Job Bridge: An AI-Powered Platform Connecting Skilled Workers with Employment Opportunities

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ABSTRACT:

Many people living in rural and semi-urban areas are skilled but unable to secure job opportunities. At the same time, some employers require employees for temporary or full-time work, but do not know where to find them. It creates an AI-powered job portal that brings skilled workers to job providers. The platform will be offered in local languages so that users understand it very easily. It enables employees to look for work based on their abilities, such as tailoring, driving, carpentry, farming, plumbing, etc. Employers can post employment needs, and the platform will present the most qualified workers through the use of artificial intelligence. For trust, it will have aspects of ID verification, ratings, and secure payment. Payment is made only after the worker and employer both agree that the job has been completed. It helps in reducing joblessness in towns and villages. It gives a chance to skilled people to earn, and helps employers find workers easily. The tech stack is HTML, CSS, JavaScript, and Bootstrap for frontend, Python for backend, MySQL for data storage, and utilities such as Google Translate API for support of various languages, and minimal AI logic for efficient matching of workers and employers.

Keywords: AI Job Portal, Rural Employment, Semi-Urban Workers, Skill Matching, Local Language Jobs, Secure Payment, Worker Verification, Short-term Jobs, Job Matching System.

I. INTRODUCTION:

Unemployment in rural and semi-urban areas continues to be a major socio-economic challenge. While many individuals possess practical skills such as tailoring, carpentry, plumbing, driving, and farm work, they lack access to organized job markets. On the other hand, employers often struggle to find reliable labor for temporary and full-time work. This mismatch creates both unemployment and inefficiency. To bridge this gap, artificial intelligence and digital platforms can be leveraged to create smart job-matching systems. The proposed system builds an AI-driven job portal designed specifically for rural and semi-urban contexts. Unlike traditional job portals that primarily serve urban, educated job seekers, this platform focuses on local languages, skill-based matching, and trust mechanisms. This paper presents the design of such a system, its methodology, and its impact on reducing unemployment and enabling inclusive economic growth.

II. OBJECTIVE:

1. To develop an AI-powered employment marketplace that links employers and qualified candidates.

2. To provide a multilingual interface for accessibility in rural and semi-urban areas.

3. To establish trust using ID verification, ratings, and secure payments.

4. To reduce unemployment and underemployment in small towns and villages

III. LITERATURE SURVEY:

Employment generation and skill-based job matching have been widely explored in recent studies. The following literature highlights different approaches and gaps addressed by prior research.

1. Patil et al. (2025) explored how technology can enhance employment opportunities for skilled workers. Their work emphasizes creating platforms that connect workers with employers efficiently, highlighting the role of digital tools in reducing unemployment in semi-urban and rural areas (Patil, S. et al., 2025).

2. Satyam Singh et al. (2023) proposed an interactive job portal for faster hiring. The study focuses on streamlining the recruitment process and improving user interaction to reduce the time between job posting and selection, making the hiring process more efficient.

3. Dapke et al. (2025) developed an online job portal emphasizing the accessibility of employment opportunities through web-based interfaces. Their research underlines the importance of user-friendly systems in increasing engagement and usability for diverse user groups.

4. Jadhav et al. (2024) examined web-grounded job portal operations, highlighting techniques for better data management, search functionality, and workflow automation in online employment systems (Jadhav et al., 2024).

5. Prakash and Rajini (2024) focused on empowering futures through online job portals, stressing Prakash and Rajini (2024) focused on empowering futures through online job portals, stressing the importance of personalized recommendations and AI integration to match candidates with appropriate job roles (Prakash & Rajini, 2024).

6. Sagar et al. (2021) studied the issues faced in job portal research and operations, identifying key challenges like data accuracy, trust, and security in online employment systems.

7. Sivakumar et al. (2023) implemented a job portal using the MERN stack, demonstrating how modern web technologies can enhance real-time operations, scalability, and user experience for both employers and job seekers (Sivakumar et al., 2023).

