



### A

**Project Report**

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**KRISHI KOM**

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**DECLARATION**

We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

Signature:

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This is to certify that Project Report entitled "KRISHI KOM" which is submitted by “Shivam Nautiyal and Shivam Sharma” in partial fulfillment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr. A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

### Mr. Rahul Kumar

**Date:**

It gives us a great sense of pleasure to present the report of the B. Tech Project undertaken during B. Tech. Final Year. We owe special debt of gratitude to Mr. Rahul Kumar Assistant Professor, Department of Computer Science, KIET Group of Institutions, Ghaziabad, for constant support and guidance throughout the course of our work. His sincerity, thoroughness and perseverance have been a constant source of inspiration for us. It is only his cognizant efforts that our endeavors have seen light of the day.

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ABSTRACT

The "KRISHIKOM" project represents a pioneering initiative aimed at empowering smallscale and marginalized farmers in the agricultural sector. Recognizing the myriad challenges faced by these farmers, from limited resources to a lack of technological solutions, this project endeavors to revolutionize their engagement with farming practices. At its core, "KRISHIKOM" seeks to uplift farmers by providing a user-friendly mobile application that serves as a comprehensive support system, offering real-time information, expert guidance, and collaboration opportunities.

The project's objectives are wide-ranging and practical, encompassing initiatives such as weather monitoring, sustainable agriculture advocacy, community building, shared farming equipment promotion, market trend analysis, financial inclusion, and partnerships with technology startups. Central to its success is the amalgamation of advanced tools and platforms, leveraging technologies like Node.js, React Native Expo, Firebase, Twilio, and more for efficient data handling, cross-platform accessibility, real-time synchronization, and effective communication.

"KRISHIKOM" transcends being merely an application; it symbolizes a transformative journey for small-scale farmers, providing them with the knowledge, support, and resources to enhance their livelihoods and champion sustainable agriculture practices. With a focus on technology-driven solutions, strategic partnerships, and data-driven insights, the project aims to become a beacon of hope, fostering resilience and progress in the face of formidable agricultural challenges.

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## LIST OF ABBREVIATIONS

ARI Agricultural Research Institutes

**SMS Short message service**

**ICT** Information and Communication Technologies

**SVM** Support Vector Machine

CNN Convolutional Neural Network

RNN Recurrent Neural Networks

**GPS** Global Positioning System

AR Augmented reality

INTRODUCTION

# INTRODUCTION

# In the realm of agriculture, small-scale and marginalized farmers grapple with an array of challenges that impede their progress and sustainability. Issues such as limited access to crucial information, inadequate resources, and a lack of technology-driven solutions serve as formidable barriers to their economic growth and the adoption of eco-friendly practices. To bridge these gaps and usher in a new era of agricultural empowerment, the "KRISHIKOM" project emerges as a groundbreaking initiative.

# This project stands poised to revolutionize the way small-scale farmers engage with the agricultural industry. At its core, "KRISHIKOM" seeks to empower farmers by equipping them with the necessary tools, information, and opportunities essential for enhancing their livelihoods. Central to its approach is the development of a user-friendly mobile application acting as a beacon of support, providing real-time information, expert guidance, and collaborative avenues for farmers.

# The "KRISHIKOM" project embodies a transformative vision aimed at addressing the pressing challenges that hinder the growth and sustainability of small-scale farmers. These individuals, often marginalized within the agricultural landscape, face daunting obstacles stemming from a lack of access to vital resources and technological innovations. This disparity impedes their ability to navigate the complexities of modern farming practices effectively.

# However, the "KRISHIKOM" initiative emerges as a beacon of hope within this landscape. It stands as a testament to the potential of technological solutions in revolutionizing the agricultural paradigm. By amalgamating cutting-edge technology with an unwavering commitment to community empowerment, the project endeavors to reshape the narrative for small-scale farmers.

# At the heart of this initiative lies a comprehensive mobile application meticulously crafted to cater to the unique needs of farmers. Beyond just a technological tool, this application serves as a gateway to empowerment, offering real-time insights, expert advice, and collaboration opportunities crucial for the advancement of farming communities.

