**Design and Development of the NMIMS Placement Portal Using MERN Technology**

**Mahaveer Mandloi1, Vishwa Bhalodia2, Vivek Jain3, Prof. Suraj Patil4**

1. Student, Department of Computer Engineering, Mukesh Patel School of Technology Management and Engineering, Shirpur, India
2. Student, Department of Computer Engineering, Mukesh Patel School of Technology Management and Engineering, Shirpur, India
3. Student, Department of Computer Engineering, Mukesh Patel School of Technology Management and Engineering, Shirpur, India
4. Assistant Professor, Department of Computer Engineering, Mukesh Patel School of Technology Management and Engineering, Shirpur, India

**Abstract**: This paper presents the design and development of the NMIMS Placement Portal, a web-based platform built using the MERN (MongoDB, Express, React, Node.js) technology stack. The portal aims to streamline the recruitment process by facilitating seamless communication between students, recruiters, and the placement department. Key features include student registration and profile management, company job postings, application tracking, interview scheduling, and comprehensive reporting for placement officers. By leveraging the capabilities of the MERN stack, the portal provides a scalable and efficient solution for managing recruitment activities. The implementation of this portal is expected to improve transparency, enhance organization, and optimize the overall placement process at NMIMS.

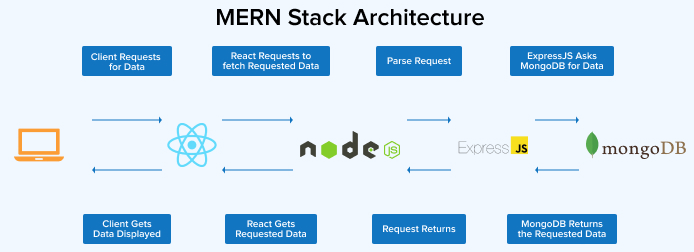
**Keywords:** NMIMS Placement Portal, MERN Stack, Student Recruitment, Job Posting, Application Tracking, Interview Scheduling, Placement Management

**Introduction:** For every student as well as college placement is important. Placement process is very difficult to handle as it involves a lot of data. In the Placement Process, college departments face issues in keeping track of the student database, eligible students, placed students and other processes. Department manually collects data most of the time and it is time consuming, and databases stored as excel sheets may be altered by mistake. Students may or may not inform the department if they receive personal emails. Interview experiences are not available to every student. The proposed work provides the facility to the students for viewing the job, applying for the same and sharing the experience, which help the students to prepare themselves for the interviews and help to increase the technical knowledge. Details of the Company are provided to the students with the Eligibility Criteria and other Requirements by the admin. So, the students can prepare themselves according to the requirements. The goal of the Project is to provide the students with clear information about the Company and secure the student data. This Project also provides the clear information about, how many students placed, Total number of students, Total number of companies visited.

**Literature Survey:** Traditional placement management at institutions like NMIMS typically involves the use of Excel spreadsheets for storing and organizing student, recruiter, and placement data. While this method may seem adequate for basic data storage, it introduces significant limitations as the complexity and volume of placement activities grow. The use of Excel sheets makes data management fragmented, prone to human errors, and inefficient for handling multiple recruitment cycles. Tracking job applications, monitoring students' participation, coordinating with recruiters, and scheduling interviews become cumbersome, often leading to delays, miscommunications, and duplicated efforts. Furthermore, the lack of automation and real-time updates prevents stakeholders from accessing timely information, reducing the overall transparency of the placement process. The system's inability to handle large datasets efficiently also makes it difficult to generate reports or insights, further impeding decision-making for placement officers. Additionally, data security is compromised, as Excel files are vulnerable to unauthorized access, loss, or corruption, risking the confidentiality of sensitive student and recruitment data.

