Project Synopsis

on

KRISHIKOM

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in

## Computer Science



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# DECLARATION

We hereby declare that this submission is our 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 acknowledgement has been made in the text.

Signature of Students Name:

Roll No.:

Date:

# CERTIFICATE

This is to certify that Project Report entitled “**KRISHIKOM**” which is submitted by **Shivam Sharma and Shivam Nautiyal** in partial fulfilment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr. Ajay Kumar Srivastva 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.

**Date: Supervisor Signature**

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Last but not the least, we acknowledge our friends for their contribution to the completion of the project.

Signature: Date : Name : Roll No:

# 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 userfriendly mobile application that serves as a comprehensive support system, offering realtime information, expert guidance, and collaboration opportunities.

The project's objectives are wideranging 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, crossplatform accessibility, realtime synchronization, and effective communication.

"KRISHIKOM" transcends being merely an application; it symbolizes a transformative journey for smallscale farmers, providing them with the knowledge, support, and resources to enhance their livelihoods and champion sustainable agriculture practices. With a focus on technologydriven solutions, strategic partnerships, and datadriven 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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## Chapter 1. Introduction

### Introduction

# In the realm of agriculture, smallscale 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 technologydriven solutions serve as formidable barriers to their economic growth and the adoption of ecofriendly 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 smallscale 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 userfriendly mobile application acting as a beacon of support, providing realtime 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 smallscale 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 cuttingedge technology with an unwavering commitment to community empowerment, the project endeavors to reshape the narrative for smallscale 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 realtime 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

## Problem Statement

Smallscale and marginalized farmers face significant barriers to growth and sustainability, primarily due to limited access to essential information, inadequate resources, and the lack of technologydriven solutions. These farmers struggle with obtaining realtime weather updates, market trends, and expert agricultural advice, which are crucial for making informed decisions. The absence of a reliable source for such information often leads to suboptimal farming practices, reduced productivity, and financial instability.

Moreover, the isolation of these farmers exacerbates their challenges. Without a platform for community building, they miss out on the benefits of shared knowledge, experiences, and support. This isolation also extends to the lack of shared farming equipment and resources, which many smallscale farmers cannot afford individually. Additionally, the technological gap prevents them from adopting modern farming techniques and innovations that could significantly boost their productivity and sustainability. Financial inclusion remains a critical issue, with many farmers unable to access financial services necessary for investment and growth.

To address these multifaceted challenges, KRISHIKOM aims to empower farmers through a comprehensive mobile application. The app will provide realtime weather monitoring, expert crop advice, and augmented realitybased irrigation guidance. It will also promote sustainable agriculture education, facilitate community building, and enable the sharing of farming equipment. By offering insights into global market trends and partnering with financial institutions, KRISHIKOM will enhance financial inclusion and awareness of government schemes. This holistic approach seeks to transform the agricultural sector, promoting sustainability, productivity, and economic growth for smallscale farmers.

## Objective

* Empower smallscale and marginalized farmers with essential tools, information, and opportunities through a comprehensive mobile application.
* Enhance farmers' livelihoods and promote sustainable agriculture by offering realtime weather updates, expert agricultural advice, ARbased irrigation guidance, and education on ecofriendly practices.
* Foster community building, facilitate resource sharing, provide market trend analysis, promote financial inclusion, and offer information on government schemes to bridge the technological gap in agriculture.

NEED FOR THIS SYSTEM BECAUSE:

* Limited access to timely and accurate information on weather patterns, market trends, and best agricultural practices.
* Difficulties in accessing necessary resources such as modern farming equipment, financial services, and expert advice.
* Significant gap in the adoption of advanced agricultural technologies among smallscale farmers.
* Lack of a robust platform for farmers to connect, share knowledge, and collaborate on resourcesharing initiatives.

### Scope

To extend this further to fulfill various requirements, following enhancements are suggested:

* Realtime Weather Monitoring: Provide farmers with uptodate weather information to aid in planning and decisionmaking for crop management.
* Expert Crop Advice: Connect farmers with agricultural experts for personalized guidance on crop selection, pest management, and sustainable farming practices.
* Augmented Reality (AR) Irrigation Guidance: Utilize AR technology to offer precise irrigation recommendations, optimizing water usage and improving crop yields.
* Sustainable Agriculture Education: Educate farmers on ecofriendly farming methods to promote soil health and longterm sustainability.
* Community Building: Facilitate connections among farmers to share knowledge, experiences, and best practices, fostering a collaborative farming community.
* Resource Sharing: Enable the sharing of farming equipment and other resources within the community to reduce costs and increase efficiency.
* Market Analysis: Provide insights into global market trends, helping farmers make informed decisions about crop selection and pricing strategies.
* Financial Inclusion: Partner with financial institutions to offer access to financial services, supporting the economic stability and growth of farmers.
* Startup Collaborations: Explore opportunities for collaboration with agricultural technology startups to bring innovative solutions to farmers.

