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FARMHELP: Real Time Mediator Between Farmer and Service Provider

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Abstract: *Several factors have been identified as primary concerns behind farmers' lack of motivation, such as resource scarcity, debts, and marketing challenges. A significant issue currently is the complication arising from intermediaries. To address this, an application has been developed to eliminate the role of middlemen. Effective and efficient agricultural marketing can be achieved through collective and integrative efforts involving farmers, intermediaries, researchers, and administrators. The problems faced by farmers, including financial constraints, limited employment opportunities, and inadequate equipment and machinery, are escalating daily, leading to a significant decline in the agricultural sector. Enhancing the effectiveness and efficiency of agricultural marketing requires a holistic and cooperative approach from all stakeholders. Addressing these increasing challenges is essential to reversing the downward trend in the agricultural industry*

Keywords: *Scarcity, Collective efforts, Integrative, Agricultural sector, Comprehensive strategy, Cooperative, Intermediaries, Mounting difficulties, Insufficient, financial backing, Limited job opportunities*

I. INTRODUCTION

This system proposes an Android application designed to assist farmers in various ways, including finding suitable agricultural jobs, renting necessary machinery at affordable prices, obtaining land on lease, and receiving financial support through investments. This initiative aims to boost the agricultural sector's growth in the country. Agriculture, along with its allied sectors, remains the largest source of livelihood in India, particularly in rural areas, and it makes a substantial contribution to the Gross Domestic Product (GDP). Recently, there has been a noticeable shift among farmers towards using advanced equipment to achieve higher yields with less effort.

However, challenges arise when equipment breaks down mid-task. Our goal is to develop a system that acts as an intermediary between farmers and service providers during such incidents.

Additionally, it will offer a platform where users can rent out their equipment and easily connect with potential customers.

II. LITERATURE SURVEY

This proposed system is an Android application aimed at supporting farmers by helping them find suitable agricultural jobs, rent necessary machinery at affordable rates, lease land, and secure financial investments. This application seeks to enhance the agricultural sector's growth in the country.

Agriculture, along with its related sectors, is the primary source of livelihood in India's extensive rural areas and significantly contributes to the Gross Domestic Product (GDP). There is a growing trend among farmers to adopt advanced equipment to achieve better yields with minimal effort. However, issues arise when this equipment fails during use. Our system is designed to serve as a mediator between farmers and service providers in such situations. Moreover, it provides a platform for users to rent out their equipment and connect with potential customers easily.

Mrs. R. Gayathri and colleagues evaluated the performance of YOLOv8 for detecting animal intrusions, finding it to be over 70% accurate for key species. They suggest incorporating Internet of Things (IoT) sensors and alert systems to notify authorities and mitigate human-wildlife conflicts. Similarly, Wenzhao Feng and collaborators proposed an efficient image transmission protocol tailored for constrained wireless networks. Their method employs saliency detection and

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segmentation to transmit only the pertinent regions of interest, thereby facilitating precise wildlife monitoring while maintaining transmission efficiency..

Chalmers et al. present a pipeline for live stream analysis and endangered species detection using drone-captured video, the Faster R-CNN model, and cloud inferencing, achieving 83% mAP for real- time rhino and vehicle detection. The study recommends adaptive frame sampling to balance speed and accuracy and suggests that R-CNNs can address limitations of lightweight models like YOLO for small, distant, or hazy objects.

For poacher detection, Shreya Shivaji Gaikwad and colleagues utilize aerial drones combined with YOLO, noting that this approach is faster and more accurate than techniques like Faster R-CNN for this application. They advocate for on-drone inferencing and optimized training to enable real-time monitoring.

Gabriel Ferrante and team benchmark YOLO models against a dataset of Brazilian wildlife to identify commonly poached species. Scaled-YOLOv4 achieves the highest recall rate, while YOLOv5-Nano is noted for its rapid recall. They employ learning transfer and data augmentation to address the issue of limited training data, with image variability affecting performance across different species. species.

