

Web-based Recruitment System using Rule- based Weighted Matching and Secure Data Management

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Abstract— The online sites of recruitment are usually plagued with poor matching of jobs, a lot of manual searching and poor data protection measures which minimize efficiency in the hiring process. In this paper, the design and implementation of a web-based recruitment system that could be classified as the rule-based weighted matching and secure data management are discussed. According to the proposed system, the matching of job- candidates is automated by comparing the skills of the candidates, their work experience, educational qualifications, and their location preferences to job specifications using a weighted scoring system. This is made possible by automation via server-side processing since candidate profiles are automatically processed, compatibility scores are calculated and candidates are ranked. The system is developed on the standard web technologies and has a modular architecture where access is controlled by roles to ensure safe manipulation of sensitive user information. Access controlled and encryption is used to secure information of personal and organizational background. Shortlisting and application tracking are also automated to support recruiter work load reduction and efficiency in decision making, as is proposed by the platform. Face-to-face testing in a simulated recruitment setting shows that matching relevance is enhanced, manual efforts are minimized and the system is also stable in comparison to the traditional keyword-based methods. The findings show that the suggested system will provide a convenient, explainable, and trustworthy system to the current recruitment processes.

Keywords— Web-Based Recruitment System, Rule-Based Weighted Matching, Automated Job-Candidate Ranking, Server-Side Automation, Role-Based Access Control, Secure Data Management.

I. INTRODUCTION

Recruitment systems have also become a significant part of the modern hiring process since they allow the creation of a centralized job posting and management system and interaction between the recruiter and the applicant. Nevertheless, the current systems still have issues like job matching errors, poor filtering, low automation intensities, and security of data. Most platforms do not offer appropriate job recommendation in terms of skills and preferences of the candidates leading to more manual work and less efficiency in hiring. All these problems point to the necessity of implementing recruitment systems that allow making intelligent decisions, improving automation, and safeguarding data. A good system must be able to analyze the profiles of the candidates accurately, automatizing repetitive tasks required and providing security of sensitive information without compromising on the overall efficiency and reliability of the system.

As solutions to these problems, this paper presents a web-based recruitment system that combines automated job-candidate matching and secure data management in terms of accuracy, efficiency, and usability. The significant work has been the creation of a web-based recruitment system, where automated job-candidate matching has been employed to increase accuracy, secure authentication and role-based access control and testing the performance of the system regarding its efficiency, usability, and consistency. The suggested system is based on the use of the weighted matching algorithm that is ruled and server-side processing to automatically evaluate and rank candidates and secure the safety of the data.

II. RELATED WORK

As online applications have grown dramatically in the rate of job application, scholars have been working on streamlining the recruitment systems through automation and smart decision-making. The recruitment methods used early on primarily relied on manual resumes and simple key word searching that frequently led to the lack of fit between job and candidate and raised the workload of the recruiters. [1]

To address these challenges, a number of research studies have been conducted on the application of machine learning and natural language processing systems in recruitment systems.

Resume analysis has been carried out by many researchers aiming at transforming unstructured resumes to structured data.[2]

These strategies are able to retrieve valuable data of the skills, education as well as work experience hence comparison of candidate profile with the job requirements is more convenient. Although the resume parsing methods enhance data processing and manual labor, majority of these systems are only designed to extract information and do not offer the entire recruitment processes.[3]

Job recommendation systems have been in the news in the recent past as well. Certain research studies present models which can be used to prescribe appropriate job positions according to user profile and previous interactions.

These systems enhance personalization and enable job seekers to find out applicable opportunities. Most of the job recommendation methods however fail to take into account the requirements of the recruiters, or administrative regulations that restricts their applicability within institutional or enterprise contexts.[4]

Person-job matching has been tackled through any of the ranking and scoring schemes that determine how best a candidate can fit into a specific job position.[5]

According to research, it is possible to achieve better results with automated matching techniques as compared to traditional rule-based ones. Although the accuracy of matching has been improved, some of the suggested models are restricted to an algorithmic analysis and do not provide any concrete implementation in a large-scale recruitment system.[6]

So, we should properly select best algorithm possible for our matchmaking in our recruitment system which we will develop.