## Chapter 2. Literature Review

**(1)**

TITLE: A Modern Farming Techniques using Android Application

AUTHORS: Santosh G. Kirkhill and Sudarshan G. Ghuge

Santosh G. Kirkhill and Sudarshan G. Guge use their research to explore the potential of Android apps to revolutionize agricultural practices. They recognize the limitations of traditional farming methods and propose to develop a comprehensive Android application specifically designed to address these shortcomings. The app will act as a central hub for farmers, offering a variety of features to optimize farm management and decision-making. Imagine a mobile app that uses built-in sensors to collect real-time data on important factors like soil moisture and temperature. This valuable information allows farmers to make informed choices about irrigation practices, potentially saving water and improving crop health. The app also includes an extensive database of crop information, giving farmers easy access to planting guides, pest control measures and disease identification tools using image recognition technology. By providing these resources accessible from a smartphone, farmers can gain the valuable knowledge they need to optimize crop growth and minimize losses. But the benefits go beyond data collection and access to information. The proposed Android application is a platform to promote a sense of community among farmers. By incorporating features that allow users to connect with agricultural experts or fellow farmers, the app can foster knowledge sharing and problem-solving on a larger scale. Farmers can share best practices, seek advice on specific issues and stay up to date on the latest developments in the agricultural sector. This collaborative approach has the potential to empower individual farmers and contribute to the overall growth and efficiency of the agricultural industry. Essentially, Kirkhill and Gouge's research suggests Android applications that go beyond simply providing information. The project aims to create a vibrant ecosystem that provides farmers with real-time data, fosters knowledge sharing and ultimately paves the way for a more sustainable and productive agricultural future.

(2)

TITLE: Applications of Smartphone-Based Sensors in Agriculture

AUTHORS: Suporn Pongnumkul, Pimwadee Chaovalit, and Navaporn Surasvadi

This study explores the exciting world of using smartphone sensors to transform agriculture. Explore how a variety of embedded sensors, including GPS and cameras, can be used in innovative applications. These applications have the potential to revolutionize the way farmers collect data, manage crops, and ultimately improve yields. Imagine a scenario where your smartphone becomes a powerful agricultural tool. GPS can track locations and map fields, and cameras combined with image recognition software can detect crop diseases for early intervention. This research pushes the boundaries by exploring the potential of other sensors, such as microphones and accelerometers, for tasks such as monitoring irrigation systems or analyzing animal behavior. Research shows that by combining these different features, a smartphone app can give farmers the ability to collect real-time data on a variety of important aspects of their land. This valuable data can be used to optimize resource use, improve decision-making, and ultimately improve agricultural productivity. In essence, this research paves the way for a new era of smart agriculture that empowers farmers to make informed choices and achieve greater success in agriculture.

**(3)**

TITLE: Smart Agriculture Applications Using Deep Learning Technologies: A Survey

AUTHORS: Maha Altalak et al.

This study, led by Maha Altalak and researchers (etc. stands for “and others”), takes a comprehensive look at the exciting field of smart agriculture based on deep learning technologies. Deep learning, a type of machine learning, is excellent for tasks related to image recognition and pattern analysis. This study explores how deep learning can be used to develop innovative applications that will transform agricultural practices. Imagine a future where farms use deep learning to detect diseases, monitor crop health, and more. Deep learning algorithms can analyze images taken by drones or smartphones to identify early signs of plant stress or disease outbreaks. This allows timely intervention to minimize crop losses and increase overall yields. The research goes beyond this basic application. Harness the potential of deep learning for tasks such as soil analysis, weed detection, and even precision irrigation. Deep learning can analyze massive agricultural data sets to reveal complex patterns and relationships, providing a more data-driven and optimized approach to agriculture. This study was conducted by Altalak et al. Highlights the significant potential of deep learning technologies to revolutionize agriculture. By leveraging the analytical capabilities of deep learning, researchers are paving the way for a future of “smart agriculture” where technology allows farmers to make informed decisions, optimize resource use, and ultimately achieve greater agricultural success.

**(4)**

TITLE: Machine learning applications for precision agriculture: A comprehensive review

AUTHORS: Sharma, A., Jain, A., Gupta, P., & Chowdary, V.

This research focuses on applying machine learning (ML) to achieve “precision agriculture.” Machine learning algorithms can analyze massive data sets collected from a variety of sources, including agricultural equipment sensors, satellite images, and weather data. By identifying patterns and trends in this data, ML can provide farmers with useful information to optimize resource allocation, predict yields, and identify potential problems early. Imagine a system that analyzes data about soil conditions, weather conditions, and historical crop yield data. The system can use machine learning to generate recommendations for fertilization, watering schedules, and even optimal planting times. This data-driven approach can lead to more targeted resource use, minimized waste, and maximized crop health. This study explores the potential of ML in various agricultural fields, including disease and pest prediction, weed detection, and livestock health monitoring. This research envisions a future that uses the power of machine learning to help farmers make informed decisions through technology, leading to a more sustainable and productive agricultural