Jacob Kamminga et al.survey various sensor technologies for poacher detection systems, including radar, infrared, acoustic, and seismic sensors. They propose the integration of multiple sensors and machine learning techniques through "cognitive sensor networks" to improve detection accuracy and reduce false alarms.

III. METHODOLOGY/APPROACH

3.1 EXISTING & PROPOSED SYSTEM

Several existing AI-enhanced wildlife conservation projects don't necessarily revolve around a single system, but rather utilize various AI techniques. DeepMind's Serengeti Project This project by DeepMind utilizes AI for species identification and population counting in Tanzania's Serengeti National Park. While they might not be using YOLOv8 specifically, it exemplifies using AI for wildlife monitoring with camera traps. DeepMind's Serengeti Project tackles the challenge of analyzing massive amounts of data collected in the Serengeti National Park and Grumeti Reserve,

Tanzania. This vast ecosystem boasts incredible biodiversity, but studying animal populations traditionally involves manually sifting through countless camera trap image.

NGO leverages AI to analyze audio data from rainforest environments. Their system can detect sounds of chainsaws used by poachers, allowing for real-time intervention. Rainforest Connection's Guardian System is an innovative approach to protecting rainforests from illegal activities like logging and poaching. It leverages the power of sound analysis and AI to create a real-time guardian for these vital ecosystems. Rainforest Connection's Guardian System is a technology-driven conservation initiative designed to protect rainforests and their inhabitants, particularly against illegal logging and deforestation

3.2 PROJECT DEVELOPMENT PHASE

- Phase 1 : Data Collection & Preprocessing the Data
  Duration – 8 weeks
- Phase 2 : Model Building & Model evaluation
  Duration – 12 weeks
- Phase 3 : Frontend Development & Documentation
  Duration – 8 weeks

3.3 SYSTEM ARCHITECTURE

A system's architecture serves as the conceptual blueprint that delineates the arrangement, functionality, and diverse perspectives of a system. It encapsulates a formal depiction and portrayal of the system, structured in a manner conducive to reasoning about its structures and functionalities. This architectural framework comprises system elements and sub-systems that collaborate to realize the overarching system objectives. Efforts have been made to standardize languages for articulating system architectures, collectively known as architecture description languages.

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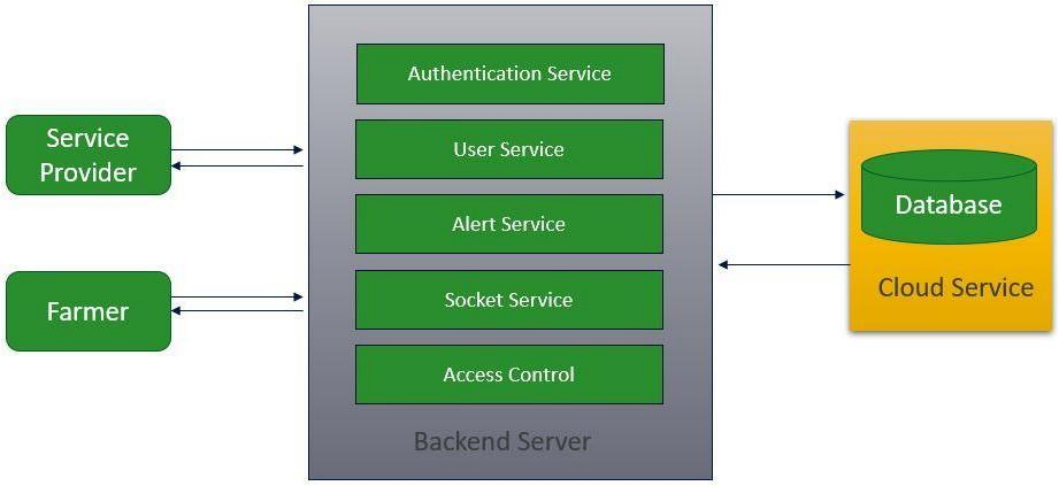

Figure 1: System Architecture

3.3 ALGORITHM AND ITS WORKFLOW

Linear Regression is an easily understandable algorithm that models the relationship between farmer and machine prices linearly. It generates coefficients that can be analyzed to determine the influence of each feature on machine rental prices.

