

Design and Development of a Web Portal for Training Placement Management

Ms. Pradnya Dnyaneshwar Kadam¹ Mr. Kshitij Santosh Bora² Ms. Yashasvi Hemant Dudhediya³
Ms. Rutuja Kakasaheb Madhawai⁴ Prof. Ms. D. P. Pawar⁵

¹PG Scholar ²Associate Professor

^{1,2}Department of Computer Engineering

^{1,2}SNJB's Late Sau. Kantabai Bhavarlalji Jain College of Engineering, Chandwad, India

Abstract — A web-based system called Onclick: Smart Campus Portal has been developed to streamline and simplify training and placement processes at higher educational institutions. It provides an environment for students, companies, and college personnel to communicate in one central location, making it easier for all parties to access the same information. A job seeker can create a profile by registering or logging into a job search site to submit resumes through a job platform posted by employers. An employer can also view the profile of a job seeker and will post available positions on the platform. Employers will also communicate directly with job seekers through the platform about upcoming interviews. An administrator of the placement platform will maintain all records of job seekers and employers to ensure that the information is accurate and up-to-date. The platform will include additional functions for tracking training programs and developing educational resources to prepare students for employment opportunities. The Onclick: Smart Campus Portal platform is built using the MERN Stack technology, including React.js for frontend development, Node.js with Express.js for backend and API development, and MongoDB for database management. Therefore, it provides a modern, scalable, and efficient web-based solution designed for higher educational institutions. As a result, the platform enables digital placement workflow, reduces manual placement workflow, and improves the efficiency of managing recruitment efforts.

Keywords: Placement Management System, Training and Placement, Web-Based Portal, Job Recruitment, MERN Stack, React.js, Node.js, Express.js, MongoDB, Employer-Student Interaction, Digital Workflow, Recruitment Automation

I. INTRODUCTION

The key objectives of the system are as follows:

- 1) To allow users to either register or log into the system to enter their information, submit their resumes, and create/edit profiles in an efficient manner.
- 2) To provide users with the ability to view job openings and submit applications for consideration, including submitting their resumes to employers.
- 3) To allow employers to create job postings and send notifications/interview invites via the platform to the individuals selected for consideration.
- 4) To allow administrators access to the aforementioned user and employer-related data to ensure that all records are accurately maintained, and to provide the means for adequate supervision of placement operations.

II. RELATED WORK

Researchers are developing new systems to help colleges and universities automate training and placement processes and

create more efficient ways to centralize student information and provide structured support for students and administrators. These studies provide examples of how to develop web-based systems and increasingly enhance their capabilities.

Kadam pradnya.Khitij Bora,Rutuja Madhawai and Yashsavi Dudhediya [1] proposed an Online Placement Portal that provides students with the tools to develop profiles and submit resumes to employers for available jobs. This Online Placement Portal also allows employers to manage the placement/recruitment process at their school through its management capabilities. However, the Online Placement Portal does not provide the level of administration or support offered by Placement on One Click. The Placement on One Click system improves on the Online Placement Portal by allowing users to register, create profiles, search for jobs, and more effectively manage their jobs through the use of the Placement on One Click Application.

The placement management system created by Pradnya Kadam[2] had been developed with the intent to streamline the data collection process for the college's Training and Placement Officer and provide real-time updates from this individual. However, this system was limited to simply allowing students the ability to register for placements and receive notifications from the college. The Placement on One Click portal has expanded on this by not only providing students with the ability to submit applications for employment opportunities based on the criteria established, but also providing companies with the ability to post job vacancies and communicate directly to those students selected for consideration for these vacancies. As such the Placement on One Click portal provides a much more user-focused and interactive method of placement administration, which promises to improve the overall success of the placement process for both students and companies seeking candidates for employment.