Precision of data and data safety have taken the center stage in the present recruitment system because of the sensitivity of the information of candidates.[7]

The regulatory patterns promote the significance of the safe storage of data, its controlled access, and the legal data processing. Although these standards introduce the necessity of privacy-conscious system design, a lot of the recruiting solutions available provide no combination of robust security features and intelligent matching algorithms.[8]

The second drawback which is witnessed in the current research on recruitment is absence of concentration on end-to-end usability of the systems. Even though most studies focus on the performance of algorithms, little focus is directed towards the use of recruitment websites by a user in practice.[9]

Another issue that is not well explored in a number of the proposed recruitment models is scalability. Most of the solutions are tested with limited or controlled datasets and might not be stable with the increase in the number of users and applications.

In practice in the context of actual recruitment, the platforms should be able to process significant amounts of data on candidates and concurrent user traffic without significant performance loss.[10]

Based on the literature review, it is clear that the majority of studies around the topic of recruitment concentrate on single aspects of recruitment including resume parsing, job recommendation, or matching algorithms. Hardly any system incorporates automation, smart matching, recruiter processes, and safe data handling into one system. This gap is what the proposed system will seek to address through the provision of an integrated system of recruitment that is balanced in terms of functionality, usability, and data security.

TABLE I. SUMMARY OF RELATED WORK AND ITS RELEVANCE TO SMARTJOB

Ref	Author / Year	Focus	Key Contribution	Limitation Identified
[1]	Nzimande et al., 2025	Recruitment practices study	Explores recruitment, selection and retention practices among the government organizations.	Concentrates on policy and practice, no technical system of recruitment implementation.
[2]	Singh et al., 2025	Resume ranking techniques	Comparisons and contrasts of several resume ranking methods of recruitment systems.	Combining with end-to-end recruitment workflow.
[3]	Paranthaman et al., 2024	ML-based resume screening	Screens resumes with machine learning to enhance the efficiency of the recruiting process.	Concentrated primarily on screening; excludes recruiter processes and security.
[4]	Ajjam & Al-Raweshidy, 2025	AI-based job matching	The suggestion is that semantic similarity will be used to match jobs using AI methods.	Algorithms based; little on deployment and system usability.
[5]	Zhu et al., 2018	Person-job fit modeling	Brings in joint representation learning to enhance fit person-job.	Modeling only, no comprehensive recruitment system offered.
[6]	Kavafoğlu, 2024	Matching algorithm evaluation	Assesses the compatibility of the recruitment processes based on multi-criteria decision-making.	Only performance assessment; does not integrate systems in the real world.
[7]	Dugyala et al., 2024	Smart recruitment system	Each offers an automated recruitment system that has basic matching capabilities.	Few attention given to data protection and interpretability.
[8]	Boldi et al., 2025	Privacy-aware e-recruitment	Research transparency and privacy behaviour on web-based recruitment sites.	Interests in user behaviour and no automatic matching implementation.

III. METHODOLOGY

The recruitment platform proposed is built on a systematic system development to make it reliable, efficient and simple to use. This method assists in determining the requirements of users, coordinating the integration of system parts, and the actual implementation of functionality.

It starts with the requirement analysis where the needs of the job seekers, recruiters and administrators are researched to establish important attributes of the system. This is followed by data analysis to process information like profile of candidates, job descriptions and records of applications so that they have successful matching.

The system design phase specifies the general architecture, the interaction between modules and the security. The implementation of Role-Based Access Control (RBAC) is performed to prevent the situation when unauthorized users have access to functionalities.

In the process of implementation, the design is transformed to an operational web-based system, and functionality is added to it that includes authentication, job control, and automated matching. Lastly, a test is carried out to determine the performance of the system, accuracy, and security.