Integrating data-driven technologies into modern agriculture holds substantial potential benefits. In this regard, we suggest developing a Farm Help Android Application that employs Linear Regression to provide farmers with critical insights. The main aim of this application is to predict and optimize factors crucial for agricultural success, such as crop yields, by analyzing various environmental and soil conditions.

Decision Trees:

Central to the application's functionality is the Decision Tree model, which serves as a structured framework to guide farmers through various decision points and scenarios. By integrating advanced machine learning algorithms, the system can analyze both historical and real-time agricultural data, offering personalized recommendations tailored to the specific circumstances of each farm.

The application employs the Decision Tree algorithm to map out decision processes within agriculture. This algorithm takes into consideration a wide range of factors, including weather patterns, soil health metrics, crop types, and historical performance data, to deliver actionable insights aimed at optimizing farm management practices.

Random Forest: The Farm Help Android Application is dedicated to furnishing farmers with personalized recommendations, drawing insights from a comprehensive analysis of diverse data sources. These encompass factors such as weather patterns, soil conditions, crop varieties, and historical yield data. To construct a robust decision support system, we will leverage the Random Forest algorithm. Renowned for its adeptness in managing intricate datasets and delivering precise predictions, the Random Forest algorithm will play a pivotal role in empowering farmers with invaluable insights.

Gradient Boosting: In modern agriculture, the integration of technology has become increasingly prevalent, aiming to enhance efficiency and productivity. This paper proposes the development of a Farm Help Android application utilizing Gradient Boosting algorithms to address challenges faced by farmers. The application is designed to support farmers in making informed decisions related to crop management, disease detection, and yield optimization.

Support Vector Machines (SVM): The agricultural sector plays a pivotal role in sustaining global food security, and technological advancements can significantly enhance efficiency and productivity. This abstract introduces a novel

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Android application designed to provide intelligent farm assistance using Support Vector Machines (SVM). Support Vector Machines are powerful machine learning algorithms capable of classification and regression tasks, making them well-suited for solving various challenges in agriculture.

Neural Networks: The primary objective of the application is to provide personalized recommendations to farmers based on real-time data, weather conditions, soil health, and crop-specific requirements. The neural network model implemented in the application is trained on historical data, including crop performance, weather patterns, and soil characteristics. This enables the system to learn and adapt, offering increasingly accurate and relevant suggestions over time

