



Empowering Farmers, Enriching Lives: The One Stop Solution for Agricultural Assistance

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Article History	Abstract
Received: 17 June 2023 Revised: 08 Sept 2023 Accepted: 08 Oct 2023	<p>This paper presents the development and evaluation of an Agriculture Farmer App designed to assist farmers in obtaining personalized scheme allotments based on crop type, income, and land area. The app also incorporates Labor availability nearby to cater to the farmers' specific requirements. The research includes a survey-based analysis to gauge the farmers' preferences and needs. Additionally, the paper outlines the architecture for information dissemination and scheme management system.</p> <p>Keywords – Agricultural Government Schemes, User Friendly Mobile App, Creating Awareness, Central Govt Schemes, State Govt Schemes, Farmer's Benefit, Farmer's Empowerment</p>
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I. Introduction

The agricultural sector in India plays a crucial role in the nation's economy, and the government has introduced various schemes over the years to support and uplift farmers. However, despite these initiatives, many farmers still face challenges in accessing and understanding the available schemes. This has led to the development of "Raita Mithra," a mobile application aimed at empowering farmers with user-friendly access to relevant schemes based on their categories [3]. Numerous research studies have shed light on the importance of such applications in addressing the digital illiteracy and usability issues faced by Indian farmers [1]. For instance, the "E-Farm with S.C.H.E.M.E." system proposes a user-friendly website and app that offer agricultural government schemes information in multiple formats, such as text, audio, and video, in both English and Marathi [1]. Another study highlights the significance of an app promoting natural farming techniques, providing crop-related information and enabling direct selling of produce to consumers [3]. Additionally, there is research that delves into the performance and impact of various government agricultural schemes, with a focus on financial inclusion and overall economic.

development [4]. However, despite significant efforts, there are still challenges in raising awareness of schemes, as evident from studies revealing low awareness levels of agricultural insurance schemes [5]. Such awareness campaigns are essential to mitigate risks and encourage farmers' participation in government programs. To support the efficient dissemination of government schemes, the proposed "Government Scheme Awareness Through App" takes advantage of cloud computing and secure database management to optimize information flow and ensure data security [7]. Through this innovative use of mobile technology, farmers can gain access to crucial government services, thereby fostering a stronger connection between citizens and the government. As agricultural schemes continue to play a pivotal role in the growth of the productive sector, this comprehensive review of relevant literature underscores the importance of user-friendly mobile applications like "Raita Mithra" in empowering farmers and driving positive change in India's agricultural landscape.

2. Literature Review

The different literature surveys that we cited are the subject of this section's whole discussion. Designing a

mobile application that is user-friendly for farmers Which quickly access the schemes available for the particular farmer depending upon their category is the major goal of the "Raita Mithra" The research by Samruddhi Khandare, Sushopti Gawade, Varsha Turkar, [1] and others aims to address the challenges faced by Indian farmers in accessing and understanding information related to government agricultural schemes due to digital illiteracy and poor usability of existing websites and mobile apps. To bridge this gap, they propose the design and development of an "E-Farm with S.C.H.E.M.E." system, which includes a user-friendly website and mobile app in English and Marathi, providing agricultural government schemes information in text, audio, and video formats. The system also offers details of nearby NGOs and agricultural help centers, reducing the digital divide and offering e-learning opportunities to farmers. They employ Naive Bayes and Levenshtein Distance algorithms for scheme classification and retrieval, and ID3 for automatic scheme retrieval based on user registration. The research strives to enhance the usability and accessibility of agricultural information, empowering Indian farmers to make informed decisions and improve their livelihoods.

The research by Sukhpreet Kaur and Kanwalvir Singh Dhindsa comparative study of Android-based M-Apps designed for farmers [2]. It delves into the various M-Apps' functionalities, including market prices, weather information, government schemes, and soil description, and compares them based on user-provided features. The review discusses the benefits and drawbacks of these M-Apps, emphasizing the need for two-way communication, multilingual support, and improved IoT integration to enhance farmers' access to information. Additionally, it addresses the limitations of current M-Apps, such as static information and language dependency. The study concludes by suggesting improvements to create a user-friendly environment, empowering farmers with advanced agricultural knowledge and practices through mobile technology.

