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Enhancing Employment Opportunities for Skilled Workers Through Technology

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ABSTRACT—

Employment accessibility for illiterate and semilit- erate skilled people remains a socioeconomic challenge in India. Existing job portals require literacy and digital proficiency and are mainly designed for the educated section of the country. This issue impacts both workers seeking job opportunities and employers seeking competent labor. To cover this gap, a multilingual and user-friendly digital platform called Empower Illiterate is proposed. To increase accessibility, the platform uses straightforward picture-based navigation, multilingual support in Hindi, Marathi, and English, and voice inputs. The solution provides efficient and real-time job matching by integrating modern web technologies such as React.js for the front end, Node.js for the backend, and MongoDB for data storage. This research addresses the benefits of a streamlined digital interface over traditional employment methods and investigates a powerful matching algorithm for optimizing worker-employer interactions.

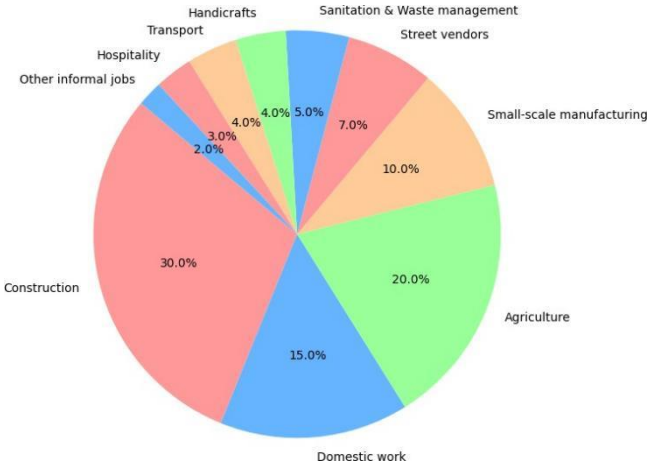
Index Terms—Employment, Illiterate Workers, Multilingual Platform, Job Matching, Digital Accessibility

Introduction

Employment opportunities in modern society are often concentrated in urban areas, where formal education and digital literacy are crucial. However, skilled but illiterate workers find it difficult to gain employment because of communication barriers and the lack of digital platforms designed for them. The growing dependencies on online job portals further widens this gap, as majority of platforms are designed for literate users, making it difficult for illiterate individuals to access job-seeking processes. This emphasizes the need for an inclusive solution that addresses their needs exclusively.

India's informal workforce is one of the largest in the world, with over 450 million workers employed in unorganized sectors [1] such as construction, domestic service, agriculture, small-scale industry, street selling, and transport services. Most of these workers are illiterate or semi-literate, making it diffi- cult for them to access stable employment through traditional employment seeking channels. The ab- sence of organized hiring practices and dependency on intermediaries tend to result in exploitative wages and employment insecurity. The spread of illiterate and semi-literate labor across sectors in India is presented below:

Fig. 1. Distribution of Skilled Workers In India



Despite their lack of formal education, a growing number of these workers own mobile phones, which presents an opportunity to bridge the employment gap. Recent data shows that 76.6% of Indians use mobile phones [2], and this figure is expected to rise to 86% by 2026 [3]. However, there is still a digital divide, as only 60% of mobile users have internet access [4], and many illiterate workers struggle with text-based platforms. The following chart illustrates mobile phone usage among non-formally educated individuals:

This data highlights that a significant portion of il- literate and semi-literate workers already use mobile phones, making mobile-based employment solutions

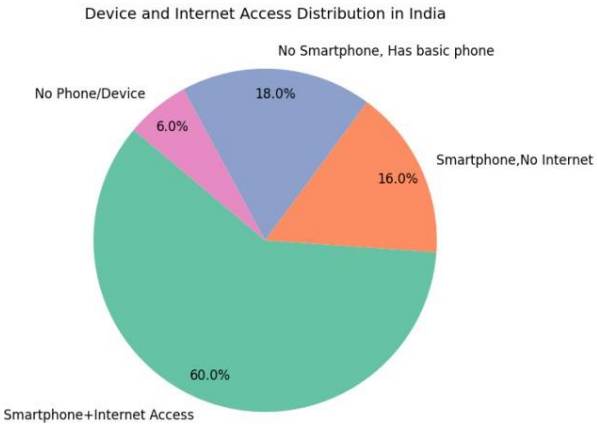


Fig. 2. Device Access and Internet Distribution In India

a viable approach [5]. While educated job seekers use mobile applications for employment, illiterate workers face literacy barriers that prevent them from using existing digital job portals. The Empower Illiterate platforms aims to create a seamless job- seeking experience for illiterate workers.

