

# **MAXIMIZING YIELD AND PROFITABILITY: AN ANALYTICS-BASED APPROACH FOR GALERANS ANIMAL RAISERS ASSOCIATION**

A Capstone Project Presented to the Faculty of  
College of Informatics and Computing Sciences  
BATANGAS STATE UNIVERSITY  
The National Engineering University  
Batangas City

In Partial Fulfillment  
Of the Requirements for the Degree  
Bachelor of Science in Information Technology  
Major in Business Analytics

By:  
Angeline S. Aniag  
Angel Joy F. Fancubit  
Pete Andrei A. Suzara

Ria L. Castillo, MSCS  
Adviser

December 2023

## APPROVAL SHEET

This capstone project entitled **MAXIMIZING YIELD AND PROFITABILITY: AN ANALYTICS-BASED APPROACH FOR GALERANS ANIMAL RAISERS ASSOCIATION** prepared and submitted by Angeline S. Aniag, Angel Joy F. Fancubit, and Pete Andrei A. Suzara in partial fulfillment of the requirements for the degree Bachelor of Science in Information Technology major in Business Analytics has been examined and is recommended for acceptance and approval for Oral Examination.

RIA L. CASTILLO, MSCS  
Adviser

Approved by the Committee on Oral Examination with the grade \_of

### PANEL OF EXAMINERS

LLOYD H. MACATANGAY, MSCS  
Chairperson

ROWELL M. HERNANDEZ, DIT  
Member

LIGAYA F. LUTERO, MEM  
Member

Accepted and approved in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology major in Business Analytics

---

Date

PRINCESS MARIE MELO, DIT  
Dean, CICS

## **ABSTRACT**

**Title : MAXIMIZING YIELD AND PROFITABILITY: AN ANALYTICS-BASED APPROACH FOR GALERANS ANIMAL RAISERS ASSOCIATION**

**Researchers : Angeline S. Ania  
Angel Joy F. Fancubit  
Pete Andrei A. Suzara**

**Degree : Bachelor of Science in Information Technology**

**Year : 2023**

**Adviser : Ria L. Castillo, MSCS**

---

### **Executive Summary**

This capstone project introduces Gara Meat Shop, an innovative online platform created to support Galerans Animal Raisers Association (GARA) in the Municipality of Puerto Galera in Oriental Mindoro. The platform uses innovative data analytics to increase meat production and profitability while giving GARA an easy way to market their meat products.

This study's main goal is to address the challenges faced by GARA, such as their restricted market access and lack of resources for data-driven decision-making. Through the use of analytics, Gara Meat Shop assists GARA in

improving their meat production operations, which boosts production and profitability.

Customers can browse and purchase a wide range of locally sourced meat products on the other side. By eliminating middlemen, Gara Meat Shop promotes transparency in the meat market and ensures fair prices. The administrative function of the Galerans Animal Raisers Association within Gara Meat Shop is crucial for managing platform operations, guaranteeing adherence to legal requirements, and aiding customers. The Galerans Animal Raisers Association serves as a facilitator, upholding the platform's integrity and encouraging a collaborative atmosphere for everyone taking part.

The results of this capstone project show how analytics-based strategies have the power to transform conventional meat production into a modern, commercially viable industry. Gara Meat Shop offers a path to increase meat production, profitability, and market access for GARA by serving as a scalable model that can be adapted and used in similar meat production contexts throughout the world.

## **ACKNOWLEDGEMENT**

The authors would like to express their sincere gratitude to the following for providing them with a tremendous opportunity towards another academic milestone that they believe established their scholarly greatness and success:

First and foremost, thanks to Almighty GOD, who guided and supported them in all their endeavors, for the unending love and grace, and who provided the group the insight and motivation, without which this research would not have come to be. Additionally, they would like to express their sincere appreciation to those mentioned below for their unwavering help and support as they finished their studies.

To Mrs. Lanie Palad, our Capstone Project professor, for her assistance and for sharing her knowledge;

To our adviser, Mrs. Ria Castillo, for her time, effort, and patience as we worked on our project;

Thank you to our panelists, Mrs. Ligaya Lutero, Mr. Joshua Abella, and Mr. Lloyd Macatangay, for their suggestions on how to make this project better.

