DYNAMIC MIGRANT LABOUR SUPPORT PLATFORM

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Abstract*: The M*igrant workers in Tamil Nadu face various challenges that demand a comprehensive digital platform to support their well-being and employment stability. To enable quick re-employment after sudden job loss, the platform will feature a real-time job matching system that connects workers with nearby job openings based on their skills and location. For those without proper documentation, it will offer secure digital storage for IDs and permits, along with guidance to help them obtain necessary documents and access formal job opportunities and government schemes. Seasonal workers will benefit from timely notifications and listings of jobs in sectors like agriculture and construction, tailored to their availability and skills. To protect workers from workplace exploitation and unsafe conditions, the platform will include anonymous reporting tools linked to legal aid and authorities. It will also foster community engagement through a networking space for sharing experiences and accessing local support. Designed to be user-friendly, multilingual, and accessible to those with limited digital literacy, this platform aims to empower and support the diverse needs of migrant workers in Tamil Nadu.

Index Terms*: Dynamic Migrant Labour Support Platform, Reporting page, Figma, *Machine Learning*, Managers, *Admin User

I. INTRODUCTION

Migrant workers are a crucial segment of the workforce in Tamil Nadu and across India, contributing significantly to various sectors such as agriculture, construction, logistics, and manufacturing. However, despite their contribution, they often face several socio-economic and operational challenges including sudden job loss, lack of job security, absence of formal documentation, language barriers, limited access to healthcare, and the constant risk of exploitation in unsafe workplaces. The absence of a unified, structured system for job discovery, complaint handling, and access to basic services continues to leave many migrant workers marginalized. To address these challenges, this project proposes a **Dynamic Migrant Labour Support Platform**, a web-based application that provides a digital ecosystem to support migrant workers by connecting them with job opportunities, managers, and essential services. The platform is built with separate modules for Admin, Manager, and Worker/User roles—each equipped with tailored functionalities such as real-time job posting and applications, digital document storage, profile management, work permit generation, and grievance reporting. The system ensures secure login, OTP verification, and SMS-based notifications to support users with limited digital literacy. By leveraging modern web technologies, the platform aims to empower migrant workers, streamline employment processes, and foster social inclusion, transparency, and accountability within the labor ecosystem

LITERATURE SURVEY

Migration has become a pivotal aspect of economic development, especially in developing regions. Numerous studies have been conducted to understand the dynamics, challenges, and technological interventions in supporting migrant workers.

Dr. (Mrs.) R. Rajini and Mrs. G. Sujitha [1] conducted a detailed investigation into the **problems faced by migrant workers in Tiruppur district, Tamil Nadu**, highlighting poor working conditions, lack of awareness about legal rights, language barriers, and exploitation by employers. Their study emphasizes the urgent need for institutional support and digital platforms to address such social and economic challenges effectively. Pratima Pradhan and Subarna Shakya [2] proposed a **big data-based architecture for the Nepalese government** aimed at supporting labor migrants. Their model emphasizes real-time data analytics for decision-making, particularly to assist in policy framing and providing timely information to migrants and their families. This work underscores the importance of scalable data systems for national-level migration management.

Wei Wang et al. [3] explored the integration of **blockchain technology with migration dynamics**, aiming to ensure the authenticity and immutability of migrant data. Their study suggests that blockchain can play a vital role in tracking the movement of

workers and ensuring transparency in employment practices. Fayu Wang [4] presented a model using **SMS and web technologies** in the development of mobile government information platforms. The study demonstrated the effectiveness of hybrid communication systems to reach rural and less digitally connected populations with important government updates and services.

Mauricio Tia Ni Gong Lin et al. [5] proposed **SMBots**, an SMS-based service management architecture. Their work demonstrates how dynamic services can be delivered using minimal infrastructure, which is particularly suitable for migrant workers who may have limited access to smartphones or stable internet connections. Alexandr A,Tarasyev and Jeenat B. Jabbar [6] discussed the **economic modeling of labor migration**, analyzing its macroeconomic effects on both source and destination regions. Their dynamic system model helps in predicting the impact of migration on employment rates, GDP growth, and policy efficiency.

These works collectively lay a strong foundation for the development of a comprehensive support platform for migrant workers. The proposed *Dynamic Migrant Labour Support Platform* leverages the key insights from these studies to design a role-based digital system incorporating authentication, job management, reporting, complaint handling, and communication modules aimed at improving the livelihood and safety of migrant laborers.