3.4 WORKFLOW

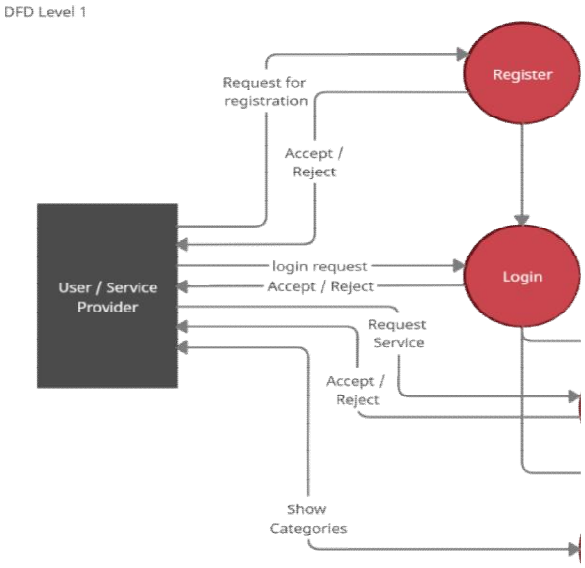

Figure 2: Workflow

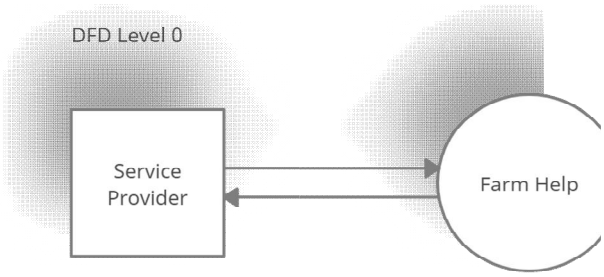

Figure 3: Data Flow

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IV. RESULTS

