Bachelor of Science in Information Systems

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# ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS

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**SUBMITTED TO THE FACULTY OF THE COLLEGE OF COMPUTER STUDIES, SULTAN KUDARAT STATE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF**

**BACHELOR OF SCIENCE IN INFORMATION SYSTEMS**

**JUNE 2025**

**TRANSMITTAL**

The capstone project attached hereto entitled **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS"** prepared and submitted by **CHARISE CARL ANN P. HIMAYA,** and **JACKELYN B. MONTECLARO,** in partial fulfillment of the requirements for the degree *Bachelor of Science in Information Systems* is hereby endorsed for approval.

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## APPROVAL SHEET

The capstone project attached hereto entitled **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS"** prepared and submitted by **CHARISE CARL ANN P. HIMAYA,** and **JACKELYN B. MONTECLARO,** for the degree *Bachelor of Science in Information Systems* has passed the standards set by the Sultan Kudarat State University and was successfully defended before this guidance committee.

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## BIOGRAPHICAL DATA

The researcher, Charise Carl Ann P. Himaya, 22 years old, was born on October 9, 2002, in Senator Ninoy Aquino, Sultan Kudarat. She is the only child of Mr. Ramelo M. Himaya and Mrs. Jennifer P. Himaya. She is resident of Cataluña Street, Purok Liwayway, Barangay Kulaman, Senator Ninoy Aquino, Sultan Kudarat.

She completed her elementary education at Senator Ninoy Aquino College Foundation in 2015 and graduated from Senator Ninoy Aquino College Foundation in 2020 for her secondary education. Continuing her academic path, she enrolled at Sultan Kudarat State University, where she took up the Bachelor of Science in Information Systems.

The researcher believes in the saying “when the time is right, I, the Lord, will make it happen” it suggests that waiting for the right time can lead to greater success or a better outcome compared to rushing the action.

## BIOGRAPHICAL DATA

Jackelyn B. Monteclaro was born on March 31, 2002, in Midsayap, North Cotabato. She is the only child of Mr. Joey M. Monteclaro and Mrs. Elena B. Monteclaro, who raised her with unending love, support and taught the importance of respect, obedience, and kindness.

She began her college journey at Sultan Kudarat State University's Isulan Campus in 2022, pursuing a Bachelor of Science in Information Systems. Her earlier education included primary school at Buenaflores Elementary School in 2014 and secondary and senior high school at Senator Ninoy Aquino College Foundation in 2018.

She truly believes in the saying, "God will always provide," and that is why she puts her trust in the Lord in everything she does. This belief has kept her strong throughout her college journey. It reminds her not to be afraid of her needs and dreams, because she knows God is always listening to her prayers and providing in His own time.

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belief in our potential, and for cultivating a learning environment that pushes students to dream bigger and reach higher.

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This capstone project is more than a requirement it is a reflection of countless hands and hearts who helped build it. Every word written and every result presented carries with it the love, effort, and support of all who stood by us. From the bottom of our hearts, thank you. This accomplishment is not only ours it belongs to all of you.

Researchers

**CHARISE CARL ANN P. HIMAYA**
**JACKELN B. MONTECLARO**

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# ABSTRACT

**CHARISE CARL ANN P. HIMAYA AND JACKELYN B. MONTECLARO, 2025. "ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE; BUYING AND SELLING CROPS"**. A capstone project of College of Computer Studies, Sultan Kudarat State University, Isulan Campus, Isulan, Sultan Kudarat.

**ADVISER: IVY LYNN F. MADRIAGA, MIT**

In today's digital era, technology significantly impacts various industries, including agriculture, by making processes like selling products more efficient. Farmers, who are crucial to food production, face significant challenges in securing fair market prices for their crops due to the involvement of intermediaries and exploitation by local brokers. This study developed a system titled "Enhancing Small Scale Farmer Trust Through Agricultural Marketplace," which aims to directly connect farmers with buyers, promoting transparency and fair trade practices in agricultural transactions. The system was designed with key features including farmer registration, product management, a chat facility, secure data handling, mobile transactions, SMS notifications, and the ability to generate reports. The main objective was to reduce the reliance on brokers and ensure that farmers receive fair prices for their products. The system was evaluated based on perceived ease of use, perceived usefulness, and user satisfaction. The evaluation revealed that the system was perceived as easy to use, with a mean score of 4.17 for ease of use, indicating that users found the platform user-friendly. The system

was considered moderately useful, receiving a mean score of 4.13, suggesting that it met the core functional needs of farmers and buyers. User satisfaction was also high, with a mean score of 4.23, reflecting positive feedback regarding the system's effectiveness and functionality. Overall, the system's performance was rated with an average score of 4.18, which indicates that users were generally satisfied and perceived the system as beneficial for their agricultural transactions. Based on the findings, the study recommends enhancing the reporting features, improving notification systems, and strengthening user profile security. Future improvements may include the development of an Android application, integration of online payment options, and adding a feedback feature to further enhance user engagement. This research contributes to the digital transformation of agriculture by providing small-scale farmers with a more equitable marketplace and fostering trust in the agricultural supply chain.

# Chapter I
# INTRODUCTION

## Background of the Study

Globally, agriculture is a key sector in guaranteeing food safety, economic growth, and rural livelihood. The Food and Agriculture Organization (FAO, 2023) estimates that more than 570 million small-scale farms exist globally, which produce over 70% of the world's food. Smallholder farmers lack a stable market, modern technology, and equitable pricing systems, hence a negative impact on their productivity and profitability. Electronic agriculture marketplaces have evolved as revolutionary tools, allowing farmers to sell their produce directly to consumers and gain access to timely market information. However, the ever-present worldwide challenge is how to instill trust in such platforms particularly among farmers who have historically been locked out of formal markets because of past exploitation and institutional biases.

Most countries have rolled out digital platforms to connect farmers with consumers using mobile applications and websites. In Kenya, for example, such platforms as Twiga Foods and M-Farm have effectively enhanced market transparency and farmers' revenues by providing real-time prices and safe payments (Aker et al., 2014; GSMA, 2023). In India, mobile applications that incorporate SMS services like eNAM have facilitated millions of farmers to sell crops directly to consumers or buyers without the use of middlemen and extracting higher profits (Saini & Singh, 2020). These global examples indicate that as much as technology can enhance market access, perceived ease of use, usefulness,

and security of the platforms are vital in establishing farmer trust, a conclusion repeated across various studies (Zhang et al., 2021).

Small-scale agriculture is still a prevailing livelihood in rural and upland communities of the Philippines, even with government initiatives such as the Kadiwa ni Ani at Kita program and markets like Mayani. Many farmers continue to use the old ways of selling products where middlemen tend to get most of the profit. A Department of Agriculture report (2023) focused on the importance of making farmer-centric digital marketplaces more secure, transparent, and stronger. But many farmers still hesitate to embrace these systems because of low digital literacy, poor infrastructure, and lack of trust in online operations. Research conducted by Mercado and Rallos (2022) and Reyes and Morales (2023) finds that these issues are normally connected to poor system support, ambiguous price mechanisms, and uneven customer interaction.

In the Sultan Kudarat context in SOCCSKSARGEN Region, agriculture provides the lifeblood of the province's economy, with thousands of small farmers growing rice, corn, coconut, banana, and other high-value commodities. Though they play a vital role in the regional food supply chains, most local farmers still face difficulties getting access to stable and transparent markets. Inadequate exposure to digital platforms, dependency on conventional trading structures, and insufficient digital infrastructure in remote barangays exposed farmers to manipulative pricing and exploitation by intermediaries (Provincial Agriculture Office of Sultan Kudarat, 2023). Informal interviews in Tacurong City and the neighboring municipalities of Isulan and Lambayong reflect that farmers are keen

to use digital marketing platforms, but they are still hesitant because of previous experience with defective systems and fake buyers. There is an obvious need for a localized, trusted, and farmer-friendly digital market that facilitates activities like registration, crop postings, communication with buyers, SMS reminders, and transaction reports to empower smallholders to take back control of their produce and prices.

This research is carried out by the researcher as a response to the pressing demand for a trusted and trust-based agricultural market system that facilitates small-scale farmers, especially in less-served communities like Sultan Kudarat. As digital transformation accelerates across the agricultural sector, the risk of excluding marginalized farming communities also increases. The researchers recognize that trust anchored in system usability, transparency, and security is a critical but often overlooked factor in the success of agricultural technology adoption. Thus, this research intends to explore and come up with a system that not only satisfies technical aspects but also captures the economic realities and behavioral issues of the farmers in the area. Emphasizing features that build trust, the study hopes to help bring more inclusive, equitable, and sustainable agricultural trade finally empowering local farmers in Sultan Kudarat and rural development across Region XII.

## Objectives of the Study

### *General Objectives*

This project aims to develop a system that creates a more equitable and reliable marketplace for small-scale farmers. The system will provide transparency, communication and fair practices in crop buying and selling, while also ensuring the security and integration.

### *Specific Objectives*

The study specifically aims to:

1. Design and develop agricultural marketplace that includes buy and sell
    1.1. Farmers and buyers Registration;
    1.2. Farmers Product Management; and
    1.3. Chat facility;
2. Implement Data Security And integrity management;
3. Utilize mobile technology on farmers transaction;
4. Employ SMS notification; and
5. Generate report such as:
    5.1. Farmers Report;
    5.2. Buy and Sell owners report; and
    5.3. Order list; and
6. Evaluate system in terms:
    6.1. Perceived ease of use;
    6.2. Perceived usefulness; and
    6.3. Perceived user satisfaction.

## Significance of the Study

The study titled Enhancing Small Scale Farmer Trust Through Agricultural Marketplace; buying and selling crops was developed to benefit the end-users. It would be beneficial to the following:

### *To the Farmers*

This system would help the farmers to easily manage the agricultural products, farmer transactions, orders, income, sales weekly, monthly and annual basis.

### *To the Buyers*

The system would help them to easily access, inquire and order agricultural products anytime and anywhere.

### *To the Researchers*

This study would help the researchers to know the importance of information systems in the chosen institution. It helped them understand the nature and procedure of the existing system of recording system. It made them to compare the advantages and disadvantages of manual system to the computerized. It gave them an idea of switching manual and traditional system into technology-based system for institution transactions.

### *To the Future Researchers*

This study will serve as their reference for their research activities and help them to gain knowledge to express their ideas in their chosen studies.

## Scope and Limitation

This study aims to develop an Enhancing Small Scale Farmer Trust Through Agricultural Marketplace: Buying and Selling Crops. This system provides interfaces for farmer, buyer, and administrator.

***Design and develop agricultural marketplace that includes buy and sell, farmers registration, farmers product management, Chat facility Reports***. The system provides an interface for farmer, buyer and admin. Where buyer and farmer register their account and the administrator verifies and registers it in the system. Every farmer who produces agricultural products can register in the system, provided their information such as name, contact number, email, password and the prerequisite documents; such as land title, business permit, tax identification, farm certification and environmental compliance are complete, they required to upload the available document as a the basis of the administrator to approve their account and after the approval they receive SMS confirmation. Only farmers account is approved by the system. Once their information is verified by the system, they can log in to the system where they can manage their respective agricultural products, such as product name, price description, product image and quantity. They receive alerts notification when the product is replenished or out of stock. The system provides a chat facility where buyers can click on a product and initiates a conversation with the farmers. They can negotiate and can take place privately and remain confidential.

Generate sales reports feature for farmers with graphical charts provides the admin copies of the for reports monitoring activity and detecting anomalies.

***Implement data security and integrity management.*** The system provide a data security and integrity management where the user can create their account; such as user name and password to protect data from unauthorized access. To enhance security during profile updates, especially when modifying sensitive information such as phone numbers or email addresses, the system implements an OTP (One-Time Password) verification feature. When a user initiates a profile change, a randomly generated OTP is sent to their registered mobile number via an SMS notification. This OTP is stored tempgeorarily with a short expiration time and validated before allowing any changes to take effect. If the OTP is correct and within the valid timeframe, the update proceeds; otherwise, it is denied.

***Utilize mobile technology on farmers transaction****.* The system provides a mobile application that allows farmers and buyers to carry out their business activities on their mobile devices or phones. The system is a digital marketplace where farmers can log, manage products, manage orders, make status updates, and notifications in real-time. Mobile application allows the farmers to upload or update details of a product, such as product name, product price, quantity available, and use of relevant images. Once buyer order products, farmers can accept, reject or change the order status, and respond to buyer questions when they come through chat facility. The app logs its transaction history and also generates performance reports, allowing farmers to track sales, income changes, or even create a business decision based on the data obtained.

For the buyer, the opportunity gives the buyer the ability to search for products base on filters, for example, product category. Buyer is able to see

product details, leave comments or feedback, and place an order right away through the mobile app. The mobile app provides a transaction completion and enable buyer the ability to connect with farmers and the marketplace smoothly. With notifications and real-time updates, buyer and farmers can have effective communications with one another preventing any further delay or misunderstanding.

***Employ SMS notification.*** Farmers receive SMS notification when their registration is approved so that they know exactly when to begin using the system. This eliminates the need for users to routinely check their given status manually and allows for a smoother onboarding experience. Short and timely registration updates via SMS also allows farmers to rely on the platform built on trust through an SMS notification, especially since many farmers are new to a digital trust-based system. The system automatically sends OTP codes via SMS to farmers when attempting to update sensitive profile information (such as their phone number, password, or financial information). OTP codes are randomly generated codes that a person needs to enter within a short time to have their identity verified. This process adds another layer of authentication and reduces the risk of any unauthorized users attempting to set-up accounts or modify them for unauthorized reasons. For buyers, the SMS channel provides order confirmations. Once a buyer places an order via the mobile app or web-based platform, they receive a message confirming the order which details the product they ordered, quantity, the total cost and when they can likely expect delivery of the product.

***Generate report such as, farmers report, buy and sell owners report, order list.*** The system have a designed data dashboard, downloadable report and printable report to view reports in graphical format such farmers report, buy and sell owners report, and order list. The data dashboard can be viewed by the farmer to easily track the performance of the business for decision-making.

Furthermore, the system was evaluated in terms of perceived ease of use, perceived usefulness, perceived user satisfaction. The researchers provided a system evaluation questionnaire evaluated by the end-users.

This research study was conducted at the Sultan Kudarat and it was pilot tested specifically at any farmers and buy and sell businesses.

This study aims to develop an Enhancing Small Scale Farmer Trust Through Agricultural Marketplace: Buying and Selling Crops. This system provides interfaces for farmer, buyer and administrator.

**Operational Definition of Terms**

The following terms were operationally and theoretically defined as used in this study:

**Administrator** - Means that the administrator can assigned person for the manage users account and reliable operation of computer systems.

**Agricultural Products** - Refers to agricultural crops such as rice, corn, coconut, nuts and coffee.

**Business** - Means the activity of making, buying, or selling goods or providing services in exchange for money

**Business Owner** - Means an individual who starts and run a business with limited resources and planning particularly in agricultural products business.

**Buy and Sell** - Means an agreement that states if a part-owner of a business wishes to sell and buy agricultural products.

**Computerized System** - Means a process, or business is one in which the work is done by computer that helps quickly provide store and retrieval

of information.

| | | |
|---|---|---|
| **Buyer** | - | Means a person or organization that buys goods or services from a store or business. |
| **Data Dashboard** | - | It is an information management tool that visually tracks, analyzes and displays key performance indicators (kpi), metrics and key data points to monitor the business process for better decision making. |
| **Farmers** | - | Means a person or organization that provides agricultural products to be sold. |
| **Income Report** | - | Means a report of a business financial performance over a specific accounting period. |
| **Order** | - | Means a products that someone has requested from a business. |
| **Perceived ease of use** | - | Means the degree to which system users perceived how easily it is to use the technology |
| **Perceived usefulness** | - | Means the degree to which a user believes that using a particular system would enhance business performance. |

| | | |
|---|---|---|
| **System** | - | It is a collection of components that works together to perform a specific task. |
| **Transaction Processing Systen** | - | Means a type of information system that collects, stores, modifies and retrieves the data transactions of a business. |
| **Web-Based Application** | - | Means any program that is accessed over a network connection using HTTP, rather than existing within a device's memory. Web-based applications often run inside a web browser. |

# Chapter II
# REVIEW OF RELATED LITERATURE

The literatures pertinent to the study that the researchers investigated are presented in this chapter. These gave them a good idea of what the title track would entail, and other researchers who were crucial to the completion of this study.

## Enhancing Small Scale Farmer Trust

A research conducted by Yeo and Keske (2024) investigated determinants of digital agriculture adoption among smallholder farmers. They discovered that profitability and simplicity are major drivers, but trust heavily moderates the relationship between economic payback and technology adoption. Data governance, privacy, and security concerns can erode trust, influencing farmers' willingness to adopt digital platforms. This highlights the importance of open and secure online marketplaces to create trust between small-scale farmers. For blockchain technology, Sudarssan (2024) suggested a framework to improve the trust and transparency of agricultural supply chains. The framework combines blockchain with IoT to offer tamper-proof records and traceable monitoring, solving problems such as fraud and information asymmetry. By maintaining data integrity, these platforms can create trust between smallholder farmers and consumers, supporting safer transactions.

A scoping review by Mushi et al. (2025) brought to the fore the need for developing digital information systems that are aligned with smallholder farmers' needs. The research underscored the need for embracing mobile apps and USSD-

based services in order to address digital illiteracy and infavorable infrastructure. Such participatory design strategies can foster user trust and drive adoption of digital marketplaces among small-scale farmers.

In West Africa, the World Bank project in Côte d'Ivoire proved the potential of digital platforms to improve market access and information for smallholder farmers. The project enabled the creation of "Agristore.ci," an online marketplace that brought buyers and farmers together and offered real-time advisory services on agriculture. The program increased productivity and instilled confidence through simple and transparent market connections.

Tran Cao Uy et al. (2024) studied the adoption of social media in agricultural development by smallholders in central Vietnam. The study established that social media are useful platforms for communicating market information and linking farmers to buyers. Through the use of such platforms, farmers can expand their market engagement and strengthen trust using open communication channels.

A European Commission report (2024) underscored the importance of digital literacy training to enhance the diffusion of digital farming technologies among smallholder farmers. Barriers including digital illiteracy, infrastructure, and users' distrust were cited as major problems. Efforts to address these through focused training and support will help raise trust and ease the adoption of digital marketplaces.

**Agricultural Marketplace**

Kumarathunga, Calheiros, and Ginige (2022) investigated applying blockchain technology to increase trust between smallholder farmers and purchasers. Their research presented a new strategy whereby farmers would leverage their social capital to secure smart futures contracts as collateral, enabling them to be paid in advance for anticipated harvests. This model would decrease transaction-related risk and increase trust through tamper-proof transaction records and smart contract execution automatically.

Yeo and Keske (2024) explored the determinants of digital agriculture adoption for smallholder farmers. They established that profitability and ease of use are key drivers, whereas trust strongly moderates the association between economic payoff and technology take-up. Issues regarding data management, privacy, and security can erode trust, influencing farmers' adoption of digital platforms.

Authors (2024) conducted a study on the impact of e-commerce platforms on sustainable agriculture practices by smallholder farmers in Sub-Saharan Africa. The study emphasized establishing trust through information-sharing initiatives, relationship building, and providing customized training programs addressing the specific needs and abilities of smallholder farmers. These interventions were found to significantly enhance the adoption of e-commerce and support sustainable agricultural practices.

Abdulai et al. (2023) investigated smallholder farmers' uptake of digital tools and services in rural Northern Ghana. According to their research, although digital

opportunities were available, farmers' uptake was limited because of low literacy rates, insufficient digital skills, and limited digital resources. The research highlighted the importance of digitalization strategies being attuned to existing and prospective structural constraints of smallholder agriculture.

Singh et al. (2024) launched Farmer.Chat, an AI chatbot that offered personalized, trustworthy, and contextually accurate agronomic advice to smallholder farmers. Implemented across four nations, Farmer.Chat interacted with more than 15,000 farmers and responded to more than 300,000 requests. The research demonstrated how novel application of generative AI improves the scalability and quality of agricultural services, enhancing confidence, response quality, and user interaction.

A systematic review by authors (2024) reviewed the practices, challenges, and future of digital transformation for smallholder agriculture. The review highlighted major challenges including poor digital agriculture policies, low access to digital applications, and inability to adopt standardized technologies to accommodate the uniqueness of smallholder farmers' needs. It highlighted the need for improved digital literacy, enhanced digital governance policies, and a conducive environment for the development of digital agriculture.

**Farmers and Buyers Registration**

World Bank (2023) highlighted the role of digital identity systems in agricultural growth. According to their work, formal registration of farmers and purchasers on digital platforms reduces fraud, enhances traceability, and

facilitates targeted support (e.g., subsidy, credit, insurance). In India, Aadhaar-linked farmer enrollment on platforms such as eNAM ensures that authentic users are involved in online transactions, enhancing transparency and accountability.