Proposed Solution

The proposed solution is a dynamic web-based platform designed to provide end-to-end support for migrant workers while offering effective tools for managers and administrators. The platform will feature three core modules—Admin, Manager, and Worker/User—each with its own dedicated login system and specialized features. **Admin login** will be secured with email and password, giving access to a dashboard where the admin can approve new user registrations and verify complaints reported by both managers and workers. These complaints will be organized like a digital complaint board, with full profile details of the individuals involved, allowing the admin to take appropriate action. **Managers** can log in using either email or mobile number along with a password. Their dashboard will allow them to post job vacancies by specifying requirements, skills, and availability, and to appoint workers directly from the user database. They can also view job requests from workers, which will be displayed along with the applicant's profile and skillset. Upon accepting a request, the system will send a confirmation to the selected worker through their portal and via SMS.

The **Worker/User module** will support account creation and login using a mobile number and password, with OTP verification required during account creation and password reset for added security. Once logged in, workers will have access to a **Profile Update page**, where they can update their skills, upload work-related certificates, and add medical records through a built-in health application. This page will also feature an **automatic review rating system**, updated based on manager feedback or contractor reviews. The **Search Bar page** will allow users to browse job categories like seasonal jobs or urgent vacancies presented as clickable boxes, leading to detailed job application forms where users can apply directly. The **Work Permit page** will help workers track the status of their job applications. If approved, the user will be able to download a digitally generated **Work Permit PDF** that includes job details, worker and company names, and important dates and times.

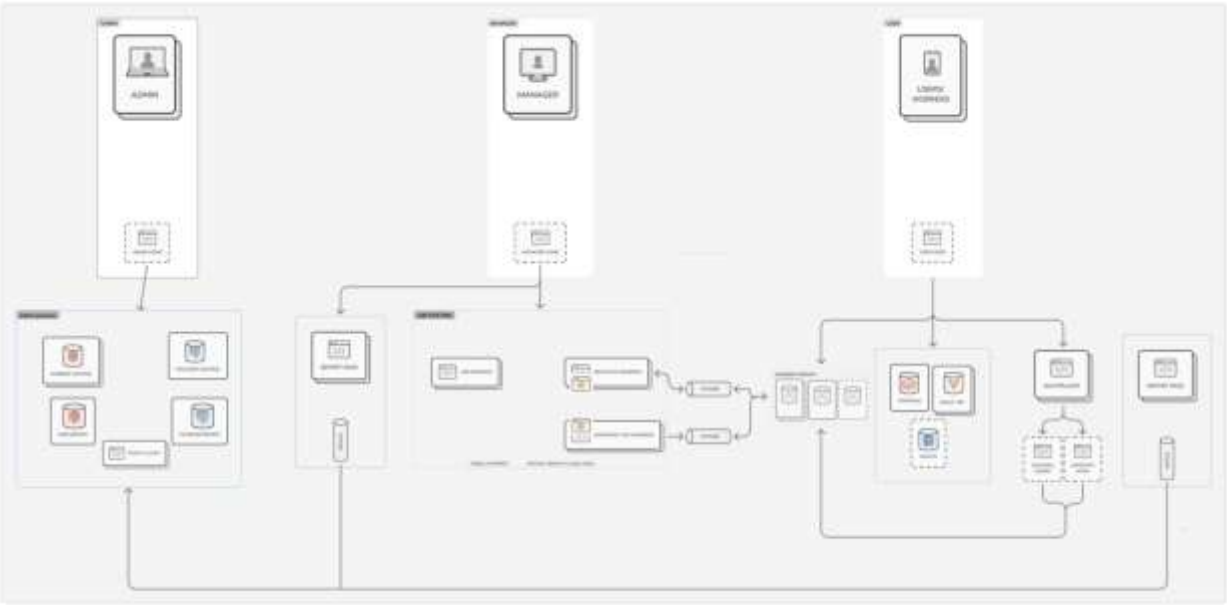
Additionally, both the Manager and Worker modules will include a **Reporting page**, enabling them to submit complaints or report issues encountered during work. Managers can report on worker behavior, while users can raise concerns about working conditions or treatment. All submitted reports will be routed directly to the admin portal for review and action. Overall, the platform will ensure transparency, timely communication, and efficient job matchmaking while prioritizing worker protection and administrative oversight.

