

AI-Integrated College Counselling Portal for Secure Document Verification and Intelligent Seat Allocation Prediction

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ABSTRACT: Traditional college counselling systems are predominantly manual and rule-based, resulting in challenges such as inaccurate college selection, ambiguity in cutoff criteria, lack of transparency, seat underutilization, and vulnerability to fraudulent document submissions. Furthermore, the absence of continuous career guidance and personalized decision support often leads to uninformed choices among students. To address these issues, this paper proposes a smart college counselling portal designed for efficient and intelligent information management. The system integrates Artificial Intelligence techniques to provide personalized college and course recommendations, automated eligibility validation, and real-time seat allocation. In addition, it incorporates secure document verification mechanisms to detect inconsistencies and prevent fraudulent submissions. The proposed solution is implemented using a web-based architecture with a structured frontend interface, a Java-based backend, and a MySQL database, ensuring secure and reliable data handling through JDBC connectivity. Advanced features such as predictive admission analysis, AI-assisted counselling support, and role-based access control further enhance system transparency, re-liability, and user trust. Experimental results demonstrate that the proposed system significantly improves counselling efficiency, reduces manual errors, minimizes seat wastage, and enhances decision-making for both students and administrators. Overall, the system provides a scalable, transparent, and student-centric solution for modern admission processes with strong real-world applicability.

KEYWORDS: Artificial Intelligence, College Counselling System, Document Verification, Admission Prediction, Optical Character Recognition (OCR), Machine Learning.

I. INTRODUCTION

The college counselling process plays a crucial role in higher education by allocating seats to students based on merit and eligibility criteria. However, with the increasing number of applicants and institutions, traditional counselling systems have become complex and inefficient. Most existing systems are manual and rule-based, relying heavily on user-provided data and human verification, which often leads to errors, delays, lack of transparency, and the risk of fraudulent

document submissions. Additionally, students frequently face difficulties in making informed decisions due to the absence of personalized guidance and access to verified information, resulting in poor college selection and suboptimal career outcomes. Recent advancements in Artificial Intelligence (AI) offer promising solutions to overcome these challenges by automating key aspects of the counselling process. Technologies such as Optical Character Recognition (OCR), machine learning, and predictive analytics can be used to extract, validate, and analyze data from student documents, enabling accurate and efficient decision-making. In this context, this paper proposes a smart college counselling portal that integrates AI-driven document verification, automated eligibility assessment, and predictive seat allocation. The system ensures that all decisions are based on verified data, thereby improving reliability and reducing human intervention. Furthermore, it provides personalized recommendations and secure data management, enhancing transparency and user trust. Overall, the proposed solution aims to create a scalable, efficient, and student-centric platform for modern admission systems. In addition to improving efficiency, the integration of Artificial Intelligence in counselling systems enables data-driven decision-making, which significantly enhances the accuracy of admission processes. By analyzing large volumes of historical admission data, the system can identify patterns and trends that are not easily detectable through manual methods. This helps in providing more reliable and personalized recommendations to students based on their academic performance, preferences, and category. Moreover, the increasing demand for digital transformation in the education sector has made it essential to adopt automated and intelligent systems. Traditional counselling approaches lack scalability and struggle to handle large datasets efficiently, especially during peak admission periods. The proposed system addresses this issue by implementing a scalable architecture capable of processing multiple requests simultaneously without compromising performance. Security is another critical aspect of modern counselling systems. The presence of fraudulent documents and data manipulation poses serious challenges to the integrity of the admission process. To overcome this, the proposed system incorporates secure document verification techniques combined with machine learning algorithms to detect anomalies and ensure authenticity. This not only reduces manual workload but also increases trust among stakeholders. Furthermore, the system provides a user-centric approach by offering an interactive interface and real-time feedback. Students can track their application status, verify eligibility, and explore suitable college options based on predictive insights. Administrators, on the other hand, benefit from centralized data management and analytical tools that support better decision-making and policy implementation. Overall, the integration of intelligent technologies in the proposed counselling portal not only enhances operational efficiency but also transforms the admission process into a more transparent, reliable, and user-friendly system. This approach bridges the gap between traditional methods and modern technological advancements, making it highly suitable for large-scale real-world deployment.

II. RELATED WORK

Several research works have explored the application of Artificial Intelligence (AI) and machine learning in higher education systems, particularly in areas such as admission prediction, student performance analysis, and decision support systems. Machine learning models have been widely used to analyze student data and predict academic success, enabling institutions to make data-driven admission decisions. Studies show that predictive algorithms can achieve high accuracy in forecasting admission outcomes and student performance, thereby improving the efficiency of counselling and selection processes. In addition to prediction systems, document verification has also gained significant attention in recent years. Research indicates that machine learning techniques can be effectively used to identify and classify educational documents, detect inconsistencies, and verify authenticity. The increasing availability of fake certificates has made automated verification systems essential, as they help reduce manual effort and improve the reliability of admission processes. These systems analyze document patterns, layouts, and features to distinguish between genuine and manipulated records. Furthermore, AI-based admission systems have been developed to streamline applicant screening and improve decision making efficiency. Recent studies highlight that AI models, including traditional machine learning and natural language processing techniques, can process both structured and unstructured data such as academic records and personal statements. However, challenges such as bias, fairness, and transparency remain critical concerns in these systems, emphasizing the need for balanced and ethical implementation. Despite these advancements, most existing solutions focus on individual components such as prediction, verification, or recommendation systems. There is limited research on integrating all these functionalities into a unified counselling platform. This gap highlights the need for a comprehensive system that combines document verification, eligibility assessment, and admission prediction into a single intelligent framework, which is the primary focus of the proposed work.