The paper [3] Prakruti Sadhya, aimed at promoting natural farming techniques in Andhra Pradesh. The app provides comprehensive information on cultivating various crops using eco-friendly methods, weather forecasts, government schemes, and minimum support prices (MSP) for crops, while also offering a platform for farmers to directly sell their produce to consumers. The survey highlights the significance of the application in addressing environmental challenges caused by chemical fertilizers and the need for sustainable agriculture. Positive feedback from farmers and APCNF officers demonstrates the successful achievement of the app's objectives in empowering farmers and promoting eco-friendly practices. The survey encourages further research in this area to support agricultural communities and ensure global food security and environmental preservation.

The research by [4] Mahesh K. M., P. S. Aithal² & Sharma K. R. S. highlights various agricultural schemes introduced by the Government of India to enhance the productive sector and achieve financial inclusion. The study analyses the performance of these schemes, their impact on farmers' welfare, and their contribution to the country's economic development. Highlighted schemes include Minimum Support Price (MPS), MIF, PMKSY, PMFBY, e-NAM, PM-KISAN, PMJDY, PM-KUSUM, PKVY, NAMS, and MGNREGS, along with innovative programs like Kisan Rail and Krishi Udaan. These schemes aim to transform the lives of farmers, ensure financial support, provide access to credit, and facilitate direct benefit transfers to beneficiaries. By adopting modern technology, promoting various agricultural activities, and involving Self-Help Groups (SHGs), these initiatives are expected to positively impact productivity, profitability, and the overall welfare of farmers, leading to the development of the country's economy. However, most of these schemes were reached their target but still there are some of the agricultural schemes yet to be accomplished their goals. There is a proper way to implement these agricultural schemes so that the productive sector will get the benefits.

The study conducted by M.S. Nain¹, Rashmi Singh² and J.R. Mishra [5] investigates farmers' awareness of agricultural insurance schemes in Southern Haryana, India, and its impact on the agricultural sector. Despite its potential as a risk-mitigating strategy, farmers' awareness of governmental initiatives in this area remains low, hindering the sector's growth. Conducted in vulnerable districts Palwal and Faridabad, the study reveals that only 34.7% of farmers and 19.7% of farm women were aware of agricultural insurance schemes. Specific knowledge about components such as coverage of risks, premium rates, and implementing agencies was lacking. The study emphasizes the importance of weather-based financial instruments and the newly launched Pradhan Mantri Fasal Bima Yojna. Perceived constraints, including low awareness, malpractices, non-compensation issues, and procedural complexities, further impede adoption. Urgent and comprehensive awareness campaigns, involving all stakeholders, are essential to promote agricultural insurance and mitigate

risks for farmers in Southern Haryana.

A study conducted by J.Sundar, 2Dr. Lalitha Ramakrishnan [6] explores the findings of a study conducted in the Kunichampet village, India, focusing on crop insurance. The study assesses farmers' awareness, perception, and willingness to pay for crop insurance. Results indicate low awareness levels, with most farmers unwilling to participate due to factors like unstable income, high premiums, inadequate compensation, distribution challenges, and limited financial knowledge. The study emphasizes the need to improve awareness and product design tailored to small and marginal farmers, as well as efficient distribution channels and better risk-sharing mechanisms to increase farmers' participation in crop insurance programs.