TOOLS AND TECHNIQUE

The Migrant Worker Support Portal leverages a focused Python stack to deliver data-driven recommendations and interactive analytics. NumPy, Pandas, and PyArrow handle large-scale transformation of worker profiles and job requirements, feeding a straightforward content-based filtering engine that matches skills to openings. Streamlit, together with Altair and PyDeck, creates an admin dashboard with live charts of application volume, job-category trends, and individual worker performance. This real-time visualization empowers managers to allocate resources and adjust postings dynamically. Behind the scenes, bcrypt secures passwords, while JSON-schema enforces consistent API payload structure. Reliable HTTP interactions—for example, SMS notifications—are managed by the Requests library and its urllib3/certifi dependencies.

A **basic authentication system** was implemented using role-based login, enabling users (Admin, Manager, Worker) to access their specific features securely. Each user type has different permissions and access levels, which improves the safety and usability of the application Operational resilience is achieved through CacheTools-backed caching and Tenacity's retry logic, which together mitigate transient database or network failures. CLI utilities built on Click and TOML parsing simplify configuration and deployment tasks, enabling scriptable environment setup and maintenance. Watchdog monitors source-file changes and triggers live-reload during development, accelerating iteration cycles. Auxiliary libraries—such as Pillow for certificate previews and attrs/typing_extensions for robust data models—round out the toolchain, ensuring the portal remains secure, maintainable, and responsive to evolving user needs.