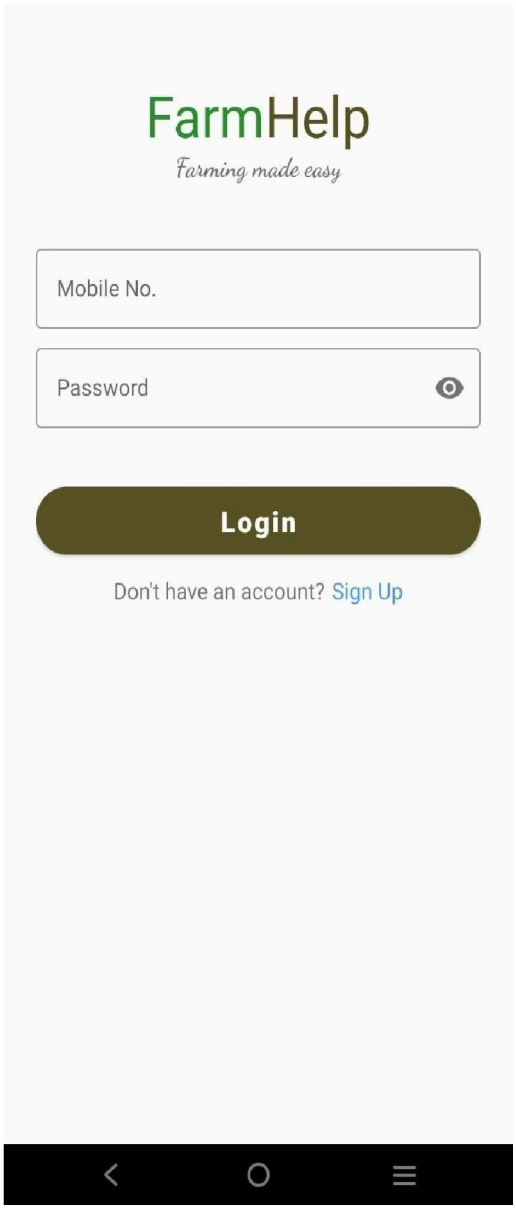

Fig: login Page

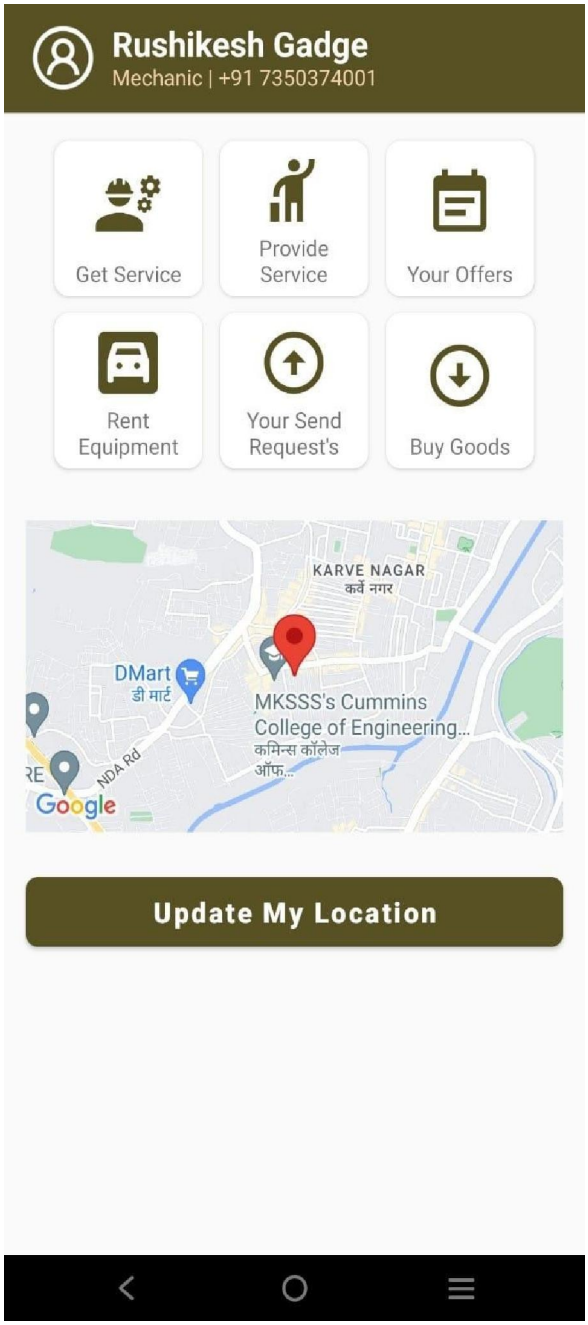

Fig: Dashboard

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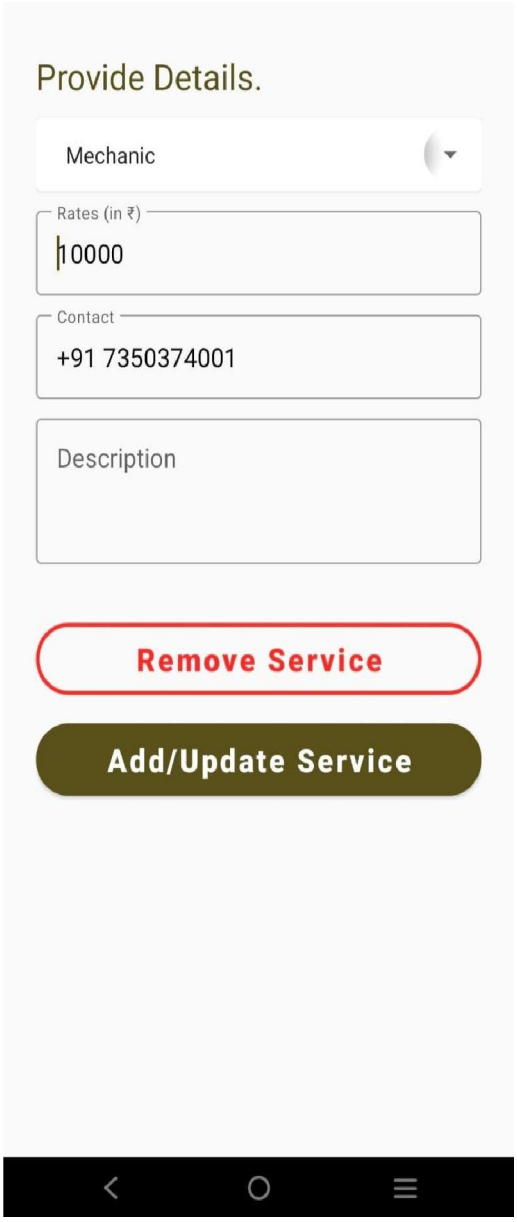

