Survey Paper on Android based solution for Indian Agriculture

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***Abstract*—Android-based solutions are a transformative force in Indian agriculture, providing innovative tools to address critical challenges like productivity, resource management, and market access. By utilizing the widespread adoption of smartphones and mobile technology, these solutions give farmers access to valuable resources, real-time data, and actionable insights that can significantly improve agricultural practices. From market information and financial services to precision farming apps and educational platforms, Android applications are facilitating better decision-making, optimizing resource use, and improving market connectivity. However, despite these advancements, issues like limited internet access and variable levels of digital literacy persist, requiring constant efforts to improve app functionality and accessibility.**

***Index Terms*— agriculture, smartphones and mobile technology, etc**

I. INTRODUCTION

The foundation of human civilization has always been agriculture, and as the world's population continues to rise, its importance has only grown in recent years. Modern agricultural technologies and applications have been created and put into use over time to increase agricultural efficiency and output in order to satisfy the growing need for food. Although applications of modern agriculture have demonstrated encouraging outcomes in terms of raising crop yields and ensuring food security, their effects on farmers' lives are varied and intricate. Farmers' livelihoods have changed as a result of the advent of contemporary technologies and agricultural practices, which have presented both new obstacles and chances for growth and development. This study looks at the applications of contemporary agriculture that farmers can use, assessing the advantages and disadvantages of different technology and methods for farmers' economic, social, and environmental well-being. The difficulties farmers encounter when implementing contemporary agricultural applications will be examined, along with possible ways to overcome these difficulties. The study is set up to give a thorough analysis of the pertinent literature on applications in contemporary agriculture, emphasizing both the advantages and disadvantages for farmers' livelihoods. In doing so, the study will shed light on the intricate relationship between farmers and contemporary agricultural applications, which will have important ramifications for agriculture's future and food security. In addition to laws and practices that support farmers' livelihoods and encourage sustainable agriculture, the study emphasizes the necessity for a thorough assessment of the advantages and disadvantages of contemporary agricultural applications for farmers. Agriculture mobile applications are seen as a game-changer in the world of agriculture since they provide real-time information on weather, crop diseases, and market prices, among other things. Understanding the elements that influence the acceptance and use of farming mobile applications is crucial for their successful integration into farming practices. By informing farmers about the benefits of these applications, localization of content, multilingual support, and straightforward user interfaces can foster greater user acceptance and usage. Adoption of mobile applications in agriculture has the potential to spur innovation, increase productivity, and improve food security. The study aims to give readers an idea of how mobile applications could be beneficial. This work also discusses the framework and implementation of mobile apps in React Native, which has important ramifications for agricultural and food security in the future. Farmers can install this software on smartphones running iOS and Android.

II. LITERATURE REVIEW

Mostafa Kamal, Tarek Aziz Bablu, "Mobile Applications Empowering Smallholder Farmers: An Analysis of the Impact on Agricultural Development" [1], Through enhanced information access, market connections, financial inclusion, and better resource management, mobile applications can empower smallholder farmers, as this research study explores. The study looks at how mobile apps have made it easier to acquire essential agricultural data in real time, such as crop pricing, weather updates, best farming practices, and pest control methods. Reliable information makes it possible for farmers to make well-informed decisions, which improves crop yields and productivity. Additionally, by enabling direct connections between farmers and buyers, decreasing reliance on middlemen, and lowering transaction costs, mobile apps have transformed market linkages, according to the report. Furthermore, by offering pricing transparency, these apps enable farmers to bargain for higher prices for their produce, increasing their revenue and securing a bigger portion of the market value. The study also emphasizes the financial services, such digital payment methods and mobile banking, that mobile applications provide in developing nations. Through these services, smallholder farmers can more easily access formal banking systems, get paid on time, and obtain finance for necessary equipment and agricultural materials. Farmers can invest in their fields by utilizing app-based financial services, which in turn increases agricultural development and output. Additionally, the study explores how mobile apps might help smallholder farmers manage their resources more effectively. These apps frequently provide resource tracking and farm management features that let farmers keep an eye on water use, fertilizer application, and other inputs, increasing productivity and cutting waste. As a result, this maximizes the use of resources, which helps smallholder farmers increase their output and revenue. Lastly, the study looks at how farmers in rural locations can now receive extension services more easily thanks to mobile apps. Extension agents may help farmers embrace contemporary agricultural methods and technologies by sharing information and knowledge via text messages, audio, and video content. Smallholder farmers' livelihoods are further improved when these practices are widely adopted since they increase productivity and income levels. The results of this study show how mobile applications have a major influence on agricultural growth, especially when it comes to enhancing the lives and means of subsistence of smallholder farmers. Through these apps, information, market connections, financial services, resource management tools, and extension services are made accessible, offering a viable route to rural prosperity and sustainable agricultural expansion.