Rutuja Madhawai [3] created a web-based campus placement portal that allowed students to create a personal profile and apply to job openings through a separate login for students and a separate login for administrators. This system greatly improved the accessibility and usability of a campus placement system; however, it did not provide any additional placement resources such as training programs and career guidance. Our project seeks to fill this void by integrating the modules for both training programs and educational materials to assist with preparing individuals for their future careers.

In their paper, Kshitij Bora. [4] proposed a new way to manage student placement and job placement online as opposed to using a spreadsheet. This helped make it easier for students and companies to find each other and provide placement data, but did not allow companies to select applicants based on eligibility or allow students and companies to communicate with each other directly. The

"Placement on One Click" system offers both of these functions, where users can upload their résumé for any job they apply to as well as send messages directly to each other.

Yashasvi Dudhediya. [5] created a placement portal for students in a department. They developed this system using the MERN technology stack and gave students the ability to view jobs posted by companies and to apply for those jobs. However, there was no function that provided any kind of management for the information related to the companies that were posting jobs on the department portal. Our system includes an administrator module that provides a greater ability to manage and organize placement data with the goal of providing complete oversight of placement management activities.

Kshitij Bora [6] proposed a web-based solution for tracking job applications and scheduling interviews in real time. However, they did not include any feature that provided access to training program materials or career planning. The Placement on One Click system includes a module for accessing training material that provides students the ability to explore education resources that will assist in their career development.

The portal was created by Kshitij, pradnya, Rutuja, and yashasvi [7] as a tool that combines analytical information to assist in creating more efficient placement strategies for students as well as centralizing student events into one place. However, the portal lacks any way for employers to directly communicate with candidates related to interviews. Conversely, our platform allows employers to send notifications and messages directly through our system to the user.

A smart automated placement system was created by Pyadnya, Rutuja, Kshitij, Yashasvi [8]. They developed a system to help filter applicants by eligibility and also provide real-time analytics of applicants. The Priyanga group's portal did not provide any way for structured access to training programs or practice materials. Placement on One Click integrates the management of training materials with career advice, along with job search, and application functionality.

Kshitij bora [9] presented a placement portal that digitized student profiles and lowered the amount of paper used. The D's Monte group also included features to enhance practice skills for students and submit resumes, which are similar features that our project has. In addition to reducing the amount of manual effort needed to place students, we have added more organized ways for managing the information about the companies, as well as managing the process of placement better with administrators.

The placement management system developed by Pradnya kadam [10] provided an automated system for storing candidate information and the ability for a company to send the candidate automated notifications but did not provide the employer with a means of posting jobs on behalf of the employer. Therefore, the Placement Portal provides a way for employers to post jobs and send messages to students directly through the portal providing a much more comprehensive approach to creating an interactive placement environment.

In conclusion, while there was a definitive need in the literature for an automated and centralised system to manage placement activities, the Onclick: Smart Campus

Portal integrates student registration, resume storage and management, job postings, company communications, and access to necessary training resources into a single user-friendly platform which improves efficiency and usability for all parties involved in the placement process.

III. SYSTEM MODEL

The proposed Placement on One Industrial will provide a centralized place for workers, employers, and administrative personnel to perform all compression and placement related activities from one location. The architecture will integrate the user interface with server-side logic and a database management system that each user or company can query for real time access to its user or employer records when needed.

The administrator module is an integral part of the architecture; by having access to user and company information, the administrator can oversee job postings, manage registered users, and perform regular audits to maintain the accuracy of company profiles. This application will allow students to search for training programs and educational resources that best fit their future careers.

Students will be able to sign up, log in, create a profile, upload resumes, and apply for positions advertised by an employer. Employers will also have the ability to create job postings and communicate directly with students through messages about interviews. This web-based application will bring together all the elements necessary to create a fluid, organized training and placement management process.

The integrated user registration, company management and administrative monitoring of placements minimises the amount of manual work required to manage student and recruiter relationships, while providing improved coordination among involved parties. By creating a single online source of truth for student placement data and interactions, the centralised structure increases the availability of placement data to students and recruiters while facilitating the effectiveness of data collection and reporting activities.

