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AI-Powered Employment Platform for Low Income Workers

Mrs. Bushra Tarannum[1], Ms. Ryakam Lavanya [2]

[1,2]Assistant Professor
Department of Computer Science and Engineering (AI & ML)
CMR Technical Campus
Kandlakoya, Hyderabad, Telangana

Abstract
The low-income worker unemployment is a major problem due to the low access to job platforms and ineffective job-matching systems. This project is an AI-Based Employment System of Low-Income workers based on machine learning. This platform tries to match workers and employers according to the relevant skills rather than qualifications of the past. It provides employers and employees with different areas to log in and have a secure connection and custom features.

Employers are able to advertise job requirements which is the listing of essential skills and workers are able to enroll their skills, experiences and job preferences. This system employs machine learning to understand the skill patterns and align job requirements to that of the workers. It suggests appropriate workers to employer and applicable job trends to workers leading to less manual search as well as enhanced efficiency in hiring. The emphasis on skill-based labor position helps the platform to introduce a flexible work environment and promote the participation of more individuals in the economy. The aim of this platform is to automate the jobs market, reduce unemployment among the low-income groups, and achieve a platform that functions at scale and is flexible enough to meet the fluctuating labor market demands. On the whole, the system demonstrates that AI and ML need to be efficiently used to produce a significant employment ecosystem.

Keywords: AI Powered, Skill-based Job matching, Non- IT Workforce, Gig Economy, Unorganized Sector Employment, Digital Employment Platform.Employment Platform,Skill-Based Job Matching,Low-Income Workers,Non-IT Workforce,Job Recommendation System,Candidate-Job Matching

1. Introduction

Unemployment among low-income workers is a persistent social and economic problem in recent years, especially where opportunities to have access to the organized employment platform are scarce. A lot of talented people have problems with proper employment as they are not visible and the systems of matching jobs are not efficient. Conventional job markets tend to focus on official credentials and low-income earners can hardly compete even where the workers possess skilled understanding and expertise in the job.

This project suggests a solution to this challenge by the use of an AI-Powered Employment Platform of Low Income Workers with the help of Machine Learning. The platform will match the employers and workers based on the skill-based matching approach. It allows employers and employees to use separate modules of login, where a role can be successfully limited to specific jobs. Employers are able to post job requirements in terms of the skills required and the workers are able to place their skills and seek relevant jobs. The method of machine learning is applied to the user profile and job specification to create the correct employment suggestions.

- The large conclusions of this paper are:
- Artificial Intelligence (AI) based Non-IT Worker Skill Matching.
- The new project proposes the AI-based matching system which targets the non-IT and informal sectors of employment, including plumbing, house wiring, and maintenance. As compared to conventional channels, it places emphasis on experience instead of educational credentials.
- Workers with Low Incomes become Employed.
- The platform directly targets the problem of unemployment among people with low income, as it is easy to find employment on the platform by demonstrating skills digitally.
- Career Networking System between Employers and Workers.
- The system will facilitate employer and employee modules which will allow employers to post work requirement where workers can then search and apply jobs according to their capabilities.
- Streamlined and Easy to Use Interface.
- The project focuses on the usability of non-technical user so that it is easy to navigate and relatively low in complexity to the worker in the unorganized sectors.
- Gig and Short-Term Employment should be encouraged.
- The platform facilitates short term and task oriented work and allows the workers to earn money in a flexible manner and allows employers to employ workers as per their short term requirements.

2. Related Work

There have been a number of studies and platforms that have been suggested to accommodate unemployment and job matching, through the help of digital technologies. Old fashioned web-based job platforms only use keywords and filtering by human capabilities, which is not always effective at delivering precise identity of low-income employees with non-formal or experience-based experience. Such systems have a tendency of putting more emphasis on educational qualifications and standardized resumes, leaving workers with more skills left out.

The studies covering the usage of artificial intelligence and machine learning in terms of recruitment and job recommendation systems are rather new. Other solutions use the techniques of content-based filtering and collaborative filtering to provide recommendations about the jobs using the user preferences and past records. Other research works concentrate on resume parsing and automated rankings on the candidates to help the employers in shortlisting of the applicants. Although they enhance efficiency, formal employment sectors are normally targeted by them and the resumes must be structured.