As noted by a Food and Agriculture Organization (FAO, 2022) report, Sub-Saharan African farmer registration databases are now key to bridging the smallholder farmers with institutional purchasers and government services. In Kenya, the registered farmer profiles linked to an e-voucher system ensured fair distribution of inputs and better access to buyers in formal marketplaces.

Sudarssan (2024) research on blockchain supply chains demonstrated that verified buyer registration—combined with rating schemes—will promote ethical business practices. Buyers who are registered are liable for their activities, and farmers are able to report poor experiences, which builds trust and safeguards farmers against exploitation.

One GSMA AgriTech report (2023) investigated the ways in which mobile registration procedures enable illiterate and far-off farmers to register via USSD or voice-based systems. In Nigeria, more than 10 million farmers and buyers were registered by the Tingo platform utilizing biometric and SIM-based identity, giving them access to price data, buyer contacts, and secure payments.

The RSBSA is the mandated registry of farmers, fisherfolk, and farmworkers in the Philippines under the Department of Agriculture (DA). RSBSA registration is necessary for access to financial assistance, crop insurance, and farm-to-market program inclusion, as stated by DA (2023). The registry plays a crucial role in the

identification of legitimate farmers and connecting them to confirmed buyers via government channels such as Kadiwa.

A research by Lopez and Ramirez (2024) analyzed AGREA's farm-to-table system, which connects farmers and buyers and logs them. The platform employs a vetting system to guarantee quality and trustworthiness, and transactions are made more secure and trustworthy. Farmers get access to markets, training, and logistics after registering, while buyers get screened for payment capability and equitable trading.

Garcia and Uy (2023) examined cooperatives in Bukidnon under which buyer registration was enforced through cooperative endorsement. This process guaranteed that buyers possessed a verified history of fair dealing. Farmers felt more secure dealing with registered buyers and engaged more actively in crop trading activities.

A policy note by the Philippine Institute for Development Studies (PIDS, 2022) proposed that enhancing registration systems with biometric authentication and mobile interconnectivity can make digital marketplaces more inclusive. It advised that both buyers and farmers go through formal onboarding procedures with verification from cooperatives or local government units.

**Farmers Product Management**

According to Gollin (2024), smallholder farmers in developing countries often face constraints not only in production but in post-harvest product management, including grading, storage, and marketing. These inefficiencies limit

their marketability and profits. Effective product management is crucial in meeting quality standards and negotiating better prices.

Agyekumhene et al. (2022) explained in a study how Information and Communication Technology (ICT) technologies assist farmers in inventory management and transactions. For example, virtual applications such as Farmforce enable smallholders to record product volumes, keep digital records, and preformat harvest information for buyers. This transparency boosts farmer professionalism and trust within the market.

Kamilaris et al. (2024) investigated how marketplaces online enable farmers to post and oversee their crop portfolios online. Marketplaces such as Twiga Foods in Kenya and Hello Tractor in Nigeria assist farmers in planning harvests, tracking stock levels, and coordinating delivery timetables. These services enhance efficiency and assist with maintaining steady supply for customers, enhancing trust and repeat sales.

A study conducted by Bijman and Iliopoulos (2023) has identified that product management is crucial in agricultural cooperatives. Through the aggregation of products, grading of quality, assurance of standard packing, and transportation, the cooperatives make smallholder produce competitive and acceptable in formal markets.

As per the Department of Agriculture (2023), the "Farm and Fisheries Clustering and Consolidation" (F2C2) initiative seeks to enhance farmers' management of their products through clustering them into cooperatives. This

assists in managing supply of the product, meeting volume levels, and enhancing traceability of agricultural products for institutional markets.

A research effort by Dela Cruz et al. (2022) of the Philippine Center for Postharvest Development and Mechanization (PhilMech) centered on post-harvest handling innovations, including solar dryers, storage bins, and digital weighing scales. These equipment enable smallholder farmers to enhance product shelf life and uphold quality standards—critical pillars of successful product management.

AGREA Philippines created an electronic produce tracker in 2023 to assist farmers in documenting harvest quantities, delivery dates, and purchase orders. Ramirez and Sison (2023) established through a study that the use of this system enhanced inventory management and minimized spoilage, allowing farmers to fill more orders with good quality and timely delivery.

A study by the Agricultural Training Institute (ATI, 2023) placed significant value on grading, sorting, and packing training for farmers. ATI-trained farmers were determined to be 40% more likely to satisfy buyers' specifications and have fewer returns.

**Chat Facility**

Singh et al. (2024) created Farmer.Chat, an AI-driven chatbot that offers personalized farming guidance using mobile phones. Implemented in India and Kenya, the chatbot assisted more than 15,000 farmers by responding to live questions regarding crop management, pricing, and sale logistics. Farmers were

found to be more likely to utilize platforms that featured trustable, prompt chat services, enhancing digital tool confidence and decision-making.

According to a study by Misaki and Suleiman (2022) in Tanzania, WhatsApp groups are increasingly being utilized by smallholder farmers to connect with buyers, exchange information about product availability, and negotiate prices. The research showed that these informal chat spaces reduced transaction costs and promoted improved buyer-seller relations, particularly in rural communities with few formal marketplaces.

A GSMA AgriTech review in 2023 underscored that chat features integrated into e-commerce applications enable instant conflict resolution between customers and farmers. Two-way communication aids in expectation management, complaint resolution in a timely manner, and adds a layer of accountability. Chat functionality worked best when supplemented by chat moderators or AI filters.

As Resnick et al. (2023) report, Southeast Asian farmers now rely more on Facebook Messenger and Telegram to reach buyers, particularly in urban areas. Both platforms enable farmers to share information on harvest, prices, and availability in real time. Informal as they are, these tools serve as reliable intermediaries for poor farmers without access to large platforms.

A case study by Ramirez and Lopez (2023) examined digital agriculture platforms such as AGREA and Cropital in the Philippines, which had integrated chat modules. These facilitated real-time communication between buyers and farmers, resulting in fewer misunderstandings regarding quantity, price, and

delivery. Farmers were more satisfied with transactions when they could directly communicate with buyers through chat.

The University of the Philippines Los Baños study by Dela Cruz et al. (2022) observed that farmers' cooperatives in Laguna and Batangas tend to utilize Facebook Messenger to facilitate sales coordination. Customers may inquire about the availability of produce, order, and negotiate pickup or delivery via chat. This arrangement enabled farmers to avoid conventional middlemen and keep more of their proceeds.

The Agricultural Training Institute (ATI) tested an SMS and chat support line in 2023 to help farmers with questions about crops. Their post-implementation report concluded that offering active, friendly communication through chat boosted platform use and allowed farmers to access expert assistance more often.

**Data Security and Integrity Management**

Kamilaris et al. (2019) highlighted the ability of blockchain technology to provide integrity for data in agricultural supply chains. Blockchain systems' decentralized and tamper-proof framework enables secure storage of records of transactions, information about crop quality, and prices, which are not retroactively modifiable. This promotes confidence between buyers and small-scale farmers, particularly when there are disagreements over delivery or product quality.

As FAO and ITU (2022) report, digital trust frameworks with a focus on data privacy, access control, and transparency are crucial for inclusive digital agriculture. The research pointed out that for farmers to trust marketplaces, platforms should

protect user data especially financial data, farm profiles, and transaction history and clearly state how this information is used and stored.

Aker et al. (2023) identified, in their review of mobile agriculture platforms across Sub-Saharan Africa, that vulnerabilities to data security such as unauthorized access to profiles for farmers or price manipulation can undermine trust in digital tools. Stronger authentication, encrypted data storage, and regular audits of platforms were identified by the authors as prime solutions.

A research by Huth et al. (2024) observed that agritech firms in the EU are required to comply with the General Data Protection Regulation (GDPR). This ranges from getting informed consent, anonymizing data of farmers, and safe data storage. According to their observation, adherence to such regulations is likely to improve the credibility of platforms and farmer engagement.

The Philippines' Registry System for Basic Sectors in Agriculture (RSBSA), which is being kept by the Department of Agriculture, has integrated data privacy measures in compliance with the Data Privacy Act of 2012. A DA (2023) report emphasized ensuring registered farmers' land ownership and personal data are safeguarded, particularly if they are associated with subsidies and government assistance programs.

A University of the Philippines study by Santos and Rivera (2023) explored how local agritech platforms Cropital and Mayani enforce two-factor authentication, encrypted transaction history, and safe buyer-seller communication. These platforms apply role-based access control to limit sensitive data viewing or editing to confirmed users, giving users greater confidence in the system.

Manlapig and Enriquez (2022) stated that most rural communities in the Philippines continue to experience poor cybersecurity policies and old data storage solutions, exposing small-scale farmers to fraud or data breaches. They suggested in their research government-initiated training on basic cybersecurity measures among cooperatives and digital service providers in agriculture.

A qualitative study conducted by Calalang (2023) revealed that most farmers who utilize digital platforms are not aware of how their data is gathered, stored, or shared. The author highlighted the need for data literacy and transparent terms of service to enable farmers to make informed choices and have faith in the platforms they utilize.

**Mobile Technology on Farmers Transaction**

Aker and Mbiti (2020) were among the first to report the impact of mobile phones on agricultural markets in Sub-Saharan Africa. The authors' research revealed that farmers could get instant price information through mobile technology, minimizing information asymmetry and enhancing the outcome of negotiations. This resulted in increased incomes and transactional trust between the farmers and buyers.

Jack and Suri (2024) analyzed M-Pesa in Kenya, where mobile money significantly enhanced rural farmers' financial inclusion. Farmers used secure and rapid payment to make transactions without using money, avoiding theft and non-payment risks. Their work highlighted the fact that mobile payments strengthened farmer trust in digital markets.

In a study by Nakasone, Torero, and Minten (2022), mobile-based platforms such as AgriMarket, iCow, and Twiga Foods, which enable farmers to list their products, accept offers from buyers, and conduct transactions all through the mobile, were investigated. Their research indicates that the platforms assist farmers in raising the volume of transactions, cutting spoilage, and having direct access to city buyers.

GSMA AgriTech (2023) identified that even as mobile platforms are of major benefits, hurdles of digital illiteracy, linguistic limitations, and absence of content localization continue to slow down uptake. The study emphasized creating uncomplicated vernacular-based mobile user interfaces and providing digital skills training to enhance the quality of transactions.

According to a study by Reyes and Morales (2023) from the University of the Philippines Mindanao, they investigated how mobile applications such as Cropital, Mayani, and Tindagat facilitate farmer transactions. Their findings indicated that through these platforms, farmers could accept payments digitally, receive notifications on orders, and monitor deliveries — making them more efficient and less reliant on middlemen.

The Department of Agriculture introduced the e-Kadiwa mobile application in 2022, which allows farmers to directly sell crops to consumers and institutional buyers. A DA (2023) report revealed that the application enhanced price transparency and boosted farmer incomes by eliminating middlemen. Farmers also gained from the in-built secure transactions in the application.

De Leon and Javier (2022) of PhilRice investigated the efficiency of SMS-based transaction systems in rural Nueva Ecija. Farmers utilized text messages to monitor crop prices, order deliveries, and receive payments. The research ascertained that such low-tech technology was efficient in internet-poor areas and substantially enhanced market responsiveness.

Santos and Dela Cruz (2023) discovered that mobile payment instruments such as GCash and PayMaya are becoming more common among Filipino farmers in provinces such as Batangas and Ilocos Norte. The study mentioned that mobile payment uptake is closely related to farmer confidence in platforms, particularly when augmented with evidence of payment and customer care via chat.

**SMS Notification**

Aker (2011) researched SMS-based price distribution systems in Niger and discovered that farmers who were provided with regular price updates through SMS could negotiate improved prices and select optimal selling markets for their produce. The provision of real-time information mitigated the power imbalance between sellers and buyers and enhanced farmers' earnings by as much as 10%.

Mittal and Mehar (2016) tested the success of SMS notification in India using the "mKisan" initiative. Their results indicated that farmers who received weather forecasts, pest warnings, and marketing information through SMS lost less and were more likely to embrace technological agricultural practices. Trust in technological services increased because of frequent, available information.

A GSMA AgriTech report (2023) recognized SMS as an important means of communication in low-connectivity areas. Esoko (Ghana) and mFarm (Kenya) utilize SMS to inform farmers of guaranteed crop purchases, delivery times, and payment status. These applications facilitated open communication and minimized missed transactions and delivery mistakes.

As Nakasone et al. (2022) indicate, some of the rural farming community's mobile wallet services send computerized SMS payment confirmations to farmers and buyers. They function as electronic receipts, heightening confidence in transactions and lowering conflicts regarding payment correctness or delivery failure.

Department of Agriculture (2023) utilized SMS messages to notify farmers of market fairs, government procurement calendars, and fertilizer subsidy availabilities. The interviewed farmers in Regions IV-A and VI stated that timely reminders assisted them in planning harvests efficiently and preventing overproduction.

Javier and Manlapig (2022) assessed the Rice Crop Manager (RCM) system created by PhilRice, in which there are SMS reminders on fertilizer spcheduling, harvesting recommendations, and market linkage notices. Farmers benefited with 20–30% increased productivity upon strictly adhering to these reminders.

One study by Santos and Reyes (2023) concentrated on local online marketplaces such as Mayani, which provide automated SMS notifications to farmers to verify order places, delivery times, and payment processing. This was

quoted as one of the key reasons for higher farmer involvement and transaction consistency.

Under the COVID-19 pandemic, the Kadiwa ni Ani at Kita program also had an SMS component for informing farmers of pickup schedules and changes in delivery. According to the Philippine News Agency (2021), this reduced miscommunication and spoilage while facilitating quicker coordination with buyers.

**Farmers' Report**

Aker et al. (2014) emphasized the use of transaction records to enhance agricultural market transparency. They discovered in their research on mobile-enabled agricultural platforms in Africa that farmers' sales reports and buyers' purchase reports are essential for monitoring crop volumes, prices, and payment history. These reports enable both parties to authenticate transactions, alleviate conflicts, and enhance market efficiency.

Based on research conducted by Lyman et al. (2022), online agro-copmmerce platforms such as Twiga Foods in Kenya use buy-and-sell owners' reports to monitor product flows, buyer activity, and payment cycles. The reports, commonly automatic, offer critical insights to both parties, including seasonal patterns, customer tastes, and sales results, enabling farmers and traders to make effective business decisions.

Sunder and Davis (2023) concentrated on order lists in big agriculture online platforms like Farmers' Market (US) and Agrilink (India). Sunder and Davis (2023) observed that order management software in digital systems produces order lists

and enables farmers to schedule harvests, inventory management, and delivery scheduling more effectively. The lists also help buyers monitor orders in real time, enhancing the trust in the system as well as timely delivery.

In their research on agricultural big data, Tadesse and Mwaura (2024) described how the reports of farmers' sales and buyers' buying patterns can be tracked to forecast demand in the market. This data-based measure helps farmers to plan their output levels based on anticipated market direction, saving them from wastage and increasing profitability. In addition, order lists help to accurately monitor supply and demand in real-time.

According to the research of Villanueva and Bacalso (2023), digital sales and transaction reports from platforms such as Mayani and AgriPro have facilitated Filipino farmers' monitoring of their inventory sales. The platforms make automatic farmers' reports, reporting quantity sold, price, and buyer information. The reports assisted farmers in keeping correct financial records and simplifying tax declarations, according to the farmers.

A study by Mercado and Rallos (2022) investigated the application of buy-and-sell owners' reports in local agricultural e-commerce platforms. The study revealed that the reports enable both buyers and farmers to trace the history of commodities, which informs both parties about the quality, quantity, and price of the crops. The reports also facilitate the resolution of conflicts, as they give an unambiguous, transparent account of transactions.

Order lists are particularly vital in programs such as the Kadiwa ni Ani at Kita, a study by Alonzo and Javier (2023) opines. Order lists enable farmers to

coordinate effectively with buyers and government buyers, particularly at market fairs. Farmers utilizing order lists were better able to control their inventory, having the right quantity of produce for fulfillment of buyers' orders, resulting in less unsold crops and waste.

A Department of Agriculture (DA, 2023) report emphasized the importance of transactional reports for farmers. Farmers are provided with a daily order list by the Kadiwa app, which includes quantities ordered, payment status, and delivery schedules. This facilitated the organization of farmers, minimized the chances of overstocking, and allowed them to better manage their finances since they could forecast and prepare for income.

### System in terms Perceived Ease of Use, Perceived Usefulness and Perceived User Satisfaction

Davis (2019) proposed the Technology Acceptance Model (TAM), which determines the probability of technology adoption by users through two variables: perceived ease of use (PEOU) and perceived usefulness (PU). In the agricultural sector, Aker et al. (2022) applied this model to determine the adoption of mobile agricultural platforms among smallholder farmers in Sub-Saharan Africa. The researchers discovered that the simplicity of use of mobile platforms and the utility of market information like price alerts and weather updates had a high impact on farmers' adoption levels. User satisfaction was tied to the extent to which these platforms integrated into the farmers' daily lives and assisted them in enhancing their income.

Zhang et al. (2021) conducted a study examining the influence of user satisfaction on the sustained use of agricultural technology platforms in China. The researchers established that the perceived ease of use and actual usefulness of the systems in benefiting farmers' activities e.g., platforms for the purchase of agricultural inputs and the sale of crops were positively associated with higher user satisfaction and sustained user engagement. Perceived ease of use was significant in driving frequent use, while perceived usefulness influenced farmers' faith in technology.

In research on mobile agriculture applications in India, Saini and Singh (2020) discovered that farmers' perceived ease of use and perceived usefulness were good predictors of the adoption of mobile apps among farmers. Farmers who perceived that apps were easy to use and helpful for tracking crop health, weather, and prices at markets were more likely to frequently use apps. Consumer satisfaction was fueled by the platform's capacity to be able to offer farmers fast responses to their queries and enhance their market results.

In their study on Southeast Asian digital farming platforms, Nakasone et al. (2022) established that design that focused on perceived ease of use supported high user satisfaction among farmers. They indicated that mobile-friendly interface design, ease of navigation, and low data input were essential determinants that resulted in higher perceived usefulness. Consequently, platforms that performed well in these parameters experienced improved usage rates and positive user sentiments.

A research conducted by Dela Cruz and Rallos (2023) analyzed the Kadiwa app and other Philippine online e-commerce platforms for agricultural items. The study concluded that farmers scored high for the perceived usefulness of such platforms based on characteristics such as direct payment systems and live buyer interaction. Farmers viewed the platform as especially beneficial for maximizing profit through the elimination of middlemen. Moreover, user-friendliness was crucial towards adoption, particularly in rural contexts where digital literacy was poor.

The Department of Agriculture (2022) cited that farmers who employed the use of the Kadiwa mobile application in the Philippines were greatly satisfied. This ppwas due to the simplicity of the application interface and its perceived usefulness in accessing the market directly. Farmers were more confident about using the app since it made buying and selling easy, improving the management of income and transaction transparency. Moreover, the ease of use perceived in the app led to increased trust in the platform.

In a research by Mercado et al. (2023), Filipino farmers in rural areas reacted strongly to SMS-based platforms that assisted in having direct transactions. The ease of use and perceived usefulness of receiving SMS alerts and having real-time market information, which includes updated prices and availability, highly contributed to user satisfaction. Farmers favored those platforms that reduced complexity and enhanced utility in enhancing their economic gains.

Santos and Enriquez (2023) investigated mobile payment systems like GCash and PayMaya for agricultural transactions. The research showed that user

satisfaction relied heavily on perceived ease of use (i.e., easy sign-up, easy transactions) and perceived usefulness (i.e., quicker, more secure payments). Farmers who had smooth integration of these payment systems in their sales process were more inclined to trust the platform and repeat their transactions.

**Synthesis**

Building small-scale farmer confidence by way of agricultural marketplaces for selling and purchasing produce is a central determinant in enhancing farmers' livelihoods and changing agricultural economies. Small-scale farmers tend to be confronted with serious difficulties in accessing transparent and fair markets, which may be mitigated by the adoption of digital platforms. Trust is the foundation of any marketplace, and farmers are likely to take up these systems only if they experience them as easy to use and beneficial. Science indicates that when digital systems have well-designed interfaces and offer tangible advantages like real-time price information about the marketplace, secure payment, and direct access to the marketplace, farmers will be more inclined to accept and trust them. In addition, data security specifically personal and financial data is paramount in building such trust. Protecting data integrity via secure systems that insulate users against fraud and misinformation is essential.