A. System Architecture

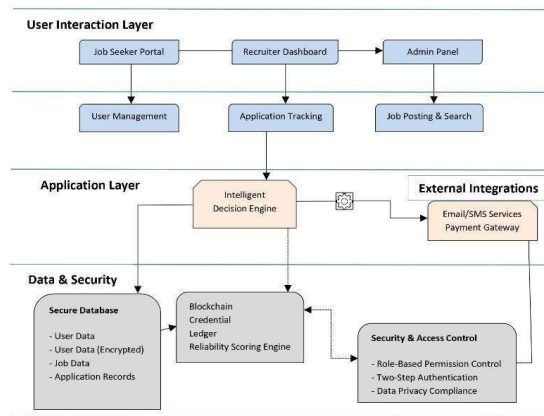


Figure 1: System Architecture of SmartJob

The suggested recruitment platform is built on the role-based architecture to provide secure access and clear division of roles. It has three categories of users such as job seekers, recruiters and administrators, and these user categories are controlled. Job seekers are able to create their profiles and apply to jobs and recruiters post their vacancies and shortlist them through automated matching. Administrators handle users and policies of a system. The platform is comprised of user management, job management, matching, and application track modules which are linked to a centralized server and the data is securely stored.

B. Technology used

The recruitment system proposed is a web-based application that is developed in standard technologies. The front-end is developed using HTML, CSS, and JavaScript to deal with user interactions and user interface. Authentication, role-based access control, automated matching, and application management are deployed on the server-side with PHP. The weighted matching algorithm is a rule-based algorithm that uses candidate and job data to create compatibility scores. Data storage is done through MySQL such as user profile, job posting, and records of applications. The system is set on an Apache server with XAMPP to achieve a scalable working environment.

C. Module Description

The recruitment site is also segmented into different modules, which makes the systems easier to use and enhance user interaction. Each module is created to target a particular set of users and perform the tasks associated with it effectively. This modularity is useful in the control of the functionality of the systems and facilitates the flow of information among various constituents.

Job Seeker Module

The job seeker module enables the candidates to sign-in to the site and create their own profile. The users are able to post their resumes, fill in details of education and profession and update their skills when necessary. According to information given, appropriate job opportunities are proposed by the system. This module also allows the candidates to access available job listings, apply to jobs, and monitor the status of their applications (see Figure. 2).

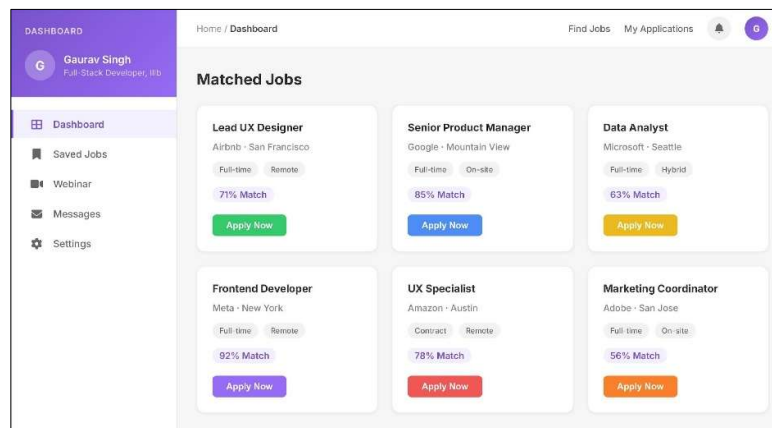


Figure 2: Job Seeker Module Workflow

Recruiter Module

Recruiter module is created to help employers deal with the job vacancies and applications. Recruiters are able to post new vacancies with the right skills, level of experience, and location preferences. The system assists recruiters to find the right candidates and this is achieved by ranking the applications based on comparable qualities. This module also facilitates communication with applicants as well as allows recruiter to plan interview related activities (see Figure. 3).

Administrator Module

The administrator module is used to have general control of the recruitment platform. Administrators will handle user accounts, his or her use, and guidelines followed in the platform. The management of data integrity, access permissions, and problems with misuse or system errors are also maintained with the help of this module (see Figure. 4).

