their preferences, and the system analyzes this information to suggest relevant domains such as Artificial Intelligence, Web Development, IoT, or Cybersecurity. This helps reduce confusion and provides direction for future learning.

D. Event Management Module

The event management module acts as a centralized hub for academic and technical events. It collects and displays information about:

- College events
- Nearby college events
- Workshops and seminars
- Hackathons and internships

Students receive notifications and reminders about upcoming events, ensuring they do not miss valuable opportunities.

E. COLLABORATION MODULE

The collaboration module enables students to connect with peers who possess complementary skills. Each student profile includes a list of skills and interests. The system matches students based on these attributes and allows them to send collaboration requests.

Once a request is accepted, students can communicate and work together on projects. This module encourages teamwork and helps students build practical experience.

F. Knowledge Sharing Module

This module promotes peer-to-peer learning by allowing students to share knowledge across different domains. Users can:

Upload notes and resources

Share tutorials and videos

Conduct learning sessions

This enhances technical understanding and supports cross-department learning.

G. Hackathon Management Module

The hackathon module organizes monthly competitions within the platform. Students can:

Register for hackathons

Submit project ideas

Upload project demonstrations

Projects are evaluated, and top-performing teams are awarded. This module encourages innovation, creativity, and real-world problem solving.

H. System Workflow

The overall workflow of the system is as follows:

Student registers and logs into the platform

Creates profile with skills and interests

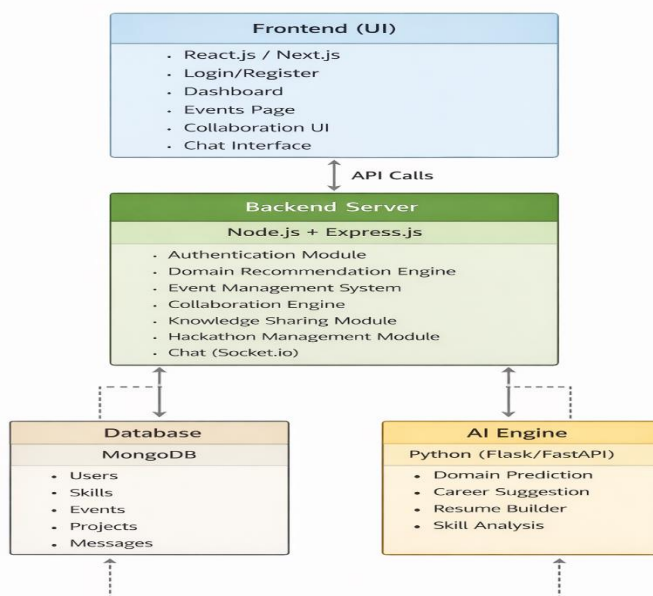
Receives domain recommendations

Browses events and opportunities

Connects with other students for collaboration

Shares knowledge and learns from peers

Participates in hackathons and submits projects



I. Technology Stack

The system is implemented using modern web technologies:

Frontend: React.js (for user interface)

Backend: Node.js with Express.js (for server-side logic)

Database: MongoDB (for data storage)

Optional AI Module: Python (for recommendation system)

IV. RESULT AND DISCUSSION

The proposed Smart Student Collaboration and Career Guidance Platform is designed to address key challenges faced by students, particularly in career decision-making, collaboration, and awareness of academic opportunities. Although the system is conceptualized as a web-based application, its expected performance can be analyzed based on functional outcomes, usability, and user engagement.

The implementation of a centralized platform is expected to significantly improve student participation in academic and technical activities. By providing real-time updates on events such as workshops, seminars, hackathons, and internships, the system ensures that students remain informed and actively involved. Unlike traditional methods where information is scattered across multiple sources, the unified platform simplifies access and increases event participation rates.

Another major improvement is observed in student collaboration. The smart collaboration module enables students to connect with peers who possess complementary skills, thereby promoting teamwork and interdisciplinary project development. This feature helps students overcome limitations related to individual skill gaps and encourages knowledge exchange across different departments. As a result, students are more likely to engage in innovative projects and practical learning experiences.

The domain recommendation module plays a crucial role in enhancing career clarity among students. By analyzing user interests and skill sets, the system provides personalized domain suggestions, helping students make informed decisions about their future career paths. This reduces confusion and improves confidence in selecting a specialization, which is especially beneficial for first-year students.

The platform also contributes to knowledge enhancement through its knowledge-sharing module. Students can access shared resources, tutorials, and peer-conducted sessions, which support continuous learning and skill development. This collaborative learning environment fosters a culture of mutual growth and academic excellence.

To evaluate the effectiveness of the system, several performance metrics can be considered:

User Engagement Rate: Number of active users and frequency of platform usage

Event Participation Rate: Increase in student attendance for academic events

Collaboration Count: Number of successful student collaborations and team formations

Project Submission Rate: Number of projects submitted in hackathons

User Satisfaction: Feedback collected from students regarding usability and usefulness

V. CONCLUSION

The proposed **Smart Student Collaboration and Career Guidance Platform** presents a comprehensive solution to the key challenges faced by students in modern academic environments, particularly in the areas of career decision-making, collaboration, and access to opportunities. By integrating multiple functionalities such as domain recommendation, event management, skill-based collaboration, and knowledge sharing into a single web-based system, the platform creates a unified and efficient ecosystem for student development.

One of the major contributions of the system is its ability to reduce confusion in selecting career paths by providing personalized domain suggestions based on individual interests and skills. This ensures that students can make informed decisions early in their academic journey. Additionally, the centralized event management module helps students stay updated with important academic and technical events, thereby increasing participation and exposure to real-world learning opportunities.

The collaboration module further enhances the platform by enabling students to connect with peers who possess complementary skill sets. This promotes teamwork, encourages interdisciplinary learning, and supports the development of innovative projects. The inclusion of a knowledge-sharing module strengthens peer-to-peer learning and fosters a culture of continuous improvement. Moreover, the hackathon management system provides a structured environment for students to showcase their ideas, gain recognition, and develop practical skills.

Overall, the platform not only improves student engagement but also empowers learners to actively participate in their academic and professional growth. It bridges the gap between student potential and available opportunities, creating a more connected and innovation-driven academic community.

For future enhancements, the system can be extended by incorporating **Artificial Intelligence-based recommendation models** to provide more accurate and adaptive career guidance. The development of a **mobile application** can improve accessibility and user convenience. Additional features such as integration with professional networking platforms, internship recommendation systems, real-time chat enhancements, and advanced analytics for tracking student progress can further enhance the effectiveness of the platform.

In conclusion, the proposed system offers a scalable, user-friendly, and impactful solution that supports holistic student development and prepares learners for successful careers in an increasingly competitive and technology-driven world.

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