Fig: Provider Details

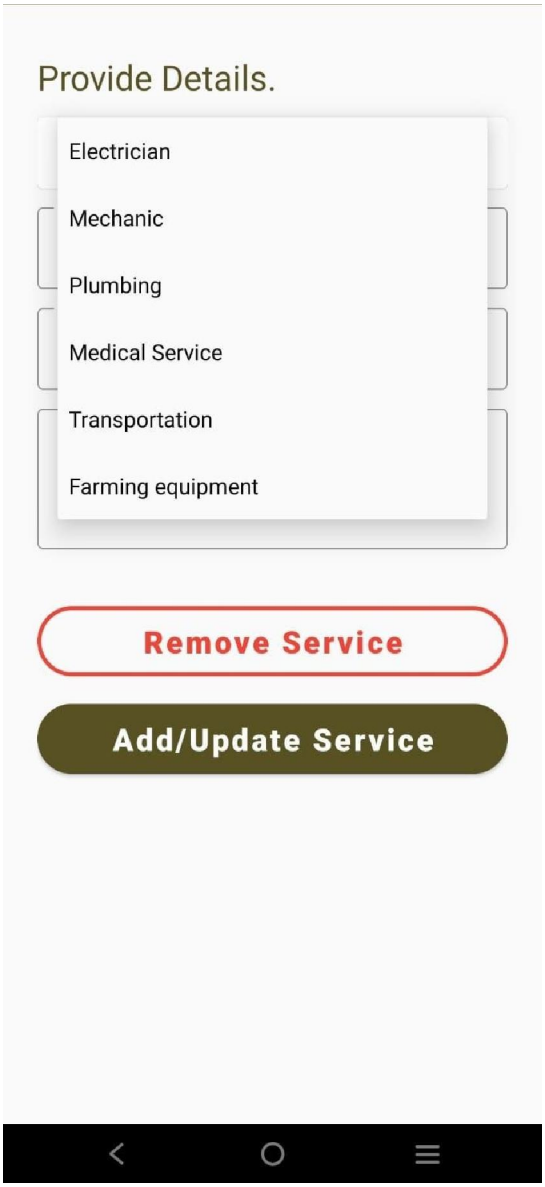

Fig: Provider Lists

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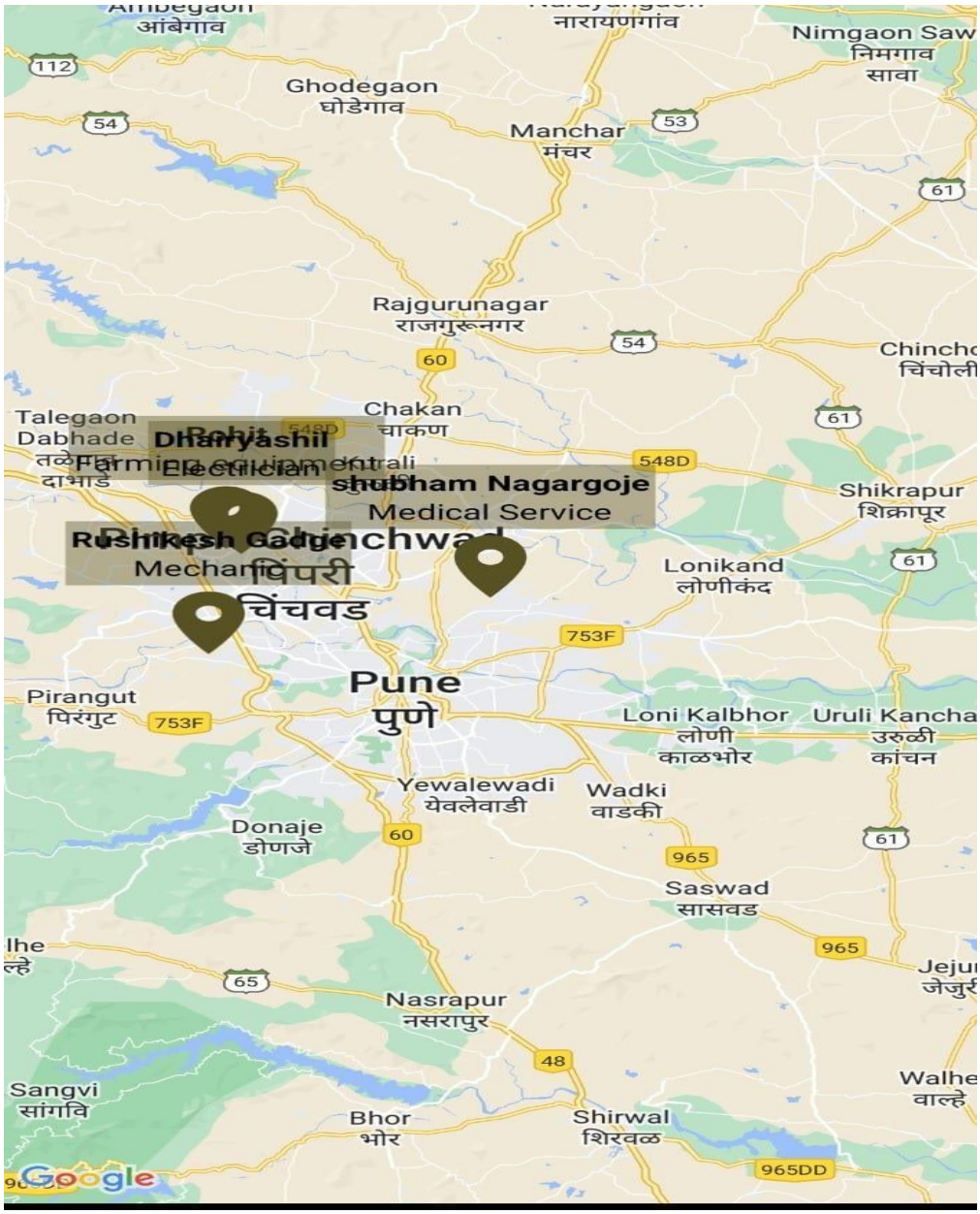

