

AI Powered Job Matching System

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ABSTRACT

The AI-Powered Job Matching System is a smart recruitment platform developed using the MERN stack (MongoDB, Express.js, React.js, and Node.js). The system aims to improve the hiring process by matching job seekers with suitable job opportunities based on their skills, qualifications, and interests. Traditional job portals often provide irrelevant recommendations and require manual screening, which consumes time and effort. This platform uses Artificial Intelligence and Machine Learning techniques to analyze resumes and job descriptions for accurate job recommendations. Recruiters can easily manage job postings and filter candidates, while users receive personalized job suggestions and notifications. The system also includes secure authentication, resume upload, and profile management features. The proposed solution increases recruitment efficiency, reduces job mismatch, and provides a user-friendly experience for both employers and applicants. It offers a modern, scalable, and intelligent approach to online recruitment systems.

1. INTRODUCTION

The AI-Powered Job Matching System is a web-based recruitment platform developed using the MERN stack, which includes MongoDB, Express.js, React.js, and Node.js. The purpose of this system is to simplify the hiring process for both job seekers and recruiters by using Artificial Intelligence and Machine Learning techniques. In traditional job portals, users often receive irrelevant job recommendations, and recruiters spend a lot of time manually checking applications. This creates delays and reduces the efficiency of recruitment. The proposed system solves these problems by automatically analyzing candidate skills, qualifications, resumes, and job requirements to provide accurate job matching. The platform allows job seekers to create profiles, upload resumes, search for jobs, and receive personalized recommendations. Recruiters can post jobs, manage applications, and shortlist suitable candidates easily. This project provides a faster, smarter, and more user-friendly recruitment solution. It improves the accuracy of job matching, saves time, and enhances the overall hiring experience for both employers and applicants.

2. METHODOLOGY

2.1 System Design and Architecture

The system follows a client-server architecture to ensure clear data flow and maintainability:

- **Frontend Layer (Presentation Layer):**

The frontend of the system is developed using React.js along with HTML, CSS, and JavaScript. This layer provides an interactive and user-friendly interface for job seekers and recruiters. Users can register, log in, create profiles, upload resumes, search for jobs, and apply for positions. Recruiters can post job vacancies, manage applications, and view candidate details. React.js helps in creating dynamic pages and smooth user experience.

- **Backend Layer (Application Layer):**

The backend is developed using Node.js and Express.js. This layer handles business logic, user authentication, API management, and communication between the frontend and database. JWT authentication and cookies are used to provide secure login and session management. The backend also processes resume data and job information for AI-based job matching.

- **Database Layer:**

MongoDB is used as the database for storing user details, job postings, resumes, applications, and recruiter information. It is a NoSQL database that provides flexibility, scalability, and efficient data management for the system.

2.2 Software Selection

The technologies were selected based on performance, accessibility, and ease of development.

The following software and technologies are selected for developing the AI-Powered Job Matching System:

- **MongoDB:** Used as the database to store user data, job details, resumes, and applications.
- **Express.js:** Handles backend routing, APIs, and server-side operations.
- **React.js:** Used for developing the frontend user interface and creating dynamic web pages.
- **Node.js:** Provides the runtime environment for backend development.
- **Visual Studio Code:** Used as the code editor for writing and managing project code.
- **Postman:** Used for testing APIs and backend functionality.
- **Git & GitHub:** Used for version control and project management.
- **JWT Authentication:** Provides secure login and user authentication.
- **HTML, CSS, JavaScript:** Used for designing and styling the frontend interface
- **Machine Learning / AI Algorithms:** Used for smart job recommendation and matching process..

2.3. System Integration

All system components are integrated to work seamlessly:

- **Frontend-Backend Integration:** The frontend developed using React.js communicates with the backend through RESTful APIs created using Node.js and Express.js. When users perform actions such as registration, login, job search, resume upload, or job application, the frontend sends HTTP requests to the backend. The backend processes these requests, performs validation and authentication, and returns appropriate responses to the frontend. This integration ensures real-time interaction and a smooth user experience.
- **Backend-Database Integration:** The backend is connected with MongoDB to store and manage application data. Express.js and Node.js handle database operations such as inserting, updating, retrieving, and deleting user profiles, job postings, resumes, and application details. Mongoose is used for database modeling and efficient data handling. This integration ensures secure and organized data management.