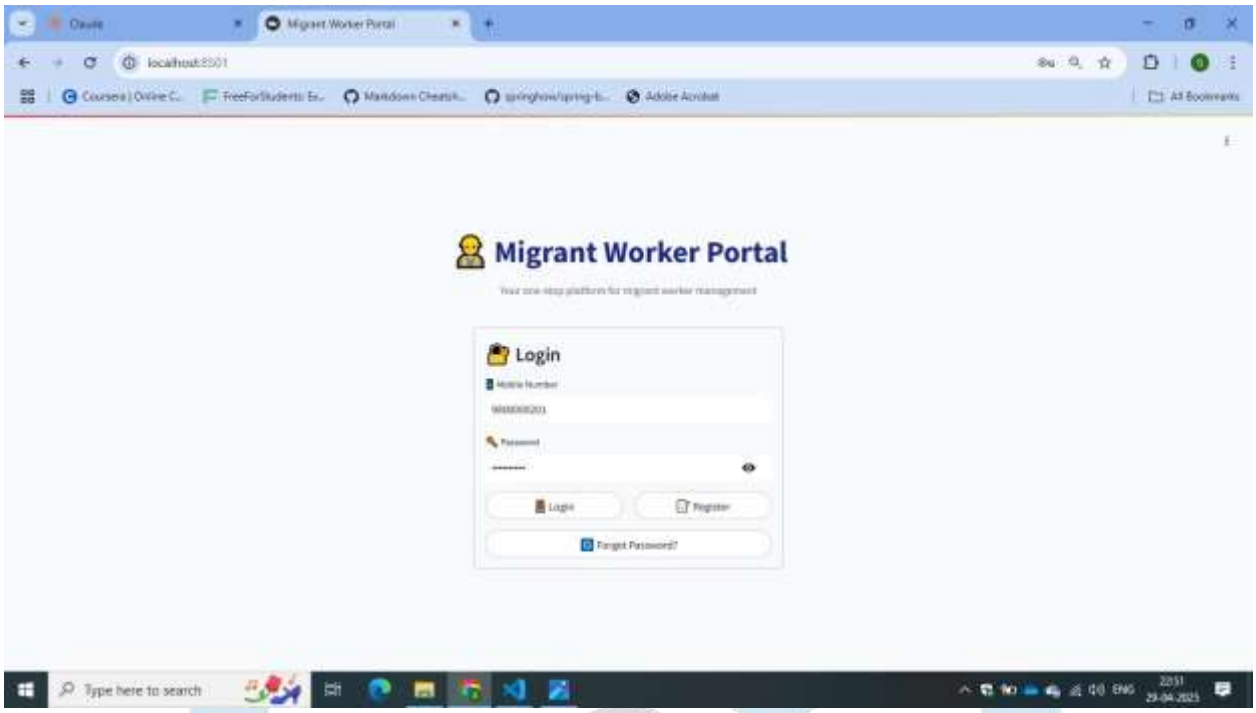
FLOW CHART

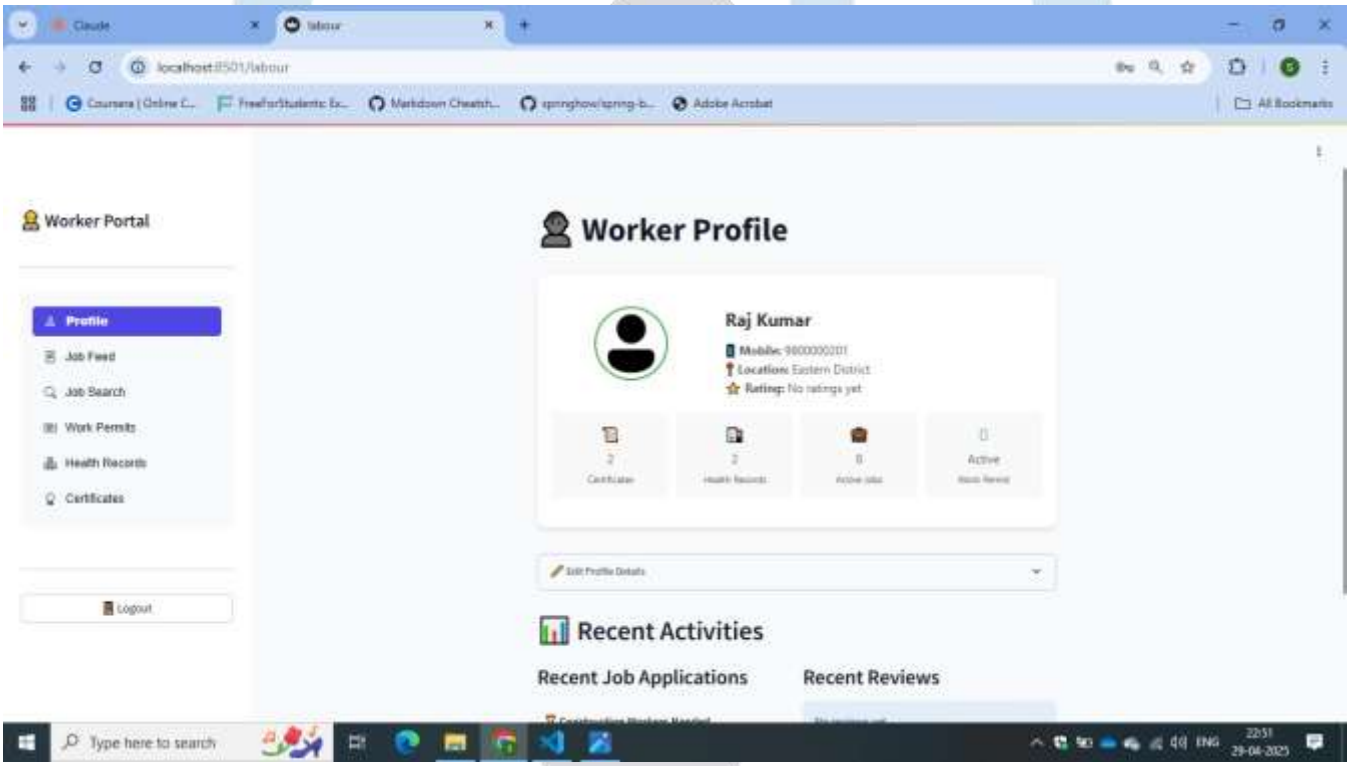


RESULT & DISCUSSION

The proposed dynamic web platform offers a structured and scalable solution to address the critical employment and welfare needs of migrant workers in Tamil Nadu. By implementing role-specific modules for Admins, Managers, and Workers, the platform ensures seamless coordination among all stakeholders involved in job posting, recruitment, and grievance handling. The Admin module ensures secure authentication, manages user approvals, and handles conflict resolution effectively through a centralized complaint dashboard. The Manager module empowers employers to post jobs, review worker applications, and appoint suitable candidates directly while providing transparency through request and behavior reporting tools. The Worker module enhances user experience through mobile-based authentication with OTP verification, profile and document management, health record uploads, job search and application tracking, and automated review ratings based on manager feedback.

The inclusion of reporting features, real-time job notifications, SMS alerts, and PDF work permits enhances credibility, accountability, and accessibility. Overall, the result is a digitally inclusive, user-friendly, and multi-functional ecosystem that bridges the gap between job providers and migrant workers while reducing exploitation and improving employment access. This platform ultimately contributes to better livelihood opportunities, improved worker-management communication, and smoother integration of migrant workers into the formal workforce through technology-driven support.


