

JOBayan: Web-Based Localized Job Finding System for Dumangas, Iloilo

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Abstract— This study addresses the challenge of limited employment accessibility in rural communities through the development of a Web-Based Localized Job-Finding System designed for Dumangas, Iloilo. While existing online job portals predominantly prioritize urban labor markets, the proposed system establishes a dedicated digital infrastructure that connects local job seekers with nearby employment opportunities and supports employers through centralized recruitment tools. The system was developed using the Agile Scrum methodology to enable iterative development and continuous stakeholder feedback. It integrates an Artificial Intelligence-based job-matching mechanism utilizing Natural Language Processing (NLP) techniques to analyze job seeker profiles and job postings and generate personalized employment recommendations. Core system features include secure user authentication, job posting and application management, application tracking dashboards, integrated messaging, real-time notifications, and a rating and feedback system. System evaluation was conducted using the ISO/IEC 25010 software quality model, with assessments provided by domain users and IT experts across key quality characteristics. Evaluation results indicate that the system met the established software quality standards and was perceived as effective and user-friendly. The findings demonstrate that the proposed system can significantly enhance local employment accessibility, reduce reliance on informal recruitment methods, and serve as a viable model for localized digital employment platforms in rural municipalities.

Keywords— Localized job-finding system, rural employment, artificial intelligence, natural language processing, ISO/IEC 25010

I. INTRODUCTION

Digital employment platforms have transformed recruitment processes globally; however, their focus remains predominantly urban-centric. Rural municipalities such as Dumangas, Iloilo experience limited access to structured digital employment infrastructures. Job seekers rely heavily on informal recruitment methods, including word-of-mouth and social media postings, resulting in inefficiencies and reduced employment transparency.

Existing job portals such as JobStreet and LinkedIn provide large-scale recruitment ecosystems but lack localization mechanisms tailored to specific municipalities. This creates a structural accessibility gap for rural labor markets.

This study proposes a Web-Based Localized Job-Finding System specifically designed for Dumangas. Unlike general-purpose portals, the system restricts job listings to verified local employers and integrates AI-driven job matching optimized for small-scale labor markets.

The primary contribution of this study lies in the integration of localized filtering mechanisms with AI-based semantic matching while maintaining compliance with ISO/IEC 25010 software quality standards [3].

II. RELATED WORKS

Previous studies demonstrate that centralized job portals improve recruitment efficiency through structured data management and application tracking [2]. AI-based recommendation systems employing Natural Language

Processing (NLP) have shown improved job–candidate matching accuracy by analyzing semantic similarity between resumes and job descriptions [4].

However, literature reveals three research gaps: Most AI-based job systems focus on large-scale metropolitan datasets; Few platforms are designed exclusively for municipal-level deployment; Limited research integrates ISO 25010 evaluation within localized employment systems.

The proposed study addresses these gaps by combining localized filtering, AI-driven matching, and standardized software quality evaluation.

III. SYSTEM ARCHITECTURE

The system follows a client–server architecture composed of a web-based user interface, PHP-based backend application server, MySQL relational database, and Python-based AI/NLP module. Users access the system through a browser interface. All requests are processed by the server, which manages authentication, role-based access control, and database transactions. The AI module performs similarity computation between job seeker profiles and job listings.

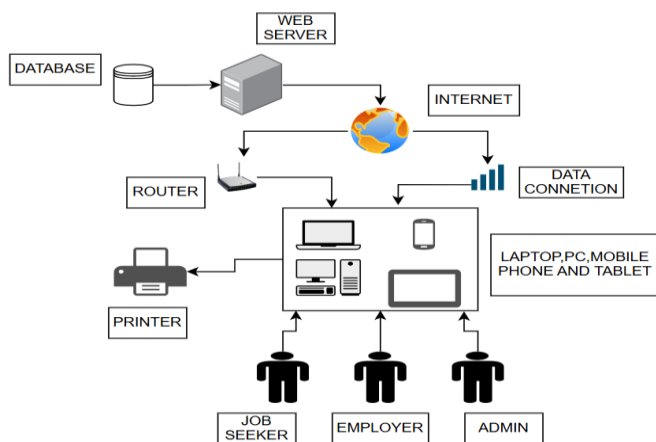


Fig. 1 System Architecture

IV. AI-BASED JOB MATCHING MODEL

The AI job-matching mechanism utilizes Natural Language Processing techniques to analyze unstructured text from resumes and job descriptions. The implementation consists of text preprocessing (tokenization, stop-word removal, lemmatization), feature extraction using TF-IDF, and similarity computation using cosine similarity.