8. Lodhi et al. (2025) introduced an online job portal system integrated with an AI chatbot, emphasizing automated query handling and intelligent guidance for users to improve engagement and efficiency (Lodhi et al., 2025).

SUMMARY:

The reviewed literature indicates that while several studies focus on improving job portals through AI, web-based systems, or interactivity, most of these systems are limited in scope for rural and semi-urban employment. Few studies integrate multilingual support, ID verification, and secure payment mechanisms for trust and accessibility. The proposed AI-powered smart job portal aims to address these gaps by combining skill-based job matching, multilingual interfaces, AI recommendations, and trust-enhancing features to provide a comprehensive solution for skilled workers and employers in underserved areas.

EXISTING WORK:

1. **Digital Job Portals:** Platforms like Naukri, Indeed, and LinkedIn focus on urban users and require internet literacy, limiting rural access.

2. **AI-Based Job Matching:** AI can match candidates with jobs based on skills and location, reducing recruitment time.

3. **Multilingual Platforms:** Regional language support increases participation from rural users.

4. **Trust & Security:** ID verification, ratings, and secure payments ensure reliable transactions.

GAPS IN BEING SYSTEMS:

1. Limited focus on pastoral and semi-urban employment.

2. Inadequate AI for skill-specific job matching in original languages.

3. minimum secure, trust-grounded mechanisms for deal

IV. METHODOLOGY:

The development of the Job Bridge portal follows a structured methodology to ensure that the platform effectively connects skilled workers with employers while maintaining inclusivity, trust, and transparency. The methodology consists of the following components:

1. Research Approach:

The research follows an applied approach focused on solving real-world problems of unemployment in rural and semi-urban areas. Instead of relying only on theoretical models, the study uses an AI-powered digital platform to practically connect workers and employers. The approach emphasizes accessibility, multilingual support, and secure payments to ensure inclusiveness.

2. Data Collection:

Primary data was collected through checks and informal interviews with workers, sewers, carpenters, drivers, plumbers, estate workers, preceptors, and original employers. These inputs helped identify major challenges, analogous to a lack of awareness of job openings, difficulty in reaching workers, and absence of trust in payments. Secondary data was reviewed from job descriptions, government reports, and journal papers to design an advanced system.

3. Proposed Solution:

1. Workers register chops and find matching jobs.

2. Employers post jobs and admit AI-grounded seeker suggestions.

3. Multilingual support improves availability.

4.ID verification, conditions, and secure payments ensure trust.

4. System Design:

The Job portal consists of three modules:

•**Workers Module –** skill listing, job search, local language interface.

•**Employers Module –** job posting, candidate selection, payment confirmation.