Also, the openness provided by these platforms, especially through farmers' reports, order lists, and buy-and-sell owners' reports, is vital in mitigating information asymmetry. These mechanisms enable buyers and farmers to monitor transactions as well as track the movement of products, which ultimately promotes

trust as it ensures that everyone is held responsible. Mobile technology has emerged as an important factor in enhancing access and market efficiency. Mobile applications and SMS services enable farmers to receive market information, monitor sales, and confirm payments instantaneously, minimizing their dependence on middlemen and enhancing overall market access. As farmers have growing confidence in the reliability of price information and payment safety, user satisfaction is raised further, encouraging them to use the platform continuously. Despite this, issues of digital illiteracy and inadequate internet connectivity remain, especially in rural areas where technology access may be limited. Despite these issues, research indicates that solutions such as training sessions and government-sponsored programs can overcome obstacles to the use of technology. For instance, applications such as the Kadiwa app in the Philippines have been effective through simple designs and information accessibility, enhancing trust and participation. Customer support and education of farmers on utilizing such technologies are also critical in ensuring that they are empowered and confident to use digital platforms.

Overall, the enhancement of trust in farm marketplaces is a multi-faceted task that involves addressing ease of use, security, transparency, and functional usefulness issues. Farmers will be more likely to trust the system and play a more active role when they can interact with digital platforms that provide real value, such as improved access to markets, financial transparency, and secure transactions. While issues involving infrastructure and digital literacy persist, they can be addressed through focused initiative, and the payoff from increased trust is

enormous toward more economic empowerment of farmers, less market inefficiency, and ultimately stronger agricultural markets for small farmers.

## Conceptual Framework

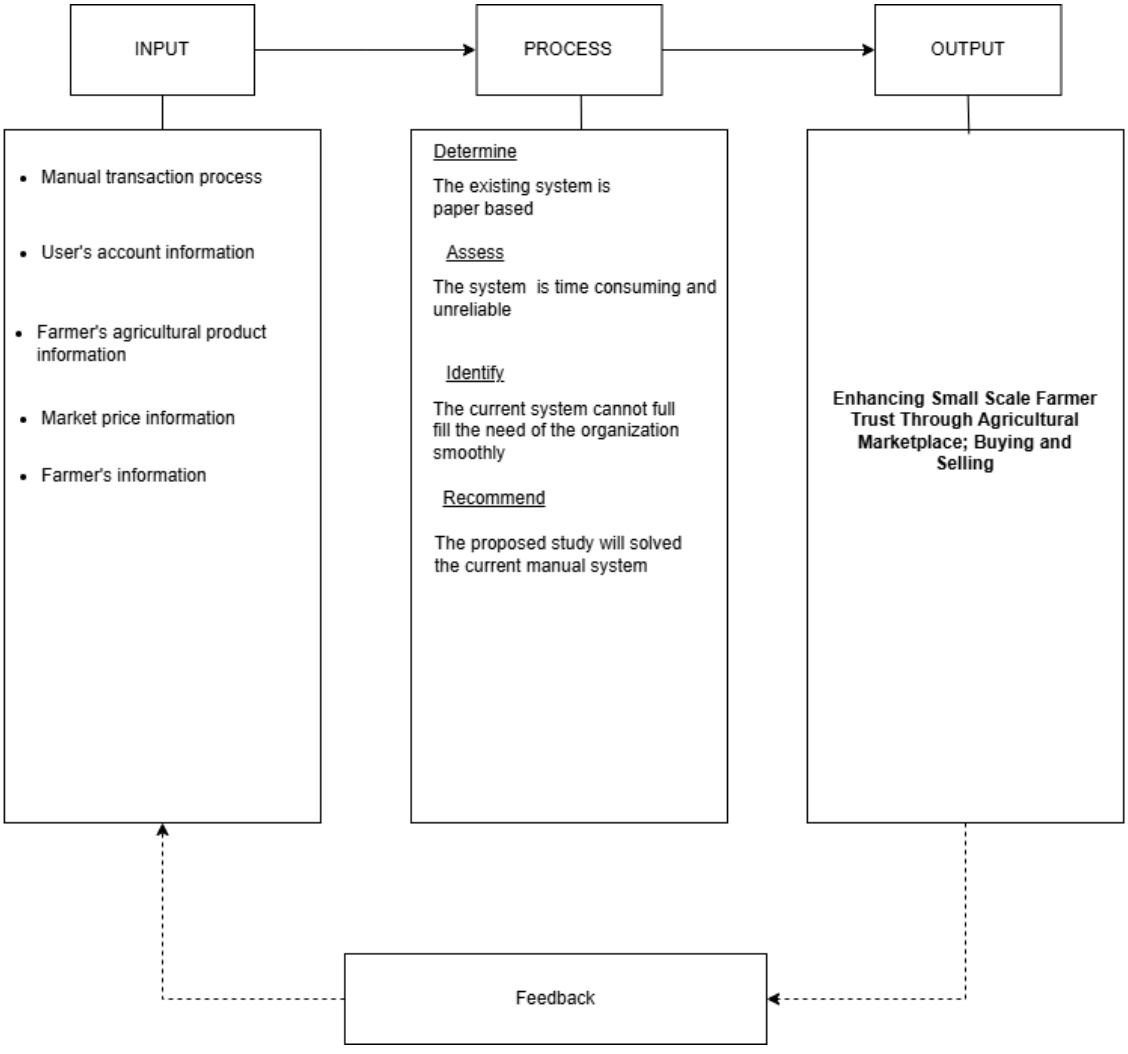


**Figure 1. Conceptual Framework of the Study**

Figure 1 shows the conceptual framework of the study through input, process, and output.

***Input***

The input contains the basic manual requirements in the manual process for the organization consists of the following: manual transaction process, user's information, farmer's agricultural product information and market price Information. The researchers developed strategies for the proposed study after fully understanding the basic information needed by the organization.

***Process***

The researchers understand the problem by determining, assessing, identifying the best solutions to the current manual system in order to recommend the proposed study. The process contained the following activities and procedures in order to develop the system. The Agile Software Development Methodology has used to ensure the satisfaction of the requirements of the existing system.

***Output***

The output was the proposed system titled Enhancing Small Scale Farmer Trust Through Agricultural Marketplace: Buying and Selling Crops.

***Feedback***

The system can modify its performance to match a desired output response through the feedback loops, which take the system output into account with the end users.

# Chapter III
# METHODOLOGY

This chapter presents the requirements, methods and ways on how the researchers used to develop the system entitled “Enhancing Small Scale Farmer Trust Through Agricultural Marketplace; buying and selling crops”. The system development life cycle used the agile methodology to ensure satisfaction of the requirements of the existing system.

## Project Development Description

### *Tools and Equipment*

The following are the required materials in the development of the system entitled “Enhancing Small Scale Farmer Trust Through Agricultural Marketplace: Buying and Selling Crops”.

**Table 1. Hardware Requirements**

| ***COMPONENTS*** | ***SPECIFICATIONS*** |
|---|---|
| Laptop | ASUS aspire 7 |
| Memory | 8GB DDR4 RAM 512GB SSD ROM |
| Internet Connection | PLDT home FIBR |
| Printer | Epson L3210 |

Table 1 shows the minimum hardware requirements that the system used in the process of development.

**Table 2. Software Requirements.**

| *ITEM* | *SPECIFICATION* |
|---|---|
| Programming Language | JavaScript, PHP |
| Web Designing Tools | HTML, CSS |
| Data Based Application | MySQL |
| Operating System | Windows 10 |

Table 2 shows the software requirements needed to develop the system; This includes the minimum operating system, front end, and backend software as well as the domain name needed to deploy the system online.

**Table 3. Budgetary Requirements.**

| *Item* | *Quantity* | *Unit* | *Description* | *Unit Price (PHP)* | *Estimated cost (PHP)* |
|---|---|---|---|---|---|
| **A. Software** | | | | | |
| 1 | 1 | 1 | XAMPP | Free | |
| 2 | 1 | 1 | Domain | 1,800.00 | 1,800.00 |
| **B. Hardware** | | | | | |
| 3 | 1 | 1 | Laptop | 30,000.00 | 30,000.00 |
| 4 | 1 | 1 | Printer | 9,000.00 | 9,000.00 |
| **Supplies and Materials** | | | | | |
| 5 | 2 | 1 | Paper one 8.5x11 | 200.00 | 400.00 |
| 6 | 2 | 1 | Clear Folder | 20.00 | 20.00 |
| **Contingency** | | | | | Php 3,942.00 |
| **Grand Total** | | | | | Php 39,420.00 |

Table 3 shows the itemized summary of estimated or intended expenditures for a given period along with proposals for financing during a period of the study. This includes the rate of spending required to meet the budget forecasts.

***Project Duration***

**Table 4 shows the Gantt Chart for Develop User Account Registration for Farmer and Buyer.**

| Task Name | Start | Finish | NOVEMBER 24, 2024-DECEMBER 3,2024 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 1 | 2 | 3 |
| **Sprint 1 (Develop User Account Registration for Farmer and Buyer)** | | | | | | | | | | | | | |
| Plan | 11/24/24 | 11/25/24 | | | | | | | | | | | |
| Design | 11/26/24 | 11/27/24 | | | | | | | | | | | |
| Build | 11/28/24 | 11/30/24 | | | | | | | | | | | |
| Test | 11/31/24 | 12/01/24 | | | | | | | | | | | |
| Launch | 12/02/24 | 12/03/24 | | | | | | | | | | | |

The researchers planned and designed an interface for farmer and buyer where it can register account information such as last name, first name, contact number, home address, user name and password.

**Table 5 shows the Gantt Chart for Facilitate Farmers Product Management with Chat Facility Feature.**

| Task Name | Start | Finish | DECEMBER 4-14, 2024 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| **Sprint 2 (Facilitate Farmers Product Management with Chat Facility Feature)** | | | | | | | | | | | | | |
| Plan | 12/04/24 | 12/05/24 | | | | | | | | | | | |
| Design | 12/06/24 | 12/07/24 | | | | | | | | | | | |
| Build | 12/08/24 | 12/10/24 | | | | | | | | | | | |
| Test | 12/11/24 | 12/12/24 | | | | | | | | | | | |
| Launch | 12/13/24 | 12/14/24 | | | | | | | | | | | |

The researchers developed a facility that provides conversation through chat and the farmer can add the product.

**Table 6 shows the Gantt Chart for Implement Data Security and Data Integrity.**

| Task Name | Start | Finish | DECEMBER 15-23, 2024 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| **Sprint 3 (Implement Data Security and Data Integrity)** | | | | | | | | | | | | | |
| Plan | 12/15/24 | 12/15/24 | | | | | | | | | | | |
| Design | 12/16/24 | 12/17/24 | | | | | | | | | | | |
| Build | 12/18/24 | 12/19/24 | | | | | | | | | | | |
| Test | 12/20/24 | 12/21/24 | | | | | | | | | | | |
| Launch | 12/22/24 | 12/23/24 | | | | | | | | | | | |

The researchers planned and designed an interface for the administrator where it can secure their account information such as last name, first name, contact number, home address, username and password.

**Table 7 shows the Gantt Chart for Utilize Mobile Technology on Farmers Transaction.**

| Task Name | Start | Finish | DECEMBER 24, 2024- JANUARY 3, 2025 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 1 | 2 | 3 |
| **Sprint 4 (Utilize Mobile Technology on Farmers Transaction)** | | | | | | | | | | | | | |
| Plan | 12/24/24 | 12/25/24 | | | | | | | | | | | |
| Design | 12/26/24 | 12/27/24 | | | | | | | | | | | |
| Build | 12/28/24 | 12/30/24 | | | | | | | | | | | |
| Test | 12/31/24 | 01/01/25 | | | | | | | | | | | |
| Launch | 01/02/25 | 01/03/25 | | | | | | | | | | | |

The researchers planned and designed an interface for farmer where it can transact online via mobile technology.

**Table 8 shows the Gantt chart for Employ SMS Notification.**

| Task Name | Start | Finish | JANUARY 4-13, 2025 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| **Sprint 5 (Employ Sms Notification)** | | | | | | | | | | | | | |
| Plan | 01/04/25 | 01/05/25 | | | | | | | | | | | |
| Design | 01/06/25 | 01/07/25 | | | | | | | | | | | |
| Build | 01/08/25 | 01/10/25 | | | | | | | | | | | |
| Test | 01/11/25 | 01/12/25 | | | | | | | | | | | |
| Launch | 01/13/25 | 01/14/25 | | | | | | | | | | | |

The researchers planned and designed an interface for farmer where it can received sms notification for incoming order.

**Table 9 shows the Gantt Chart for Generate Report such as, Farmers Report, Buy and Sell Owners Report, Order List.**

| Task Name | Start | Finish | JANUARY 14-23, 2025 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| **Sprint 6 (Generate Report such as, Farmers Report, Buy and Sell Owners Report, Order List)** | | | | | | | | | | | | | |
| Plan | 01/14/25 | 01/15/25 | | | | | | | | | | | |
| Design | 01/16/25 | 01/17/25 | | | | | | | | | | | |
| Build | 01/18/25 | 01/19/25 | | | | | | | | | | | |
| Test | 01/20/25 | 01/21/25 | | | | | | | | | | | |
| Launch | 01/22/25 | 01/23/25 | | | | | | | | | | | |

The researcher planned and developed a generate report feature of the summary of all the transactions between the buyer and the farmer.

**Software Development Methodology**


**Figure 2. Agile Software Development Methodology**

The researchers provided a letter of permission to the respondents as an initial step. The researchers started identifying the requirements and determining the problem, then the researchers found the needs to enhance the current system for business transactions.

***Sprint 1 (Farmers and Buyer Registration)***

The researchers planned and designed an interface for farmer and buyer where it can register account information such as last name, first name, contact number, home address, user name and password. Once registered, the requester can log in using his/her valid user name and password.

*Build:* The system was developed by having functions where the user could perform create, read, update, delete and search account information. In the development of the system. The researchers applied the knowledge base method in which the researchers gathered the information coming from the business. The researchers followed its prototype to come up with the feature. The utilized the HTML, CSS, JavaScript, for the front-end of the system while the programming

language, PHP server-side scripting language and MySQL5.7 were details for the database application.

*Test and Review:* The system was tested by the end-users to ensure the satisfactions of the system. The researchers trained the end-users on how to use the system properly.

***Sprint 2** (**Implement Data Security And Data integrity**)*

*Plan and Design:* The researchers planned and designed an interface for administrator where it can secure their account information such as last name, first name, contact number, home address, username and password.

*Build:* The system was developed by having functions where the user can create their strong password for the data security. In the development of the system. The researchers applied the knowledge base method in which the researchers gathered the information coming from the business. They followed its prototype to come up with the feature and utilized the HTML, CSS, JavaScript, for the front-end of the system. As for the programming language, PHP server-side scripting language and MySQL5.7, were used for the database application.

*Test and Review:* The system was tested by the end-users to ensure the satisfactions of the system. The researchers trained the end-users on how to use the system properly.

***Sprint 3** (**Utilize Mobile Technology on Farmers Transaction**)*

*Plan and Design:* The researchers planned and designed an interface for farmer where it can transact online via mobile technology.

*Build:* The system was developed by having functions where the farmer could enter information required and sent information. In the development of the system, the researchers applied the knowledge base method in which the researchers gathered the information coming from the business. The researchers followed its prototype to come up with the feature. They utilized the HTML, CSS, JavaScript, for the front-end of the system and for the programming language, PHP server-side scripting language and MySQL5.7 were used for the database application.

*Test and Review:* The system was tested by the end-users to ensure the satisfactions of the system. The researchers trained the end-users how to use the system properly.

***Sprint 4** (**Employ SMS Notification**)*

*Plan and Design:* The researchers planned and designed an interface for farmer where it can received sms notification for incoming order.

*Build:* The system was developed by having functions where the farmer could view and update price status. The researchers followed its prototype to come up with the feature. The researchers utilized the HTML, CSS, JavaScript, for the front-end of the system; for as programming language PHP server-side scripting language and MySQL5.7 as database application were used.

*Test and Review:* The system was tested by the end-users to ensure the satisfactions of the system. The researchers trained the end-users a how to use the system properly.

Furthermore, the system provided the following generated reports such as Farmers report, Buy and Sell owners report and order list. The researchers conducted a series of testing to check if there is an error in the system. When the system is already free from bugs or errors, it was evaluated in terms of perceived ease of use, perceived usefulness and perceived user satisfaction. The researchers pilot tested the system and conducted a training procedure with the system users.

***Use Case Description***

**Table 10. Farmers Registration.**

| Use Case Name: | Farmers Registration |
|---|---|
| Scenario | Administrator can manage farmers information. Administrator can read, update, delete and search account information |
| Triggering Events: | administrator will manage account information |
| Description | The registered user's account is required to register in the system. The administrator can view, edit/update, delete and search records. |
| Actors | administrator |
| Related Use Case: | None |
| Pre-Conditioned | Administrator last name, first name, address, contact, email, username and password. |
| Post-Conditioned | None |
| Flow of Activities | 1. Register user account information<br>2. Update user's account information |
| Exceptional Condition: | None |

Table 10 shows the farmers registration use cases description.

**Table 11. Farmers Product Management.**

| Use Case Name: | Farmers Product Management |
|---|---|
| Scenario | farmer will perform create, edit/update, delete, product information |
| Triggering Events: | Farmer will manage product information |
| Description | Manage farmer product information |
| Actors | Farmer |
| Related Use Case: | None |
| Pre-Conditioned | Product information such as price, quantity, and description. |
| Post-Conditioned | None |
| Flow of Activities | 1. Manage product information<br>2. Save the product information |
| Exceptional Condition: | None |

Table 11 shows the farmers product management use case description.

**Table 12. Chat Facility.**

| | |
|---|---|
| Use Case Name: | Chat facility |
| Scenario | The farmer and buyer will communicate within that product . |
| Triggering Events: | administrator will administer agricultural product information |
| Description | The administrator is required to administer add, edit/update, delete and search agricultural product information. |
| Actors | Farmer/buyer |
| Related Use Case: | None |
| Pre-Conditioned | Agricultural products such as product name, image, price, items and description. |
| Post-Conditioned | None |
| Flow of Activities | 1. Manage agricultural product information<br>2. Save agricultural product information |
| Exceptional Condition: | None |

Table 12 shows the Chat facility use case description.

**Table 13. Implement Data Security and Integrity Management.**

| | |
|---|---|
| Use Case Name: | Implement Data Security And integrity management |
| Scenario | Administrator will implement firewall to prevent unauthorized network traffic. |
| Triggering Events: | Administrator can limit physical access to systems containing sensitive data. |
| Description | Manage and monitor data. |
| Actors | Administrator |
| Related Use Case: | None |
| Pre-Conditioned | Data security |
| Post-Conditioned | None |
| Flow of Activities | 1. implement data security<br>2. Save data security |
| Exceptional Condition: | None |

Table 13 shows the implement data security and integrity management use case description.

**Table 14. Employ SMS Notification.**

| | |
|---|---|
| Use Case Name: | Employ sms notification |
| Scenario | farmer will received notification, view and update |
| Triggering Events: | The farmer can view buyer message. |
| Description | The farmer can view, edit/update send notificaion |
| Actors | farmer |
| Related Use Case: | None |
| Pre-Conditioned | Farmer name, transaction id number. |
| Post-Conditioned | None |
| Flow of Activities | 1. farmer can view notification<br>2. Update notification. |
| Exceptional Condition: | None |

Table 14 shows the sms notification use case description.

**Table 15. Generate Report.**

| | |
|---|---|
| Use Case Name: | Generate report |
| Scenario | Administrator can view reports in the system using a data dashboard |
| Triggering Events: | The administrator can view reports. |
| Description | The administrator can view reports in the system. |
| Actors | Administrator |
| Related Use Case: | None |
| Pre-Conditioned | Search record, view and print report |
| Post-Conditioned | None |
| Flow of Activities | 1. Search and view records<br>2. Farmers report<br>3. Buy and sell owner report<br>4. order list |
| Exceptional Condition: | None |

Table 15 shows the generate report use case description.

**Table 16. Farmers Report.**

| | |
|---|---|
| Use Case Name: | Farmers report |
| Scenario | Administrator can view farmers report. |
| Triggering Events: | Administrator allow to search farmers report |
| Description | The administrator can view farmers report |
| Actors | Administrator |
| Related Use Case: | None |
| Pre-Conditioned | Search record, view farmer report |
| Post-Conditioned | None |
| Flow of Activities | 1. Search and view records<br>2. Farmers report<br>3. Buy and sell owner report<br>4. order list |
| Exceptional Condition: | None |

Table 15 shows farmers report use case description.

**Table 17. Buy and Sell Owner Report.**

| | |
|---|---|
| Use Case Name: | Buy and Sell owner report |
| Scenario | administrator can view and print system reports |
| Triggering Events: | Administrator allow to search, view and print sales report |
| Description | The administrator can view and print system reports |
| Actors | Administrator |
| Related Use Case: | None |
| Pre-Conditioned | Search record, view and print report |
| Post-Conditioned | None |
| Flow of Activities | 1. Search and view records<br>2. Farmers report<br>3. Buy and sell owner report<br>4. Order list |
| Exceptional Condition: | None |

Table 17 shows Buy and Sell owner report use case description.