The Government Scheme Awareness Through App by Pranav Patil, Ritik Rana, Bikas Maharana, Ashwini Kothawale [7][9] discussed the transformation of government services through cloud computing and the significance of secure database management to prevent data loss. Communication systems between web applications and embedded systems have been explored, alongside research on e-government identification solutions. The importance and impact of mobile government apps on information flow, particularly in local-level governance, have been investigated. Additionally, there are studies on developing accessible apps for disabled individuals and the utilization of mobile technology to enhance government-citizen interaction. Privacy permission management for Android apps and user-friendly interface design have also been addressed. These studies collectively inform the proposed government schemes app, facilitating seamless connectivity between citizens and government services while optimizing data security and user experience. The paper "Review on: Design and Development of Mobile App for Farmers" by Ms. Shubhangi G. Mane and Dr. Kulkarni R. V [8] delves into the significance of mobile applications for farmers in India's agriculture sector. The authors discuss the challenges faced by farmers in accessing timely and relevant information for precision farming. Through an extensive literature review, they explore various existing mobile apps and research papers related to agriculture.

The paper highlights the potential of mobile apps to provide valuable information services to farmers, including weather forecasts, market prices, and crop management advice. Identifying a gap in the current app offerings, the authors propose developing a user-friendly mobile application that consolidates diverse agricultural services and provides a platform for interaction between farmers and experts. The proposed app aims to bridge the knowledge gap and empower farmers with essential information to enhance agricultural productivity and livelihoods. The paper "An Android-based Application for Farmers to Trade and Predict Crops" [9] proposes a solution to address the exploitation of farmers by intermediaries in India's agriculture sector. The Android app facilitates direct trade between farmers and consumers, eliminating middlemen and enabling farmers to set fair prices for their crops. The application offers features like crop trading, crop prediction based on location and climate, real-time weather updates, and information on agricultural produce prices in different districts. Through a thorough literature review, the authors establish the significance of their app in enhancing agricultural productivity and empowering farmers with essential tools and information for better decision-making, ultimately contributing to the growth and sustainability of the agricultural sector.

Table:1

Sl. No	Age	No Of Farmers
1	0-25	1
2	25-50	20
3	50-75	22
4	75-100	7
Total		50

Survey Analysis

Type of study: Empirical

Data Collection: Primary & Secondary Data

Area of Study: The population for the present study consists of farmers from Kundapura Taluk. 50 farmers from different villages (Kandavara, Basrur, Rattady, Hengavalli and Japti) in Kundapura Taluk were selected through the random sampling technique for the study.

Sample Size: 50

Questionnaire Design: Structured

Statistical Tool: Weighted Average Mean with Rank Correlation Analysis.

$$\text{Weighted Average} = \frac{\sum wx}{\sum w}$$

Data Analysis and Interpretation

Demographic Profile:

Table 2

Sl.No	Particulars	Numbers
1	Male	21
2	Female	29
Total		50

Interpretation:

Based on the data collected from the survey, as shown in Table:1 there were 21 male respondents and 29 female respondents, making a total of 50 respondents in total

Interpretation:

Based on the data collected from the as shown in Table:2 survey, age group 0-25 includes only 1 farmer, indicating there is a relatively small number of farmers in the younger age bracket. The majority of farmers fall into the age group of 25-50 & 50-75. The age group of 75-100 has the lowest number of farmers.

Awareness on Government Schemes:

Table:3

Sl. No	Particulars	No Of Farmers
1	Aware & benefited	6
2	Unaware & Not Benefited	44
Total		50

Interpretation:

Out of the total surveyed farmers, as shown in Table:3 6 farmers are categorized as aware & benefited. This means that these farmers are both aware of the particular schemes and have also derived benefited from it. And remaining 44 farmers are categorized as unaware & not- benefited. Additionally, the data suggests that efforts should be made to reach out to and inform the unaware farmers about the available opportunities, enabling them to maximize their benefits and improve their livelihoods.