Most notably, we would like to thank our kind and understanding parents for providing the moral, financial, and spiritual support necessary to complete this project.

## **DEDICATION**

The project is sincere and entirely dedicated to everyone.

who helped and guided us as we shaped our future.

To the Almighty God, who is the creator,

the one who created everything, who is also the source of life and love,

To our parents:

who have unwaveringly supported us financially and morally

for the advancement of the study,

To our colleagues,

who we converse with about our daily enjoyment and headaches,

Furthermore, I appreciate our instructors sharing their knowledge with us.

in addition to having the required skills to do the project.

## TABLE OF CONTENTS

TITLE PAGE	i
APPROVAL SHEET	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	v
DEDICATION	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	viii
LIST OF FIGURES	viii
CHAPTER I: INTRODUCTION	
Background of the Study	1
Objectives of the Study	2
Significance of the Study	3
Scope and Limitation of the Study	4
Definition of Terms	6
CHAPTER II: REVIEW OF RELATED STUDIES AND SYSTEMS	
Technical Background	8
Local Related Studies	17
Foreign Related Studies	20
Local Related Systems	28
Foreign Related Systems	32
Conceptual Framework	37
CHAPTER III: METHODOLOGY	
Software Methodology Model	40
Analysis of the Existing System	44
Fishbone Analysis	45
System Boundary	46
Hardware Requirements	47
Software Requirements Specifications	49
Functional Requirements	50
Non- Functional Requirements	51
Constraints	53
Multiple Design	57
Trade-Offs	57

System Design/Architecture	58
Link Architecture	59
Use Case	60
Sequence Diagram	61
Database Design	63
Software Development Tools	64
Operating System	64
Database	66
Subscriptions	66
Testing	67
Testing Procedure	70
Data Gathering	71
Deployment Plan	72
Maintenance Plan	74
Risk Management Plan	75
CHAPTER IV: RESULTS AND DISCUSSION	83
CHAPTER V: SUMMARY, CONCLUSION, AND RECOMMENDATION	
Summary of Findings	88
Conclusions	90
Recommendations	91
BIBLIOGRAPHY	93



## **LIST OF TABLES**

Table No.	Table Name	Page
Table 1	System's Hardware Requirements for Laptop/Desktop	48
Table 2	System's Hardware Requirements for Smartphones	48
Table 3	Server-Side Scripting Languages	53
Table 4	Database	54
Table 5	Text and Image Editor	55
Table 6	Testing Tools	56
Table 7	Multiple Technology Stacks	58
Table 8	Testing Procedures	70
Table 9	Hardware matrix for System Deployment	73
Table 10	Software Matrix for System Implementation	74
Table 11	Identified Risks	76
Table 12	Risk Measurement	76

Table 13	Risk Impact and Likelihood	77
Table 14	Risk Control	77
Table 15	Reviews of Risk and Issues	78
Table 16	Monitoring of Risk and Issues	79
Table 17	Reporting of Risk and Issue	79
Table 18	Project Roles and Responsibilities	102
Table 19	Budget Cost Management Plan	103

## **LIST OF FIGURES**

Figure No.	Figure Name	Page
Figure 1	Popular Database in 2022	13
Figure 2	Gara Meat Shop 's Conceptual Framework	38
Figure 3	Agile Development Model	40
Figure 4	Fishbone Diagram	45
Figure 5	System Boundary	46
Figure 6	Context Diagram	58
Figure 7	Link Architecture	59
Figure 8	Use Case Diagram	60
Figure 9	Sequence Diagram	62
Figure 10	Entity Relationship Diagram	63
Figure 11	Risk Assessment Matrix	80
Figure 12	Gantt Chart	101

# **CHAPTER I**

## **INTRODUCTION**

### **Background of the Study**

Meat has long been a mainstay of human diets and is both a fundamental and culturally significant food item. Because of its abundance of vital elements, including protein, vitamins, and minerals, it is an important part of diets all over the world. As a matter of fact, the meat output in the Philippines has increased at an average annual rate of 3.68%, from 541,458 tons in 1972 to 2.79 million tons in 2021 (Philippines Total output of Meat, 1961-2022 - knoema.com, 2023). The meat industry, which provides year-round access to protein-rich food and significantly boosts the food and agricultural sectors, is vital to the livelihoods of millions of Filipinos. In this market, numerous associations of meat producers have emerged.