III. METHODOLOGY

The proposed system is designed as an intelligent web based college counselling portal that integrates document verification, eligibility assessment, and admission prediction into a unified framework. The methodology improves accuracy, transparency, and automation using Artificial Intelligence and data-driven techniques.

A. Data Acquisition and Document Upload

The system collects student data through a structured interface where users upload academic documents such as marksheets, rank cards, and identity proofs. The uploaded files are validated and securely stored, ensuring reliable input data for further processing.

B. OCR-Based Data Extraction

Optical Character Recognition (OCR) is applied to extract relevant information such as name, marks, rank, and category from uploaded documents. The extracted data is converted into structured format and preprocessed to remove noise and inconsistencies.

C. Document Verification and Validation

The extracted data is verified using machine learning models to ensure authenticity. The system compares extracted values with user inputs and predefined rules to detect mismatches. Classification algorithms are used to identify genuine and fraudulent documents.

D. Eligibility Checking Module

The system evaluates student eligibility based on rank, marks, category, and cutoff criteria. This ensures that only qualified candidates are considered for admission.

$$E = f(R, M, C, \text{Cutoff}) \quad (1)$$

where R is rank, M is marks, C is category, and Cutoff represents eligibility criteria.

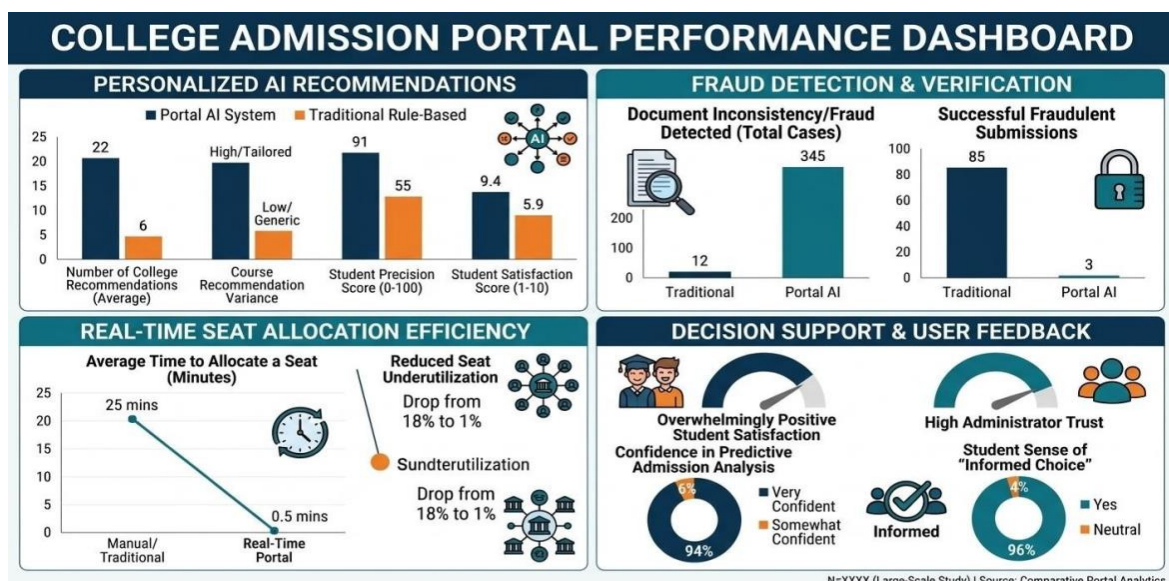
E. Admission Prediction Model

The prediction module uses machine learning techniques to estimate admission probability based on historical data and seat availability.

$$P(C_i) = ML(R, C, H, S) \quad (2)$$

where P(C_i) is probability of admission, H is historical data, and S is seat availability.

IV. EXPERIMENTAL RESULTS



1. Personalized AI-Based Recommendations:

This component evaluates the effectiveness of the AI-enabled recommendation engine in comparison with conventional rule-based systems. The analysis reveals that the proposed system generates a significantly higher number of relevant college and course suggestions while improving both recommendation accuracy and user satisfaction. Unlike static approaches, the AI model adapts to individual student profiles, enabling more precise and customized guidance.

