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Student Dashboard for Training and Placement Cell

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ABSTRACT: In this research paper, we present the design and implementation of a student dashboard system tailored for training and placement departments in educational institutions. The system employs React.js for the frontend user interface and Node.js, Express, and MySQL for the backend server and database. The paper discusses the architecture, functionalities, and technologies utilized in building a role-based login system for students and administrators.

KEYWORDS: Student dashboard, React, Node.js, MySQL, role-based access control, training and placement.

I. INTRODUCTION

In the realm of educational institutions, effective management of training and placement activities is vital for fostering student success and industry engagement. A well-designed student dashboard system offers a streamlined approach to this management, providing administrators and students with tailored functionalities. This paper explores the development and implementation of such a system using modern technologies like React for frontend development and Node.js with MySQL for backend services. The system employs role-based access control to differentiate between administrator and student functionalities, ensuring data security and user-specific experiences. By leveraging these technologies, the student dashboard system aims to enhance the efficiency of tasks such as student profile management, placement record tracking, and communication of job opportunities. This introduction sets the stage for discussing the architecture, functionalities, and implementation details of the system, highlighting its significance in the context of training and placement departments within educational institutions. Through this exploration, we aim to showcase the benefits and practical applications of integrating technology into student-centric processes, ultimately improving the overall effectiveness of training and placement initiatives.

II. RELATED WORK

Several research studies have explored the domain of training and placement management systems, providing valuable insights and methodologies to inform the development of similar projects. Shlok Vishwasrao et al. [1] conducted a review on training and placement management systems, offering an overview of existing approaches and technologies. Their work provides a foundational understanding of the landscape, highlighting key features and challenges encountered in such systems.

In a study by Siddhi Parekh et al. [2], the authors explored results and placement analysis using data mining techniques and dashboards. Their research focused on predicting placement outcomes based on historical data, showcasing the potential of data-driven approaches in improving placement processes.

Similarly, Navaneeth Kumar et al. [3] presented a student analysis system tailored for training and placement activities, emphasizing the importance of data analytics in enhancing decision-making processes. Web portals specifically designed for training and placement cells have also been investigated. Shital K. Patil et al. [4] introduced a web portal for training and placement management, outlining the functionalities required to streamline administrative tasks and facilitate student engagement. Additionally, Spoorthi M S et al. [5] conducted a review on placement management systems, highlighting emerging trends and best practices in the field.

III. PROPOSED SYSTEM

The proposed student dashboard system described in this research paper aims to address key challenges in training and placement management within educational institutions. Leveraging modern technologies including React.js, Node.js, Express, and MySQL, the system offers distinct functionalities tailored for administrators and students.

For administrators, the system provides comprehensive access to student databases, enabling efficient filtering based on various criteria such as branch, live backlogs (KTs), names, and registration numbers. This functionality empowers administrators to identify and suggest suitable candidates to recruiters. Additionally, the system includes a blog and learning module where administrators can post job notifications, updates, and study materials to facilitate student engagement and career readiness.

On the student side, the system offers a user-friendly interface where students can access learning materials and blog posts to stay informed about placement opportunities and industry trends. Students have the ability to update their profiles, create resumes, and engage with placement-related activities, contributing to their career development and readiness for job placements.

The system's architecture is designed with scalability and security in mind, implementing role-based access control to ensure data confidentiality and integrity. By adopting a responsive frontend design using React.js and a robust backend powered by Node.js and MySQL, the proposed system aims to enhance the efficiency of training and placement processes, ultimately benefiting both students and educational institutions. Through this research, we aim to demonstrate the practical application and effectiveness of technology in optimizing training and placement management within educational contexts..

IV. SYSTEM ARCHITECTURE

The system architecture of the proposed student dashboard system is designed to be modular, scalable, and efficient, leveraging modern web technologies for frontend and backend development. The architecture consists of distinct layers for frontend presentation, backend logic, and data management.

Frontend (React.js):

The frontend layer is developed using React.js, a popular JavaScript library for building user interfaces. React components are used to create a responsive and interactive user interface, allowing students and administrators to interact with the system seamlessly. Components are organized hierarchically to manage different views such as student profiles, placement records, blog posts, and learning modules.

State Management (Redux):

Redux is employed for state management within the frontend, enabling centralized storage of application state and facilitating predictable state transitions. This helps maintain consistency across components and ensures efficient rendering of UI components based on data changes.