**Table 18. Order List.**

| | |
|---|---|
| Use Case Name: | Order list |
| Scenario | Administrator can view and print system reports |
| Triggering Events: | Administrator allow to search, view and print sales report |
| Description | The administrator can view and print system reports |
| Actors | Administrator |
| Related Use Case: | None |
| Pre-Conditioned | Search record, view and print report |
| Post-Conditioned | None |
| Flow of Activities | 1. Search and view records<br>2. Farmers report<br>3. Buy and sell owner report<br>4. Order list |
| Exceptional Condition: | None |

Table 18 shows the order list use case description.

***Use Case Diagram***

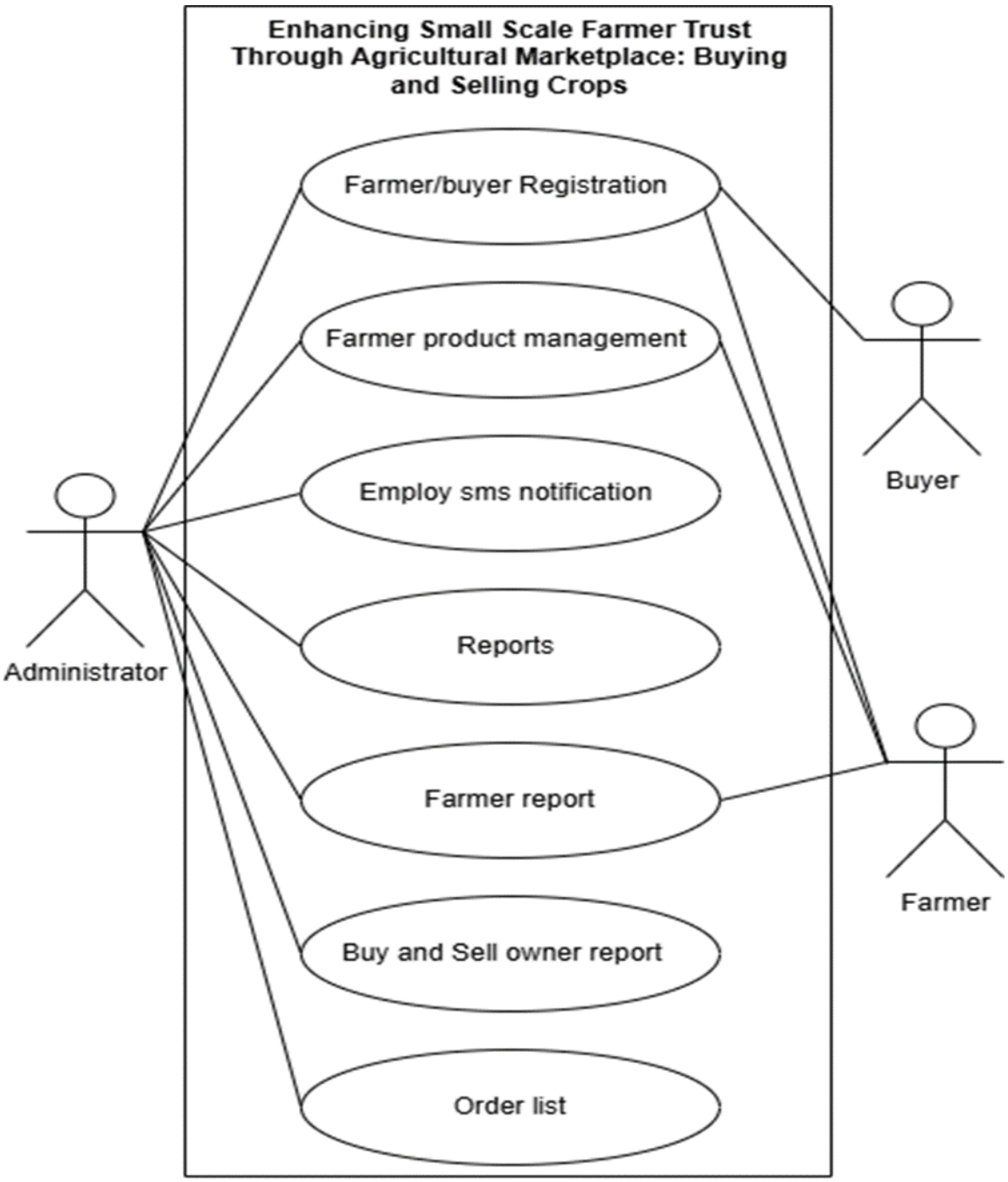


**Figure 3. Use Case Diagram of the System**

Figure 3 shows the interaction of users such as farmer, buyer and administrator

***Activity Diagram of the System***

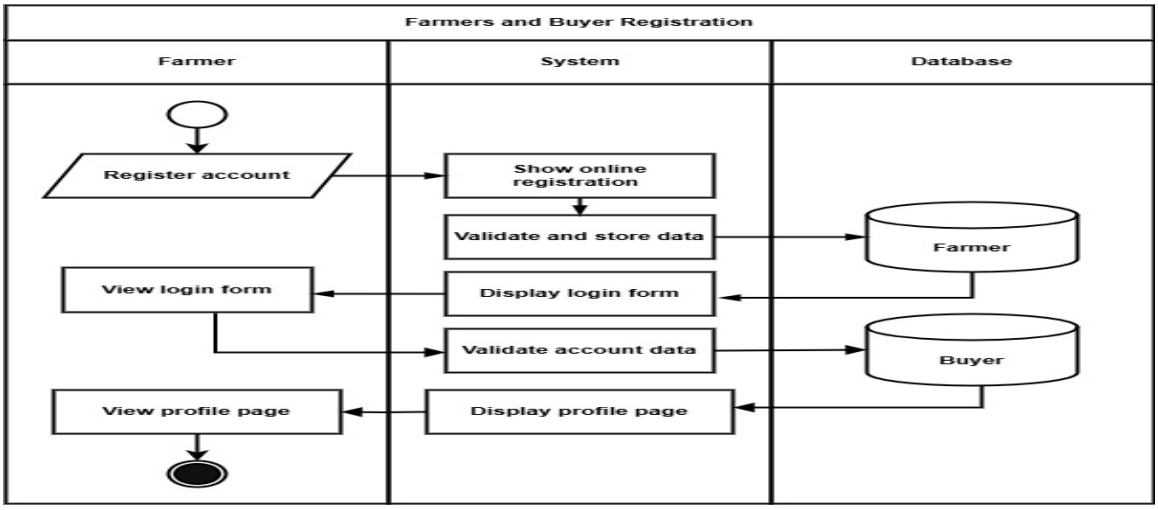


**Figure 4. Activity Diagram of Farmers Registration**

Figure 4 shows the farmer registration activity diagram. It allows farmer to register, create an account , and login.

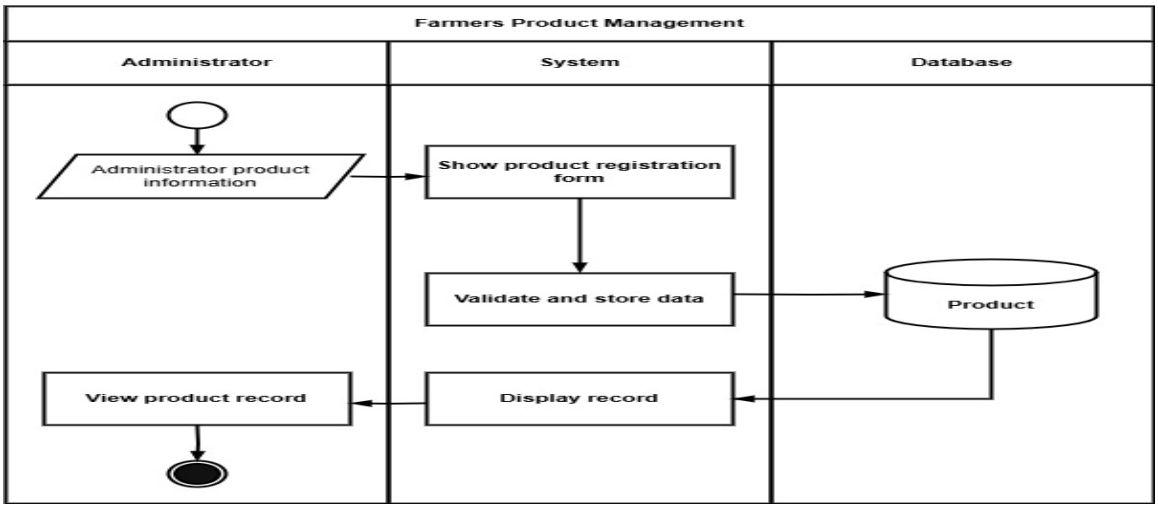


**Figure 5. Activity Diagram of Farmers Product Management**

Figure 5 shows the farmers product management activity diagram. It allows administrator to manage product information, where it can add, edit/update, delete and search record.

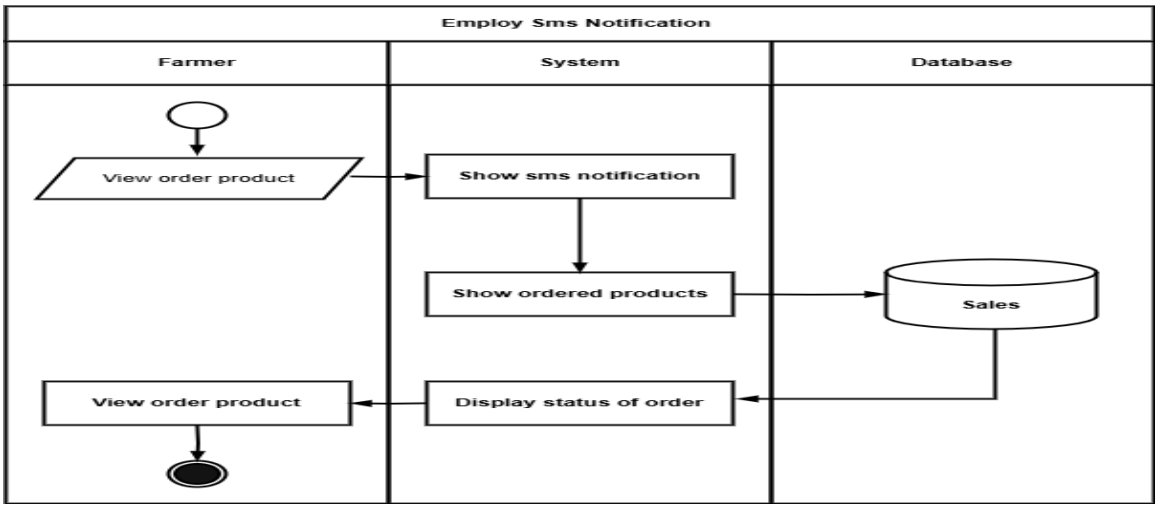


**Figure 6. Activity Diagram of Employ Sms Notification**

Figure 6 shows the employ SMS notification activity diagram. It allows farmer to view notification for incoming orders and registration approval.

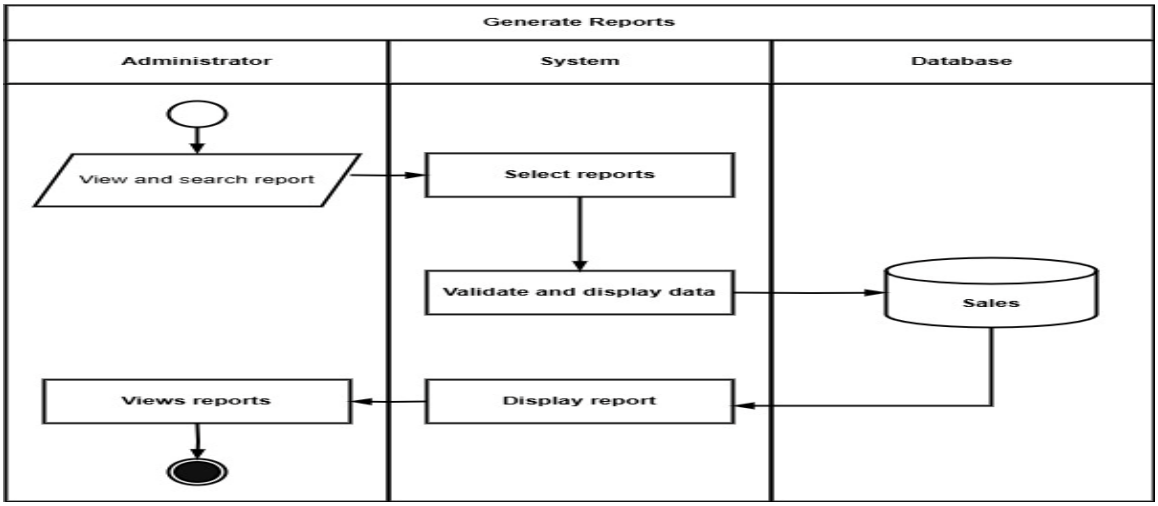


**Figure 7. Activity Diagram of Generate Reports**

Figure 7 shows This figure allows the system to generate reports for the user.

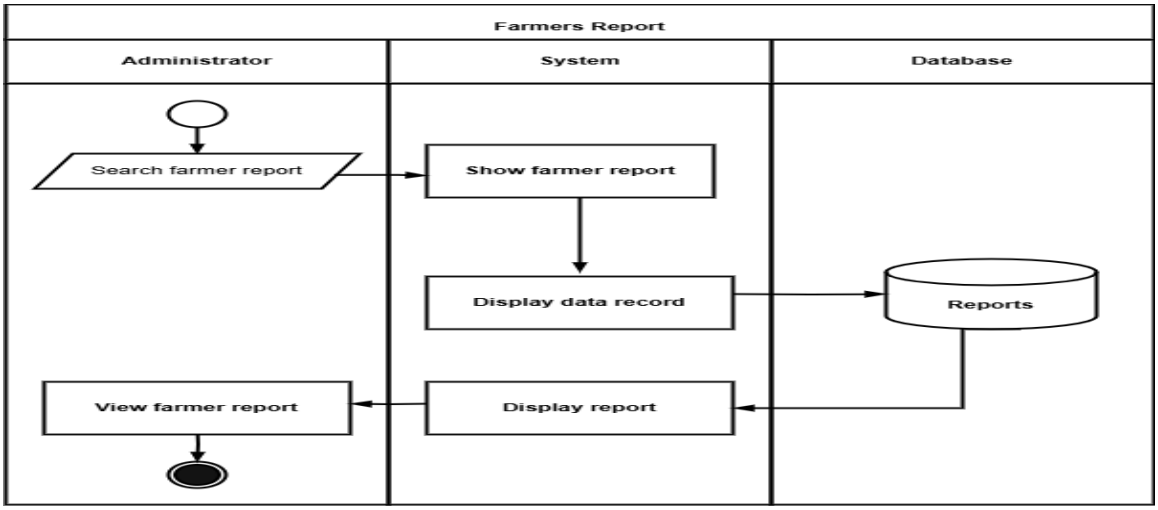


**Figure 8. Activity Diagram of Farmers Report**

Figure 8 shows that the system allows farmer to report for the user.

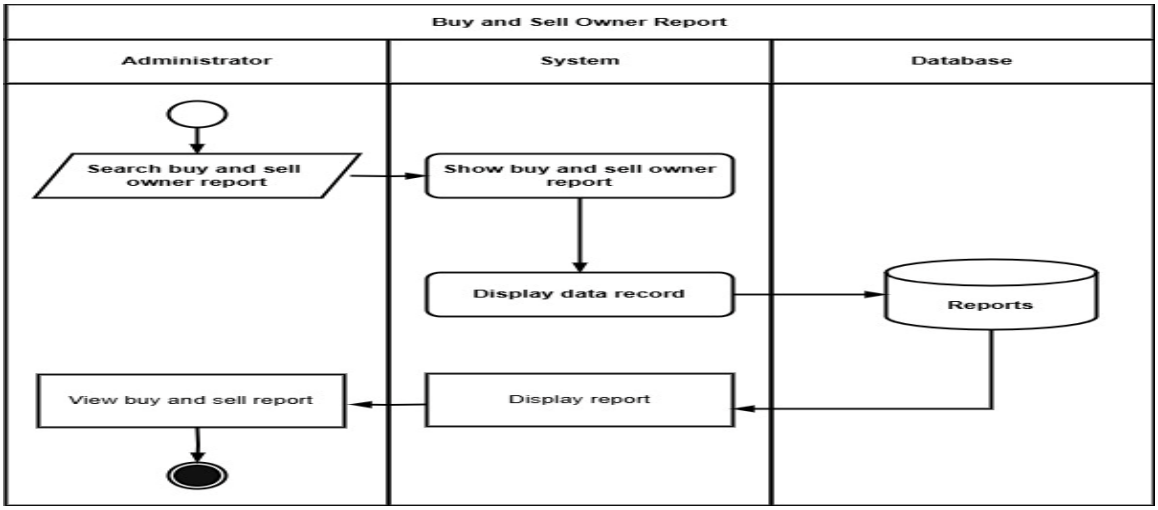


**Figure 9. Activity Diagram of Buy and Sell Owner Report**

Figure 9 shows the system can generate buy and sell report for the user.

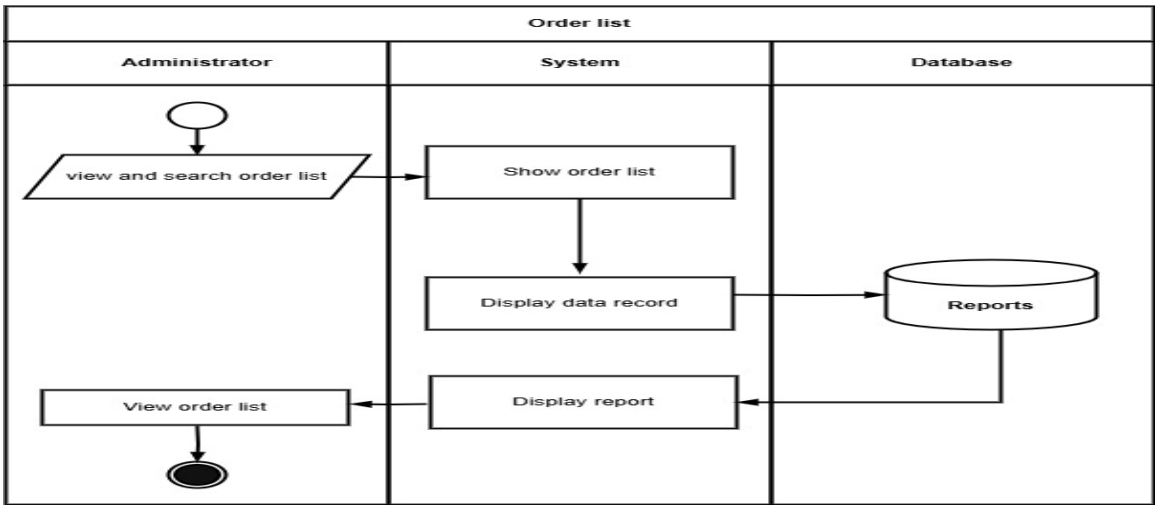


**Figure 10. Activity Diagram of Order List**

Figure 10 shows the system to allow order list for the user.