Some skill-matching solutions have been launched to facilitate freelance and work-on-demand jobs, but they are not intelligent and do not scale to low-income employees. In comparison with available

solutions, the proposed system focuses on matching employers and low-income workers based on skills through machine learning as a more effective method of matching them. The platform is meant to cyber bully the drawbacks of the traditional systems to deliver easy, non-discriminatory, and smart job suggestions. It is our task to eliminate the obstacle to establish a connection between the people and the employer in order to provide employment to the people and earn them a passive income using their talents.

3. Problem Statement and Objectives

Another issue that is present in low-income workers is unemployment because they do not have effective and inclusive job boards. Often, those people have practical skills and cannot utilize formal job networks and digital tools that can work best to demonstrate the gained skills. Current employment procedures are largely based on filtering based on qualification and manual searches of jobs, however these methods have proven ineffective in matching the employer with qualified low-income earners. Besides, employers are challenged by the inability to find talented employees within a short period because of unstructured information and ineffective matching processes. This is because the intelligent job recommendations are not available, which leads to the longer hiring time, lesser employment and the lack of skills utilisation. Accordingly, an intelligent, accessible and skill-oriented job market able to conceal the employment gap between employers and the low-income workers through methods of machine learning is needed. That is why an AI-driven job search engine focused on non-IT, skill-based employment and allowing successful job matching by means of machine learning is necessary.

The goals of the proposed system are:

- To create an employment site with AI serving low-income and non-IT employees.
- To subsidize skilled jobs like plumbing, house wiring, electrical jobs and maintenance.
- To allow the employers to locate the right employees according to their needs and occupation.
- To offer the workers who have no formal qualifications work and job search opportunities easily.
- To apply machine learning to smart matching job needs and skills of workers.
- To lower joblessness and also enhance income stability among the low-income workers.

4. System Architecture and Design

The AI-Powered Employment Platform of Low Income Workers with ML is designed in a modular fashion and can be extended to skill-based job matching of the non-IT and informal job market. The proposed system consists of three layers: User Interface Layer, Application Layer, and Data & ML Layer.

User Interface Layer also allows employers and job seekers to log in to the system through different login modules. Job seekers are allowed to provide their skills, job preference and availability whereas the employers provide job specifications like job type, ability requirement, and locality. It is also designed in a user-friendly and easy to use way by low-income and non-IT job seekers.

The Application Layer works with the overall logic of the application including authentication, job posting, job search as well as Employers and Job Seekers communication. The Data and ML layer also deal with the request processing and safe transfer of information.This layer will store the data of the

users, the job data, and the skill data. Smart job and worker recommendations are generated by the machine learning algorithms that work with skill data and job requirements.

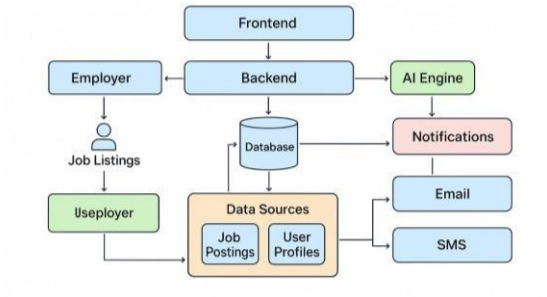

Fig. 1. System Architecture of AI-Powered Employment Platform for Low Income Workers

Database Layer

All data is stored in a MangoDB relational database. Key tables include:

- Users
- Profiles
- Skills
- Jobs
- Contact
- Mail
- Password
- Location

Frontend (React + TypeScript):

- Builds the user interface
- Handles user interactions
- Sends requests to the backend
- Uses TypeScript for type safety and fewer errors

Backend (Supabase + PostgreSQL):

- Stores and manages data
- Handles authentication and security
- Provides APIs for frontend to fetch or update data
- Uses PostgreSQL for relational database management

5. Implementation

The artificial intelligence powered job site among low income workers is deployed through a modular and layered scalability and reliability strategy. Registering and logging in are safe. Employees also offer their skills (e.g., plumbing, electrical, carpentry), work preferences whereas employers place jobs with skills required and location. The database stores all the information in a structured form to have an easy time accessing the necessary information.

The ML module is used to transform skills and job requirements into skills and job requirements which are then represented in form of a structure and an algorithm is used to calculate similarity score which is a match score. Recommendations are also made on the relevant jobs to employees and the relevant workers to employers.

The application layer will connect the users with both the database and the ML model in real-time, providing the opportunity to match the skills and activities by use of the accumulation of skills and data according to the needs and requirements of the human resource (IT, low-income workers) positively, thereby reducing human labor and increasing employment.

6. Results And Discussion

The proposed system was developed and obtained a proper interfaces for the interaction between the employers and workers.