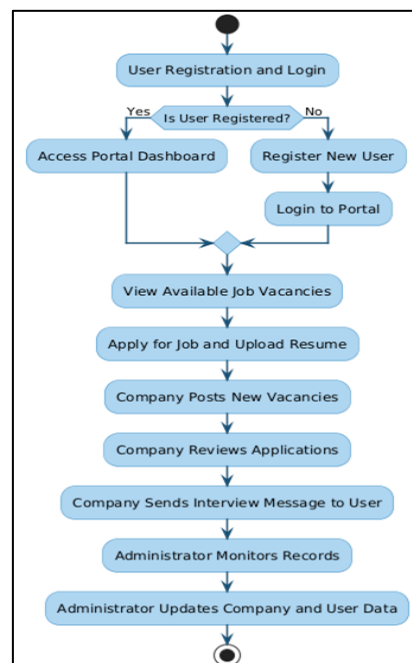


Fig. 1. Flow diagram of the system

IV. METHODOLOGY & MODULES

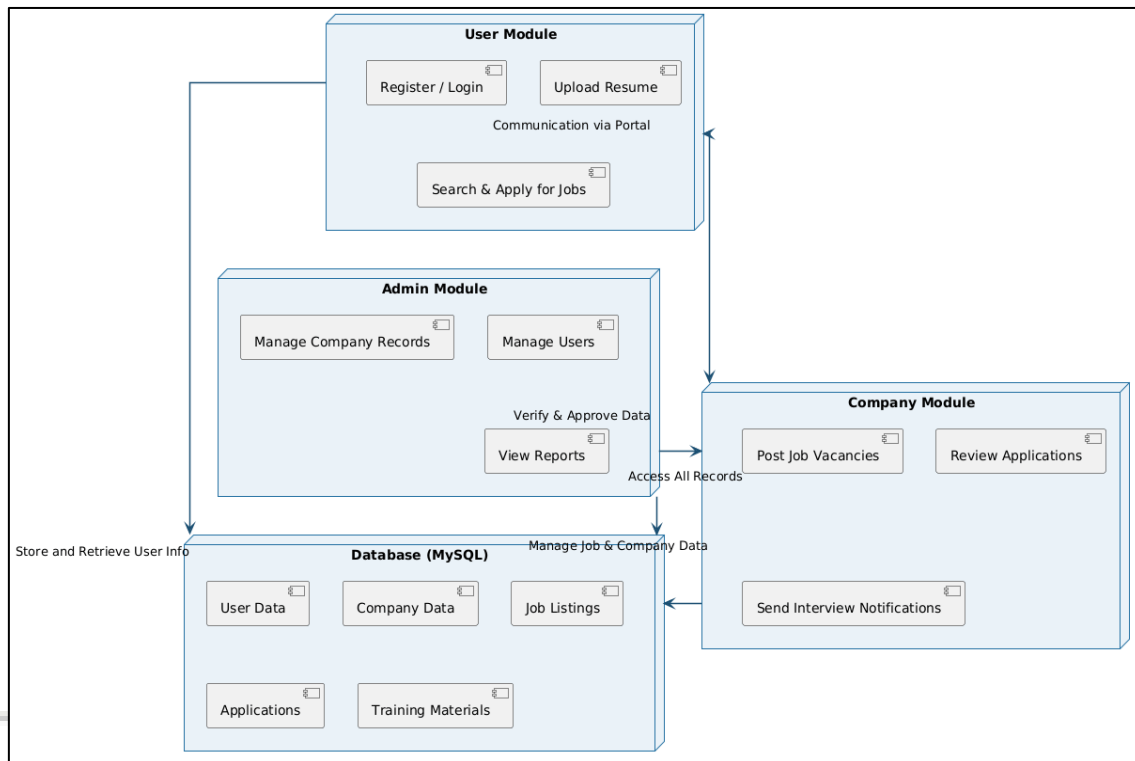


Fig. 2. System Architecture Diagram

The Onclick: Smart Campus Portal is developed as a web-based solution built on top of a modular architecture that contains various components to support students, employers, and administrators. Each of these modules performs one or more functions, which collectively work toward automating and organizing the Training and Placement process. The Onclick: Smart Campus Portal uses the MERN Stack technology, including React.js for frontend development, Node.js with Express.js for backend and API development, and MongoDB as the database to create a modern, scalable, and efficient web-based environment accessible through an intuitive user interface.