***Database Schema***

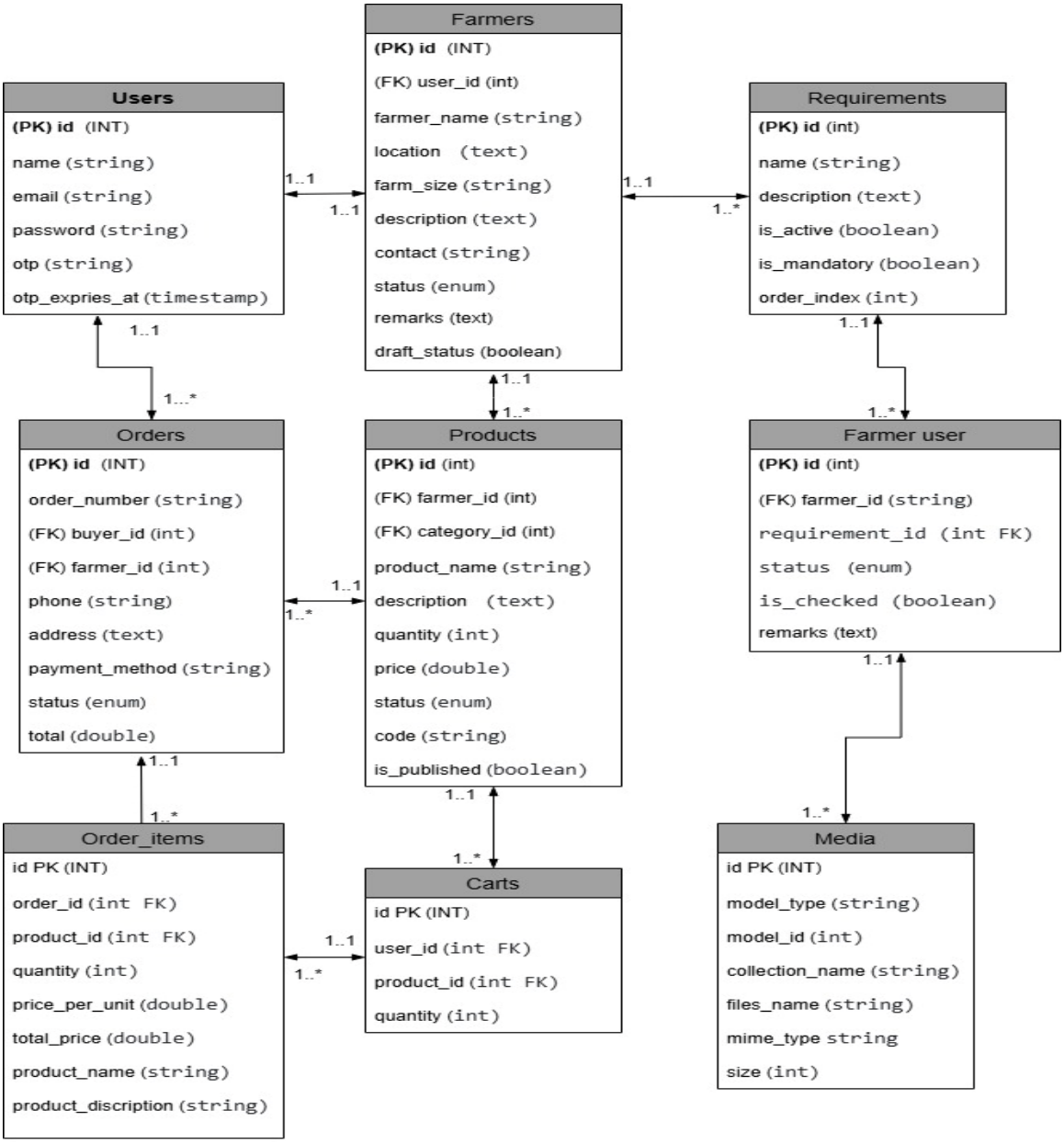


**Figure 11. Database Schema of the System**

Figure 11 shows a class diagram of the system. It shows the entity relationship among objects to each how they are connected.

## Evaluation Methodology

Evaluation of any system is a crucial part in its development. This determines whether the system works properly, meets the objectives, and satisfies the users.

### *Research Design*

Descriptive method of research was used to describe the present situation based on the impressions of the respondents. This type of descriptive research was found appropriate for learning about the study's current situation's wide range of different conditions.

### *Methods of research*

This study employed a descriptive method of research to evaluate the system’s ease of use, usefulness, and job relevance in attaining its objectives.

### *Respondents of the Study*

This study employed a descriptive method of research to evaluate the system’s ease of use, usefulness, and job relevance in achieving its objectives. A total of 30 respondents participated, consisting of 5 buyers and 25 randomly selected farmers.

### *Data Gathering Procedures*

This study used a rating scale questionnaire to gather the needed data and responses to evaluate the system.

The rating scale questionnaire was used to evaluate the ease of use, usefulness, and job relevance of the system. It contains questions to evaluate all the buttons, links, forms, etc. included in the system. It also contains the list of all system objectives and deliverables that the researchers wanted to evaluate.The researchers prepared a questionnaires for the evaluation of the system in terms of perceived ease of use, perceived usefulness, and perceived user satisfaction. It was already checked by the statistician and approved by the adviser.

### *Data Gathering Instruments*

This study used a rating scale questionnaire to gather the needed data and responses in evaluating the system. The outcome was based on the determined evaluation sheet of the respondents.

### *Questionnaire*

The researchers utilized this instrument to collect information from the respondents who experienced using the system under the study.

***Observation***

This method was employed for the researchers to obtain knowledge on how the users react on the system and to identify the problems arising while using it.

***Statistical Tools and Treatment of Data***

To evaluate the functionality, accuracy and acceptability of the system users, a 5-point liker scale questionnaire was used.

**A.** For finding the percentage, the researcher used this formula

$$WM = \frac{xf + xf + xf +}{\sum N}$$

***Where:***

WM = weighted mean

X = number of respondents

F = weight given to each respondent

N = number of cases

**Table 19. Rating Scale Used in the Study**

| RATING SCALE | MEAN RANGE | DESCRIPTION |
|---|---|---|
| 5 | 4.20-5.00 | Strongly Agree |
| 4 | 3.40-4.19 | Agree |
| 3 | 2.60-3.39 | Moderately |
| 2 | 1.80-2.59 | Disagree |
| 1 | 1.00-1.79 | Strongly Disagree |

**B.** The frequency counts and the percentage was computed.

$$\mathbf{Wm = \frac{(1)FSD + (2)FD + (3)FMA + (4FA) + (5)FSA}{N}}$$

**WM =** weighted mean

**N =** number of respondents

**FSD =** frequency of strongly disagree respondents

**FD =** frequency disagree

**FMA=** frequency of moderately response

**FA =** frequency agree response

**FSA =** frequency strongly agree response

**Table 20. Interpretative Scale Used to Interpret the Perceived Ease of Use.**

| MEAN RANGE | DESCRIPTION | INTERPRETATION |
|---|---|---|
| 4.20-5.00 | Strongly Agree | Very easy to use, useful, relevant |
| 3.40-4.19 | Agree | easy to use, useful, relevant |
| 2.60-3.39 | Moderately | Moderately easy to use, useful, relevant |
| 1.80-2.59 | Disagree | Less easy to use, useful, relevant |
| 1.00-1.79 | Strongly Disagree | Not easy to use, useful, relevant |

**Table 21. Interpretative Scale Used to Interpret the Perceived Usefulness.**

| MEAN RANGE | DESCRIPTION | INTERPRETATION |
|---|---|---|
| 4.20-5.00 | Strongly Agree | Very useful |
| 3.40-4.19 | Agree | Useful |
| 2.60-3.39 | Moderately | Moderately useful |
| 1.80-2.59 | Disagree | Less useful |
| 1.00-1.79 | Strongly Disagree | Not useful |

**Table 22. Interpretative Scale Used to Interpret the Perceived User Satisfaction.**

| MEAN RANGE | DESCRIPTION | INTERPRETATION |
|---|---|---|
| 4.20-5.00 | Strongly Agree | Very satisfy |
| 3.40-4.19 | Agree | Satisfy |
| 2.60-3.39 | Moderately | Moderately satisfy |
| 1.80-2.59 | Disagree | Less satisfy |
| 1.00-1.79 | Strongly Disagree | Not satisfy |

# Chapter IV
# RESULTS AND DISCUSSION

This chapter presents the comprehensive results of the evaluation of the system titled “Enhancing Small-Scale Farmer Trust Through Agricultural Marketplace: Buying and Selling Crops.” The system was evaluated by two (2) primary groups of end-users: buy-and-sell business owners and farmers. Their feedback was critical in determining the system’s performance, usability, and overall effectiveness in meeting the intended objectives.

The primary purpose of this study was to design and develop a web- and mobile-based system that would improve the management of farmers’ information, products, market prices, and daily transactions. By digitizing these processes, the system aimed to streamline agricultural trading, enhance communication between buyers and farmers, and ultimately improve service delivery and business performance. Key features of the system included user account management, centralized information for farmers and products, dynamic market price monitoring, and support for secure and efficient daily transactions.

Basic management functions, the system implemented essential operational and security features. These included data security and integrity management to protect sensitive user information from unauthorized access or alteration, mobile technology integration to ensure farmers could access and manage their accounts and transactions through smartphones, and SMS notification services to improve communication by providing real-time updates. Farmers received SMS alerts for registration approval and OTPs for account

changes, while buyers were notified of order confirmations—ensuring both security and operational transparency. These SMS alerts were intentionally made non-replyable to prevent unmonitored conversations and maintain streamlined communication.

One of the most notable features of the system is its report generation and data dashboard capability. The system allowed users to generate specific reports such as Farmers Reports, Buy-and-Sell Owners Reports, and Order Lists, which were available in downloadable and printable formats. Through the interactive dashboard, users could view these reports in graphical form, aiding in performance tracking and data-driven decision-making. The dashboard was especially useful for farmers, who could use it to analyze sales trends, inventory levels, and market demand without needing technical expertise.

The system also featured a multi-user interface. It included admin, buyer, and farmer interfaces, each designed with distinct roles and permissions. The login page served as the system's entry point, ensuring that users could securely access their respective dashboards and features. Once logged in, administrators could manage all user accounts and content, farmers could list and manage their products, and buyers could browse items and place orders. All these interactions were conducted securely via the internet, with the system being hosted online and accessible through its designated domain name. This ensured continuous availability and ease of access for users regardless of location.

The system was evaluated based on three (3) key usability metrics: perceived ease of use, perceived usefulness, and perceived user satisfaction. These criteria were assessed using a structured evaluation questionnaire completed by actual end-users. The results showed a high level of agreement that the system was user-friendly, met the users' needs, and delivered a satisfactory experience. These findings confirmed that the project's goals were successfully achieved, and that the system has the potential to significantly improve agricultural trade and build trust between small-scale farmers and their market partners.

**Results and Discussion**

The project was pilot tested and evaluated at the any farmers and buy and sell businesses. It was participated by the buyer and farmers. This study made used an evaluation questionnaire and a follow-up interview in collecting the data. Questionnaires were constructed and administered to the three 2 groups of respondents; 5 buyers and 25 randomly selected farmers in total of 30 respondents participated.

**Table 23. Evaluation Results of the System's Perceived Ease of Use.**

| Perceived Ease of Use | WM | SD | Interpretation |
|---|---|---|---|
| **1. Using the system, learning to navigate and operate the agriculture marketplace platform would be straightforward for me.** | 4.8 | 0.73 | Strongly Agree |
| **2. The system's interface and functionalities are clear and easy to understand.** | 4.28 | 0.67 | Strongly Agree |
| **3. I can quickly to develop the necessary skills to use the system effectively.** | 4.18 | 0.80 | Agree |
| **4. The system allows me o perform desired tasks, such as buying or selling crops, effortlessly** | 4.36 | 0.69 | Strongly Agree |

| | | | |
|---|---|---|---|
| **5. The system is adaptable and provides a flexible user experience.** | 4.12 | 0.92 | Agree |
| **6. The process of registering as a farmer on the marketplace is simple and straightforward.** | 4.06 | 0.84 | Agree |
| **7. The product management tools provided by the system are effective in managing and updating my agricultural products.** | 4.12 | 0.77 | Agree |
| **8. The chat feature enables me to easily communicate with buyers and farmer, enhancing the transaction experience.** | 4.14 | 0.86 | Agree |
| **9. The reports generated by the system, such as sales and orders, are useful for managing my business.** | 4.02 | 0.71 | Agree |
| **10. I feel confident that my personal and transaction data is secure while using the system.** | 4.06 | 0.74 | Agree |
| **11. The mobile version of the system makes it easier for me to manage my agricultural transactions while on the move.** | 4.18 | 0.77 | Agree |
| **12. The SMS notifications I receive keep me updated about important activities related to my transactions, such as order confirmations and changes.** | 4.22 | 0.82 | Strongly Agree |
| **Total** | **4.17** | **0.07** | **Moderately Easy to Use** |

Table 23 shows the result of the system's functionality with a weighted mean of 4.17, denotes that the system is "Moderately easy to use" in which system users perceived how easy it is to use. The interaction with the Enhancing Small Scale Farmer Trust Through Agricultural Marketplace; Buying and Selling Crops has been clear and understandable. The users find it easy to become skilled in using the AGRIMARKET. It could easily pick up how to utilize the AGRIMARKET as a user, and the user would find the AGRIMARKET to be flexible to interact.

**Table 24. Evaluation Results of the System's Perceived Usefulness.**

| Perceived Usefulness | WM | SD | Interpretation |
|---|---|---|---|
| **1. Using the agricultural marketplace system would allow me to accomplish buying or selling tasks more efficiently.** | 4.10 | 0.89 | Agree |
| **2. The system would enhance the quality and accuracy of transactions and decision-making.** | 4.12 | 0.77 | Agree |
| **3. The system would significantly increase my productivity as a buyer or seller in the agricultural market.** | 4.24 | 0.82 | Strongly Agree |
| **4. The system would improve my overall performance in managing agricultural transactions.** | 4.14 | 0.81 | Agree |
| **5. The system would make my tasks, such as buying or selling crops, easier to perform.** | 4.32 | 0.77 | Strongly Agree |
| **6. Using the system would provide me with better control and flexibility in managing my buying or selling schedules.** | 4.1 | 0.76 | Agree |
| **7. I would find the system highly beneficial and useful for my agricultural buying and selling activities.** | 4.16 | 0.77 | Agree |
| **8. The registration process for farmers is designed in a way that makes it easy to join the marketplace and start selling or buying.** | 4.04 | 0.86 | Agree |
| **9. The product management system allows me to easily list, update, and remove my agricultural products when needed.** | 3.98 | 0.94 | Agree |
| **10. The product management system allows me to easily list, update, and remove my agricultural products when needed.** | 3.98 | 0.70 | Agree |
| **11. The mobile version of the system provides me with all the essential features needed to manage my transactions conveniently on my phone.** | 4.20 | 0.79 | Strongly Agree |
| **12. SMS notifications help me stay informed about critical updates, such as order statuses or buyer inquiries, in real-time.** | 4.18 | 0.83 | Agree |
| **Total** | **4.13** | **0.06** | **Moderately Useful** |

Table 24 shows the result of the system's acceptability with a 4.13 weighted mean, which denotes that the system is "Moderately Useful." It implies that the user believes that using a particular system would enhance business performance. Using the AGRIMARKET in the job would enable user to accomplish task more quickly. The user finds the AGRIMARKET useful. Using the AGRIMARKET user's transaction productivity significantly increased. The ARGIMARKET meets user's needs, and allows the user to have great control over user's work schedule.

**Table 25. Evaluation Results of the System's Perceived User Satisfaction.**

| Perceived User Satisfaction | WM | SD | Interpretation |
|---|---|---|---|
| **1. The system is user-friendly and easy to navigate.** | 4.36 | 0.75 | Strongly Agree |
| **2. The system provides a smooth and efficient experience for managing agricultural transactions.** | 4.44 | 0.73 | Strongly Agree |
| **3. The reports generated by the system are well-organized and easy to understand.** | 4.32 | 0.74 | Strongly Agree |
| **4. I am confident in the accuracy and reliability of the system's data.** | 4.32 | 0.74 | Strongly Agree |
| **5. The system's mobile access allows me to manage transactions conveniently.** | 4.30 | 0.65 | Strongly Agree |
| **6. The notification feature helps me stay updated and manage transactions in real time.** | 4.20 | 0.78 | Strongly Agree |
| **7. The system's security features make me feel confident about data protection.** | 4.12 | 0.75 | Agree |
| **8. Overall, I am satisfied with the system's performance and usefulness.** | 4.08 | 0.85 | Agree |
| **9. The system provides accurate and reliable data reports that help in decision-making.** | 4.04 | 0.73 | Agree |
| **10. The farmer registration process is designed to meet the needs of agricultural sellers efficiently.** | 4.04 | 0.73 | Agree |

| | | | |
|---|---|---|---|
| **11. The product management feature helps me track and organize my agricultural products effectively.** | 4.28 | 0.76 | Strongly Agree |
| **12. The chat facility is useful for communication and resolving issues during transactions.** | 4.22 | 0.74 | Strongly Agree |
| **Total** | **4.23** | **0.6** | **Moderately Satisfied** |

Table 25 shows the result of the system's accessibility with a 4.23 weighted mean. It denotes that the system is "Moderately" accessible and capable of performing the goals. This result means that the user account using the AGRIMARKET. Users need to use of the AGRIMARKET system for daily transactions. The farmers can use AGRIMARKET for online transaction, users have a clear view of the system reports, and users can properly manage the organizations information.

**Table 26. Overall Evaluation Results of the System**

| Overall Result | Weighted Mean | Standard Deviation | Description |
|---|---|---|---|
| Perceived ease of use | 4.17 | 0.07 | Moderately Easy to use |
| Perceived usefulness | 4.13 | 0.06 | Moderately useful |
| Perceived user satisfaction | 4.23 | 0.06 | Moderately Satisfactory |
| **Overall** | **4.18** | **0.01** | **Agree** |

Table 23. shows the overall result of the system's evaluation with an overall mean of 4.18 which denote that the participants agree, that the system is easy to use, useful, and satisfactory. This result proved that the system met its requirements and was accepted.

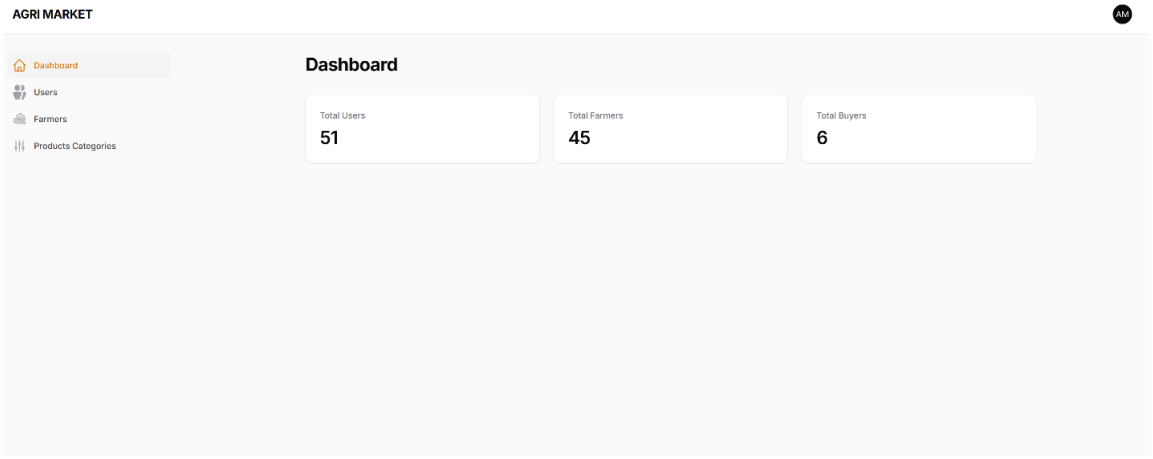


**Figure 12. The Administrator's Dashboard Interface**

Figure 12 shows the administrator's dashboard interface of the system. It allows the user to manage user's account, farmers, and product information.

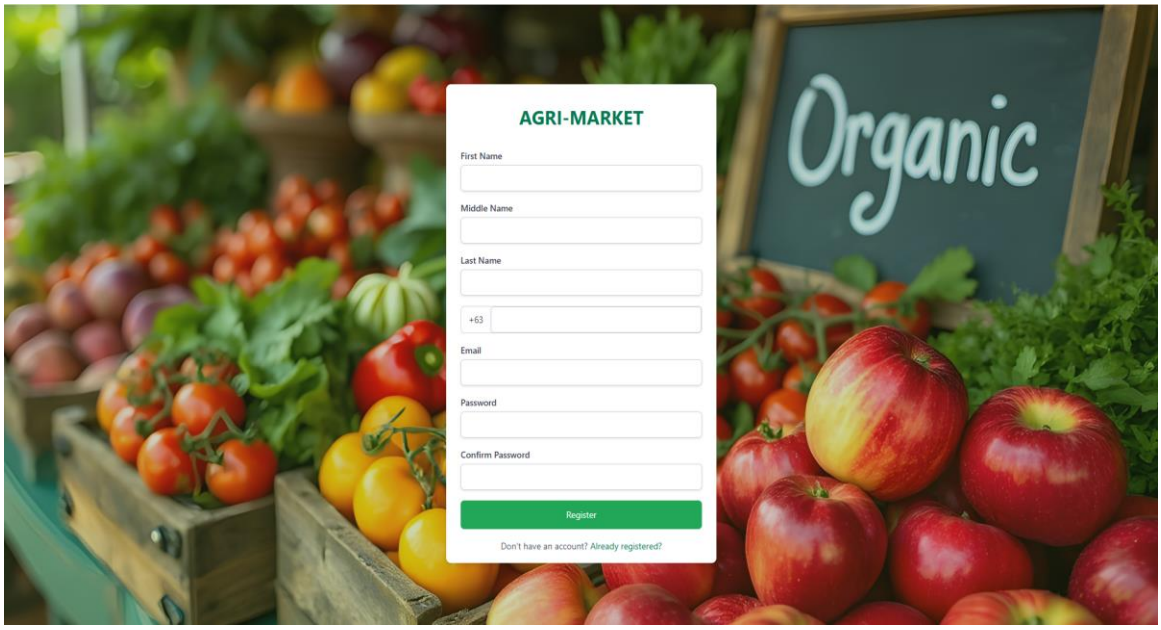


**Figure 13. Farmers account registration**

Figure 13 shows the farmer registration form. It allows farmer to register online.