# Through strategic partnerships and a multifaceted approach encompassing weather monitoring, sustainable agricultural practices, community building, and financial inclusion, "KRISHIKOM" seeks to create a robust ecosystem that uplifts farmers and fosters sustainable agricultural practice

# PROJECT DESCRIPTION

**KRISHIKOM** is a mobile application designed to revolutionize the agricultural sector by empowering farmers with a comprehensive suite of features. Built using React Native technology, KRISHIKOM offers a user-friendly interface to address common challenges faced by farmers and promote sustainable practices.

**Key Features:**

* **Real-time weather monitoring:** Get up-to-date weather information to make informed decisions about crops and irrigation.
* **Expert crop advice:** Connect with agricultural experts for personalized guidance on crop selection, pest management, and more.
* **AR-based irrigation guidance:** Utilize augmented reality to optimize water usage and ensure efficient irrigation practices.
* **Sustainable agriculture education:** Learn about eco-friendly farming methods to promote long-term soil health and crop yields.
* **Community building:** Connect with other farmers to share knowledge, experiences, and best practices.
* **Shared farming equipment:** Facilitate resource sharing within the farming community to reduce costs.
* **Global market trend analysis:** Gain insights into global market trends to make informed decisions about crops and pricing.
* **Financial inclusion:** Access financial services through partnerships with financial institutions, promoting financial well-being.
* **Startup collaborations:** Explore collaboration opportunities with startups in the agricultural technology sector.

**Addressing the Technological Gap:**

KRISHIKOM prioritizes ease of use for individuals with varying literacy levels. The application offers a user-friendly interface and leverages SMS services for effective communication.

**Technology Stack:**

* **Application Development:** React Native with Expo
* **Server Infrastructure:** Node.js
* **SMS Services:** Twilio

**Overall Impact:**

KRISHIKOM aims to address critical challenges faced by farmers, ultimately leading to improved financial well-being, promoting sustainable agricultural practices, and bridging the technological gap in the agricultural sector.

LITERATURE REVIEW

The agricultural sector is crucial for both global food security and economic development. However, small-scale and marginalized farmers often grapple with challenges in accessing necessary information and resources to enhance their agricultural productivity. Addressing these challenges is pivotal in increasing farmers' income and livelihood. To this end, several academic sources and real-world applications have been reviewed to comprehend the existing technological landscape in agricultural solutions.

Santosh G. Karkhile and Sudarshan G. Ghuge presented a paper titled "A Modern Farming Techniques using Android Application." This paper elaborates on the development of a mobile phone-based solution that supports farm management, thereby improving agricultural yield. The authors emphasize that traditional farming methods necessitate substantial labor and several activities, whereas modern farming streamlines the process with the assistance of mobile devices, machines, and advanced technology. They proposed a system architecture for a farming application, encompassing operations like farmer registration, weather forecasting, news updates, multiple language support, and market trading.

Suporn Pongnumkul, Pimwadee Chaovalit, and Navaporn Surasvadi contributed to a systematic review titled "Applications of Smartphone-Based Sensors in Agriculture." Their research focuses on smartphone applications utilizing built-in sensors to provide diverse agricultural solutions. Categorized by specific agricultural functions, these applications cater to different areas, including disease detection and diagnosis, soil study, crop water needs estimation, HR management, and extension service applications. GPS and cameras are identified as the most common sensors employed in these smartphone applications for farming.

In their paper titled "New Technologies for Disseminating and Communicating Agriculture Knowledge and Information: Challenges for Agricultural Research Institutes in Tanzania," Barakabitze and Kitindi thoroughly explore the extensive array of Information and Communication Technologies (ICTs) employed within Agricultural Research Institutes (ARIs). They underscore the multifaceted utility of ICT tools across diverse realms of agriculture, encompassing aspects such as dissemination of information on crop varieties, optimization of land use practices, efficient irrigation strategies, access to real time weather reports, effective pest and disease control measures, promotion of crop awareness and education, implementation of pollution control initiatives, and adoption of novel farming techniques. Through their comprehensive analysis, the authors shed light on the pivotal role played by ICTs in enhancing productivity, sustainability, and resilience within Tanzania's agricultural landscape, while also addressing the challenges encountered by ARIs in effectively harnessing these technological advancements to maximize their impact on agricultural development.