This paper is structured as follows: Section 2 reviews relevant literature. Section 3 details the system architecture and methodology, Section 4 presents results, and Section 5 concludes with future scope.

Literature Review

This section reviews key literature related to de- signing inclusive employment platforms for individ- uals with limited digital literacy.

In a study, Kumar & Singh [6] highlight the difficulties low-skilled workers face when navigat- ing conventional job application systems. Many platforms require technical skills such as uploading resumes or interpreting complex job descriptions, which act as significant barriers to digital inclusion. Their study emphasizes the need for simplified platforms with minimal technical requirements to improve accessibility for this demographic.

Patel & Joshi [7] focus on designing digital employment platforms tailored to illiterate populations. They propose eliminating complex features such as resume uploads and intricate job descriptions and in- stead advocate for the use of visual and voice-based interfaces. Their findings suggest that incorporating intuitive design elements, such as clear navigation and multimedia support, can make job portals more inclusive.

Singh & Kaur [8] explore the use of digital solutions to enhance employment access for non- literate job seekers. Their study emphasizes the importance of eliminating text-heavy interfaces and suggests using visual cues, voice guidance, and mul- tilingual support. Chavan & Mehta [9] investigate the design principles that can make job portals more accessible to users with low digital literacy. Their study underscores the importance of clear, intuitive interfaces, minimal use of complex technologies, and the integration of basic features such as audio instructions and easy-to-read text. Additionally, they discuss obstacles such as user resistance to technol- ogy and the need for comprehensive training.

Joshi & Mehta [10] examine strategies for re- ducing the digital literacy gap among illiterate job seekers. They argue that many job portals cater to users with basic digital skills, creating barriers for illiterate individuals. Their research proposes solu- tions such as voice-based navigation, clear visual instructions, and localization in terms of language and cultural context. These insights align with the goals of this project, which aims to develop a job portal that prioritizes usability and accessibility by removing complex features.

Ahmed et al.[11] proposed a mobile application for illiterate people in Bangladesh to bridge the digi- tal divide. Their work focused on developing a user-friendly interface with voice commands, pictorial representations, and minimal text, allowing users to search for jobs and services easily. The results showed significantly improved accessibility and us- ability for the target audience. The study emphasizes the importance of inclusive design principles in digital solutions for marginalized communities.

Medhi et al. [12] designed two text-free user inter- faces for illiterate and semi-literate domestic slum laborers in Bangalore, finding that users strongly preferred the text-free design over text-based inter- faces. The design focused on graphical icons, voice feedback, and minimal text. In another study [13], they explored various audio-visual representations for illiterate users, comparing text, static images, hand-drawn animations, and videos with or without voice annotations to determine the most comprehen- sible format.

The reviewed literature collectively highlights the importance of designing job portals that cater to users with limited literacy and digital skills. Key strategies include simplifying the application pro- cess, integrating visual and voice-based navigation, minimizing text-based content, and ensuring mul- tilingual support. These findings provide a strong foundation for developing an inclusive employment platform that addresses the challenges faced by illiterate and low-skilled workers.

Methodology

Research Approach

The research follows a design-based qualitative research approach, focusing on solving a real world problem by practically implementing a digital so-lution.The objective of this research is to empower skilled but illiterate or semi-illiterate individuals by implementing a digital platform .

Data Collection

Initial data was collected through informal inter- views and field observations involving electricians, tailors, domestic helpers, and other local workers. These interactions highlighted the dependency on middlemen, lack of access to job platforms, and the desire for a simple, direct connection with employers. Secondary research from government labor reports and online sources was also used to validate the findings.