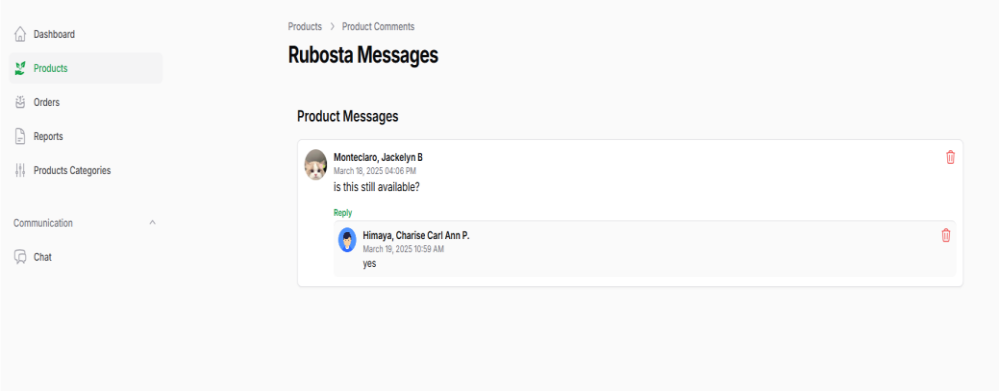


**Figure 14. Chat Facility**

Figure 14 shows the farmer and buyer chat facility module. It allows buyer and farmer communicate through its product online.

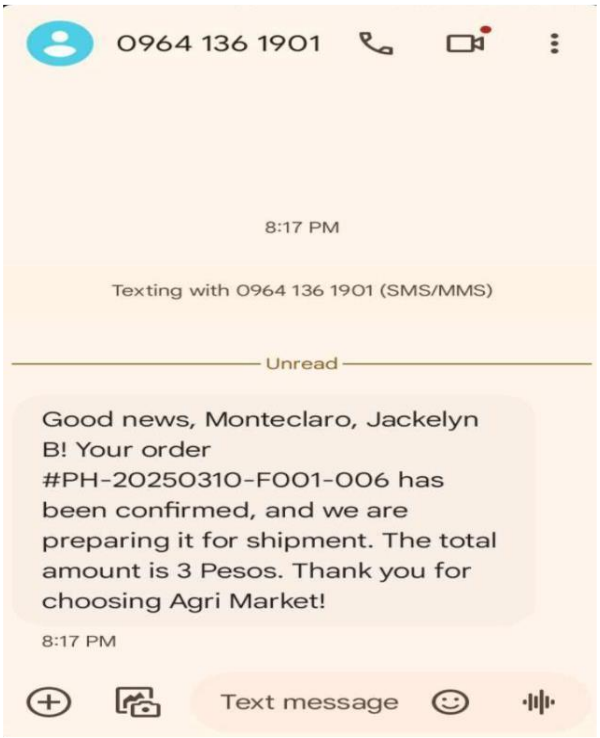


**Figure 15. SMS Notification**

Figure 15  shows the SMS notification module. It allows farmers to received messages.

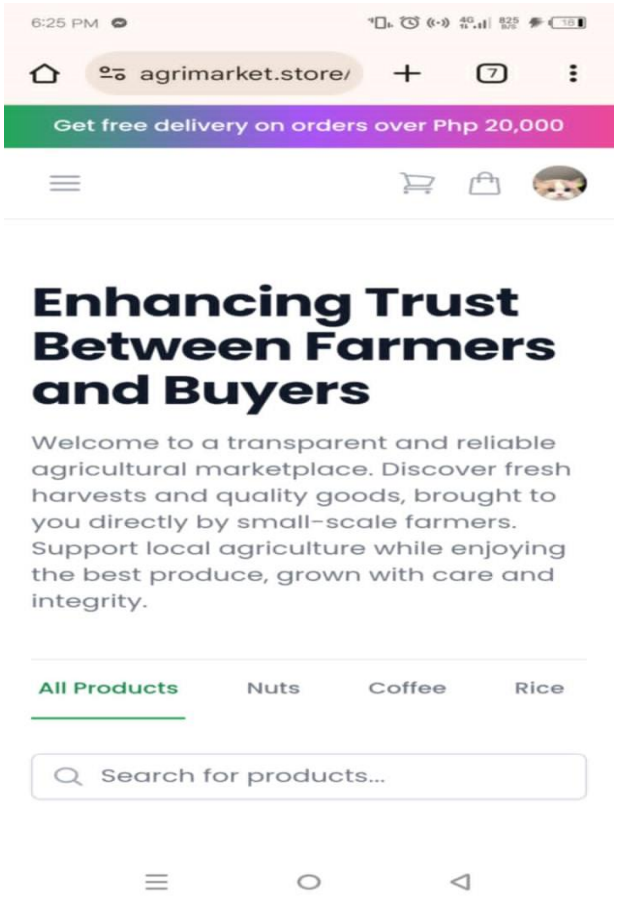


**Figure 16. Utilize Mobile Technology on Farmers Transaction**

Figure 16 shows the mobile technology. It allows farmers and buyers to carry out their business activities on their mobile devices or phones

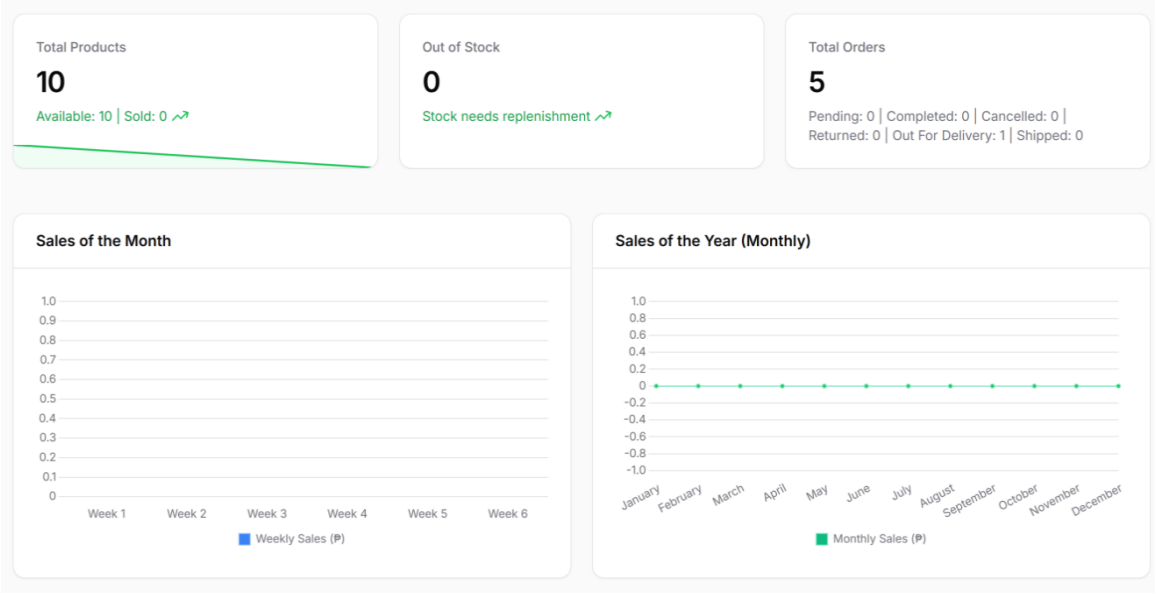


**Figure 17. Generate Reports**

Figure 17 shows the statistical reports such as sales report daily, monthly, and yearly.

# Chapter V
# SUMMARY, CONCLUSION, AND RECOMMENDATION

This chapter presents the summary of findings, conclusions, and recommendations of the researchers based on the results of the evaluation.

## Summary

The purpose of the study was to design and develop a system called "Enhancing Small Scale Farmer Trust Through Agricultural Marketplace: Selling and Buying Crops." The objective of the project is to provide a digital platform that enables a seamless and trustworthy transaction between farmers and purchasers. As small-scale farmers face a number of difficulties like limited market access and transparent pricing, they often hedge their bets and fail to provide additional cash flow to their family by assuring a safe price. They lack the business tools afforded to larger operations. Thus, the system was a way to short circuit these problems through technology, providing the basic components of user account management, product listing, market price updates, reporting tools, SMS notifications.

The system evaluation centered around three key areas of usability: perceived ease of use, perceived useful, and perceived user satisfaction. In determining these areas of evaluation, a system evaluation questionnaire was provided to selected end-users, which included business owners, buyers, and farmer end-users, all of whom engaged with the platform directly. These targeted users were appropriate to highlight in the evaluation because they are the main stakeholders of the system. This means that their responses provide valuable

feedback in terms of the systems usage and functionality and relevance in a real-world agricultural context.

The evaluation results show that the system met its design objectives. The users said the users reported that they found the system easy to use and the interface easier to navigate, and rated the system usability a weighted mean of 4.17, suggesting that users could find their way around the platform and perform the tasks they need to do without much difficulty. This is especially important in agricultural communities where the users might not be tech experienced, which makes usability paramount to success.

In terms of perceived usefulness, our system received a mean score of 4.13, which categorized as moderately useful. This means the users acknowledged the system was capable of increasing their support for business processes maintain product listings, fulfil orders, engage with a buyer or seller. While the overall usefulness of the system was not rated at the highest level the results indicate the system did provide functional value that contributed to the user's objective and increased transaction efficiency.

In terms of user satisfaction, the platform received the highest average of 4.23 indicating overall the users had a favourable experience when using the system. Higher satisfaction levels represent an overall positive experience, ease of completing tasks, and few technical issues while using the system. Having a high level of satisfaction is very important to encourage continued use of the system and build trust in the system, especially farmers who are often reluctant to try adopt new technologies.

In total, the overall mean score average of 4.18 falls under the interpretation of "Moderately Agree". This indicates users had moderately agreed the system was easy to use, useful to their operations, and satisfactory in overall performance. These results prove the system was successful in achieving features that were in accordance to the user's needs and expectations; therefore, demonstrating the primary focal objectives of the study. The consistency of feedback across all user types (farmers and buyers) demonstrates how well-balanced and inclusive the systems design approach was.

Overall the evaluations physical results considerably support the feasibility of the system in practical agricultural environments. It is a proof, that the system can in the future determine with further developments and larger deployments, the system is likely to become a plausible digital format structuring small-scale farmer trust and broadening agricultural marketplace applications.

**Conclusion**

Based on the evaluation results, it was concluded that the study has successfully accomplished its system requirements which means that the user found out that managing user accounts, managing information, managing product information, chat facility, Implement Data Security and integrity management, Utilize mobile technology on farmers transaction, Employ SMS notification and generating reports easy to use, useful and satisfactory.

The researchers also concluded that the study has successfully accomplished its system requirements and has met its desired objectives. This

study also concluded that the developed system can be used by the end user as a solution to the problem of its existing system. All this conclusion is provided by the end users that evaluated the system in terms of perceive ease of use, perceive usefulness, and perceived user satisfaction.

**Recommendations**

This presents the recommendations of the project based on the preceding results and findings. The following recommendations have been made for the improvement of the project; enhance reporting feature, improve the notification for the registrations status and strengthen security measures to protect users' profile information. Additionally, future improvements should be enhance system with an android application to increase accessibility and convenience, integrate an online payment feature to streamline transactions and add a feedback feature to gather input from farmers and improve the platform accordingly.

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Department of Agriculture. (2023). Strengthening the digital agricultural marketplaces in the Philippines: A report on Kadiwa ni Ani at Kita and Mayani. *Agricultural Development Journal*, 20(4), 31-45.

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# APPENDICES

Appendix 1 Form 1

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

## PLAN OF COURSE WORK

Name: **CHARISE CARL ANN P. HIMAYA** Course: **BSIS**

| Course No. | Course Description | Unit | Remarks |
|---|---|---|---|
| ACCTG111 | Financial Accounting and Reporting | 3 | Passed |
| ACCTG121 | Basic Accounting for Partnership and Corporate Entitis | 3 | Passed |
| CC111 | Introduction to Computing | 3 | Passed |
| CC112 | Computer Programming | 3 | Passed |
| CC113 | Computer Programming | 3 | Passed |
| CC114 | Data Structures and Algorithms | 3 | Passed |
| CC115 | Information Management | 3 | Passed |
| CC116 | Application Development and Emerging Technologies | 3 | Passed |
| ELECT1 | Elective 1 (Customer Relationship Management) | 3 | Passed |
| ELECT2 | Elective 2 (Data Mining) | 3 | Passed |
| ELECT3 | Elective 3 (Supply Chain Management | 3 | Passed |
| ELECT4 | Elective 4(Business Intelligence) | 3 | Passed |
| ENG001 | Advanced Technical Writing | 3 | Passed |
| FIN212 | Financial Management | 3 | Passed |
| FTS321 | Field Trip and Seminars | 3 | Passed |
| GE701 | Mathematics in the Modern World | 3 | Passed |
| GE702 | Purposive Communication | 3 | Passed |
| GE703 | Ethics 3.00 | 3 | Passed |
| GE704 | Science, Technology and Society | 3 | Passed |
| GE705 | The Contemporary World | 3 | Passed |
| GE706 | Art Appreciation | 3 | Passed |
| GE707 | Readings in Philippine History | 3 | Passed |
| GE708 | Understanding the Self | 3 | Passed |
| GE709 | The Life and Works of Jose Rizal | 3 | Passed |
| GE711 | Culture of Mindanao | 3 | Passed |
| GE712 | Gender and Society | 3 | Passed |

| | | | |
|---|---|---|---|
| GE713 | Kontekstwalisadong Komunikasyon sa Filipino (KOMFIL) | 3 | Passed |
| GE715 | Filipino sa Iba't ibang Disiplina (FILDIS) | 3 | Passed |
| IS 121 | Organization and Managements Concepts | 3 | Passed |
| IS 121 | Organization and Managements Concepts | 3 | Passed |
| IS 221 | Systems Analysis and Design | 3 | Passed |
| IS111 | Fundamentals of Information Systems | 3 | Passed |
| IS121 | Organization and Management Concepts | 3 | Passed |
| IS121 | IT Infrastructure and Network Technology | 3 | Passed |
| IS222 | Enterprise Architecture | 3 | Passed |
| IS223 | Business Process and Management | 3 | Passed |
| IS311 | Evaluation of Business Performance | 3 | Passed |
| IS312 | System Infrastructure and Integration | 3 | Passed |
| IS313 | IS Project Management 1 | 3 | Passed |
| IS314 | Professional Issues in Information Systems | 3 | Passed |
| IS321 | Management Information Systems | 3 | Passed |
| IS322 | Capstone Project I | 3 | Passed |
| IS323 | Quantitative Methods | 3 | Passed |
| IS324 | Information Systems Policy | 3 | Passed |
| IS411 | IS Strategy, Management and Acquisition | 3 | Passed |
| IS412 | Capstone Project 2 | 3 | Passed |
| IS421 | Practicum for Information Systems (486 hours) | 6 | Passed |
| NSTP101 | National Service Training Program 1 | 3 | Passed |
| NSTP102 | National Service Training Program 2 | 3 | Passed |
| PE101 | Physical Fitness and Self-Testing Activities | 2 | Passed |
| PE102 | Rhythmic Activities | 2 | Passed |
| PE103 | Recreational Activities | 2 | Passed |
| PE104 | Team Sports | 2 | Passed |
| STAT003 | Statistics with Computer Application | 3 | Passed |

Total Number of Units Required for the Period : **155.00**
Total Numbers of Units Earned : **155.00**
Percentage of Units Earned : **100%**

Certified Correct:

**JOVANIE S. LINGCAY**
Campus Registrar

_____
Date

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

_____
Date

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

## PLAN OF COURSE WORK

Name: **JACKELYN B. MONTECLARO** Course: **BSIS**

| Course No. | Course Description | Unit | Remarks |
|---|---|---|---|
| ACCTG111 | Financial Accounting and Reporting | 3 | Passed |
| ACCTG121 | Basic Accounting for Partnership and Corporate Entitis | 3 | Passed |
| CC111 | Introduction to Computing | 3 | Passed |
| CC112 | Computer Programming | 3 | Passed |
| CC113 | Computer Programming | 3 | Passed |
| CC114 | Data Structures and Algorithms | 3 | Passed |
| CC115 | Information Management | 3 | Passed |
| CC116 | Application Development and Emerging Technologies | 3 | Passed |
| ELECT1 | Elective 1 (Customer Relationship Management) | 3 | Passed |
| ELECT2 | Elective 2 (Data Mining) | 3 | Passed |
| ELECT3 | Elective 3 (Supply Chain Management | 3 | Passed |
| ELECT4 | Elective 4(Business Intelligence) | 3 | Passed |
| ENG001 | Advanced Technical Writing | 3 | Passed |
| FIN212 | Financial Management | 3 | Passed |
| FTS321 | Field Trip and Seminars | 3 | Passed |
| GE701 | Mathematics in the Modern World | 3 | Passed |
| GE702 | Purposive Communication | 3 | Passed |
| GE703 | Ethics 3.00 | 3 | Passed |
| GE704 | Science, Technology and Society | 3 | Passed |
| GE705 | The Contemporary World | 3 | Passed |
| GE706 | Art Appreciation | 3 | Passed |
| GE707 | Readings in Philippine History | 3 | Passed |
| GE708 | Understanding the Self | 3 | Passed |
| GE709 | The Life and Works of Jose Rizal | 3 | Passed |
| GE711 | Culture of Mindanao | 3 | Passed |
| GE712 | Gender and Society | 3 | Passed |

| | | | |
|---|---|---|---|
| GE713 | Kontekstwalisadong Komunikasyon sa Filipino (KOMFIL) | 3 | Passed |
| GE715 | Filipino sa Iba't ibang Disiplina (FILDIS) | 3 | Passed |
| IS 121 | Organization and Managements Concepts | 3 | Passed |
| IS 121 | Organization and Managements Concepts | 3 | Passed |
| IS 221 | Systems Analysis and Design | 3 | Passed |
| IS111 | Fundamentals of Information Systems | 3 | Passed |
| IS121 | Organization and Management Concepts | 3 | Passed |
| IS121 | IT Infrastructure and Network Technology | 3 | Passed |
| IS222 | Enterprise Architecture | 3 | Passed |
| IS223 | Business Process and Management | 3 | Passed |
| IS311 | Evaluation of Business Performance | 3 | Passed |
| IS312 | System Infrastructure and Integration | 3 | Passed |
| IS313 | IS Project Management 1 | 3 | Passed |
| IS314 | Professional Issues in Information Systems | 3 | Passed |
| IS321 | Management Information Systems | 3 | Passed |
| IS322 | Capstone Project I | 3 | Passed |
| IS323 | Quantitative Methods | 3 | Passed |
| IS324 | Information Systems Policy | 3 | Passed |
| IS411 | IS Strategy, Management and Acquisition | 3 | Passed |
| IS412 | Capstone Project 2 | 3 | Passed |
| IS421 | Practicum for Information Systems (486 hours) | 6 | Passed |
| NSTP101 | National Service Training Program 1 | 3 | Passed |
| NSTP102 | National Service Training Program 2 | 3 | Passed |
| PE101 | Physical Fitness and Self-Testing Activities | 2 | Passed |
| PE102 | Rhythmic Activities | 2 | Passed |
| PE103 | Recreational Activities | 2 | Passed |
| PE104 | Team Sports | 2 | Passed |
| STAT003 | Statistics with Computer Application | 3 | Passed |

Total Number of Units Required for the Period : **155.00**
Total Numbers of Units Earned : **155.00**
Percentage of Units Earned : **100%**

Certified Correct: Approved:

**JOVANIE S. LINGCAY**
Campus Registrar

_____
Date

**ROMMEL M. LAGUMEN**
Campus Director

_____
Date

Appendix 2 Republic of the Philippines Form 2

**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

**APPLICATION FOR CAPSTONE PROJECT TITLE**

October 15, 2024
Date

| | | |
|---|---|---|
| **ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS** | _____ Remarks | _____ Signature |
| **E- COFFEE BEANS INTEGRATED MANAGEMENT SYSTEM** | _____ Remarks | _____ Signature |
| **SNAVODA E- PASSENGER SITTING RESERVATION SYSTEM** | _____ Remarks | _____ Signature |

We are planning to write our capstone project title on October 15, 2024 defense at SKSU Isulan Campus.

Very respectfully yours,

**CHARISE CARL ANN P. HIMAYA**
**JACKELYN B. MONTECLARO**
Student

Recommending Approval:

**GREGORIO C. ILAO, PhD**
Member

**MARY GRACE L. PEROCHO, PhD**
Member

**IVY LYNN F. MADRIAGA, MIT**
Adviser

Endorsed:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator

_____
Date Signed

**ELBREN O. ANTONIO, DIT**
College Dean

_____
Date Signed

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

_____
Date Signed

Appendix 3 Republic of the Philippines Form 3

**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

## NOMINATION OF GUIDANCE COMMITTEE

We, **CHARISE CARL ANN P. HIMAYA,** and **JACKELYN B. MONTECLARO,** students of **BSIS** hereby nominate the following as adviser and members of my thesis guidance committee.

