FARM CALCULATION SYSTEM

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Abstract. The modern agricultural landscape demands precise financial planning and resource management to ensure sustainable and profitable farming operations. This project introduces a sophisticated farm calculation system that aids farmers in determining the total expenses associated with crop cultivation. The system is tailored to calculate costs based on several crucial factors: the specific crop type, the number of acres under cultivation, and the prices of essential chemical inputs, such as pesticides, herbicides, and fertilizers. By incorporating these variables, the system generates a comprehensive financial analysis, offering detailed insights into the total expenses required for a growing season.

Keywords: farm, calculation, report, image, propose, agreement

INTRODUCTION

Farm Calculation System accommodates the diverse needs of different crop types, adjusting calculations based on specific chemical usage and their associated costs. This allows users not only to estimate expenses accurately but also to optimize their farming strategies by identifying cost-saving opportunities and ensuring efficient use of resources. The farm calculation system is built to be user-friendly and adaptable, making it a valuable tool for farmers of all scales, from smallholders to large agribusinesses. Its dynamic nature ensures that it can be updated with changing market prices and agricultural practices, maintaining its relevance in the evolving agricultural sector. By providing precise financial forecasts, this system empowers users to make informed decisions that enhance productivity, profitability, and sustainability in agriculture. Farm Calculation System is developed using React js (frontend), node js (backend), mariadb (database), Github (version control system), backblaze cloud storage server, JWT token system, VS code (Text Editor), b2 Native Api (method to fetch image from cloud server) [2].

PROBLEM

Traditional methods of cost estimation and reporting are often time-consuming, prone to errors, and lack the flexibility needed to adapt to changing market conditions. This project is motivated by the need to streamline these processes through a modern, integrated system that combines precise expense calculation with efficient reporting mechanisms. By automating

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the calculation of farm expenses, the system empowers owners to make informed financial decisions, optimize resource allocation, and maximize profitability. With features like expense calculating, proposal handling, and secure online payments, the Farm Calculation System serves as a centralized platform that simplifies complex farm management tasks.

APPROACH

The owner dashboard serves as the central hub from which the owner can perform a variety of tasks. These tasks include viewing the worker list, calculating expenses, proposing expenses, viewing proposals, and reviewing agreements. Additionally, the owner can view report images, make online payments, and print agreement forms.

The admin can perform various tasks, including viewing owner details, reviewing pending posts, approving posts, and approving report images. These tasks allow the admin to manage content and users within the system effectively.

The worker can perform various tasks, including viewing propose details, making agreement with owner, inserting QR code at agreement to receive payment, viewing agreement's details. Worker can also send report images with description to owner about crop's conditions. Worker can also print agreement form.