Design of the system

The platform designed primarily consists of 2 modules: Admin and User . Admin Module is designed to manage the user profiles and prevent any fraud registration on platform by monitoring the user actions . User Module is further classified into Employer and Worker . Worker and Employer can do their respective jobs of registering themselves on the platform. Figure 3 shows the detailed flow of the system.
A Conceptual framework was designed to develop a web application for workers and employers to find a job and hire a worker respectively. Since the main motive of this research is to develop a user-friendly , intuitive and effective platform for illiterate people, thus, the platform should include multilingual interface, intuitive icons, easy naviga- tion. The conceptual framework is shown below:

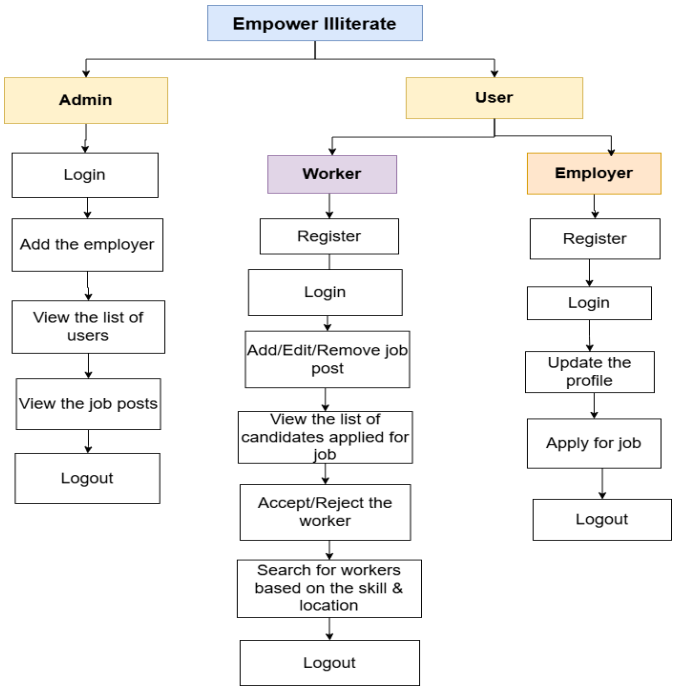
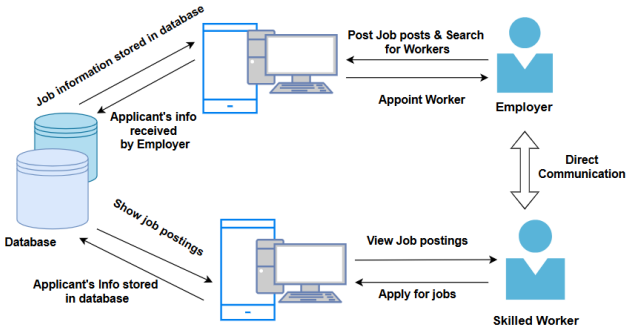


Fig. 3. System flow

Fig. 4. Conceptual flow of the system



As shown in figure 4 , the main stakeholders of this application are skilled workers and em- ployers.The application is multilingual and includes Hindi, Marathi, English languages. Both employer and worker can register themselves on the applica- tion. Employer can post the jobs and workers can apply for the job. Employer can also search workers based on the skill and location and connect with them via direct calls.

Development of the system

The web based application was developed using Visual Studio Code to materialize the conceptual framework. React JS was used to develop fron- tend and chosen for its modularity and ability to create an intuitive user interface. JavaScript was used for dynamic client-side scripting and interac- tivity. In backend Node.js was used which Ensures asynchronous, event-driven execution for handling multiple requests efficiently. A No-SQL database MongoDB is used for storage and selected for its schema flexibility and ability to handle unstructured data efficiently.