**IVY LYNN F. MADRIAGA, MIT**
Adviser

**GREGORIO C. ILAO, PhD**
Member

**MARY GRACE L. PEROCHO, PhD**
Member

We, hereby certify our willingness to act as adviser / members of the guidance committee**.**

**IVY LYNN F. MADRIAGA, MIT**
Adviser

**GREGORIO C. ILAO, PhD**
Member

**MARY GRACE L. PEROCHO, PhD**
Member

---

Endorsed:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator

_____
Date Signed

**ELBREN O. ANTONIO, DIT**
College Dean

_____
Date Signed

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

_____
Date Signed

Appendix 4

Form 4

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

**APPLICATION FOR CAPSTONE PROJECT OUTLINE DEFENSE**

Name: **CHARISE CARL ANN P. HIMAYA** Course/Major: **BSIS**
**JACKELYN B. MONTECLARO**

We have the honor to apply for outline defense for our study entitled: **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYNG AND SELLING CROPS "**

Time: 3:00 pm - 4:00 pm
Date: October 15, 2024
Venue: CCS Deans Office

**GREGORIO C. ILAO, PhD**
Member

**MARY GRACE L. PEROCHO, PhD**
Member

**LOWELL D. ESPINOSA**
Statistician

**DOREEN B. TAMPUS, PhD**
English Critic

**IVY LYNN F. MADRIAGA, MIT**
Adviser

---

Endorsed:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator

Recommending Approval:

**ELBREN O. ANTONIO, DIT**
College Dean

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

Appendix 5

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

Form 6

**APPROVAL OF CAPSTONE PROJECT OUTLINE**

Name: **CHARISE CARL ANN P. HIMAYA** Course/Major: **BSIS**
**JACKELYN B. MONTECLARO**

Capstone Project Title: **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYNG AND SELLING CROPS"**

**APPROVED BY THE GUIDANCE COMMITTEE**

| | | |
|---|---|---|
| **IVY LYNN F. MADRIAGA, MIT** | _____ | _____ |
| Adviser | Signature | Date |
| **GREGORIO C. ILAO, PhD** | _____ | _____ |
| Member | Signature | Date |
| **MARY GRACE L. PEROCHO, PhD** | _____ | _____ |
| Member | Signature | Date |
| **LOWELL D. ESPINOSA** | _____ | _____ |
| Statistician | Signature | Date |
| **DOREEN B. TAMPUS, PhD** | _____ | _____ |
| English Critic | Signature | Date |

Endorsed:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator

Recommending Approval:

**ELBREN O. ANTONIO, DIT**
College Dean

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

Appendix 6 Form 7

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

## CERTIFICATION OF STATISTICIAN

This is to certify that the capstone project entitled **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYNG AND SELLING CROPS"** conducted on March 25, 2025, authored by **CHARISE CARL ANN P. HIMAYA,** and **JACKELYN B. MONTECLARO,** was evaluated/checked by the undersigned as to the statistical analysis and interpretation.

Issued on this _____ day of _____.

**LOWELL D. ESPINOSA**
Statistician

Noted:

**ROMMEL M. LAGUMEN**
Campus Director

Appendix 7 Form 8

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

## CERTIFICATION OF ENGLISH CRITIC

This is to certify that the capstone project entitled **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYNG AND SELLING CROPS"** conducted on March 25, 2025, authored by **CHARISE CARL ANN P. HIMAYA,** and **JACKELYN B. MONTECLARO,** was edited by the undersigned as to its grammar.

Issued on this _____ day of _____.

**DOREEN B. TAMPUS, PhD**
English Critic

Noted:

**ROMMEL M. LAGUMEN**
Campus Director

Appendix 8

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

Form 9

**APPLICATION FOR THESIS FINAL DEFENSE EXAMINATION**

Name: **CHARISE CARL ANN P. HIMAYA** Course/Major: **BSIS**
**JACKELYN B. MONTECLARO**

Capstone Project Title: **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS"**

Please write **×** whether: (x) First ( ) Second ( )Third
Date: March 25, 2025 Time: 10:00 am - 11:00 am Venue: CCS Defense Room

Guidance Committee

| Name | Signature | Date |
|---|---|---|
| **IVY LYNN F. MADRIAGA, MIT**<br>Adviser | _____ | _____ |
| **IVY LYNN F. MADRIAGA, MIT**<br>Member | _____ | _____ |
| **CERILO B. RUBIN JR., MIT**<br>Member | _____ | _____ |
| **LOWELL D. ESPINOSA**<br>Statistician | _____ | _____ |
| **DOREEN B. TAMPUS, PhD**<br>English Critic | _____ | _____ |

Endorsed:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator

Recommending Approval:

**ELBREN O. ANTONIO, DIT**
College Dean

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

_____
Date

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

**Report on the Result of Final Defense**
(Action taken by the Guidance Committee. Please indicate whether Passed or Failed)

| Signature | Date | Remarks |
|---|---|---|
| | | |
| | | |
| | | |

Approved:

**ROMMEL M. LAGUMEN**
Campus Director

Appendix 9

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

Form 10

**APPLICATION FOR THE CAPSTONE PROJECT FINAL PRINTING AND BINDING**

This is to certify that the capstone project entitled **"ENHANCING SMALL SCALE FARMER TRUST THROUGH AGRICULTURAL MARKETPLACE: BUYING AND SELLING CROPS"** was thoroughly reviewed by the guidance committee and recommended for final printing and binding.

**DOREEN B. TAMPUS, PhD**
English Critic
_____
Date Signed

**LOWELL D. ESPINOSA**
Statistician
_____
Date Signed

**GREGORIO C. ILAO, PhD**
Member
_____
Date Signed

**MARY GRACE L. PEROCHO, PhD**
Member
_____
Date Signed

**IVY LYNN F. MADRIAGA, MIT**
Adviser
_____
Date Signed

Recommending Approval:

**ELMER C. BUENAVIDES, DIT**
Campus Research Coordinator
_____
Date Signed

**ELBREN O. ANTONIO, DIT**
College Dean
_____
Date Signed

Approved:

**ROMMEL M. LAGUMEN**
Campus Director
_____
Date Signed

Appendix 10

**SAMPLE QUESTIONNAIRE**

Republic of the Philippines
**SULTAN KUDARAT STATE UNIVERSITY**
College of Computer Studies
Isulan Campus
Isulan, Sultan Kudarat

Name : _____ Gender: _____
Profession:_____ PhoneNumber: _____

**Survey Questionnaire**

To our valued participants:

We are on the stage of testing the technology developed for our study entitled **Enhancing Small-Scale Trust Through Agricultural Marketplace Buying and Selling Crops.** Your generous help to evaluate the system is highly appreciated. This gesture will help the researchers to improve the system and deliver more satisfactory services to all the employee of sultan kudarat state university – Isulan Campus.

Thank you and God bless to all of us!

**The Researchers**

**Charise Carl Ann P. Himaya**

**Jackelyn B. Monteclaro**

**Instructions:** Check the corresponding circle that corresponds to how the best you agree to the statement provided.

**Rating scale used in the Study**

| RATING SCALE | MEAN RANGE | DESCRIPTION |
|---|---|---|
| **5** | 4.20-5.00 | **Strongly Agree** |
| **4** | 3.40-4.19 | **Agree** |
| **3** | 2.60-3.39 | **Moderately Agree** |
| **2** | 1.80-2.59 | **Disagree** |
| **1** | 1.00-1.79 | **Strongly Disagree** |

| Perceived Usefulness | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 1. The agricultural marketplace platform is easy to use. | | | | | |
| 2. The system's interface and functionalities are clear and easy to understand. | | | | | |
| 3. I can quickly develop the necessary skills to use the system effectively. | | | | | |
| 4. The system allows me to perform desired tasks, such as buying or selling crops, effortlessly | | | | | |
| 5. The system is adaptable and provides a flexible user experience. | | | | | |
| 6. The process of registering as a farmer on the marketplace is simple and straightforward. | | | | | |
| 7. The product management tools provided by the system are effective in managing and updating my agricultural products. | | | | | |
| 8. The chat feature enables me to easily communicate with buyers and sellers, enhancing the transaction experience. | | | | | |
| 9. The reports generated by the system, such as sales and orders, are useful for managing my business. | | | | | |
| 10. I feel confident that my personal and transaction data is secure while using the system. | | | | | |
| 11. The mobile version of the system makes it easier for me to manage my agricultural transactions while on the move. | | | | | |
| 12. The SMS notifications I receive keep me updated about important activities related to my transactions, such as order confirmations and changes. | | | | | |

**Comments/Suggestions/Recommendations:** _____

| Perceived Usefulness | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 1. Using the agricultural marketplace system would allow me to accomplish buying or selling tasks more efficiently. | | | | | |
| 2. The system would enhance the quality and accuracy of transactions and decision-making. | | | | | |
| 3. The system would significantly increase my productivity as a buyer or seller in the agricultural market. | | | | | |
| 4. The system would improve my overall performance in managing agricultural transactions. | | | | | |
| 5. The system would make my tasks, such as buying or selling crops, easier to perform. | | | | | |
| 6. Using the system would provide me with better control and flexibility in managing my buying or selling schedules. | | | | | |
| 7. I would find the system highly beneficial and useful for my agricultural buying and selling activities. | | | | | |
| 8. The registration process for farmers is designed in a way that makes it easy to join the marketplace and start selling or buying. | | | | | |
| 9. The product management system allows me to easily list, update, and remove my agricultural products when needed. | | | | | |
| 10. The product management system allows me to easily list, update, and remove my agricultural products when needed. | | | | | |
| 11. The mobile version of the system provides me with all the essential features needed to manage my transactions conveniently on my phone. | | | | | |
| 12. SMS notifications help me stay informed about critical updates, such as order statuses or buyer inquiries, in real-time. | | | | | |

**Comments/Suggestions/Recommendations:** _____

_____

_____

_____

| Perceived User Satisfaction | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 1. The system is user-friendly and easy to navigate. | | | | | |
| 2. The system provides a smooth and efficient experience for managing agricultural transactions. | | | | | |
| 3. The reports generated by the system are well-organized and easy to understand. | | | | | |
| 4. I am confident in the accuracy and reliability of the system's data. | | | | | |
| 5. The system's mobile access allows me to manage transactions conveniently. | | | | | |
| 6. The notification feature helps me stay updated and manage transactions in real time. | | | | | |
| 7. The system's security features make me feel confident about data protection. | | | | | |
| 8. Overall, I am satisfied with the system's performance and usefulness. | | | | | |
| 9. The system provides accurate and reliable data reports that help in decision-making. | | | | | |
| 10. The farmer registration process is designed to meet the needs of agricultural sellers efficiently. | | | | | |
| 11. The product management feature helps me track and organize my agricultural products effectively. | | | | | |
| 12. The chat facility is useful for communication and resolving issues during transactions. | | | | | |

**Comments/Suggestions/Recommendations:** _____

_____

_____

_____

_____

_____

**Thank you for your time!**

Appendix 11

**PICTORIALS**



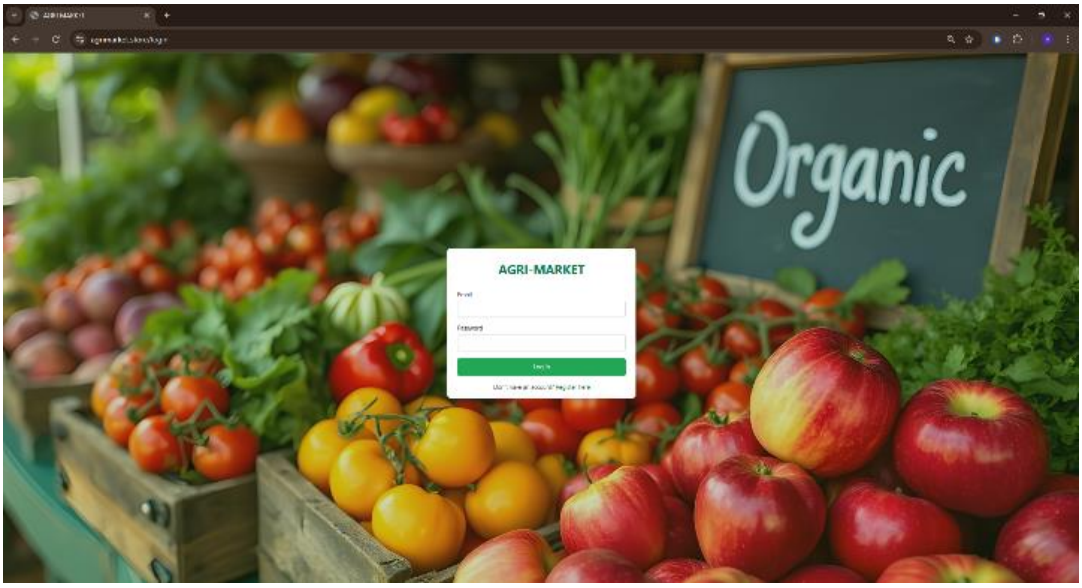



These photos were taken during the system evaluation with the farmers of Barangay Sampao and Barangay Kudanding.


These photos were taken during the system evaluation with the buy and sell business owner.

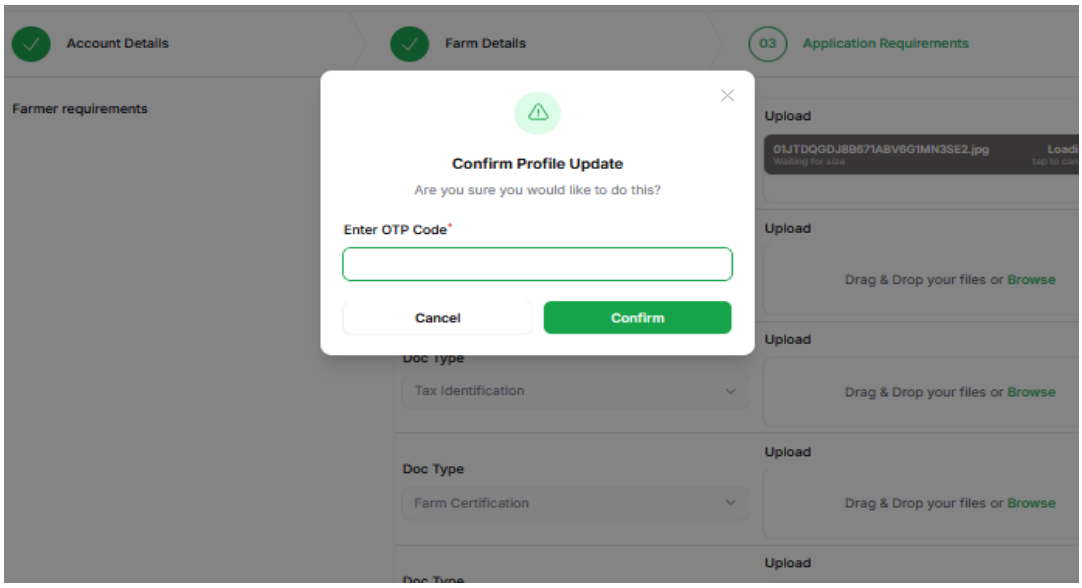
Appendix 11

## SCREENSHOTS



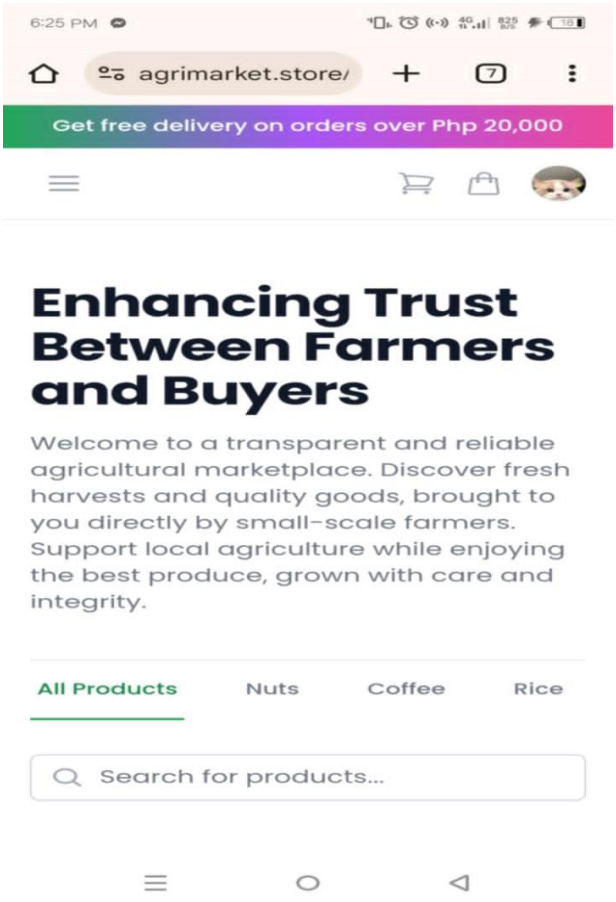

**Login**

The farmers and buyer login form. It allows farmer to login their account



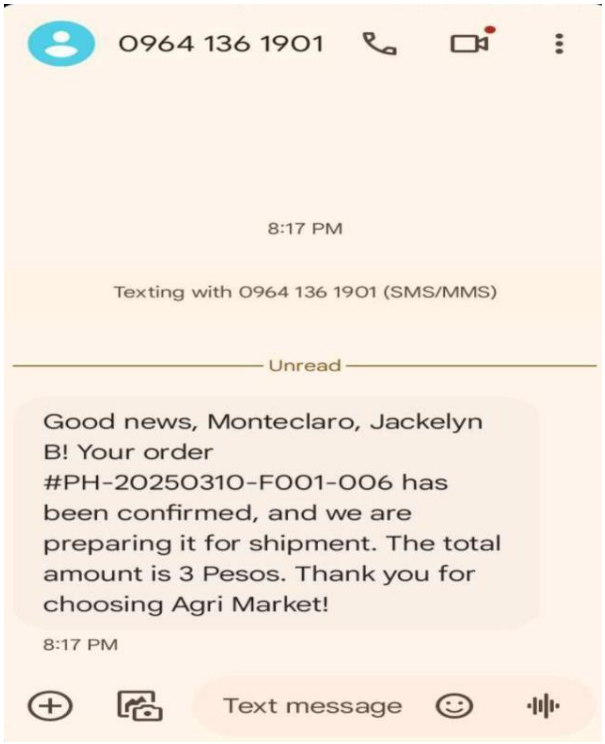

**The Data Security and Integrity**

The data security and integrity. User initiates a profile change, a randomly generated OTP is sent to their registered mobile number via an SMS notification.



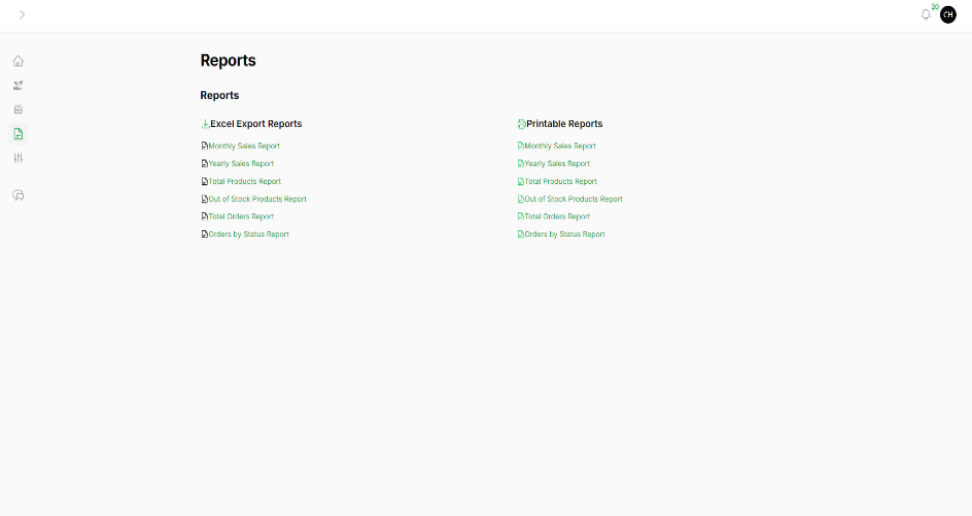

**Mobile Technology on farmers transaction**

The mobile technology on farmers transaction. It allows farmers and buyers to carry out their business activities on their mobile devices or phones.