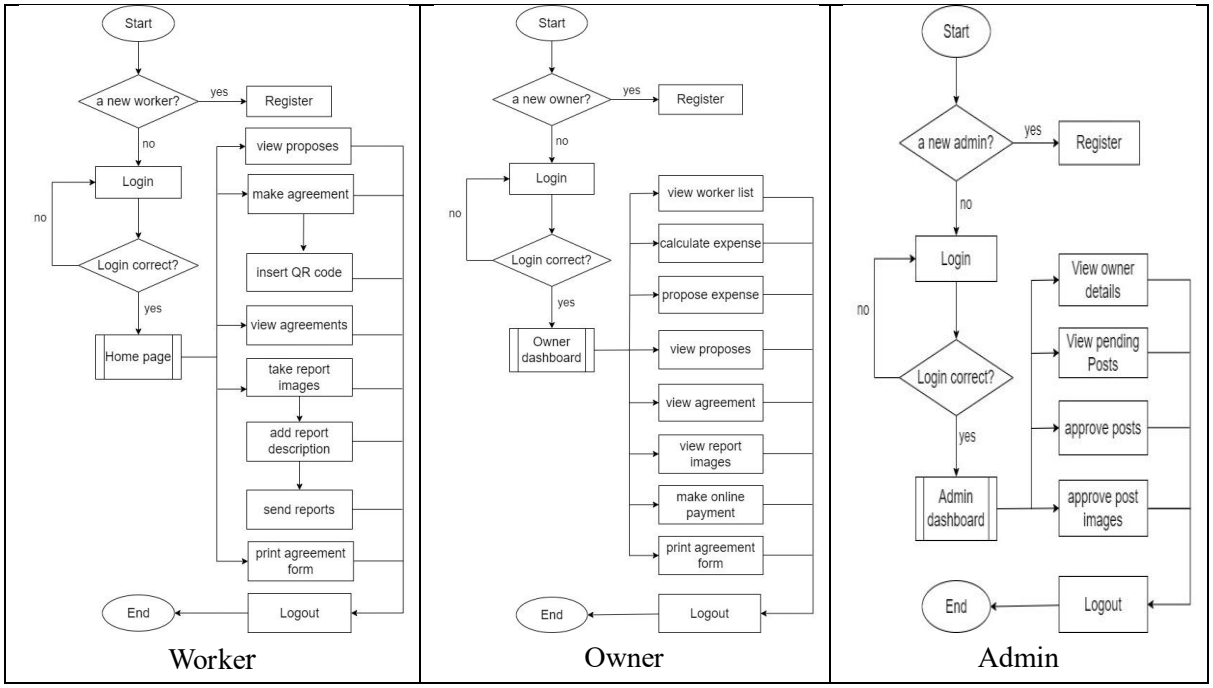

Figure 1: System Flow Diagram

An Entity Relationship Diagram uses data modeling techniques that can help define business processes and serve as the foundation for a relational database. An ERD attribute can be denoted as a primary key, which identifies a unique attribute, or a foreign key, which can be assigned to multiple attributes. A cardinality notation can then define the attributes of the relationship between the entities. In the database, a total of eleven tables are used to effectively manage the data. These tables include User, Worker, crop, Image, chemical, job, wage, post_general_info, post_job_info, post_total_cost, price_analyst, and post_total_cost.The figure 2 shows database design for all the data tables and their relationship of the database [7].

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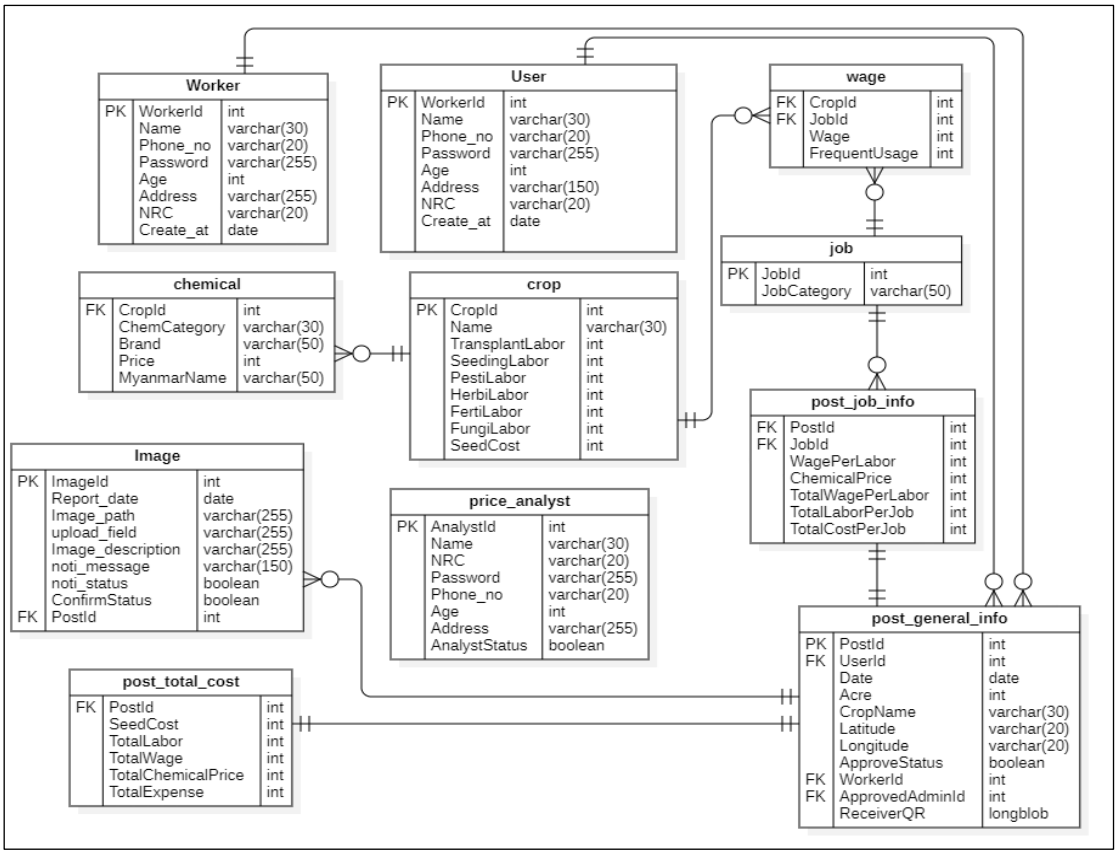