Migrant Worker Portal
Login
Type here to search


Worker Portal
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Job Feed
Job Search
Work Permits
Health Records
Certificates
Logout
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Recent Activities
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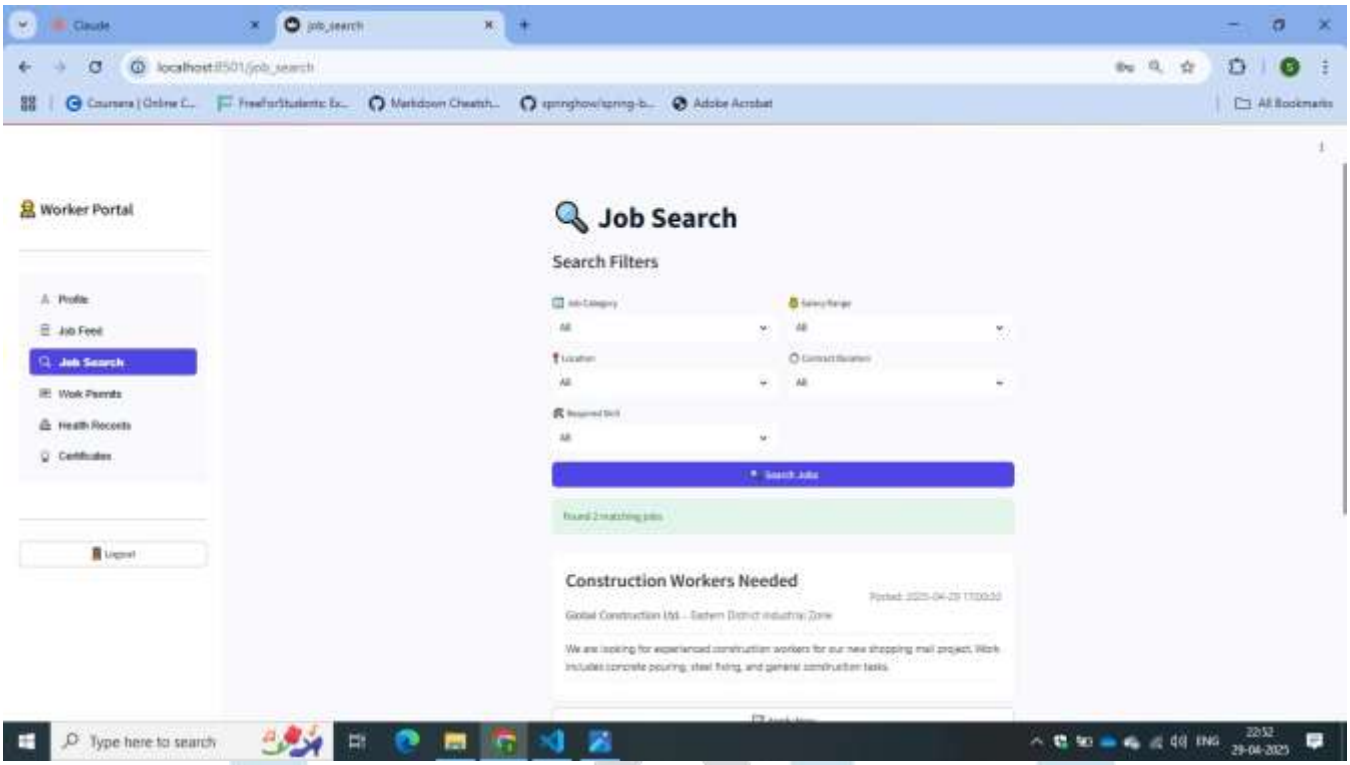