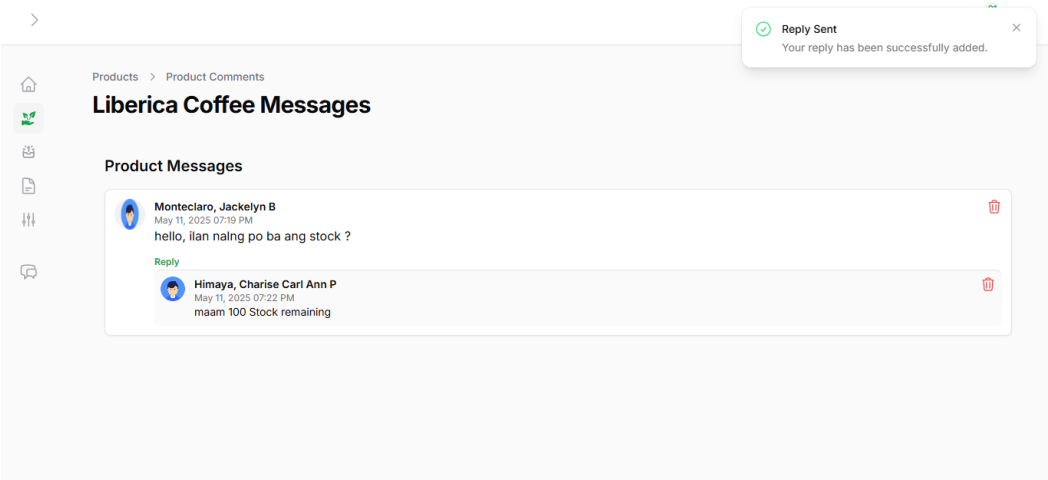

**SMS Notification**

The SMS notification. It allows farmers receive SMS notification for updates.




## Reports

The system have a designed data dashboard, downloadable report and printable report to view reports in graphical format such farmers report, buy and sell owners report, and order list.




## Chat Facility

The farmer and buyer chat facility module. It allows buyer and farmer communicate through its product online.

Appendx 13

## SOURCE CODES

**USER**

```
<?php

namespace app\models;
use filament\panel;
// use illuminate\contracts\auth\mustverifyemail;
use app\models\cart;
use app\models\order;
use app\models\farmer;
use app\models\location;
use illuminate\support\str;
use laravel\sanctum\hasapitokens;
use spatie\medialibrary\hasmedia;
use namu\wirechat\traits\chatable;

use filament\models\contracts\hasname;
use laravel\jetstream\hasprofilephoto;
use illuminate\support\facades\storage;
use filament\models\contracts\hasavatar;
use illuminate\notifications\notifiable;
use filament\models\contracts\filamentuser;
use spatie\medialibrary\interactswithmedia;
use illuminate\database\eloquent\collection;

use laravel\fortify\twofactorauthenticatable;
use illuminate\database\eloquent\factories\hasfactory;
use illuminate\foundation\auth\user as authenticatable;

class user extends authenticatable implements filamentuser, hasname , hasmedia ,hasavatar
 {

    use hasapitokens;
    use hasfactory;
    use hasprofilephoto;
    use notifiable;
    use twofactorauthenticatable;
    use interactswithmedia;
    use chatable;
    public function getfilamentavatarurl(): ?string
    {
        $avatarcolumn = config('filament-edit-profile.avatar_column', 'avatar_url');
        return $this->$avatarcolumn ? storage::url("$this->$avatarcolumn") : null;
    }


    public function getcoverurlattribute(): ?string
    {
      return self::getimage();
    }
    public const farmer = 'farmer';
    public const buyer = 'buyer';
    public const admin = 'admin';

    public const role_options = [
        self::farmer => self::farmer,
        self::buyer => self::buyer,
        self::admin => self::admin,
    ];

    /**
     * the attributes that are mass assignable.
     *
     * @var array<int, string>
     */
    protected $fillable = [
```

```
        'first_name',
        'middle_name',
        'last_name',
        'email',
        'password',
    ];

    /**
     * the attributes that should be hidden for serialization.
     *
     * @var array<int, string>
     */
    protected $hidden = [
        'password',
        'remember_token',
        'two_factor_recovery_codes',
        'two_factor_secret',
    ];

    /**
     * the attributes that should be cast.
     *
     * @var array<string, string>
     */
    protected $casts = [
        'email_verified_at' => 'datetime',
    ];

    /**
     * the accessors to append to the model's array form.
     *
     * @var array<int, string>
     */
    protected $appends = [
        'profile_photo_url',
    ];
    public function canaccesspanel(panel $panel): bool
    {
        return true;
        // return match($panel->getid()){
        //     'admin'=> $this->hasanyrole(['admin']),
```

**ORDER**

```
<?php

namespace app\models;

use app\models\user;
use app\models\farmer;
use app\models\orderitem;
use app\models\transaction;
use app\models\ordermovement;
use illuminate\support\facades\auth;
use illuminate\database\eloquent\model;
use illuminate\database\eloquent\casts\attribute;
use illuminate\database\eloquent\factories\hasfactory;

class order extends model
{
    use hasfactory;


    protected $casts = [
        'order_date' => 'datetime',
        'shipped_date' => 'datetime',
        'delivery_date' => 'datetime',
    ];



    use hasfactory;


    public const pending = 'pending';
    public const processing = 'processing';
    public const confirmed = 'confirmed';
    public const shipped = 'shipped';
    public const out_for_delivery = 'out for delivery';
    public const completed = 'completed';
```

```
    public const cancelled = 'cancelled';
    public const returned = 'returned';

    // status options
    public const status_options = [
        self::pending =>  self::pending,
        self::processing                    =>
self::processing,
        self::confirmed =>  self::confirmed,
        self::shipped =>  self::shipped,
        self::out_for_delivery              =>
self::out_for_delivery,
        self::completed                     =>
self::completed,
        self::cancelled =>  self::cancelled,
        self::returned =>  self::returned,
    ];


    public                                  const
admin_order_manage_options = [
        self::pending =>  self::pending,
        self::confirmed =>  self::confirmed,
        self::shipped =>  self::shipped,
        self::out_for_delivery              =>
self::out_for_delivery,
        self::completed                     =>
self::completed,
        self::cancelled =>  self::cancelled,
        self::returned =>  self::returned,
    ];

    public const if_pending = [
        self::confirmed => self::confirmed,
        self::cancelled => self::cancelled,
    ];



    public const if_confirmed = [
        self::shipped => self::shipped,
        self::cancelled => self::cancelled,
    ];



use
filament\forms\components\textinput;
use filament\notifications\notification;
<?php

namespace app\actions\fortify;

use app\models\user;
use illuminate\support\facades\hash;
use
illuminate\support\facades\validator;
use
laravel\fortify\contracts\createsnewuse
rs;
use laravel\jetstream\jetstream;

class createnewuser implements
createsnewusers
{
    use passwordvalidationrules;


    /**
     * validate and create a newly
registered user.
     *
     * @param   array<string, string>
$input
     */
    public function create(array $input):
user
    {
        validator::make($input, [
            'first_name'    =>    ['required',
'string', 'max:255'],
            'last_name'    =>    ['required',
'string', 'max:255'],
            'middle_name'  =>  ['required',
'string', 'max:255'],
           'phone'        =>        ['required',
'regex:/^9\d{9}$/', 'unique:users'],
            'email'  =>  ['required',  'string',
'email', 'max:255', 'unique:users'],
            'password'        =>        $this-
>passwordrules(),
            'terms'                          =>
jetstream::hastermsandprivacypolicyfe
ature() ? ['accepted', 'required'] : '',
        ])->validate();
```

```
        return user::create([
            'first_name'                    =>
$input['first_name'],
            'last_name'                     =>
$input['last_name'],
            'middle_name'                   =>
$input['middle_name'],
            'phone' => $input['phone'], //
add this line
            'email' => $input['email'],
            'password'                      =>
hash::make($input['password']),
        ]);
    }
}
```

**LOGIN**

```
<x-guest-layout>
    <x-authentication-card>
        <x-slot name="logo">
            {{-- <x-authentication-card-logo
/> --}}
            {{-- AGRI market --}}
            {{--                            <img
src="{{asset('images/agri-
market.png')}}" alt="agir" class="bg-
red-400 h-[200px]"> --}}
        </x-slot>

        <x-validation-errors class="mb-4"
/>


        @if (session('status'))
            <div class="mb-4 font-medium
text-sm text-green-600">
                {{ session('status') }}
            </div>
        @endif

        <div class="flex flex-col justify-
center items-center mt-4 mb-8">
            <p class="text-3xl text-
eucalyptus-700 font-bold">AGRI-
MARKET</p>
        </div>

        <form method="POST"
action="{{ route('login') }}">
            @csrf

            <div>
                <x-label for="email"
value="{{ __('Email') }}">Email</x-
label>
                <x-input id="email"
class="block mt-1 w-full" type="email"
name="email" :value="old('email')"
required autofocus
autocomplete="username" />
            </div>

            <div class="mt-4">
                <x-label for="password"
value="{{ __('Password') }}">Password
</x-label>
                <x-input id="password"
class="block mt-1 w-full"
type="password" name="password"
required autocomplete="current-
password" />
            </div>

            {{-- <div class="block mt-4">
                <label for="remember_me"
class="flex items-center">
                    <x-checkbox
id="remember_me"
name="remember" />
                    <span class="ms-2 text-
sm text-gray-600">{{ __('Remember
me') }}</span>
                </label>
            </div> --}}

            <div class="mt-4">
                <x-button class="w-full flex
items-center justify-center py-3"
type="submit">
                    {{ __('Log in') }}
                </x-button>
            </div>
```

```
        <div class="mt-4 text-center">
            <p class="text-sm text-gray-600">
                {{ __("Don't have an account?") }}
                <a href="{{ route('register') }}" class="text-eucalyptus-700 hover:underline">
                    {{ __('Register here') }}
                </a>
            </p>
        </div>
    </form>
</x-authentication-card>
</x-guest-layout>
```

**SMS**

```
<?php

namespace App\Services;

use Illuminate\Support\Facades\Http;
use Illuminate\Support\Facades\Log;

class SmsService
{
    protected string $apiKey;
    protected string $senderName;

    public function __construct()
    {
        $this->apiKey = config('services.semaphore.api_key');
        $this->senderName = config('services.semaphore.sender_name');
    }

    /**
     * Format the phone number to the +63 standard
     *
     * @param string $phone The phone number to format
     * @return string The formatted phone number
     */
    public function formatPhoneNumber(string $phone): string
    {
        // Remove all non-digit characters
        $phone = preg_replace('/\D/', '', $phone);

        // If starts with 09, convert to +63 format
        if (substr($phone, 0, 2) === '09') {
            return '+63' . substr($phone, 1);
        }

        // If starts with just 9, add +63 prefix
        if (substr($phone, 0, 1) === '9') {
            return '+63' . $phone;
        }

        // If already in +63 format, return as is
        if (substr($phone, 0, 3) === '+63') {
            return $phone;
        }

        // Log error for invalid format
        Log::error('Invalid phone number format: ' . $phone);
        return $phone;
    }

    /**
     * Send SMS via Semaphore API
     *
     * @param string $number The recipient's phone number
     * @param string $message The message to send
     * @return array
```

```
     */
    public function sendSms(string $number, string $message): array
    {
        try {
            // Format the phone number to ensure it's in the correct format
            $formattedNumber = $this->formatPhoneNumber($number);

            $payload = [
                'apikey' => $this->apiKey,  // Include the API key
                'number' => $formattedNumber,
                'message' => $message,
                // 'sendername' => $this->senderName, // Optional sender name
            ];

            // Log the request payload
            Log::info('Semaphore SMS Request:', $payload);

            $response = Http::asForm() // Automatically sets 'Content-Type' to 'application/x-www-form-urlencoded'
                ->post('https://api.semaphore.co/api/v4/messages', $payload);

            $responseData = $response->json(); // Parse JSON response

            // Log the response
            Log::info('Semaphore SMS Response:', $responseData);

            return $responseData;
        } catch (\Exception $e) {
            Log::error('Semaphore SMS Failed: ' . $e->getMessage());
            return [
                'error' => true,
                'message' => $e->getMessage(),
            ];
        }
    }
}


 // $smsService = new SmsService();

    // // Hardcoded number for testing
    // $number = '+639366303145'; // Already formatted correctly for Semaphore
    // $message = $data['message']; // Message entered in the form

    // // Send the SMS
    // $response = $smsService->sendSms($number, $message);

    // // Log the response
    // \Log::info('SMS Response:', $response);

    // // Handle response
    // if (isset($response['error']) && $response['error']) {
    //     FilamentForm::notification('Failed to send SMS: ' . $response['message']);
    // } else {
    //     FilamentForm::notification('SMS sent successfully to ' . $number);
    // }
```

**COMMENT**

```
<?php

namespace App\Models;

use App\Models\Farmer;
use App\Models\Product;
use Illuminate\Database\Eloquent\Model;
```

```
use Illuminate\Database\Eloquent\Factories\HasFactory;

class Comment extends Model
{
    use HasFactory;

     protected $fillable = ['product_id', 'buyer_id', 'farmer_id', 'parent_id', 'content', 'creator', 'is_read'];

    protected $casts = [
        'creator' => 'string',
    ];

    public function product()
    {
                        return $this->belongsTo(Product::class);
    }

    public function buyer()
    {
                        return $this->belongsTo(User::class, 'buyer_id');
    }

    public function farmer()
    {
                        return $this->belongsTo(Farmer::class, 'farmer_id');
    }

    public function replies()
    {
                        return $this->hasMany(Comment::class, 'parent_id')->with('replies');              // Recursive relation
    }

    public function parent()
    {
                        return $this->belongsTo(Comment::class, 'parent_id');
    }

                        public function scopeVisibleToUser($query, $buyerId, $farmerId, $productId)
{
    return $query->where('product_id', $productId)
        ->where(function ($query) use ($buyerId, $farmerId) {
            $query->where('buyer_id', $buyerId) // Show comments for the authenticated buyer
                ->orWhere('farmer_id', $farmerId); // Show all comments to the farmer (product owner)
        });
}

public function scopePrivateToFarmerAndBuyer($query, $buyerId, $farmerId, $productId)
{
    return $query->where('product_id', $productId)->where('farmer_id', $farmerId)->where('buyer_id', $buyerId)
    ;

}



}
```

**REPORT**

```
<?php

namespace App\Http\Controllers;

use App\Models\Farmer;
use App\Models\Order;
```

```
use App\Models\Product;
use Illuminate\Http\Request;
use App\Exports\OutOfStockExport;
use App\Exports\TotalOrdersExport;
use App\Exports\YearlySalesExport;
use App\Exports\MonthlySalesExport;
use App\Exports\TotalProductsExport;
use
Maatwebsite\Excel\Facades\Excel;
use
App\Exports\OrdersByStatusExport;
use
App\Exports\FarmerDocumentsExport
;
use App\Exports\FarmersExport;
use Illuminate\Support\Facades\Auth;
use Illuminate\Support\Facades\DB;

class ReportController extends
Controller
{
   public function
exportMonthlySales(Request
$request)
{
   $month = $request->get('month',
now()->month); // Default to current
month
   $year = $request->get('year', now()-
>year);    // Default to current year

   $monthName = now()-
>setMonth($month)->format('F');
   $filename =
"Monthly_Sales_{$monthName}_{$ye
ar}.xlsx";

   return Excel::download(new
MonthlySalesExport($month, $year),
$filename);
}

public function
exportYearlySales(Request $request)
{
   $year = $request->get('year', now()-
>year); // Default to the current year

   $filename =
"Yearly_Sales_{$year}.xlsx";

   return Excel::download(new
YearlySalesExport($year), $filename);
}


public function exportTotalProducts()
{
   $filename = 'Total_Products_' .
now()->format('Y-m-d') . '.xlsx';

   return Excel::download(new
TotalProductsExport, $filename);
}

public function
exportOutOfStockProducts()
{
   $filename =
'Out_Of_Stock_Products_' . now()-
>format('Y-m-d') . '.xlsx';

   return Excel::download(new
OutOfStockExport, $filename);
}

public function exportTotalOrders()
{
   $filename = 'Total_Orders_' . now()-
>format('Y-m-d') . '.xlsx';

   return Excel::download(new
TotalOrdersExport, $filename);
}


public function exportOrdersByStatus()
{
   $filename = 'Orders_By_Status_' .
now()->format('Y-m-d') . '.xlsx';
```

```
    return Excel::download(new
OrdersByStatusExport, $filename);
}


public function
exportFarmerDocuments(Farmer
$farmer)
{
    $fileName = "{$farmer->user-
>full_name}_{$farmer-
>farm_name}_documents.xlsx";

    return Excel::download(new
FarmerDocumentsExport($farmer->id),
$fileName);
}

// Printable Reports

public function
printableMonthlySales(Request
$request)
{
    $month = $request->get('month',
now()->month); // Default to current
month
    $year = $request->get('year', now()-
>year);    // Default to current year

    // Fetch completed orders for the
given month and year
    $orders = Order::where('status',
Order::COMPLETED)
        ->whereMonth('order_date',
$month)
        ->whereYear('order_date', $year)
        ->with('buyer') // Eager load the
buyer relationship
        ->latest()
        ->get();

    $monthName = now()-
>setMonth($month)->format('F');

    return
view('reports.printable.monthly-sales',
[
        'orders' => $orders,
        'month' => $month,
        'year' => $year,
        'title' => 'Monthly Sales Report',
        'subtitle' => $monthName . ' ' .
$year
    ]);
}

public function
printableYearlySales(Request
$request)
{
    $year = $request->get('year', now()-
>year); // Default to the current year

    // Group orders by month and
calculate total sales and total orders
    $monthlySales =
Order::where('status',
Order::COMPLETED)
        ->whereYear('order_date', $year)
        ->select(
            DB::raw("MONTH(order_date)
as month_number"), // Group by raw
month number

DB::raw("MONTHNAME(order_date)
as month"),     // Use month name for
display
            DB::raw("COUNT(*)
total_orders"),       // Count total orders
            DB::raw("SUM(total)
total_sales")         // Sum total sales
        )
        -
>groupBy(DB::raw("MONTH(order_da
te), MONTHNAME(order_date)")) // Fix
the GROUP BY clause
        -
>orderBy(DB::raw("MONTH(order_dat
e)")) // Order by raw month number
        ->get()
```

```
        ->keyBy('month_number') // Key by the raw month number for consistent indexing
        ->toArray();

    return view('reports.printable.yearly-sales', [
        'monthlySales' => $monthlySales,
        'year' => $year,
        'title' => 'Yearly Sales Report',
        'subtitle' => 'For Year ' . $year
    ]);
}

public function printableTotalProducts()
{
    $farmerId = Auth::user()->farmer->id; // Get the authenticated farmer's ID

    // Retrieve product data for the farmer
    $products = Product::myProduct($farmerId)
        ->with('category') // Include category details
        ->get();

    return view('reports.printable.total-products', [
        'products' => $products,
        'title' => 'Total Products Report',
        'subtitle' => 'As of ' . now()->format('F j, Y')
    ]);
}

public function printableOutOfStockProducts()
{
    $farmerId = Auth::user()->farmer->id; // Get the authenticated farmer's ID

    // Retrieve out of stock products for the farmer
    $products = Product::myProduct($farmerId)
        ->where('quantity', 0)
        ->with('category') // Include category details
        ->get();

    return view('reports.printable.out-of-stock-products', [
        'products' => $products,
        'title' => 'Out of Stock Products Report',
        'subtitle' => 'As of ' . now()->format('F j, Y')
    ]);
}

public function printableTotalOrders()
{
    $farmerId = Auth::user()->farmer->id; // Get the authenticated farmer's ID

    // Retrieve total orders for the farmer
    $orders = Order::where('farmer_id', $farmerId)
        ->notProcessing()
        ->with(['buyer']) // Include buyer details
        ->get();

    return view('reports.printable.total-orders', [
        'orders' => $orders,
        'title' => 'Total Orders Report',
        'subtitle' => 'As of ' . now()->format('F j, Y')
    ]);
}

public function printableOrdersByStatus()
{
    $farmerId = Auth::user()->farmer->id; // Get the authenticated farmer's ID

    // Retrieve orders grouped by status
```

```
    $ordersByStatus = Order::where('farmer_id', $farmerId)
        ->with(['buyer']) // Include buyer details
        ->orderBy('status') // Order by status
        ->get()
        ->groupBy('status'); // Group by status

    return view('reports.printable.orders-by-status', [
        'ordersByStatus' => $ordersByStatus,
        'title' => 'Orders by Status Report',
        'subtitle' => 'As of ' . now()->format('F j, Y')
    ]);
}

public function printableFarmerDocuments(Farmer $farmer)
{
    return view('reports.printable.farmer-documents', [
        'farmer' => $farmer,
        'title' => 'Farmer Documents Report',
        'subtitle' => $farmer->farm_name
    ]);
}

public function exportFarmersExcel()
{
    $filename = 'Farmers_Report_' . now()->format('Y-m-d') . '.xlsx';
    return Excel::download(new FarmersExport, $filename);
}

public function printableFarmers()
{
```

Appendix 13

**DVD**