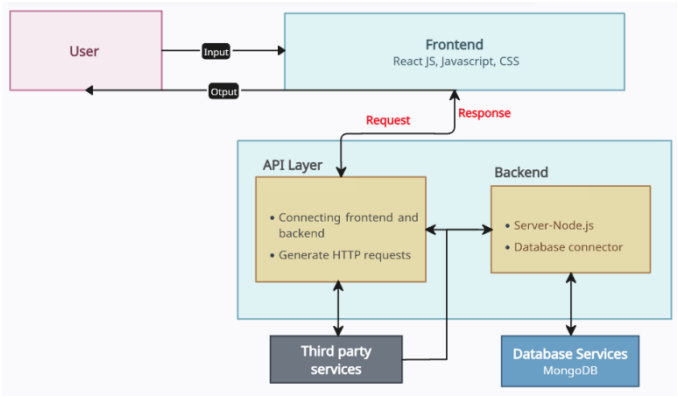


Fig. 5. System development

Results and Discussions

The Empower Illiterate platform successfully ad- dresses the employment challenges faced by skilled illiterate workers by providing a structured and accessible job matching system. The system effec- tively manages three distinct user roles: Admin, Employer, and User, ensuring smooth operations such as job postings, candidate searches, and ap- plication management. The intuitive interface with multilanguage support enhances accessibility, mak- ing it easier for illiterate users to navigate and apply for jobs. The OTP-based authentication ensures se- cure access, voice based inputs make it easier for user to register. Performance testing confirmed that the database efficiently handles user registrations, job postings, and applications, while the search functionality allows employers to quickly find can- didates. Initial user feedback has been positive, highlighting the ease of use and structured approach in contrast to traditional job-seeking methods. How- ever, some challenges remain, such as the need for assistance during registration for completely illiter- ate users and expanding access to rural areas with limited internet connectivity. Future improvements, including voice-based navigation, AI-driven job rec- ommendations, and a mobile app version, can fur- ther enhance the platform's effectiveness and reach. Overall, Empower Illiterate provides a scalable and impactful solution to bridge the employment gap for illiterate workers by leveraging technology to connect them with potential employers efficiently.

Features	**Traditional Job Portals**	**Empower Illiterate**
Resume Requirement	Mandatory	Not Required
Literacy Needed	High	None to Basic
Employer-Worker Contact	Limited	Direct Call-Based Interaction
Multilingual Support	Limited	Hindi, Marathi, English
Accessibility for Low Digital Literacy Users	**Difficult**	**Simplified**