The research paper "Smart Agriculture Applications Using Deep Learning Technologies: A Survey" by Maha Altalak et al. presents a thorough examination of recent advancements in applying deep learning techniques, including convolutional neural networks (CNN) and recurrent neural networks (RNN), in agriculture. The paper highlights the significance of smart agriculture in addressing the food demands of a growing population and emphasizes the role of deep learning in optimizing agricultural processes. Through a systematic literature review spanning five years, the paper analyzes various research articles, discussing their contributions and the challenges they address. It explores how deep learning facilitates decision-making for farmers by leveraging data from IoT devices and other sources. Additionally, the paper proposes a novel hybrid deep learning model combining CNN and support vector machine (SVM) to enhance the early detection and classification of plant leaf diseases, addressing a key limitation in existing smart agriculture systems. Overall, the paper provides valuable insights into the applications of deep learning in agriculture and offers a promising direction for future research in the field

PROPOSED METHODOLOGY

1. **Requirement Analysis:.**

At the onset of the research project, a comprehensive understanding of farmers' needs and challenges is pursued. Stakeholder engagement, surveys, and interviews with farmers, agricultural experts, and other relevant parties aid in identifying critical requirements for the mobile application's development

1. **Prototyping:**

During the initial phase of development, the team focuses on creating detailed wireframes and prototypes that accurately depict the user interface and functionalities of the KRISHIKOM application. These visual representations serve as blueprints for the development process, ensuring that the final product aligns closely with user needs and expectations. By meticulously crafting wireframes and prototypes, the team can iteratively refine and enhance the application's design to maximize usability and user satisfaction.

1. **Technology Selection**:

The selection of an appropriate technology stack is paramount for ensuring the success of the project. Following a meticulous assessment of the project's objectives and requirements, technologies such as React Native for app development. Node.js for server infrastructure, and Twilio for SMS services are chosen due to their compatibility and proven effectiveness in aligning with project goals and facilitating seamless development and functionality.

1. **Development Phase**:

a) Front-end Development: In the front-end development phase, the primary objective is to craft a visually appealing and intuitive user interface for the mobile application. This involves not only creating an aesthetically pleasing design but also ensuring that the interface is easy to navigate and interact with. Key functionalities such as weather monitoring, crop advice, AR-based irrigation support, and community building are seamlessly integrated into the front-end to enrich the user experience and foster engagement. By prioritizing user-centric design principles and incorporating these essential features, the front-end development team aims to enhance usability, accessibility, and overall satisfaction for KRISHIKOM users.

b) Back-end Development: Meanwhile, in the back-end development phase, the focus shifts towards establishing a robust and scalable server infrastructure to support the functionality of KRISHIKOM. This involves setting up servers, configuring databases and integrating application programming interfaces (APIs) to enable features such as real-time weather updates and market trend analysis. The back-end serves as the backbone of the application, facilitating seamless communication and data management between the front-end interface and external data sources. By meticulously addressing these crucial components, the back-end development team ensures that KRISHIKOM operates smoothly and efficiently, delivering reliable access to essential information and services for its users

1. **Testing Phase**:

Thorough testing is crucial to guarantee that KRISHIKOM operates effectively, efficiently, and reliably. This process involves systematically evaluating each aspect of the application to identify and resolve any potential issues or bugs. Functionality testing ensures that all features perform as expected, usability testing assesses the user experience, and reliability testing verifies the stability and consistency of the application. Through rigorous testing, KRISHIKOM can deliver a seamless and reliable experience to its users.

1. **Deployment:**

Once testing is successfully completed and all necessary refinements are implemented, the KRISHIKOM application undergoes the deployment process. This entails making the application available for farmers' use through various distribution channels, such as the Google Play Store or other relevant platforms. The deployment process involves ensuring compatibility with different devices and operating systems to maximize accessibility for users. Additionally, thorough documentation and user support resources are provided to assist farmers in seamlessly accessing and utilizing the application to optimize their farming practices.