Table:4

Sl. No	Govt. Schemes	Highly Aware-1	Aware-2	Not Aware-3	Weight	Weighted Mean	Rank
1	Pradhan Mantri Kisan Samman Nidhi Scheme	8	11	31	3	21	1
2	Pradhan Mantri Fasal Bhima Yojana (Pmfby)		3	47	2	16.7	2
3	Neem Coated Urea		2	48	2	16.7	2
4	Gramin Beej Yojana		1	49	2	16.7	2
5	Soil Health Card Schemes		1	49	2	16.7	2
6	Gramin Bhandaran Yojana		0	50	1	8.3	3
7	Paramparagat Krishi Vikas Yojana		0	50	1	8.3	3
8	Horticultural Schemes		0	50	1	8.3	3

Interpretation:

The data provided in Table :4 represents the results a survey conducted on awareness levels of various government schemes among the respondents. The survey categorized respondents into 3 groups: Highly

Aware-1, Aware-2, Not Aware-3. The survey also assigns weights to each category based on their significance. Pradhan Mantri Kisan Samman Nidhi Scheme has the highest awareness level among the respondents, with a significant number of people being highly aware when compared to the other schemes.

Equipment Usage

Table: 5

Sl. No	Equipment	Users In %
1	Tractor	60%
2	Tiller	32%
3	Milking Machine	8%
4	Others	8%

Interpretation:

Among the 50 farmers surveyed, from Table:5 it appears that a significant portion of them rely on hired labor rather than their family members to meet their labor requirements.

Labour Requirement:

Table: 6

Sl. No	Requirement Of Labour	No Of Farmers
1	Yes	45
2	No	5
Total		50

Interpretation:

Among the 50 farmers surveyed, as shown in Table:6 it appears that a significant portion of them rely on hired labor rather than their family members to meet their labor requirements.

Need for the App by Farmers

Table:7

Sl. No	Need App Yes	Need App No
1	50	0

Interpretation:

The data provided in Table:7 represents the responses to a survey

Scheme Customization:

The heart of the Smart Farmer's Application lies in its scheme customization algorithm, as shown in Figure 3. The server's backend system utilizes this algorithm to analyze the farmer's data and match it with the eligibility criteria of various government schemes. Based on this analysis, the system generates a list of tailored scheme recommendations, which are sent back to the farmer's mobile app for display. regarding the need for an app. All 50 respondents have indicated a need for an app. This suggests a unanimous agreement among the respondent that an app is necessary.

Architecture:

The Smart Farmer's Application follows a client-server architecture, as shown in Figure 1. The client-side comprises the mobile application installed on the farmer's device, while the server-side involves a backend system responsible for processing data and providing personalized scheme recommendations.

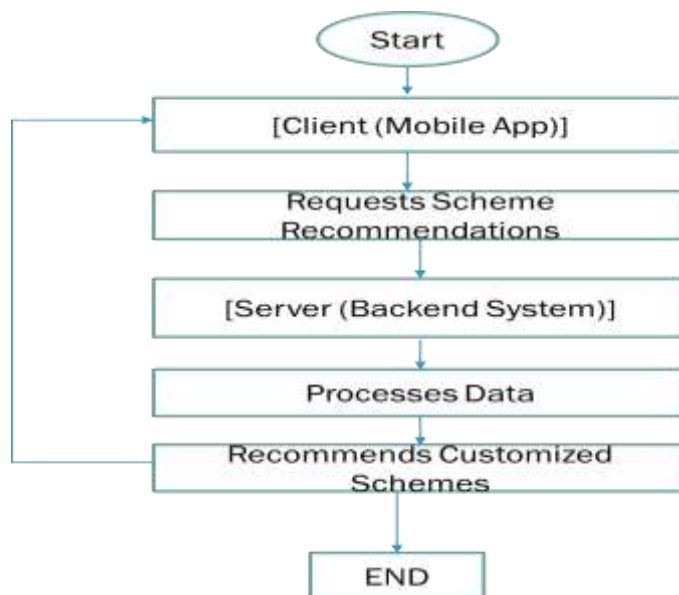


Figure 1: Client Server Architecture

Data Collection and Processing:

Figure 2 illustrates the data collection and processing workflow. The mobile application collects essential information from the farmer, including income, land area, crop type, and other relevant data. This data is securely transmitted to the server for processing.