The system is comprised of a number of connected and interacting components to handle user sign-up and onboarding, employer/employee interaction, job posting, and administrative functions. The database is the heart of the architecture, as it provides a single point of access for all records, to make them accessible and easy to find.

The Onclick: Smart Campus Portal consists of several modules, each designed to carry out individual tasks to ensure the system operates properly. This document describes each of these modules in detail.

A. Student Module

Users (i.e., students) can create an account, log onto the site and manage their individual student profile using this module. Once a user's account has been created, students can upload a copy of their resume, add information about their educational background, any certification(s) they hold, their Computer Software/Hardware skills, and any extracurricular activities they have participated in while in school. Students may also search for available job openings on the site, applying for openings that match their qualifications.

Algorithm: User Registration & Job Application Algorithm

- Connect to the database.
- Verify the user's registration or login credentials.
- If the user is successfully registered, save their user information in the database.
- When the user has logged into the site successfully, they will have access to view available jobs.
- The user submits their resume for each available position that they wish to apply for, and any information they upload becomes part of their application information in the database.

B. Module for Agency

The Agency (or Company) module allows Agencies to access their account, create and manage new jobs (vacancies), and review applicants using the Agency's portal (App). Agencies can also communicate via the portal with job candidates who have been shortlisted or rejected from a position.

Algorithm: Company Job Posting

- Log in using agency credentials.
- Add new job postings/advertisements (including title, description, qualifications).
- Store job advertising in the agency's database.
- Retrieve and show job advertising to all users on the agency Portal.
- Send notifications to candidates who were shortlisted for an interview.

C. Administrator Module

The Administrator module is where the administrator manages all aspects of the Administrator Module and therefore is considered the control center of the operations.

Administrators can keep track of all user registrations, update all the company's information, and view the entire placement process from start to finish.

Algorithm: Administrative Management

- Authenticate the Administrator's login.
- Access the database for user and company records.
- Verify job postings and individual User accounts.
- Create user activity and company statistics reports.
- Modify/delete invalid records.

D. Training Material Module

This module enables administrators to upload training materials and educational resources for users to enhance their skills and increase employability.

Algorithm: Training Material Management

- Administrator uploads training material (PDF, video, or document)
 - System validates and stores in database
 - System retrieves and displays training materials for user
- Mathematical representation of Data Retrieval from the Database:
- $R = \sigma \text{ userID} = u (\text{Training_Material})$ where
 - R is the retrieved record and u is the user ID

E. Job Search Module

This module finds what jobs are available that meet your search criteria (Company, Course, Category, Location).etc.

Algorithm: Job Search Process

- Input parameters (Company Name, Job Category, or Location) provided by the user.
- Example SQL Query for Example Below:
 $\text{SELECT} * \text{ FROM Jobs WHERE Category} = c \text{ OR Location} = l.$
- The results from the query are displayed to the user.
- The user has the option to select and apply for any jobs in the results displayed.
- Details of the application submitted by the user are stored in the database.

F. Admin Dashboard & Settings Module

Admin Settings allows for the creation/edition and management of company, course, and location data.

- Retrieve user and company stats.
- Display reports using structured (graphical and tabular) formats.
- Allow for data to be edited and saved back to the database.

V. RESULTS

Through the Onclick: Smart Campus Portal, all placement activities have been integrated into one easy-to-use interface. This provides a streamlined way for students, administration staff members and corporations to communicate/work with one another. There is an implementation snapshot that demonstrates how this has been accomplished.