Figure 2: Database Design

RESULTS

The system is designed to get a better user experience with a simple user interface. It can make complex calculation with a few clicks. Developer put a lot of efforts on performance optimization and security. Owner and worker can now be made agreement easily from online. Worker also send real time report images to owner and owner can view that images with accurate date and time. This system also contains real time location and both owner and worker can view location of farm with google map [4].

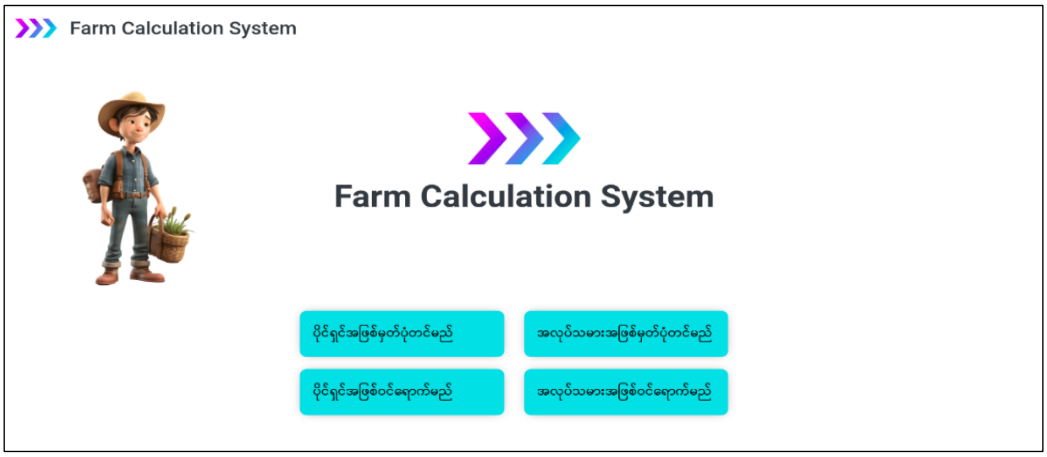

Figure 3: Implementation of this system

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CONCLUSION

The Farm Calculation System is a strategic tool designed to enhance the financial planning and management of farming operations, particularly for farm owners. By focusing on the accurate calculation of expenses based on crop type, acreage, and chemical inputs, the system provides a reliable and detailed analysis that supports informed decision-making. The integration of a secure and efficient reporting mechanism ensures that farm owners receive authentic updates from workers, safeguarding the integrity of the data.

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