1. **Evaluation**:

Continuous monitoring of the application's performance, gathering feedback from users, and analyzing user analytics are essential components of the evaluation process to gauge the effectiveness of the KRISHIKOM application. This iterative approach allows for ongoing assessment of how well the application meets user needs and expectations. By continuously gathering feedback and analyzing user interactions, developers gain valuable insights into areas for improvement and refinement. These insights inform iterative updates and enhancements to the application, ensuring that it remains relevant, competitive, and aligned with evolving user preferences and technological advancements. Through this iterative process of improvement, KRISHIKOM can continuously enhance its functionality, usability, and overall user satisfaction, thereby maximizing its impact and effectiveness within the agricultural community

**Results and Discussion**

The results of the research conducted shed light on various aspects of agricultural technology adoption, utilization, and its impact on farming communities. Through an extensive review of literature and empirical studies, several key findings emerged, which are discussed below.

1. Adoption and Potential of Mobile Phones in Agriculture:

- Ansari and Pandey (2013) highlighted the significant potential of mobile phones in agriculture, facilitating access to information, market updates, and advisory services.

- Mittal et al. (2010) emphasized the socio-economic impact of mobile phones on Indian agriculture, revealing evidence of productivity enhancement and contribution to farmers' well-being.

2. Impact of Information and Communication Technologies (ICTs) on Agriculture Development:

- Chhachhar et al. (2014) investigated the impact of ICTs on agriculture development, revealing their positive influence on improving farming practices, market access, and knowledge dissemination.

- Emerick et al. (2016) explored technological innovations and their role in modernizing agriculture, emphasizing the importance of downside risk management and adoption of innovative practices.

3. Role of Digital Technologies in Agricultural Extension:

- Ferroni and Zhou (2012) discussed achievements and challenges in agricultural extension in India, highlighting the crucial role of digital technologies in extending advisory services and disseminating agricultural knowledge.

- Saravanan and Vincent (2020) provided insights into agricultural extension and advisory systems in Tamil Nadu, showcasing the importance of technology-driven approaches in enhancing extension services and farmer outreach.

4. Potential of M-Commerce in Agricultural Inputs:

- Kittur et al. (2016) explored the potential of M-Commerce in agricultural inputs, particularly in Kolar, Karnataka, India, revealing opportunities for leveraging mobile platforms for input procurement and distribution.

5. Innovative Use of Mobile Applications in Agriculture:

- Hellstrom and Troften (2010) discussed the innovative use of mobile applications in East Africa, highlighting the transformative role of mobile technology in providing agricultural information, market access, and financial services to farmers.

6. Digital Transformation in Indian Agriculture:

- Seth and Ganguly (2017) discussed digital technologies transforming Indian agriculture, emphasizing the integration of digital platforms, data analytics, and IoT solutions in enhancing farm productivity and efficiency.

Overall, the results indicate a growing recognition of the transformative potential of technology in agriculture, with mobile phones, ICTs, and digital platforms playing pivotal roles in empowering farmers, improving productivity, and fostering sustainable agricultural development. However, challenges such as digital divide, infrastructure constraints, and adoption barriers need to be addressed to fully harness the benefits of technological advancements in agriculture

Screenshots of a cell phone screen

Description automatically generated

Figure 1 ) Application UI

CONCLUSION AND FUTURE SCOPE

1. **CONCLUSION:**

The deployment of KRISHIKOM signifies a pivotal step in aiding small-scale farmers by addressing critical farming challenges. Through its innovative features and intuitive interface, it offers real-time weather monitoring, expert agricultural advice, AR irrigation support, and financial inclusion. By prioritizing farmers' needs, KRISHIKOM promotes sustainability and productivity while fostering prosperity in the agricultural sector. Its evolution promises transformative changes through technological innovation and strategic partnerships, ushering in a brighter future for agriculture globally

1. **FUTURE WORK**

1. Enhanced AI and Machine Learning Integration for predictive analysis of weather and crop advice.

2. Localization of language support and customization for personalized recommendations.

3. Expansion of partnerships with agri-tech startups, government agencies, and educational institutions.

4. Integration of features for real-time market analysis on market trends, pricing, and crop demand.

5. Continual improvements in AR-based technology for irrigation and crop management assistance.

6. Implementation of automation technologies throughout the development process for efficiency and user-friendliness.

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