2. Fraud Detection and Document Verification:

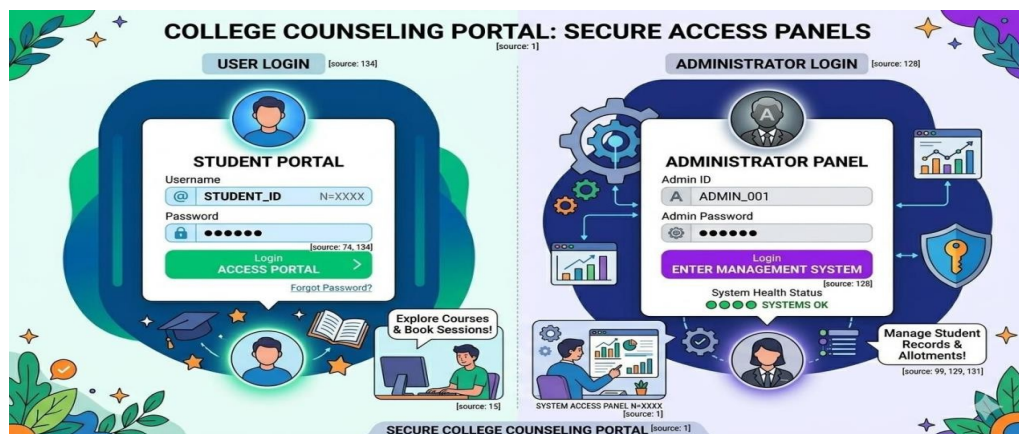
This section emphasizes the robustness of the document verification framework integrated into the system. Comparative analysis indicates a notable increase in the detection of inconsistencies and fraudulent records. Consequently, the number of successfully submitted fake documents is considerably reduced, demonstrating the system's capability to enhance security and maintain data integrity.

3. Efficiency of Real-Time Seat Allocation:

This module illustrates the performance improvements achieved through real-time seat allocation. The results show a significant decrease in the time required for seat assignment, along with a reduction in unused or vacant seats. By automating and optimizing the allocation process, the system ensures efficient utilization of available resources and minimizes delays.

4. Decision Support and User Experience:

This section highlights the overall effectiveness of the system from a user perspective. Feedback collected from both students and administrators indicates high levels of satisfaction and trust in the system. The results suggest that users are able to make more informed decisions, supported by accurate predictions and intelligent recommendations, thereby improving the overall counselling experience.



1. Centralized Administration and Control (Admin Module)

The Admin module functions as the core management unit of the counselling portal and is accessible only to authorized personnel through secure authentication. It eliminates the dependency on manual record handling and scattered data storage by providing a unified platform for managing all administrative activities. Through this module, administrators can oversee the complete lifecycle of student data, starting from registration to final admission. The system also automates seat allocation based on predefined parameters such as merit, category, and seat availability, thereby improving efficiency and minimizing manual effort. In addition, administrators are responsible for verifying applications, updating course and institution details, publishing counselling schedules, and monitoring overall system operations, ensuring a structured and scalable process.

2. Digitized Student Interaction (User Module)

The User module serves as the primary interface for students, enabling them to participate in the counselling process through a fully digital platform. It removes the need for physical visits and reduces the time and cost traditionally involved in admission procedures. After registration and login, students can complete application forms, upload required documents, select preferred colleges and courses, and monitor their application status in real time. The module also allows

students to view their seat allotment results once the process is completed. By integrating all these functionalities into a single platform, the system simplifies the overall experience and reduces the effort required from students and their families.

3. Transparent Seat Allocation and Resource Optimization

One of the major limitations of conventional counselling systems is the lack of clarity regarding seat availability, which often leads to confusion and inefficient utilization. The proposed system addresses this issue by providing real-time updates on seat allocation and vacancy status through the portal. Students can continuously access this information and make informed decisions based on current availability. This level of transparency helps reduce seat wastage and ensures optimal utilization of resources. Additionally, the ability to review and modify choices during the counselling process further enhances decision-making and improves overall system effectiveness.

V. CONCLUSION

The experimental evaluation of the proposed AI-integrated college counselling portal shows significant improvements over traditional counselling systems in terms of accuracy, efficiency, and reliability. The system's performance was analyzed using key metrics like verification accuracy, prediction accuracy, precision, recall, and processing time. The experimental findings demonstrate a significant improvement in verification accuracy achieved by the proposed system through the integration of OCR and machine learning based validation techniques. Similarly, the prediction module exhibits enhanced performance by accurately estimating admission probabilities based on historical data, rank, and category. Furthermore, the precision and recall values are notably higher compared to traditional systems, showing improved classification performance and better detection of eligible candidates. The system minimizes false positives and false negatives, resulting in more reliable decision-making. Additionally, automating document verification and eligibility checking significantly cuts processing time, leading to faster and more efficient counselling operations. Overall, the results confirm that the proposed system outperforms traditional counselling methods across all evaluated parameters. Integrating Artificial Intelligence ensures consistent performance, reduces human intervention, and enhances transparency in the admission process. In conclusion, the proposed smart college counselling portal effectively addresses the limitations of existing systems by integrating automated document verification, intelligent eligibility assessment, and predictive admission analysis. The system improves accuracy, reduces fraud, minimizes seat wastage, and supports better decision-making for students and administrators. It is highly scalable and suitable for real world implementation in large-scale counselling environments. Future work may involve integrating blockchain technology for secure document management and using advanced deep learning models to further enhance prediction accuracy.

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