A. Worker Job Listing Interface

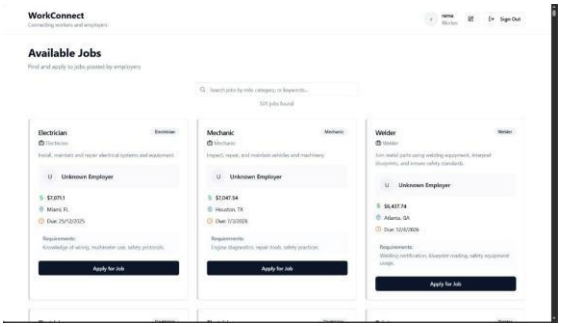

Fig. 2. Worker Job Listing Interface

This interface provides the list of existing jobs among registered workers on the platform. Jobs can be searched by workers either using key-words or categories or by employment like electrician or mechanic and welder. Both job cards present fundamental information such as job title, employer, salary, location, the date of due and skills required to perform the job. This is because the button of Apply about Job gives workers an opportunity to declare their interest in an appropriate work. The interface makes it easier to help low-income workers discover jobs as they simply display the relevant opportunities in a simplified format.

B. Employer Service Browsing Interface

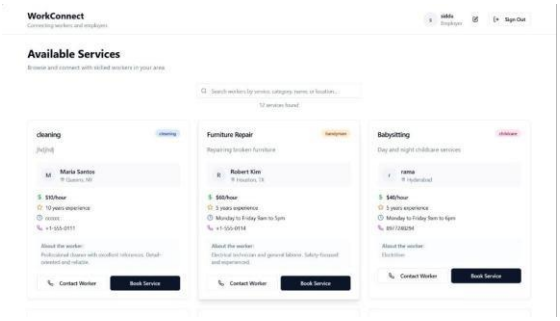

Fig. 3. Employer Service Browsing Interface

Through this screen, employers can browse and network with qualified personnel providing different non-IT services like cleaning, furniture repair, babysitting and maintenance work. Every employee profile will show their experience, hourly pay, location, availability and contact information. The

platform allows the employers to contact workers directly or they can book services. Through this interface, employers are in a position to find ideal workers fast and at the same time offering wider publics like the skilled who may not be able to get through the formal employment systems.

C. Home Page and Platform Overview

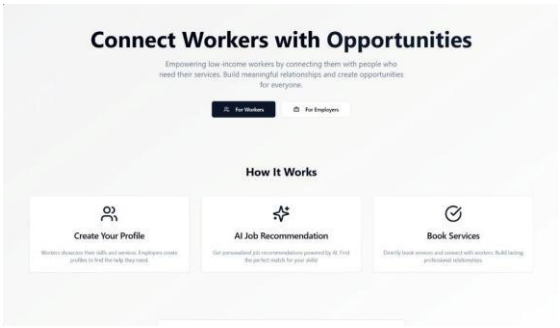

Fig. 4. Home Page and Platform Overview

The home page can be considered the gateway of the system that informs about the purpose of the platform. It emphasizes the idea to match low-income workers to a job option with the help of AI suggestions. The interface is designed with the ease of navigation by both the workers and the employers with different buttons. The flow of the platform has been described in easy steps under the How It Works section and first-time users can understand how to navigate through the system in no time and be able to start using the system effectively.

D. AI Job Recommendation Dashboard

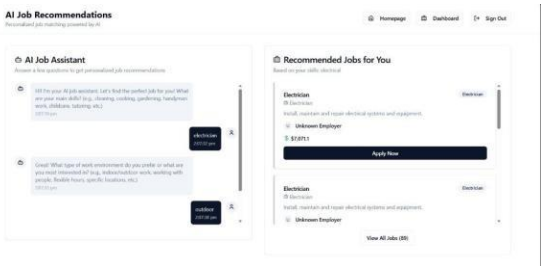

Fig. 5. AI Job Recommendation Dashboard

This interface shows the feature of job recommendation on the platform by AI. The AI job assistant relates with the employees posing questions regarding their work preferences and their abilities. Depending on the inputs, the system will produce custom job recommendations at the dashboard. This smart working interaction saves manual job searching time and enables workers to find the right society of their skills in minimal time like electrical working or outdoor working.

E. Discussion Summary

The platform implements skill matching with the help of ML to find low-income laborers the right job. It is also scaled and reliable thanks to its modular design, and real-time recommendations decrease the amount of manual work and increase the chances of employment.

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