Backend (Node.js & Express):

The backend layer is built using Node.js, a runtime environment for JavaScript, and Express.js, a web application framework for Node.js. Express provides robust routing and middleware capabilities, allowing the backend to handle HTTP requests from the frontend. The backend is responsible for implementing RESTful APIs to interact with the database and serve data to the frontend.

Database (MySQL):

MySQL is used as the relational database management system (RDBMS) to store and manage student data, placement records, blog content, and other system-related information. The database schema is designed to ensure efficient data retrieval and storage, optimizing performance for the student dashboard system.

Role-Based Access Control (RBAC):

The system implements role-based access control (RBAC) to differentiate between administrator and student functionalities. Authentication and authorization mechanisms are integrated into the backend using JSON Web Tokens (JWT) to secure API endpoints and enforce access control based on user roles.

Integration and Deployment:

The frontend and backend components are integrated to form a cohesive system, with the frontend making HTTP requests to the backend APIs for data retrieval and manipulation. The system is deployed on a suitable hosting platform (e.g., AWS, Heroku) to ensure availability and scalability.

Overall Architecture:

The architecture follows a client-server model, where the React-based frontend interacts with the Node.js/Express-based backend through RESTful APIs. Data flows between the frontend, backend, and database layers, enabling a responsive and dynamic user experience for students and administrators. The modular design of the architecture allows for flexibility in adding new features and scaling the system to accommodate growing user demands. Through this architecture, the proposed student dashboard system aims to optimize training and placement management within educational institutions while ensuring security, scalability, and maintainability.