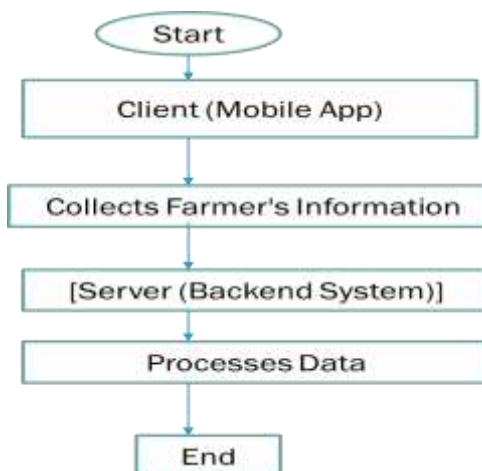


Figure 2: Data Collection and Processing and workflow

Scheme Customization:

The heart of the Smart Farmer's Application lies in its scheme customization algorithm, as shown in Figure 3. The server's backend system utilizes this algorithm to analyze the farmer's data and match it with the eligibility criteria of various government schemes. Based on this analysis, the system generates a list of tailored scheme recommendations, which are sent back to the farmer's mobile app for display.

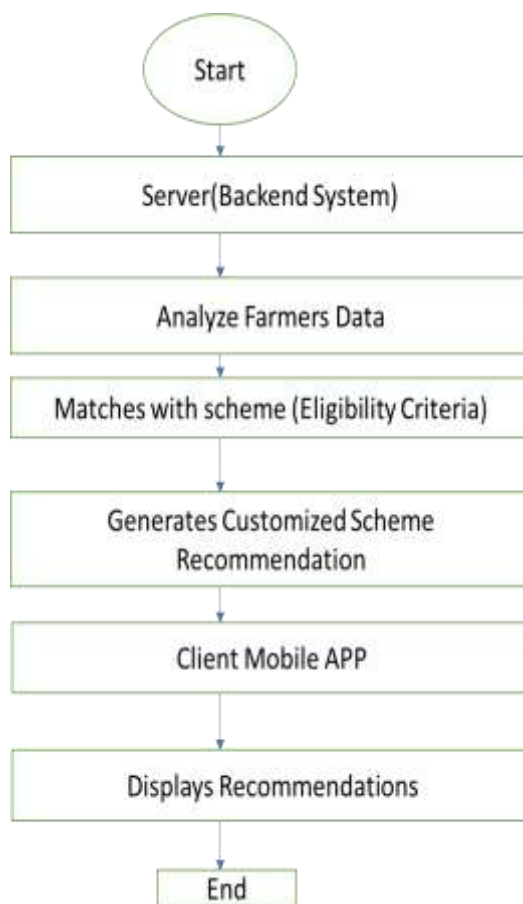


Figure 3: Scheme Customization Algorithm

Real-Time Updates:

To ensure that the scheme recommendations remain relevant, the Smart Farmer's Application employs real-time updates. Whenever the government introduces new schemes, modifies existing ones, or changes eligibility criteria, the backend system fetches this information and adjusts its recommendation engine accordingly.

User Interface:

The user interface (UI) of the mobile app is designed to be intuitive and user-friendly. Upon logging in, the farmer can view the recommended schemes, filter schemes based on various parameters, and access detailed information about each scheme.

3. Conclusion:

The Smart Farmer's Application Raitha Mithra provides an innovative solution to address the challenges farmers face in accessing appropriate government schemes. By leveraging a dynamic recommendation system, farmers can now receive personalized scheme suggestions based on their individual circumstances, streamlining the process of availing benefits and support from government initiatives.

Future Enhancements:

Future work includes expanding the app's capabilities to support multiple languages, incorporating machine learning to improve scheme recommendations, and integrating weather forecasts to enhance crop-specific suggestions.

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