Cosine Similarity is defined as:

$$\text{Similarity} = \frac{(A \cdot B)}{(\|A\| \times \|B\|)}$$

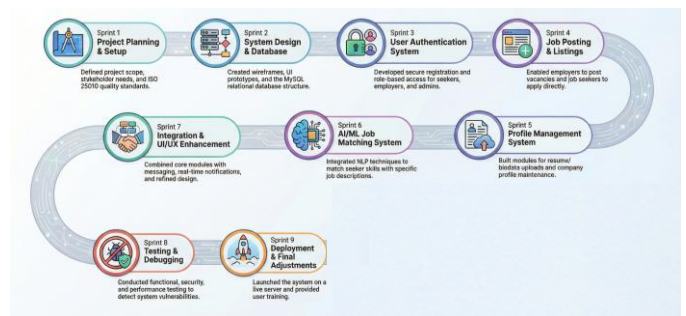
where A and B represent vectorized job and applicant profiles. A higher similarity score indicates greater alignment between candidate qualifications and job requirements. This approach enables personalized recommendations without requiring large-scale datasets, making it suitable for municipal-level implementation.

V. METHODOLOGY

As shown in Fig. 2, the system was developed using Agile Scrum methodology across nine sprints: Planning and Requirement Analysis, Database Design, Authentication Module, Job Posting Module, Profile Management, AI Integration, System Integration, Testing and Debugging, and Deployment.

Fig. 2 9-Sprint Journey to Localized Employment

System evaluation was conducted using ISO/IEC 25010



quality characteristics including Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. Fifteen respondents participated in the evaluation, including domain users and IT experts.

As shown in table I, the evaluation used a five-point Likert Scale, a common psychometric instrument for measuring user attitudes, satisfaction, and perceptions. Respondents were asked to rate their agreement with various system-related statements. The scale ranged from 1 to 5, where:

TABLE I
Five-Point Likert Scale

Scale Range	Interpretation
4.21 – 5.00	Excellent
3.41 – 4.20	Very Good
2.61 – 3.40	Good
1.81 – 2.60	Poor
1.00 – 1.80	Very Poor

VI. RESULTS AND DISCUSSION

Table II
Summary of Results of the Evaluation of the Domain Users and the IT Experts

Criteria	Group Mean	Interpretation
Functional Suitability	4.43	Excellent
Performance Efficiency	4.67	Excellent
Usability	4.59	Excellent
Reliability	4.63	Excellent
Security	4.83	Excellent
Compatibility	4.60	Excellent
Maintainability	4.40	Excellent
Portability	4.57	Excellent
Total Group Mean	4.64	Excellent

As shown in table II, the system obtained a Total Group Mean of 4.64, interpreted as Excellent, indicating that the Web-Based Localized Job-Finding System demonstrates very high overall software quality and strong alignment between user satisfaction and technical evaluation.

The strongest criterion is Security, which received a group mean of 4.83 (Excellent). This indicates that both Domain Users and IT Experts highly agree that the system effectively protects data confidentiality, enforces access control, and maintains system integrity.

The weakest criterion, though still rated Excellent, is Maintainability, which obtained a group mean of 4.40 (Excellent). This suggests that while the system is well-structured and modifiable, there is relatively more room for refinement in terms of code optimization, documentation, or long-term maintenance improvements compared to other criteria.



Fig. 3 System Development Results and Evaluation

As shown in fig. 3, the AI-based job matching mechanism improved recommendation relevance by computing semantic similarity between textual inputs. Testing confirmed that job seekers received ranked job suggestions aligned with declared skills and preferences.

The integration of dashboards, messaging, and notifications significantly reduced communication latency between employers and applicants. These results suggest

that localized digital employment platforms can operate effectively even with limited geographic scope when supported by structured architecture and AI-based filtering.

VII. CONTRIBUTION AND INNOVATION

This study contributes to the field of localized digital employment systems by introducing a municipality-restricted AI job-matching model, within a rural employment platform, demonstrating scalable architecture for small labor markets, and providing a replicable framework for other municipalities. Unlike existing national job portals, this system prioritizes geographic specificity and structured municipal governance.

VIII. CONCLUSION

The Web-Based Localized Job-Finding System for Dumangas, Iloilo provides a structured digital infrastructure tailored to rural employment contexts. By integrating AI-driven semantic matching with secure authentication and application tracking, the system enhances recruitment transparency and efficiency.

The findings demonstrate that localized platforms can significantly reduce reliance on informal recruitment practices and improve employment accessibility. Future work may include mobile optimization, SMS-based notification integration, and extended cross-municipality deployment.

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REFERENCES

- [1] R. S. Pressman, *Software Engineering: A Practitioner's Approach*, 7th ed. New York, NY, USA: McGraw-Hill, 2010.
- [2] T. Connolly and C. Begg, *Database Systems: A Practical Approach to Design, Implementation, and Management*, 6th ed. Harlow, UK: Pearson, 2015.
- [3] ISO/IEC 25010, *Systems and Software Engineering—Systems and Software Quality Requirements and Evaluation (SQuaRE)*, 2011.
- [4] S. Jurafsky and D. Martin, *Speech and Language Processing*, 3rd ed. Draft, 2021.