- **Outcomes :** Faster and efficient job matching process

Secure user authentication and data handling

Easy management of job postings and applications Personalized job recommendations for users

Improved user experience for recruiters and job seekers Scalable and reliable recruitment platform

2.4. Testing and Deployment

System Testing: System testing is performed to ensure that the AI-Powered Job Matching System works correctly and efficiently. Different types of testing are carried out to identify and fix errors before deployment.

- **Unit Testing:** Individual modules such as login, registration, and job application are tested separately.
- **Integration Testing:** Communication between frontend, backend, and database is tested to ensure smooth data flow.
- **Functional Testing:** All features like resume upload, job search, and job posting are checked for proper functionality.
- **Security Testing:** JWT authentication and user authorization are tested to protect user data and prevent unauthorized access.
- **Performance Testing:** The system is tested for speed, responsiveness, and handling multiple users efficiently.

System Deployment: The system is deployed using modern web hosting platforms for easy accessibility and scalability.

- **Frontend Deployment:** React.js frontend can be deployed using platforms like Vercel or Netlify.
- **Backend Deployment:** Node.js and Express.js backend can be hosted on Render or Railway.
- **Database Deployment:** MongoDB Atlas is used for cloud database hosting and management.

The deployment process makes the application accessible online and ensures reliable performance for users.

AI POWERED JOB MATCHING SYSTEM - SYSTEM DESIGN

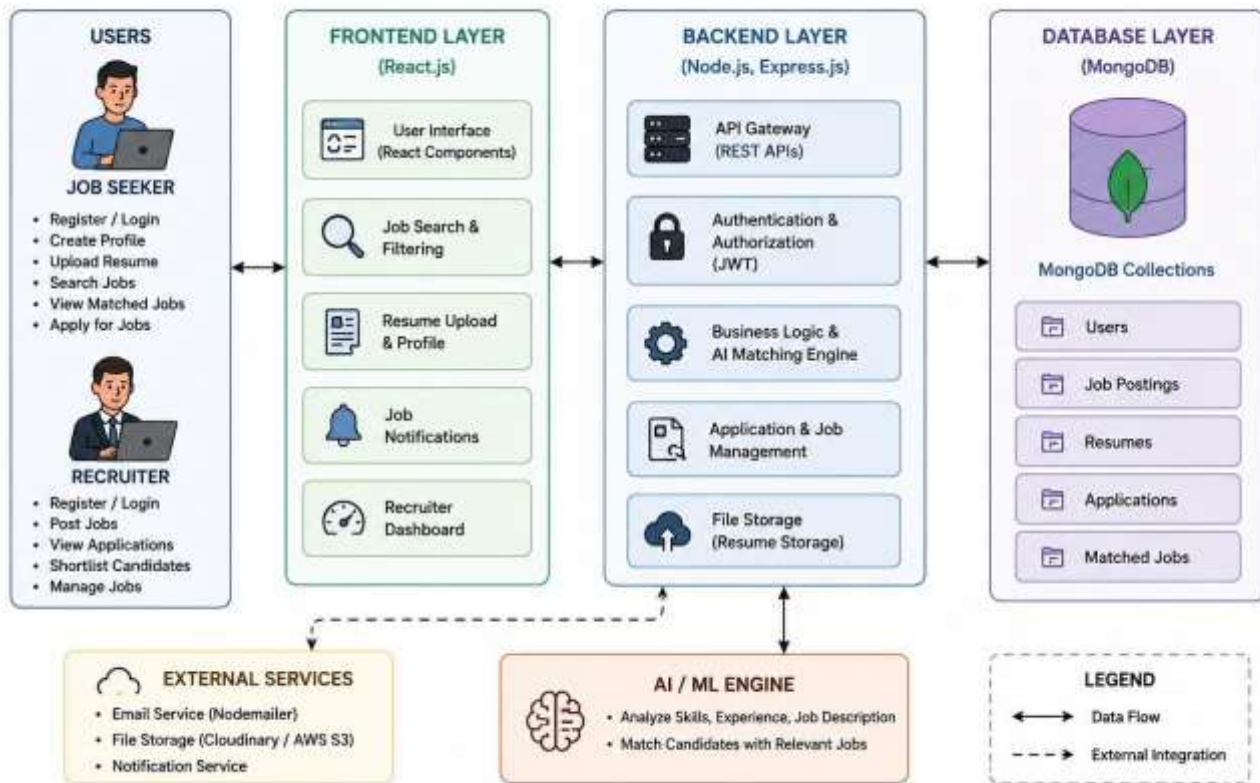


Fig: System Design

3. RESULTS AND DISCUSSION

The AI-Powered Job Matching System was successfully implemented using the MERN stack and tested for different functionalities such as job posting, resume upload, authentication, and AI-based job matching. The system improved the recruitment process by providing a faster, smarter, and more user-friendly platform for both recruiters and job seekers.