In response to these challenges, we propose the development of the NMIMS Placement Portal using the MERN (MongoDB, Express, React, and Node.js) technology stack. This web-based platform is designed to address the limitations of traditional systems by offering a fully digital and scalable solution for managing placement activities. The portal simplifies the placement process by providing a centralized, automated system that ensures seamless communication between students, recruiters, and the placement department. Key features include secure student registration, dynamic profile updates, automated job application tracking, real-time interview scheduling, and comprehensive analytics tools for placement officers. By leveraging the power of modern web technologies, the portal enables enhanced data transparency, reduces manual workloads, and ensures more accurate and timely information flow. Moreover, the portal offers robust data security measures, protecting sensitive information and minimizing the risk of data loss. Overall, the NMIMS Placement Portal aims to optimize the recruitment process, improve collaboration, increase efficiency, and provide a more organized, transparent, and user-friendly experience for all stakeholders involved in the placement process.

**System Architecture:** The system architecture of the NMIMS Placement Portal is designed using the MERN (MongoDB, Express, React, Node.js) stack, which follows a client-server model to ensure efficient handling of data and user interactions. At the core of the architecture is MongoDB, a NoSQL database that stores and manages structured and unstructured data, such as student profiles, company job postings, and placement records. Express, a lightweight Node.js framework, serves as the backend API that processes requests, performs business logic, and communicates with the database. React is used for the front-end user interface, offering a dynamic and responsive experience for students, recruiters, and placement officers. React components interact with the backend using RESTful APIs, allowing users to perform actions like registering, applying for jobs, scheduling interviews, and generating reports.



Node.js runs as the runtime environment, enabling asynchronous, event-driven operations that improve system performance and scalability. Together, these technologies provide a modular and maintainable system that can handle a high volume of data, support concurrent users, and offer real-time updates.

**Methodology:** The development of the NMIMS Placement Portal follows an agile methodology to ensure iterative progress and continuous feedback. The process begins with requirement gathering from placement officers, students, and recruiters to identify key functionalities needed for the system. The system design phase involves planning the architecture, database schema, and user interface layout. During development, the MERN stack is used to implement features incrementally, allowing for regular testing and validation at each stage. Key functionalities include user authentication, profile management, job postings, application tracking, and reporting.

A diagram of a web site

Description automatically generated

Unit testing is performed on individual components to ensure functionality, followed by integration testing to verify that the components work together seamlessly. Throughout the development cycle, regular feedback is collected from stakeholders, ensuring that the final product meets their needs. The system is deployed on cloud infrastructure to provide scalability and easy access for all users, with regular updates and improvements made based on user feedback. The agile approach ensures flexibility, allowing for timely adjustments and enhancements as the system evolves.

**Things to Add**

**Use Case Modelling and Analysis**

**Features of the Placement Portal**

**Features:** The NMIMS Placement Portal provides a comprehensive and secure platform designed to streamline the entire placement process for students, companies, and placement administrators. With a robust set of features, the portal enhances efficiency, transparency, and communication between all stakeholders involved in recruitment activities. Below is a detailed overview of the key features offered by the placement portal.

**Secure Session Management:** Security is critical in the placement process, and the NMIMS Placement Portal incorporates a robust session management system using accesstokens and refreshtokens to ensure the safety and confidentiality of user data. Upon successful authentication, the portal issues an access token, which is used to authorize API requests. This token is short-lived to minimize the risk of unauthorized access. A refresh token, stored securely in the client (often in HTTP-only cookies), is issued alongside the access token and is used to obtain a new access token when the original one expires, without requiring the user to log in again. This token-based mechanism ensures continuous and secure sessions, while also preventing session hijacking or unauthorized access. Sessions are further secured by automatic termination after periods of inactivity, and role-based session management ensures that each user—whether a student, admin, or company—has access only to resources relevant to their role. This layered security approach significantly enhances protection against data breaches, while providing seamless access for authorized users.

**Automated Mailing System for Notifications:** A key feature of the NMIMS Placement Portal is its automated mailing system, which ensures that students, administrators, and companies receive timely notifications about critical events. Implemented using the Nodemailer library in JavaScript, this system streamlines communication by automatically sending emails for important actions. For instance, when a company registers or posts a new job opening, students are promptly informed via email. Similarly, administrators and students are notified of updates such as changes in interview schedules or job application statuses. By utilizing Nodemailer, the portal can send emails reliably and securely, helping to keep all users informed and reducing the chances of missing important updates. This feature significantly enhances communication, transparency, and engagement within the placement process, ensuring that all stakeholders stay connected and up to date on critical information.