# CHAPTER 3 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:

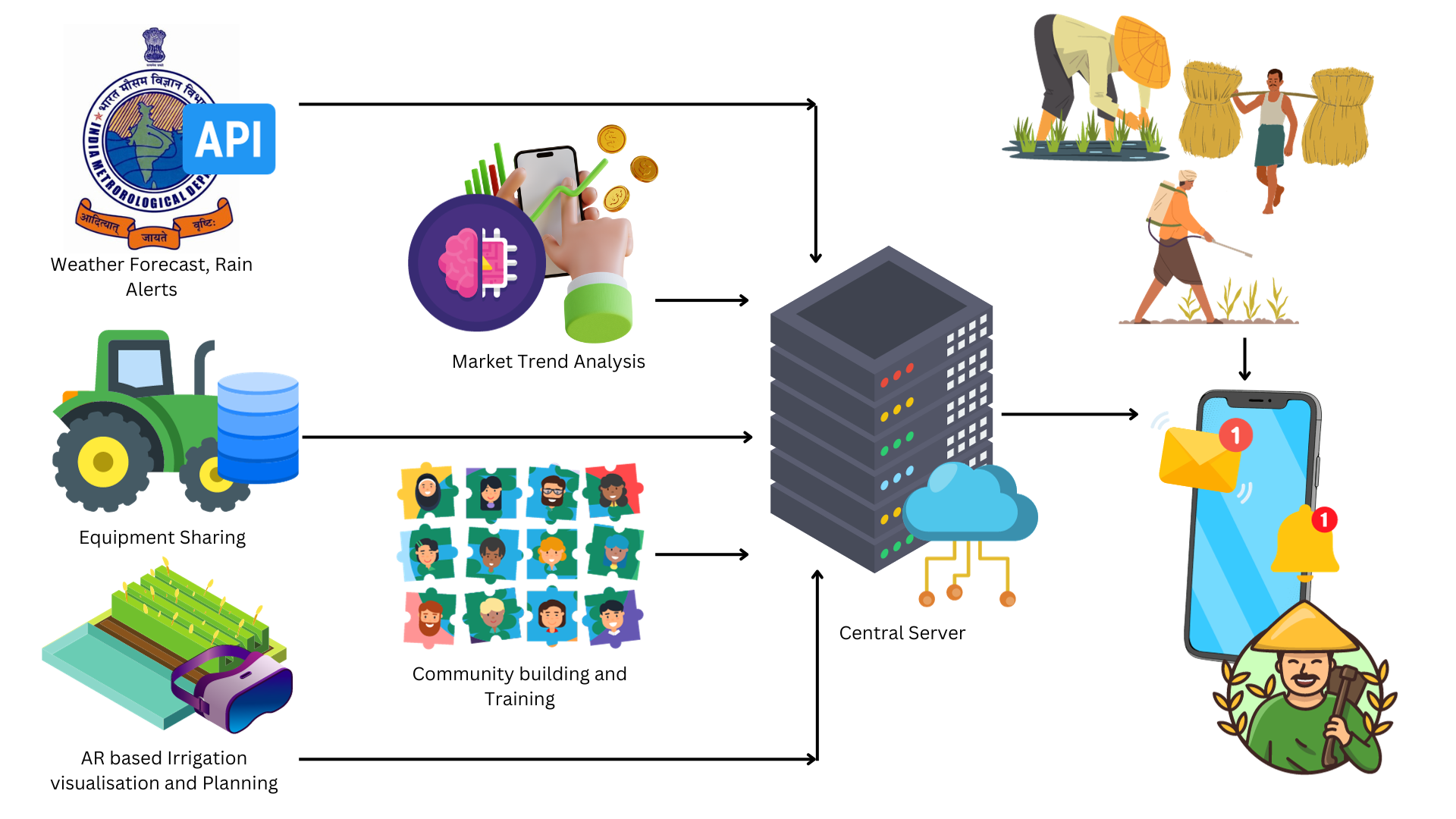
Once testing is successfully completed and all necessary refinements are implemented, the KRISHIKOM application undergoes the deployment process. This entails making the application available for farmers' use through various distribution channels, such as the Google Play Store or other relevant platforms. 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.

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## 3.1 Flowchart

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# CHAPTER 4 CONCLUSION

The KRISHIKOM mobile application stands as a transformative tool poised to revolutionize agricultural practices and empower farmers. Developed on the React Native platform and leveraging Firebase for database setup and messaging services, KRISHIKOM offers a comprehensive suite of features tailored to the diverse needs of farmers. From real-time weather monitoring and rain prediction to community chat forums, crop disease detection, and access to government-provided farmer schemes, KRISHIKOM provides a holistic solution to enhance agricultural productivity and financial well-being. The app's intuitive interface and user-friendly design facilitate seamless navigation, while its integration of Firebase ensures secure and efficient data management. Looking ahead, future enhancements will focus on enhancing AI and machine learning integration for predictive weather analysis, further localization and customization options, and continued collaboration with Agri-tech startups and government agencies. Through ongoing innovation and partnership, KRISHIKOM remains committed to empowering farmers, promoting sustainable agriculture, and fostering a supportive community for agricultural innovation.

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