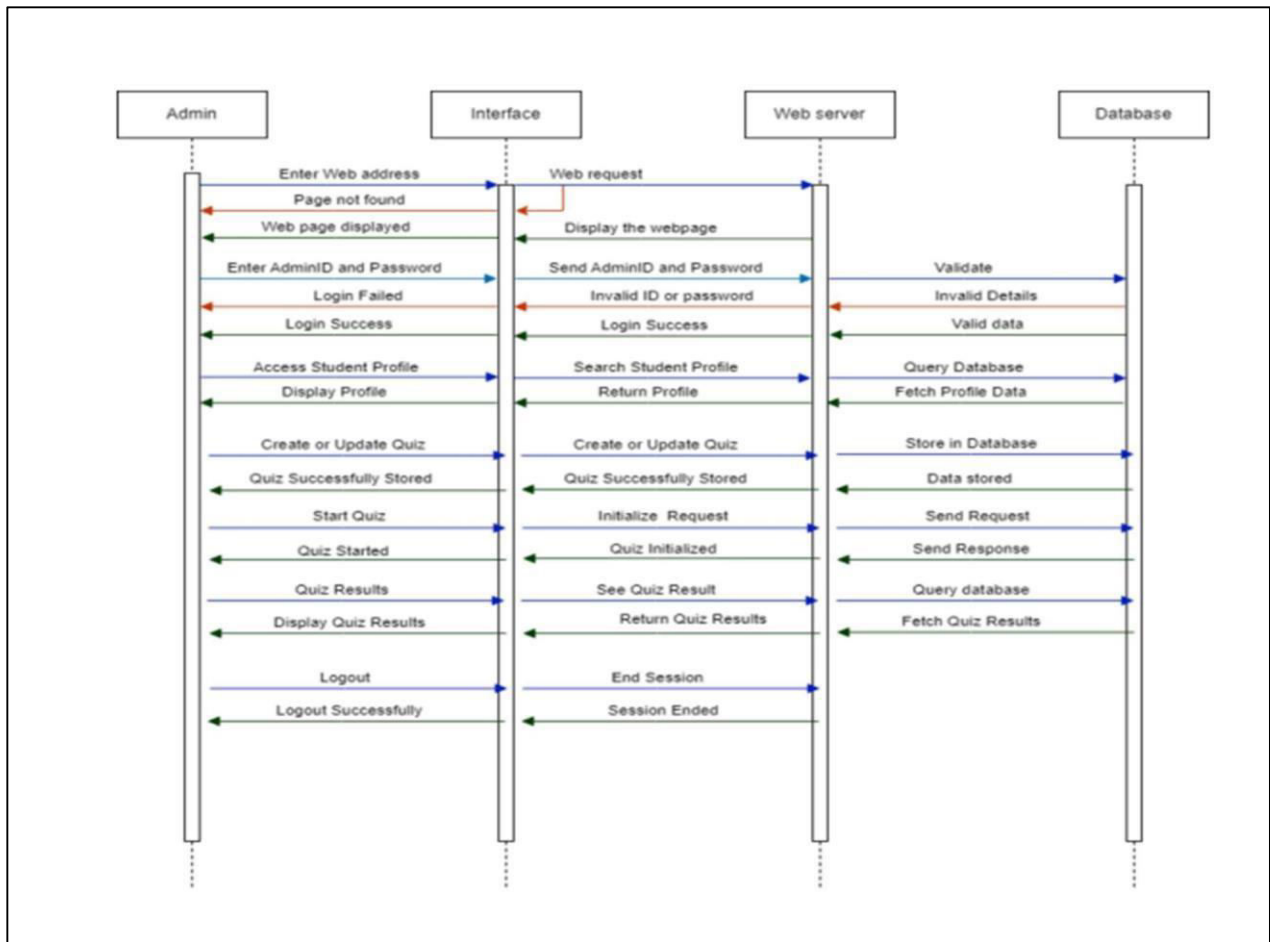


Fig1. System Architecture

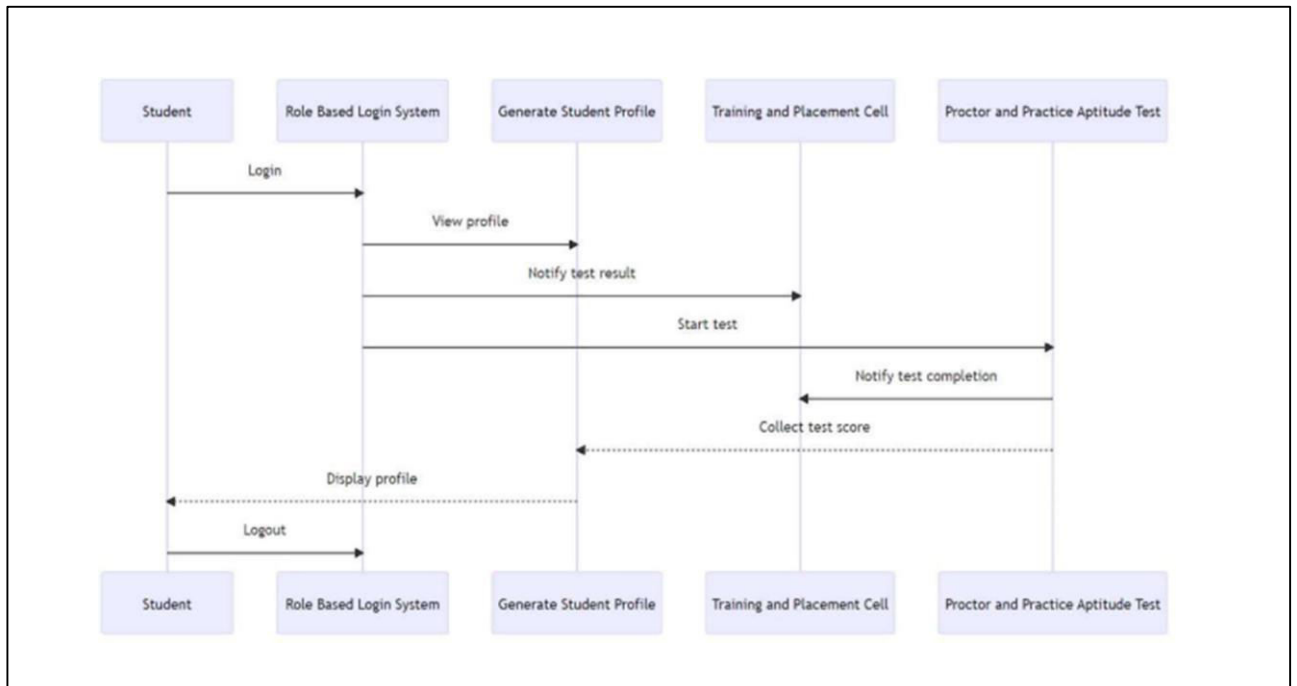


Fig2. Work Flow

V. SIMULATION RESULTS

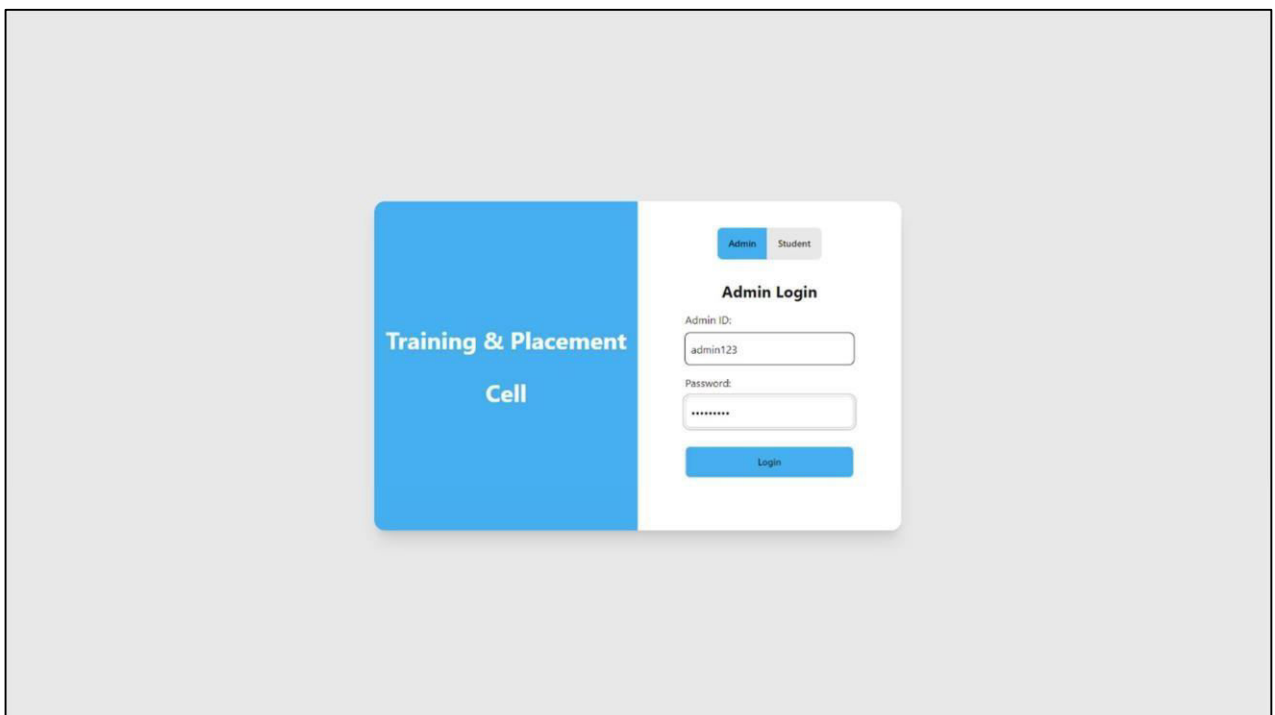


Fig3. Login Page

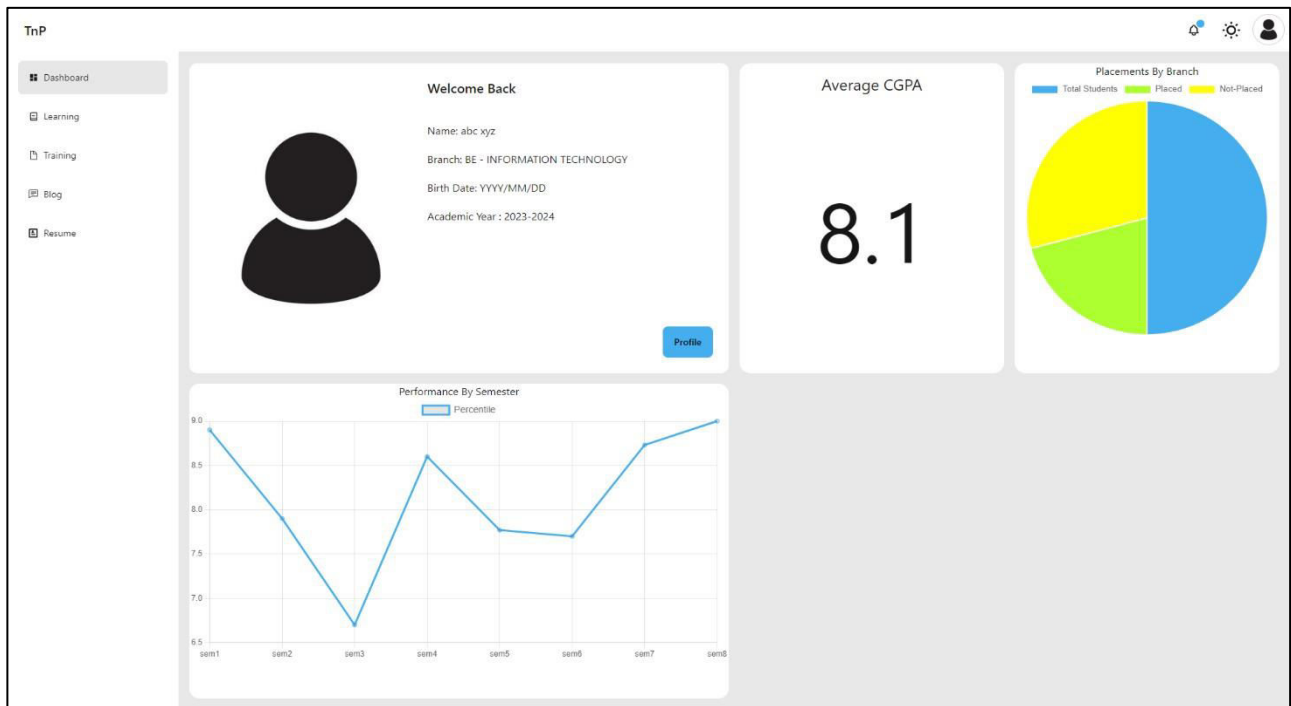


Fig4. Dashboard

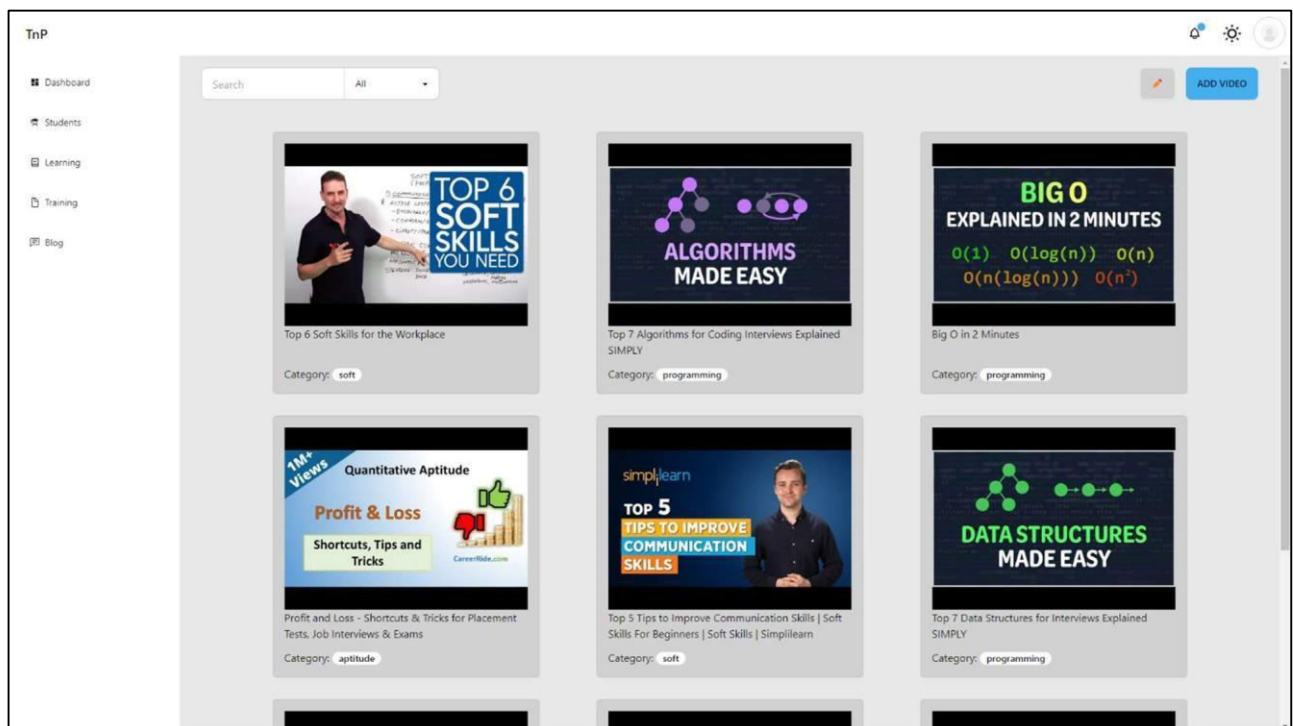


Fig5. Learning

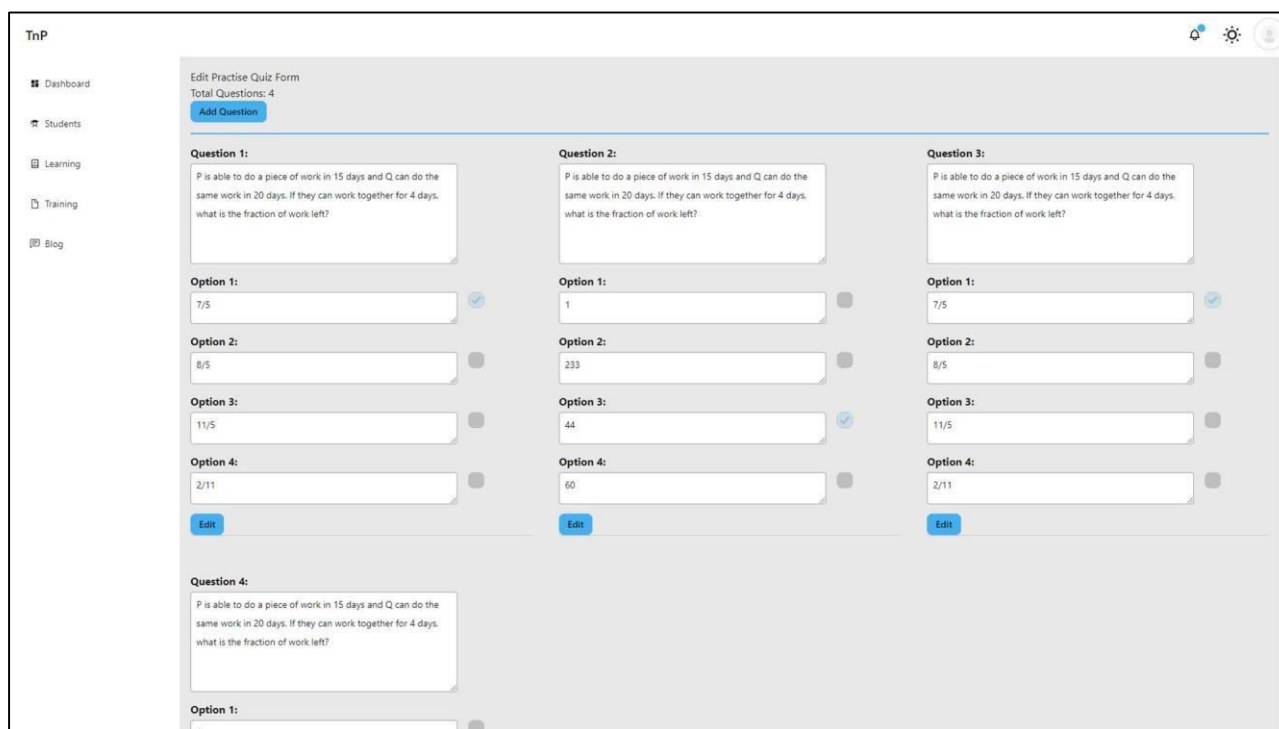


Fig6. Training

VI. CONCLUSION AND FUTURE WORK

In conclusion, the development and implementation of the role-based student dashboard system using React, Node.js, Express, and MySQL present a promising solution for enhancing training and placement management in educational institutions. This research paper has highlighted the architecture, functionalities, and technologies utilized to create a user-centric platform that caters to both administrators and students.

The student dashboard system offers significant benefits, including streamlined access to student databases for administrators, empowering them to efficiently filter and recommend candidates to recruiters based on specific criteria. The inclusion of a blog and learning module facilitates effective communication of job opportunities, updates, and study materials, fostering student engagement and career readiness.

For students, the dashboard provides essential functionalities such as profile management, resume creation, and access to placement-related information, contributing to their overall career development and job placement success.

Looking ahead, future work on this system could involve several enhancements and extensions. One area of focus could be the implementation of advanced analytics and reporting features to provide insights into placement trends and student performance metrics. Integration with machine learning algorithms could enhance the system's ability to match students with relevant job opportunities based on their profiles and preferences.

Furthermore, the addition of interactive features such as chatbots or virtual assistants could enhance user experience and support students with queries related to placements and career guidance. Improvements in UI/UX design based on user feedback and usability testing could further optimize the system's usability and accessibility.

Additionally, exploring integration with external APIs for accessing real-time job data and industry insights could enhance the system's relevance and currency in the dynamic job market landscape.



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