Rohan Kumar Raman, Dhiraj Kumar Singh, Sudip Sarkar, Ujjwal Kumar, "Agricultural Mobile Apps for Transformation of Indian Farming" [2], Potential digital technologies that can be used to quickly and efficiently reach a large number of farmers with agricultural information are mobile applications. They can be used to increase agricultural production and revenue by giving farmers accurate information, improving farm management and inputs, making marketing simple, connecting them with government agencies to support their policies, etc. But there are obstacles including poor internet access, low digital literacy among farmers, a low rate of smartphone uses in rural India, and a lack of agricultural information available in local languages, among others.

Kushwaha, M., Singh, D. K., & Gupta, A., "Mobile applications for agriculture and rural development: A review of literature." [3], The possibilities and constraints of mobile phones in providing rural services for agricultural and rural development in developing nations are systematically reviewed in this essay. According to the study, research has grown rapidly in recent years, with an increasing number of primary research projects that have established rigorous techniques for data collecting and analysis. Institutions and researchers in poor countries have also made a welcome contribution to this growth. Literature gaps point to potential topics for future study focus. Among these are the availability of agricultural data sources that can serve as the foundation for efficient planning and policymaking, as well as the evaluation of information and service requirements that considers gender disparities and the possibility of user participation in the planning of service delivery. The possibility of financial market integration, sustainable business models, sector performance and productivity metrics, and evaluation of wider social and community-level effects all require further research.

R.L.Meena, B. Jirli, M. Kanwat, N.K. Meena, "Mobile Applications for Agriculture and Allied Sector" [4], For millions of farmers, agriculture remains the most vital sector of the Indian economy and is essentially their only source of income. The price of commodities fluctuates virtually daily, land and water supplies are

nearly depleted, most marginal and small farmers make very little money, and most importantly, it is difficult to obtain information. Since agriculture employs the majority of people in India, the system for updating technology needs to be reviewed and revitalized. Small-scale farmers make up the majority of Indian farmers, yet they frequently lack access to the knowledge and technology tools that could boost productivity and raise prices for their goods. The widespread mobile phone network was crucial in addressing this issue. The mobile phone-based solution aids in farm management, which raises agricultural productivity and contributes to farm care and maintenance, bringing the agricultural industry to its pinnacle. Soft resources like expertise and information are just as, if not more, crucial in modern agriculture than hard resources like inputs. However, estimates show that a significant adoption gap results from 60% of farmers not having access to any information source about innovative agricultural technologies. There are currently roughly 0.1 million field level extension employees available, compared to an estimated 1.3–1.5 million individuals needed.

DRK Saikanth, Karuna Jeba Mary, Ashish Kumar Nagar, Rishabh Yadav, Abhijeet, P Thilagam and Shubham Singh ,"Mobile applications for agricultural transformation: Types, impacts, case studies, and recommendations" [5], In a time of swift technological development and the increasing importance of agriculture to the Indian economy, a number of mobile applications have surfaced to completely transform how farmers interact with and oversee their farming operations. These applications, which include Meghdoot, Farm-opedia, Kisan Suvidha, and Pusa Krishi, are essential in tackling a wide range of agricultural issues. Kisan Suvidha provides farmers with up-to-date information on weather, market pricing, and other topics, while Pusa Krishna acts as an innovation hub, supplying state-of-the-art agricultural technology. For rural Gujarat, Farm-o-Pedia is a comprehensive site that provides weather updates and crop advice, while Meghdoot guarantees timely weather forecasts and multilingual agro advisories. Together, these applications represent the marriage of technology and agriculture, improving the farming community's general well-being, sustainability, and production in India. These digital solutions, where knowledge, information, and innovation come together to create a more promising and prosperous agricultural landscape in India, hold the key to the future of agriculture.

III. CHALLENGES IN PLANT DISEASE DETECTION

1. Operating mobile apps demands specialized labor, which calls for digital literacy.
2. Why It is challenging to create apps in local languages due to linguistic diversity across the nation.
3. The information needs to be translated at several points, which could degrade its quality and make it less acceptable to the farming community.
4. Using mobile apps requires a faster internet connection. Mobile application services are frequently impacted by internet connectivity and speed issues in rural areas.
5. Farmers lack the necessary skills and knowledge to use mobile applications.
6. Since many mobile apps charge for their use, farmers might not be able to afford the paid services offered by these apps.
7. One major issue is the lower acceptance and use of mobile apps by farmers, which the government must address by promoting digital literacy.
8. Three major obstacles to using mobile apps include uneven digital access, inaccurate data in apps, and a lack of content tailored to local needs.

IV. CONCLUSION

Mobile applications are promising digital technologies that can be used to quickly and efficiently disseminate agricultural information to a large number of farmers. Through accurate information, improved input and farm management, simple marketing, connections to government agencies for policy support to farmers, etc., they can be used to increase farm income and productivity. Nonetheless, there are obstacles such as the low rate of smartphone use in rural India, inconsistent internet access, farmers' low levels of digital literacy, the scarcity of agricultural information in regional languages, etc. agriculture mobile in the future.

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