•**Admin Module –** ID verification, approval of postings, monitoring payments, and dispute resolution.
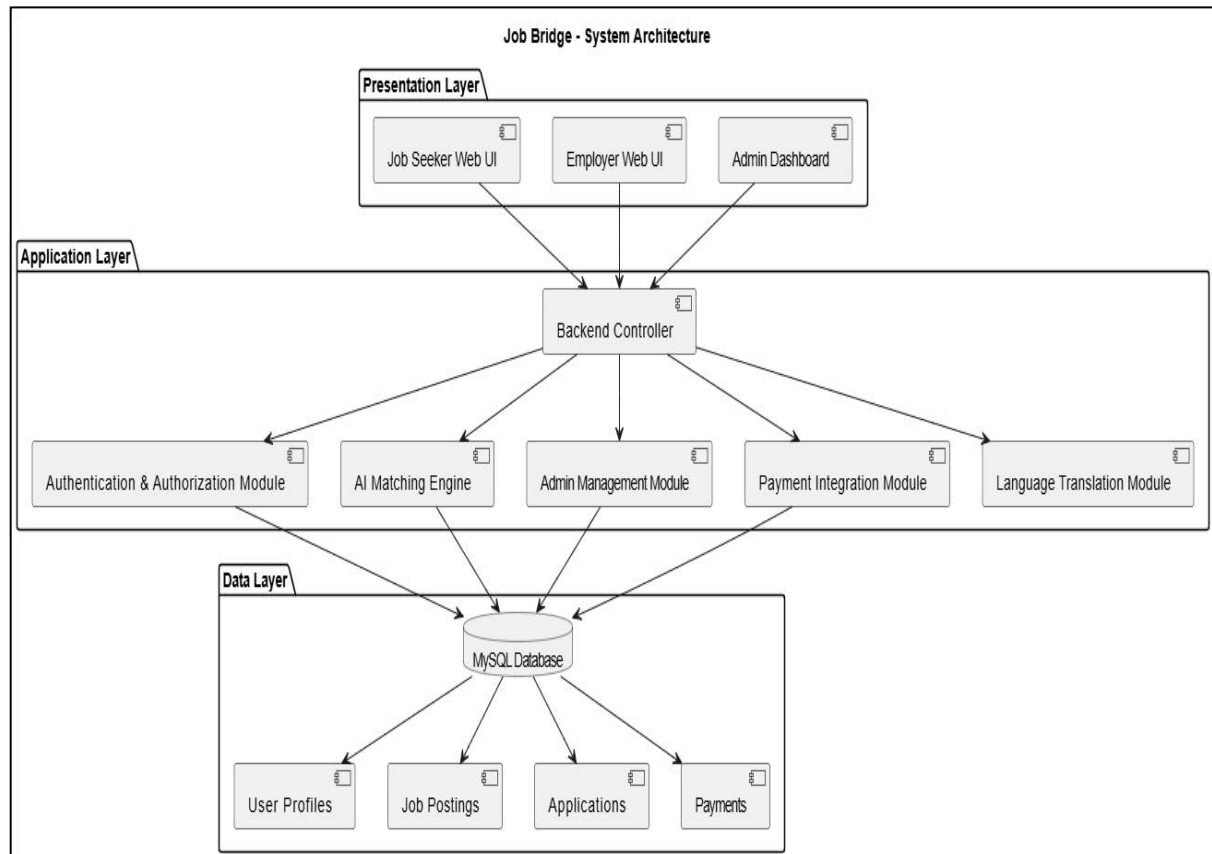
5. System Architecture:

Figure 1: System Architecture

There are three Architecture layers:

1. Presentation Layer – The page job seekers, employers, and admins use.

2. Application Layer – The brain that does login, job matching, payments, etc.

3. Data Layer – Stores all info like profiles, jobs, and payments.

5. UML Diagrams:
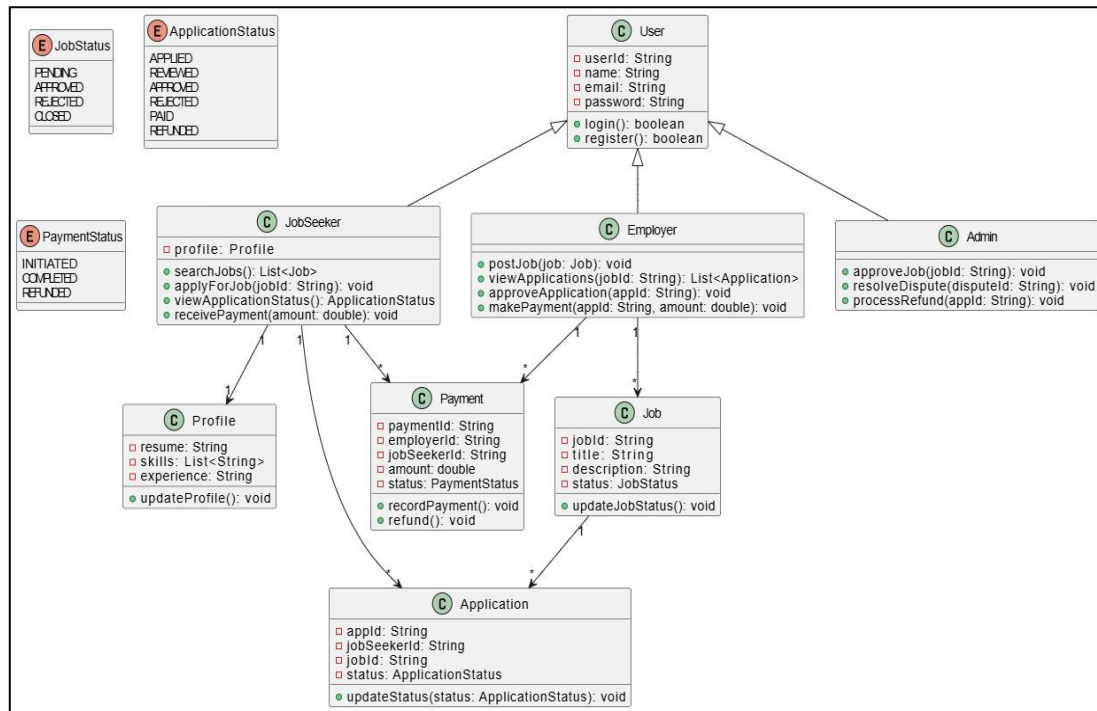
1. Class Diagram:

Figure 2: Class Diagram

This class diagram represents a job portal system where the main User class serves as a base for three user types: Jobseeker, Employer, and Admin. Jobseekers can create profiles, search for jobs, apply for them, track application statuses, and receive payments. Employers can post jobs, review applications, approve or reject them, and make payments. Admins manage job approvals, resolve disputes, and process refunds. The system also includes entities for managing job details, applications, and payments, with status tracking to monitor progress and actions within the platform.
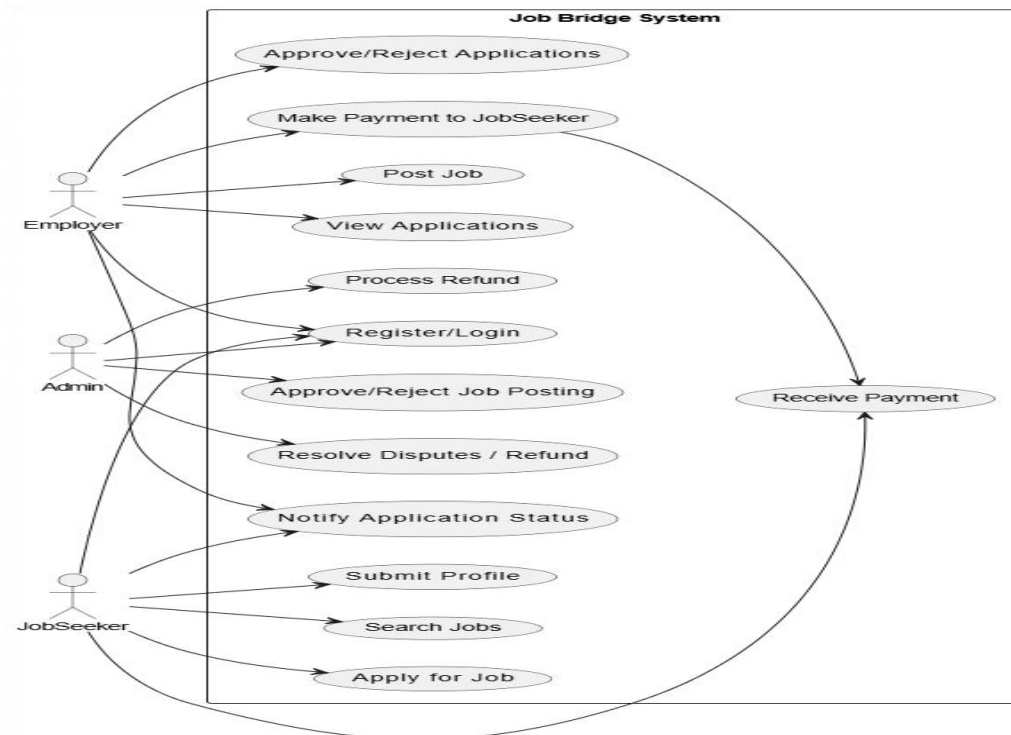
2. Use Case Diagram:

Figure 3: Use Case Diagram

The Job Bridge System connects Job Seekers, Employers, and Admins, enabling job search, applications, job postings, and dispute resolution. It streamlines the hiring process by managing profiles, payments, and approvals efficiently.
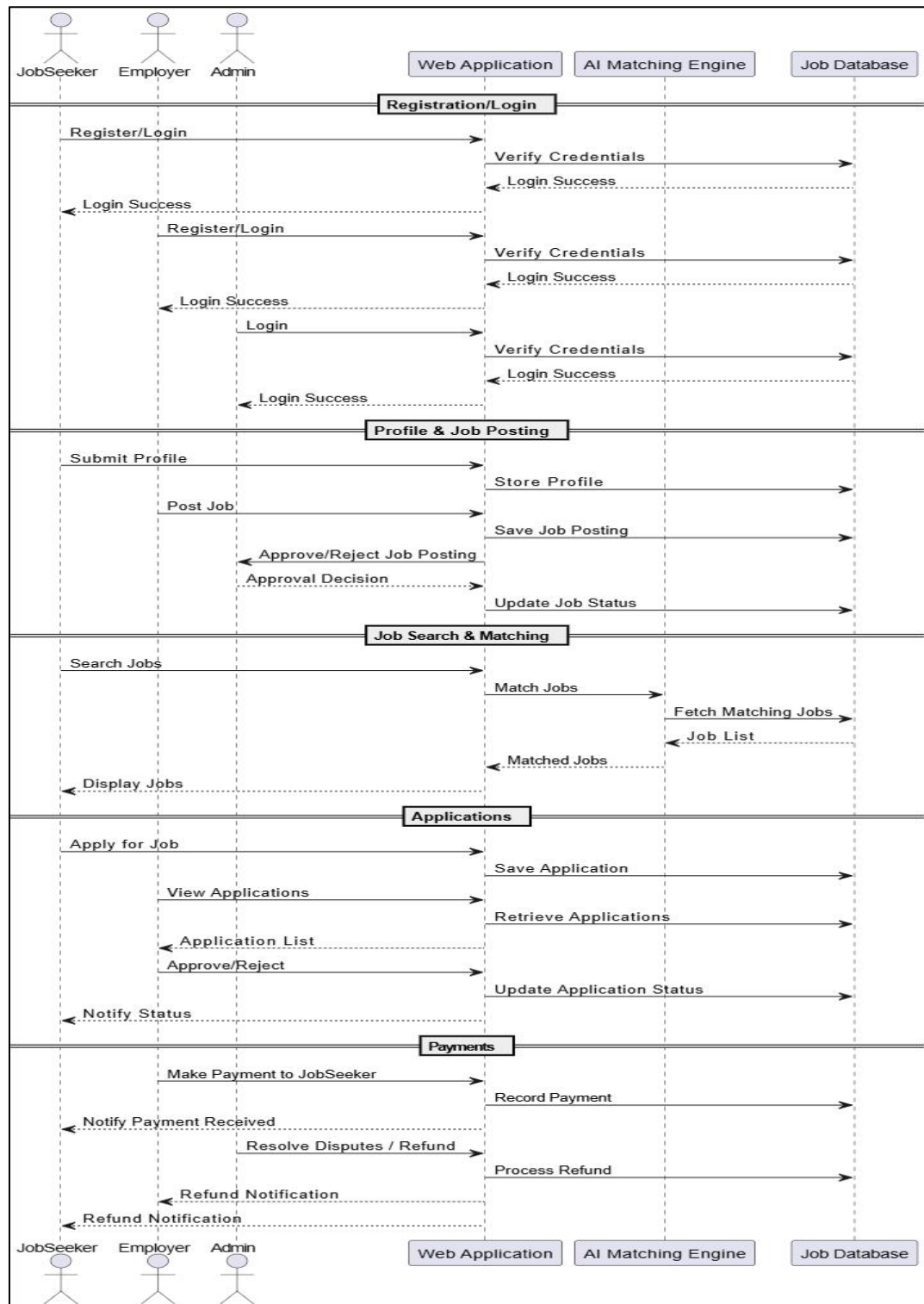
3. Sequence Diagram:

Figure 3: Sequence Diagram

This sequence diagram illustrates the interactions between Job Seeker, Employer, Admin, Web Application, AI Matching Engine, and Job Database. It covers key processes including user registration/login, profile submission, job posting and approval, job searching and matching, job application and status updates, payments, and dispute resolution. The flow highlights how each user interacts with the system components to perform their respective tasks in the job portal.

6. System Requirements:

Table 1: The Job Bridge portal requires both hardware and software resources for smooth operation.

Category	Requirements
Hard ware	Intel i3 or higher, 4GB Ram, 250GB storage, Internet
Software	Windows/ Linux, Python, MySQL, HTML, CSS, JavaScript, Bootstrap
Tools	PyCharm / VS Code, Chrome/Firefox, OTP

V. SYSTEM IMPLEMENTATION:

The AI-powered smart job bridge portal uses a web-based architecture integrating frontend, backend, database, and AI modules to connect skilled workers with employers efficiently.

1. Frontend:

•Technologies: HTML, CSS, JavaScript, Bootstrap

•Features: Responsive UI, separate registration/login for workers and employers, job search & posting, rating & feedback system.

2. Backend:

•Technology: Python (Flask)

•Features: User authentication & ID verification, AI-based job matching, payment management, multilingual support via Google Translate API.

3. Database:

•Technology: MySQL

•Features: Stores user profiles, job postings, applications, completion status, payments, and feedback.

4. AI Module:

•Technologies: Simple AI logic for matching.

•Features: Matches workers to jobs and recommends suitable candidates.

5. Security & Trust:

•ID verification, ratings & feedback, secure payment release after mutual confirmation.

6. Workflow:

1. Worker registers and lists skills.

2. Employer posts job requirements.

3. AI recommends suitable workers.

4. Job alerts sent to workers in the local language.

5. Employer selects a worker.

6. Job completed and payment released securely.

VI. RESULTS AND DISCUSSION:

The Job Bridge portal effectively addresses employment challenges in rural and semi-urban areas by connecting skilled workers with employers through AI-based job matching, multilingual support, and secure payment systems.

Key Outcomes:

For Workers: Increased access to job opportunities based on their skills such as tailoring, carpentry, plumbing, driving, and farm work. Workers gain recognition for their abilities and a reliable platform to earn income.

For Employers: Easier access to verified skilled labor, with reduced recruitment time and effort due to AI-based candidate recommendations.

For Admins / Platform: Ensures transparency in operations and manages secure payments, while monitoring trust mechanisms such as ratings and ID verification.

Socio-Economic Benefits:

1. Reduces unemployment in towns and villages.

2. Promotes digital literacy among rural and semi-urban users.

3. Encourages skill development and recognition of local talent.

Preliminary Feedback:

1. Local language support significantly improves usability and adoption.

2. Secure payment features increase trust among workers and employers, encouraging more frequent use of the platform.

Overall, the Job Bridge portal provides a reliable, accessible, and trustworthy system that bridges the gap between skilled workers and employers, supporting socio-economic growth and employment in underserved communities.

VII. CONCLUSION:

The proposed AI-powered job bridge portal provides a practical and inclusive solution to rural unemployment and labor shortages. By leveraging artificial intelligence for skill-based matching and ensuring trust with verification and secure payments, the platform addresses key gaps in existing job markets. It empowers skilled individuals to earn sustainable livelihoods and helps employers find workers efficiently. With proper implementation, this system can play a significant role in reducing unemployment in rural and semi-urban regions, contributing to economic development and digital inclusion.

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