Fig: Nearest Providers Locations

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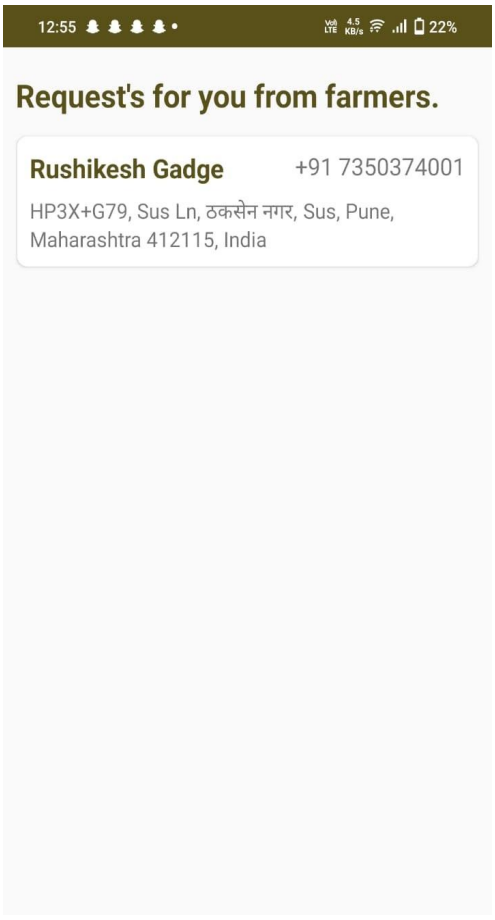

Fig: Received Request From Farmer To Provider

Fig: Request Can Receive By Provider

V. CONCLUSION

In response to the prevailing challenges faced by farmers, including issues such as scarcity, pending dues, and marketing complexities, this proposal addresses a significant contemporary obstacle— intermediate complications. To alleviate farmer apathy and eliminate reliance on middlemen, an Android application is introduced. The core objective is to enhance the effectiveness and efficiency of agricultural marketing through collaborative efforts involving farmers, middlemen, researchers, and administrators.

This proposed solution aims to tackle the escalating problems confronting farmers, encompassing financial constraints, diminished job opportunities, and inadequate access to equipment and machinery. The Android application serves as a comprehensive system, facilitating farmers in finding suitable agricultural jobs, securing affordable machinery rentals, identifying available land for lease, and obtaining essential financial support in the form of investments. The envisioned impact of this initiative is a positive transformation in the agricultural sector, countering its current decline.

By leveraging technology, the proposed application aligns with the broader goal of offering streamlined processes and direct connectivity among stakeholders. Emphasizing a holistic approach, the initiative seeks to address various facets of the agricultural ecosystem. This abstract underscores the application's potential to contribute significantly to the overall well-being and growth of the agricultural sector, emphasizing the role of collaborative and integrated technological solutions.

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