TABLE I

COMPARISON WITH EXISTING JOB PLATFORMS

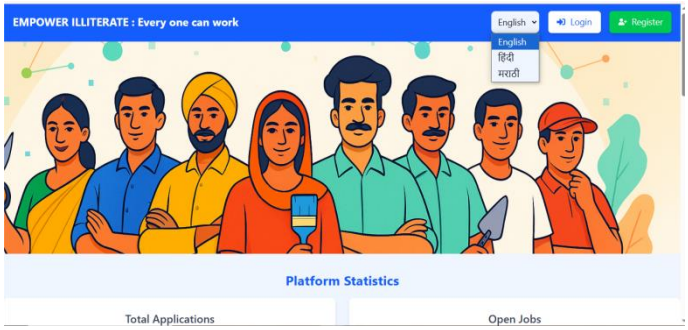


Fig. 6. Homepage of the application

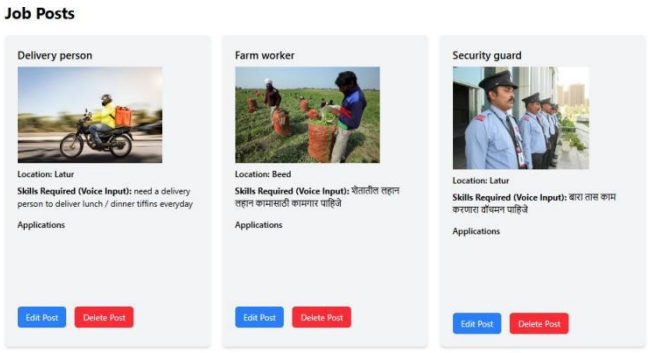


Fig. 7. Job Posts

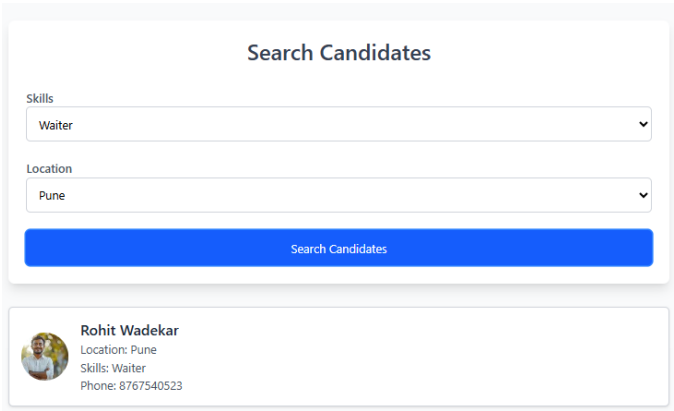


Fig. 8. Searching Workers

CONCLUSIONS

In this paper, a web application was designed and developed for skilled illiterate people in India. The major goal of this research is to analyze the necessity of employment platforms for illiterate workers who are uninformed of the digital world, and to design an effective platform for the same based on the data of individuals using mobile phones to make it easy for them to access the jobs. The study shows that there is a large informal workforce in India who struggles to get the job , considering the number of people using mobiles phones is a key factor to make a inclusive platform for this workforce. The results indicates that a usable, efficient and user friendly application will lead the illiterate people to use and adopt the IT solutions which truly help in empowering them. In future, the application can be enhanced using AI for job matching and more extensive accessibility features may further enhance its contribution to employment inclusion.

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REFERENCES

1. (2024) Unorganised sector in india. Accessed: 2024- 08-16. [Online]. Available: https://www.statista.com/topics/12207/ unorganized-sector-in-india/#topicOverview
2. (2024) Internet subscribers in india. Accessed: 2024-08-30. [Online].
3. Available: https://pib.gov.in/PressReleasePage.aspx?PRID=2040566
4. (2024) Mobile phone penetartion in india. Accessed: 2024-09- 20. [Online]. Available: https://pib.gov.in/PressReleasePage.aspx?PRID= 2040566
5. Telecom Regulatory Authority of India, "The indian telecom services performance indicator report july - september, 2024," Telecom Regulatory Authority of India (TRAI), Tech. Rep., January 2025, accessed: 20-Feb-2025. [Online]. Available: https://www.trai.gov.in/ release-publication/reports/performance-indicators-reports
6. J. Poushter *et al.*, "Smartphone ownership and internet usage continues to climb in emerging economies," *Pew Research Center*, vol. 22, p. 144, 2016.
7. S. Kumar and P. Singh, "Simplifying the job application process for low- skilled workers: An assessment of digital inclusion," *Global Journal of Employment and Technology*, vol. 12, no. 3, pp. 78–93, 2020.
8. R. Patel and V. Joshi, "Designing digital employment platforms for illiterate populations: An innovative approach to job seeking," *Journal of Applied Technology and Society*, vol. 11, no. 3, pp. 75–89, 2019.
9. R. Singh and S. Kaur, "Accessing employment: Digital solutions for non-literate job seekers," *Journal of Educational Technology and Accessibility*, vol. 12, no. 1, pp. 25–38, 2018.
10. D. Chavan and R. Mehta, "Simplified job portals for digital literacy deficient users: Design, challenges, and opportunities," *International Journal of Inclusive Technology*, vol. 14, no. 4, pp. 215–227, 2020.
11. S. Joshi and A. Mehta, "Bridging the digital literacy gap: Empowering illiterate job seekers through simplified platforms," *International Journal of Human-Centric Computing*, vol. 9, no. 2, pp. 234–245, 2018.
12. M. A. Ahmed, M. N. Islam, F. Jannat, and Z. Sultana, "Towards developing a mobile application for illiterate people to reduce digital divide," in *2019 International Conference on Computer Communication and Informatics (ICCCI)*. IEEE, 2019. [Online]. Available: https://www.researchgate.net/publication/331315068

    I. Medhi, A. Sagar, and K. Toyama, "Text-free user interfaces for illiterate and semi-literate users," in *Information and Communication Technologies and Development, 2006. ICTD'06. International Confer- ence on*. IEEE, 2006, pp. 72–82.

13. Medhi, A. Prasad, and K. Toyama, "Optimal audio-visual represen- tations for illiterate users of computers," in *Proceedings of the 16th International Conference on World Wide Web*, 2007, pp. 873–882.
14. A. Khan, S. S. Hussain, S. Z. A. Shah, T. Iqbal, and M. Shafi, "Job search website for illiterate users of pakistan," *Telematics and Informatics*, vol. 34, no. 2, pp. 481–489, 2017.
15. S. Shinde, G. Jadhav, R. Shelke, S. Gadhave, and A. Deshmukh, "Job search application using android," in *2019 International Conference on Communication and Computing (ICCCI)*. IEEE, 2019, accessed: 2025- 04-15.