**Personalized Student Profiles**: The NMIMS Placement Portal enables students to create personalized profiles that serve as digital portfolios. These profiles allow students to upload essential documents such as resumes, certifications, and mark sheets from all six semesters. Students can easily update their profiles with educational qualifications, skills, and internship experiences, which are visible to recruiters. Additionally, the portal offers a centralized hub for tracking job applications and provides tailored job recommendations based on the students’ qualifications and preferences, streamlining the placement process and enhancing user experience.

**Student Registration and Profile Management**: To ensure the integrity of the placement process, the NMIMS Placement Portal features a robust document verification system managed by administrators. Upon registering, students must fill out a comprehensive form that includes personal details, academic records (such as class 10th and 12th marks, and any diploma certificates), and additional information like profile images. The admin reviews all submitted documents, including resumes and transcripts, and has the authority to approve or reject them based on accuracy and completeness. Once verified, students receive their login credentials via email, allowing them to access the portal. This verification process enhances the credibility of the platform, ensuring that only genuine candidates are eligible to apply for job opportunities.

**Company Job Posting and Management**: The NMIMS Placement Portal features a streamlined interface for administrators to manage company job postings. Admins can add new companies and create detailed job listings that include role descriptions, required qualifications, skills, and application deadlines. Once a job is posted, it becomes visible to students, who can apply directly through the portal. To keep students informed, an automated email notification is sent whenever a new company or job listing is added. This centralized approach simplifies the recruitment process, allowing admins to efficiently manage applications and student profiles while enhancing engagement between students and potential employers.

Comprehensive Reporting for Placement Officers:

Placement officers have access to a comprehensive reporting system within the portal. This feature allows them to generate detailed reports on student applications, job postings, interview outcomes, and overall placement performance. The reports can be filtered by various criteria such as department, company, or job role, providing valuable insights into the recruitment process. These reports assist placement officers in tracking progress, identifying trends, and making data-driven decisions to improve the placement process in future sessions.

Branch-Specific Opt Out Statistics:

The placement portal is designed to cater to the specific needs of different academic branches and departments within the college. The system allows placement officers to manage placement activities for specific branches, ensuring that students from different departments have equal opportunities. This branch-specific management feature also enables companies to target students from particular departments or fields of study, helping match candidates with suitable job roles.

**Mobile-Friendly and Responsive Design**: The NMIMS Placement Portal is built with a mobile-friendly and fully responsive design, ensuring accessibility across various devices, including smartphones, tablets, and desktops. This design is essential for students and company representatives who may need to access the portal while on the go. Utilizing technologies such as React, Material UI, Tailwind CSS, and custom CSS, the portal provides a seamless user experience. All features—ranging from job applications to profile management and notifications—are optimized for different screen sizes, allowing users to engage with the platform easily, regardless of their device.

**Scalability and Future Enhancement:** The NMIMS Placement Portal is built using the MERN stack, which provides a scalable and flexible framework. As the number of users and data grows, the system can easily be scaled to accommodate increased traffic and larger datasets. Future enhancements could include integrating AI-based job matching algorithms, real-time chat features for students and recruiters, and analytics dashboards for students to track their placement preparation progress.

**Challenges and Limitations**: The development of the NMIMS Placement Portal faced several challenges. Ensuring robust security was a top priority, as protecting sensitive user data and preventing unauthorized access posed significant challenges, particularly in managing user sessions and safeguarding information. Developing a responsiveuserinterface that performs well across a variety of devices and screen sizes was also a challenge, especially in ensuring that all features worked seamlessly on both mobile and desktop platforms. Handling largevolumesofdata, including student profiles, job postings, and application statuses, required careful consideration of database management and optimization to maintain system performance. Maintaining accuracyandintegrity of information across the platform was another critical challenge, particularly in document verification and keeping track of application processes. Additionally, ensuring transparency in communication between students, administrators, and recruiters required detailed tracking of activities, notifications, and system interactions.

**Future Enhancements**

**Conclusion**

**Acknowledgements**

**References**