3.1. Streamlined Communication via Broadcast Center

The system provides smooth communication between recruiters and job seekers through notifications and updates. Recruiters can send job alerts, interview information, and application status updates to candidates. Users receive instant notifications about matching jobs and application activities, which improves communication efficiency and reduces delays in the recruitment process.

3.2. Improved User Experience and Interface

The React.js frontend provides a simple, responsive, and user-friendly interface. Users can easily register, search for jobs,

upload resumes, and manage profiles. Recruiters can manage job postings and applications through an organized dashboard. The easy navigation and modern interface improve overall user satisfaction and accessibility.

3.3. Accurate Data Management

MongoDB is used for storing user profiles, resumes, job postings, and applications securely. The backend efficiently handles data operations such as storing, updating, retrieving, and deleting records. The AI-based matching process analyzes user skills and job requirements accurately, reducing mismatched job recommendations.

3.4. Simplified System Maintenance

The MERN stack architecture makes the system modular and easy to maintain. Separate frontend, backend, and database layers allow developers to update or modify specific modules without affecting the entire system. This improves scalability, debugging, and future enhancement of the platform.

Job Portal

[Home](#) [Browse](#) [Jobs](#) [About](#)[Login](#)[Register](#)

No.1 Job Hunt Website

Search Apply & Get Your Dream Job

Find the right opportunities, apply instantly, and grow your career with our intelligent recruitment platform.

Find Your Dream Job



Categories

Explore our extensive job market.



Frontend Developer

Backend Developer



Latest & Top Job Openings

Fig: Home page

Latest & Top Job Openings

India

Backend developerr

We need a professional backend developer

100 Open Positions 8LPA Pune Full Time

India

Frontend Developer

We need a professional frontend developer

1 Open Positions 8LPA Delhi Full Time

India

Fullstack

skills required web development,mern stack ,python

8 Open Positions 7LPA Bangalore, India office

India

Full Stack Developer

We are looking for a skilled Full Stack Developer who can work on both frontend and backend technologies. The candidate should be comfortable working with modern JavaScript frameworks and backend APIs.

20 Open Positions 8LPA Pune, Maharashtra, India Full-Time

India

Electric engineer

skilled electric engineer is required

5 Open Positions 3LPA Bangalore, India office

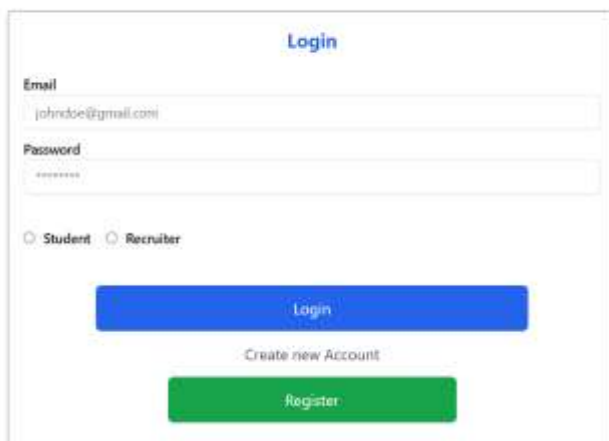
India

Software developer

skilled software developer recruitment for organizations growth

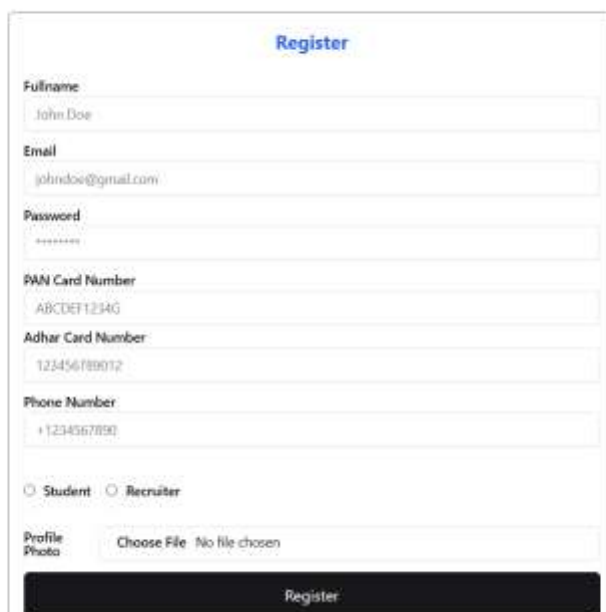
2 Open Positions 4LPA pune remote

Fig: Latest Job Opening



The login page features a white form with a blue header 'Login'. It includes input fields for 'Email' (containing 'johndoe@gmail.com') and 'Password' (masked with dots). Below these are radio buttons for 'Student' and 'Recruiter'. At the bottom, there is a blue 'Login' button, a link 'Create new Account', and a green 'Register' button.