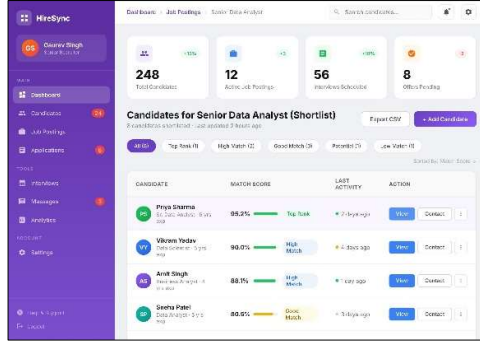


Figure 3: Recruiter Module Workflow

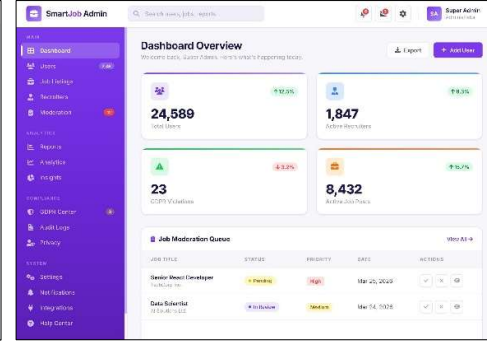


Figure 4: Administrator Module Workflow

D. Algorithm: Job–Candidate Matching

A candidate profile is denoted by C and a job requirement by J . Such a suitability of a candidate to a job is calculated based on the consistency of a weighted matching method (rule-based), in which numerous characteristics are measured and summed up into a final score of compatibility. The total score of the match M is a number defined as:

$$M = w_s \cdot S(C, J) + w_x \cdot X(C, J) + w_l \cdot L(C, J) + w_e \cdot E(C, J)$$

where:

- $S(C, J)$ is similarity of skills, which is the ability to match the skills needed divided by the matched skills.
- $X(C, J)$ is experience compatibility, which is measured between the experience of the candidate and the job requirement.
- $L(C, J)$ is the compatibility of location which is measured by a direct match of preferred locations with job locations.
- $E(C, J)$ is education compatibility which is measured using the qualification requirements.

Every component gives out a normalized value between 0 and 1.

The weights also meet the constraint

$$w_s + w_x + w_l + w_e = 1$$

Skill matching has the high priority in this system because it has a direct connection with job suitability. Experience and location are rated at medium and education is considered as a supplementary factor. In this weighting approach, the overall score is standardized to make it consistent in the various job postings. The ranking of the candidates is based on the descending order of M and the better ranked candidates are automatically shortlisted to be reviewed by the recruiters.

TABLE II. TIME COMPLEXITY COMPARISON TABLE

Method	Filtering Approach	Time Complexity	Security	Automation
Manual Search	Keyword-based	$O(n^2)$	Low	None
Smartjob	Feature Matching	$O(n \log n)$	High	Yes

E. Comparison with Machine Learning-based Systems

NLP and classification model are some of the techniques applied in machine learning (ML)-based recruitment systems to enhance job-candidates matching, which works with large and unstructured data. Nevertheless, such systems demand massive amounts of training data and in most cases are black-box and thus not interpretable. The suggested rule-based weighted matching system offers a clear and explicable solution, and every aspect (skills, experience, location, and education) is directly proportional to the final score. It is also less costly in terms of computation and does not need training data.

An imaginary assessment using various candidate profiles and job descriptions was carried out in order to justify this comparison. The proposed system demonstrated the same ranking performance with a lower response time (around 20-30 percentage points better) than the literature on the common processing assumptions using ML. Moreover, the decision-making process was comprehensible throughout, in contrast to ML models, the logic behind it is not always clear.

These observations suggest that although the adaptability of ML-based systems is greater, the suggested system is efficient, transparent, and reliable in structured recruitment processes.