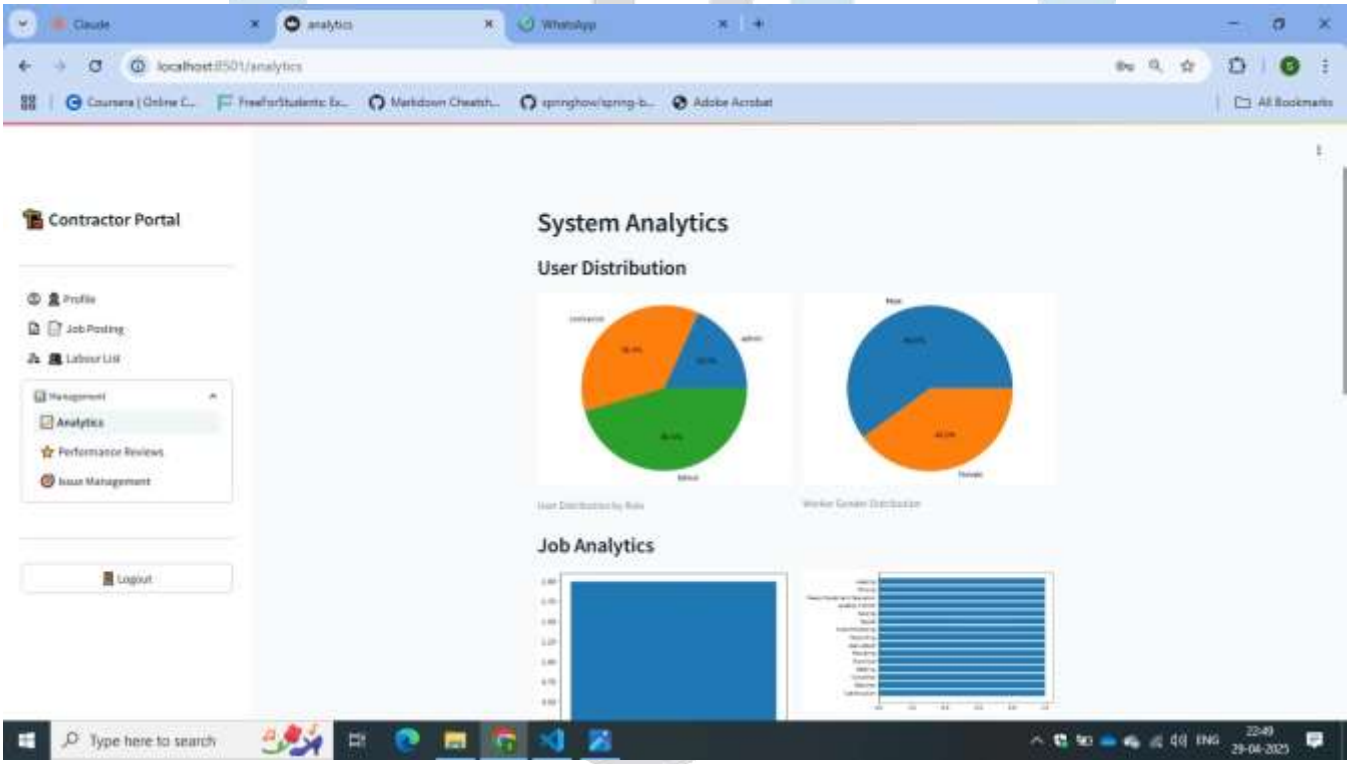

CONCLUSION

The proposed web platform serves as a comprehensive solution to support the employment, safety, and well-being of migrant workers. By offering separate modules for admin, managers, and workers, the system ensures organized and efficient management of job opportunities, worker profiles, reporting, and communication. With features like real-time job updates, skill-based job search, secure document handling, work permit generation, and issue reporting, the platform empowers workers while enabling managers and admins to maintain transparency and accountability. This digital approach not only simplifies the employment process but also strengthens the connection between migrant workers and job providers, ensuring a fair and supportive environment for all users involved.

Reference

[1] Dr. (Mrs.) R. Rajini and Mrs. G. Sujitha, "Problems faced by the Migrant Worker in Tiruppur district of Tamil Nadu," *International Journal of Creative Research Thoughts (IJCRT)*, 2024.

[2]] Pratima Pradhan and Subarna Shakya, "Big Data Application for Nepalese Government: A Proposed Solution for Labor Migrant," *International Conference on Networking and Network Applications*, 2017.

[3] Wei Wang, Aiting Zhang, Guokun Qu, and Yonggang Ye, "Blockchain On the Dynamic Factors of Migrant Workers' Migration," *IEEE Chinese Control and Decision Conference (CCDC)*, 2011.

[4] Fayu Wang, "Using SMS and Web Technology in Mobile Government Information Services Platform," *International Conference on Educational and Information Technology*, 2010.

[5] Mauricio T. N. Gong Lin, Thomaz P. C. Silva, Roberto O. dos Santos, André F. da S. Neto, "Its SMBots - An architecture to manage dynamic services based on SMS," *Eleventh International Conference on Mobile Data Management*, 2020.

[6] Alexandr A, Tarasyev and Jeenat B. Jabbar, "Dynamic Modeling of Labor Migration Impact on the Economic System Development," *IFAC PapersOnLine*, vol. 51, no. 32, pp. 407-412, 2018