A. Snapshot of System

Fig. 9: Posting a new Job

Fig. 10: Company Registration Page

Fig. 11: Job category Window

Fig. 12: User Resume View Page

Fig. 13: Additional training module Page

B. Results and Performance Evaluation

Event	Benchmark	Output
User Registration	Valid user credentials	Successful login and access granted

Job Posting	Valid company account	Job details added to the database
Job Application	Eligible user	Resume submitted and recorded
Resume Management	Uploaded resume	Resume stored and accessible
Training Material Upload	Valid file format	Material displayed for users
Data Retrieval	Search by company or course	Accurate and relevant data displayed
Administrative Oversight	Admin request	Report generated successfully

Table 2: System outcome for different functions

The results indicate that the Onclick: Smart Campus Portal operates successfully across all known functional modules of the system. The application effectively validates the user's data entry, performs database actions, and generates prompt feedback for the user and the admin, thereby proving to be an efficient tool for both the student and the company.

Testing indicated that the system was able to successfully complete user registration and login transactions with a high level of accuracy. All aspects of both job application and company posting modules were able to perform as anticipated and effectively facilitated interaction between students and companies. The ability of the platform to execute administrative functions such as record management, report generation, and training material upload was also completed without delay and error.

The performance of the Onclick: Smart Campus Portal was evaluated on the basis of response correctness and stability. All responses were executed reliably and consistently throughout all combinations of test cases; therefore, the centralized data base architecture of the system offered rapid access to data which demonstrates the efficiency of the system when storing and retrieving large quantities of employment-planning data.

Overall, the Onclick: Smart Campus Portal met its goals for fulfilling design specifications through the effective automation of manual processes and the facilitating of effective communication between all stakeholders. As such, it will provide students, companies, and all other parties with an accurate and effective means of managing training and employment solutions while improving both the efficiency of training and placing, as well as increasing the satisfaction of all stakeholders with respect to their participation within the organization.

VI. TECHNOLOGY

- MERN Stack – Used for full-stack web application development.
- React.js – Used for designing the front-end user interface.
- Node.js – Used for backend and server-side development.
- Express.js – Used for API creation and routing management.
- MongoDB – Used as a database to store application data.
- HTML, CSS & Bootstrap – Used for webpage structure, styling, and responsive design.

The proposed system is developed using the MERN Stack, which is a modern web development technology stack used for building fast, scalable, and interactive web applications. The MERN stack consists of MongoDB, Express.js, React.js, and Node.js. For the front-end development, the system uses React.js, which provides a dynamic and responsive user interface. React.js allows the application to create reusable components, improving performance and user experience. It helps users interact with the portal smoothly and efficiently.

For the back-end development and API creation, the system uses Node.js with Express.js. Node.js provides a fast and scalable runtime environment, while Express.js simplifies server-side development and routing. Together, they handle user authentication, job postings, resume uploads, database communication, and API management effectively.

The system uses MongoDB as the database because it is a flexible and powerful NoSQL database that stores data in JSON-like documents. MongoDB efficiently manages student records, company details, job postings, resumes, and training materials. The MERN stack architecture ensures high performance, scalability, easy maintenance, and smooth communication between the client side and server side of the application. It also supports real-time data handling and provides a secure and reliable environment for managing placement activities

VII. CONCLUSION

An effective web-based solution for overseeing training and placement activities within a college is provided by the Onclick: Smart Campus Portal. By automating crucial procedures like registration, job applications, company postings, and record management, it unites administrators, businesses, and students on a single platform. Students can easily access job opportunities through the portal, which also gives employers the ability to manage open positions and speak with candidates directly. Throughout the placement process, administrators can ensure seamless coordination by accurately monitoring and maintaining all records. All things considered, Onclick: Smart Campus Portal streamlines placement processes, lessens manual labor, and improves user communication. It acts as a dependable digital platform that improves the efficiency, organization, and transparency of placement management.

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