Fig: Login Page



The register page features a white form with a blue header 'Register'. It includes input fields for 'Fullname' (containing 'John Doe'), 'Email' (containing 'johndoe@gmail.com'), 'Password' (masked with dots), 'PAN Card Number' (containing 'ABCDEF1234G'), 'Adhar Card Number' (containing '123456789012'), and 'Phone Number' (containing '+1234567890'). Below these are radio buttons for 'Student' and 'Recruiter'. At the bottom, there is a 'Profile Photo' section with a 'Choose File' button and the text 'No file chosen', followed by a large black 'Register' button.

Fig: Register Page

Job Portal

[Home](#) [Browse](#) [Jobs](#) [About](#)

Sweety Sharma
Software Engineer



 sharma@gmail.com

 3456765423

Skills

JavaScript MongoDB HTML CSS Node.js Next.js Express.js Bootstrap SQL GitHub AWS cloud

Resume

[Download](#)

Applied Jobs

Date	Job Title	Company	Status
2026-05-22	Fullstack	CloudSphere Technologies	pending
2026-05-22	Frontend Developer	NestGen Infotech	pending

Recent Applied Jobs

Fig: Profile Page

Job Portal

[Home](#) [Browse](#) [Jobs](#) [About](#)

Filter Jobs

Location

- ☐ Delhi
- ☐ Mumbai
- ☐ Kolhapur
- ☒ Pune
- ☐ Bangalore
- ☐ Hyderabad
- ☐ Chennai
- ☐ Remote

Technology

- ☐ Mern
- ☐ React
- ☐ Data Scientist
- ☐ Fullstack
- ☐ Node
- ☐ Python
- ☐ Java
- ☐ Frontend

1 days ago

**Backend developerr**

We need a professional backend developer

100 Positions Full Time 6LPA

[Details](#)

[Save For Later](#)

72 days ago

**Pratiti Technologies**

India

Full Stack Developer

We are looking for a skilled Full Stack Developer who can work on both frontend and backend technologies. The candidate should be comfortable working with modern JavaScript frameworks and backend APIs.

20 Positions Full Time 8LPA

[Details](#)

[Save For Later](#)

74 days ago

**TechNova Solutions**

India

Software developer

skilled software developer recruitment for organizations growth

2 Positions remote 4LPA

[Details](#)

[Save For Later](#)

Fig: Search jobs based on filters

Job Portal

[Home](#) [Browse](#) [Jobs](#) [About](#)

Search Results 6

1 days ago

Info
India

Backend developerr

We need a professional backend developer

100 Positions Full Time 6LPA

[Details](#) [Save For Later](#)

70 days ago

NextGen Infotech
India

Frontend Developer

We need a professional frontend developer

1 Positions Full Time 6LPA

[Details](#) [Save For Later](#)

77 days ago

CloudSphere Technologies
India

Fullstack

skills required web development,mem stack ,python

6 Positions office 7LPA

[Details](#) [Save For Later](#)

72 days ago

Pratiti Technologies
India

Full Stack Developer

We are looking for a skilled Full Stack Developer who can work on both frontend and backend technologies. The candidate should be comfortable working with modern JavaScript frameworks and backend APIs.

5 Positions office 3LPA

[Details](#) [Save For Later](#)

74 days ago

ByteBridge Systems
India

Electric engineer

skilled electric engineer is required

5 Positions office 3LPA

[Details](#) [Save For Later](#)

74 days ago

TechNova Solutions
India

Software developer

skilled software developer recruitment for organizations growth

2 Positions remote 4LPA

[Details](#) [Save For Later](#)

Fig: Search Result

Recommended Jobs

71 days ago

NextGen Infotech
India

Frontend Developer

We need a professional frontend developer

1 Positions Full Time 6LPA Match: 50%

[Details](#) [Save For Later](#)

73 days ago

Pratiti Technologies
India

Full Stack Developer

We are looking for a skilled Full Stack Developer who can work on both frontend and backend technologies. The candidate should be comfortable working with modern JavaScript frameworks and backend APIs.