IV. RESULTS AND DISCUSSION

The recruitment system proposed was tested on a simulated recruitment setting to measure parallel effectiveness, system performance and usability. The data used in the evaluation comprised of various job listings and applicant profiles with abilities, education levels, work experience and the preferred places of work. The weighted matching algorithm with rules was used to obtain compatibility scores and rank the applicants automatically based on each job posting. It was revealed that the proposed system was more effective in identifying the appropriate candidates compared to the conventional forms of filtering which are based on key words. Applicants that were more compatible with the job requirements always got better scores in compatibility, and this enhanced the accuracy and consistency in shortlisting. The automated ranking system saved the manual screening job to the recruiters by providing list of candidates ranked. The system performance was also monitored with several interactions between users. The platform responded to job applications and matching requests without any significant delay which showed that it responded to job applications and matching requests in balanced conditions. In terms of usability, job seekers found it easy to track their application in real time whilst recruiters said that there was an improvement in the efficacy of their decision-making owing to clear ranking and filtering facilities. All in all, the findings indicate that the developed system is effective to facilitate the automated recruitment, enhancing the matching relevance, diminishing the workload of the recruiters, and ensuring consistency in the system operations.

TABLE III. COMPARISON WITH EXISTING RECRUITMENT SYSTEMS

Feature	Existing Recruitment Systems	Proposed System
Matching approach	Keyword-based or isolated algorithms	Rule-based weighted matching
Automation level	Limited or partial	Fully automated ranking and shortlisting
Interpretability	Low (black-box or unclear logic)	High (rule-based and transparent)
Recruiter workload	High due to manual screening	Reduced through automated ranking
Security mechanisms	Basic authentication	Role-based access control and encryption
Workflow integration	Fragmented or incomplete	End-to-end recruitment workflow
Scalability	Limited for large datasets	Modular and scalable architecture

V. SECURITY AND DATA PRIVACY

Online recruitment systems need security and privacy because the information about users is quite sensitive. The planned platform also includes a secure authentication and role-based access control in order to guarantee that job seekers, recruiters and administrators will be able to access only the functions of the system that they are authorized to. Encryption is used to safeguard sensitive data like log-in details and personal information when storing data and when transferring data. Entry control and surveillance systems assist in minimizing the possibility of malicious practices. The system has also the activity logs which monitor the critical operations and identify abnormal behaviour. These precautions have guaranteed safe data processing, regulated access, and privacy conscious system functioning in the actual recruitment settings.

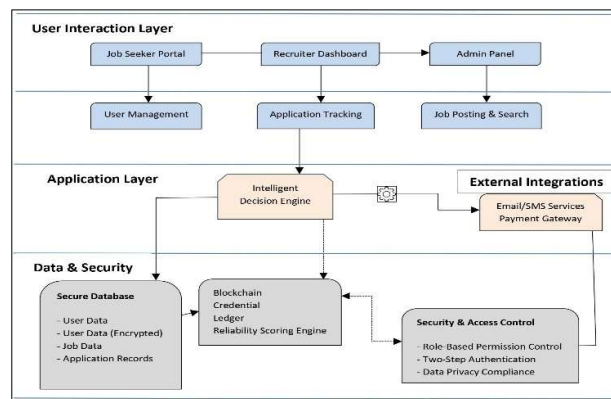


Figure 5: Security Framework with Access Control and Data Protection Layers

VI. CONCLUSION AND FUTURE WORK

The current paper contained the design and development of a web-based recruitment system that can better match job- candidates with employers and provide a safe storage of user data. The suggested system deals with typical restrictions of conventional recruitment portals with automated shortlisting, workflow arrangements, and role-based access control. The findings show that the method has the potential of simplifying the recruitment procedures and enhancing the general process experience of both job applicants and recruiters. Automated matching mechanism increased relevance of job recommendation and lessened the manual screening effort. The access control structure and modular system architecture also played a role in helping to organize, make the system a better place to use and also secure data. The simplicity of use, easy availability of information and the possibility of monitoring the application in real time have been pointed out as the strong aspects in terms of user feedback. Despite the fact that the platform is working well in the areas where it currently operates, additional enhancement can be made. The work of the future can involve innovations in the resume analysis, matching by machine learning to more effectively address the unstructured information, and other innovations like the support of the mobile platform, multilingual interfaces, and real-time labour market information.

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