20 Positions Full-Time 8LPA Match: 33%

[Details](#) [Save For Later](#)

74 days ago

TechNova Solutions
India

Software developer

skilled software developer recruitment for organizations growth

2 Positions remote 4LPA Match: 0%

[Details](#) [Save For Later](#)

74 days ago

ByteBridge Systems
India

Electric engineer

skilled electric engineer is required

5 Positions office 3LPA Match: 0%

[Details](#) [Save For Later](#)

73 days ago

CloudSphere Technologies
India

Fullstack

skills required web development,mem stack ,python

6 Positions office 7LPA Match: 0%

[Details](#) [Save For Later](#)

1 days ago

Info
India

Backend developerr

We need a professional backend developer

100 Positions Full Time 6LPA Match: 0%

[Details](#) [Save For Later](#)

Fig: Recommended Jobs

Job Portal

Companies Jobs



Filter by Name

Add Company

Logo	Company Name	Date	Action
	TechNova Solutions	2026-03-08	***
	CodeSphere Technologies	2026-03-08	***
	NextGen Infotech	2026-03-08	***
	ByteBridge Systems	2026-03-08	***
	Pratiti Technologies	2026-03-10	***
	CloudSphere Technologies	2026-03-10	***

Your recent registered Companies

Fig: Listed Companies

Job Portal

Companies Jobs



Title	Description
Enter job title	Enter job description
Location	Salary
Enter job location	Enter job salary
Position	Requirements
	Enter job requirements
Experience	Job Type
Enter job experience	Enter job type
Select a Company	
Post Job	

Fig: Job Description

Job Portal

Companies

Jobs



Filter by Name & Jobs

Post new Job

Company Name	Role	Date	Action
TechNova Solutions	Software developer	2026-03-08	***
ByteBridge Systems	Electric engineer	2026-03-08	***
Pratiti Technologies	Full Stack Developer	2026-03-10	***
CloudSphere Technologies	Fullstack	2026-03-10	***
NextGen Infotech	Frontend Developer	2026-03-12	***

Your recent Posted Jobs

Fig: Listed Companies

Job Portal

Companies

Jobs



Applicants 8

FullName	Email	Contact	Resume	Date	Action
Karan Chopra	karan@gmail.com	6754374569	NA	2026-05-23	***
Sweety Sharma	sharma@gmail.com	3456765423	Download	2026-05-22	***
Anurag Deshmane	Anur@gmail.com	9876543201	NA	2026-05-23	***
Rohit Verma	rohit.verma@gmail.com	9123456780	Download	2026-05-21	***
Priya Mehta	priya.mehta@gmail.com	8987654321	NA	2026-05-20	***
Vikas Patil	vikas.patil@gmail.com	7012345678	Download	2026-05-19	***
Neha Singh	neha.singh@gmail.com	7894561230	NA	2026-05-18	***
Amit Kumar	amit.kumar@gmail.com	7564983210	Download	2026-05-17	***

A list of your recent applied user

Fig: Job applicants

4. CONCLUSION

The AI-Powered Job Matching System developed using the MERN stack provides an efficient and intelligent solution for modern recruitment processes. The system successfully connects job seekers and recruiters through AI-based job recommendations and smart candidate matching. It simplifies the hiring process by reducing manual effort, saving time, and improving the accuracy of job matching.

The platform offers important features such as user authentication, resume upload, job posting, personalized job recommendations, and application management. The React.js frontend provides a responsive and user-friendly interface, while Node.js, Express.js, and MongoDB ensure secure data handling and smooth system performance.

The integration of Artificial Intelligence and Machine Learning improves recruitment efficiency by analyzing user skills, qualifications, and job requirements. The system is scalable, easy to maintain, and suitable for future enhancements. Overall, the project achieves its objective of providing a smart, secure, and user-friendly online recruitment platform that benefits both recruiters and job seekers.

5. ACKNOWLEDGEMENTS

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We also want to acknowledge the **Department of Computer Science & Engineering at Government College of Engineering, Chandrapur** for providing us with the necessary academic environment, infrastructure, and resources required to carry out this work effectively.

Lastly, a special thanks goes out to our peers and team members. The collaborative spirit, mutual support during the technical troubleshooting phases, and shared dedication were absolutely crucial in bringing this digital platform to life.

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