Established on July 13, 2021, the Galerans Association of Animal Raisers (GARA) is a Puerto Galera-based meat producer association. It consists of people who also happen to be animal raisers. They raise a variety of animals, including chickens, pigs, and others, and then slaughter them to provide the community with meat.

However, the researchers found out that GARA is dealing with problems in handling the distributions of meat products. With the growth of e-commerce and

the increasing acceptance of online platforms for a wide range of products, the food business has seen a significant transformation in recent years. One well-known segment of the food industry that has grown significantly in the online market is the meat products sector. Online platforms have become a viable means of satisfying the demands of consumers who are looking for quick and easy ways to obtain meat products. In this instance, GARA was being left behind since it uses the traditional marketing approach.

One of the significant challenges faced by GARA is having its production reach limited barangays in Puerto Galera. Since the strategy is traditional, the only people who could be potential clients are those who live close to GARA. Consequently, no chance exists for the entire Puerto Galera community to obtain reasonably priced meat products.

The researchers saw this as an opportunity to support the Galerans Animal Raisers Association (GARA) of Puerto Galera in developing an online platform for GARA and its customers which would be known as the Gara Meat Shop. It aims to automate the traditional marketing strategy in the association and offers convenience, diverse product selection, and transparency through the utilization of analytics.

## **Objectives of the Study**

The main objective of this study is to leverage analytics to design and develop an online platform that optimizes the yield and profitability of the Galerans Animal Raisers Association (GARA), thereby contributing to the attainment of Sustainable Development Goal (SDG) 12.

Specifically, this study aims to achieve the following specific objectives:

1. Build an online platform for Galerans Animal Raisers Association (GARA) which would enable them to:
  - 1.1 view sales reports
  - 1.2 add and delete meat products
  - 1.3 modify product's details
2. Create an online platform that would allow customers to:
  - 1.1 Add to cart and check-out meat products
  - 1.2 view meat products availability
  - 1.3 Pre-Order meat products
3. Develop a platform that utilizes analytics through dashboard. Thus, providing the Galerans Animal Raisers Association (GARA) with improved transparency and the customers with up-to-date details on product availability and cost.

## **Significance of the Study**

The study on developing an online platform for GARA of Puerto Galera, which is now known as Gara Meat Shop, holds significant implications for

GARA, various establishments, and the town itself. With the increasing number of e-commerce platforms and advancements in technology, most people today prefer a more effortless and convenient way of doing things, which makes online marketplace for meat products increasingly relevant. The development of Gara Meat Shop provides a user-friendly platform that is easy to access and utilize, catering to the evolving needs of consumers in the present day.

Furthermore, this study contributes to the advancement of Sustainable Development Goal (SDG) 12, which seeks to ensure sustainable consumption and production patterns. By developing an online platform for meat products, the study supports the growth of the local economy while promoting sustainable development.

Addressing the major issue with the manner that meat products are now sold and bought is the existence of intermediaries. The study offers a direct selling procedure from GARA to customers, which lessens the need for middlemen. Customers can buy meat products at reasonable prices using the proposed approach.

Overall, this study significantly impacts GARA, customers, and the town of Puerto Galera by developing a user-friendly online platform. The development of Gara Meat Shop results in more sales, greater profitability, and more reasonably priced meat products, all of which help the town's economy expand. GARA is provided with transparency through the analytics that the platform would employ.

## **Scope and Limitations of the Study**

The study aims to design and develop an online platform that optimizes GARA's yield and profitability while providing transparency through leveraging analytics. The platform allows GARA to create their profiles and upload information regarding a wide range of meat products.

The study commences with an overview of an online platform for meat products and its importance for GARA and its users. The review of related literature covers studies about the online platform for meat products and existing systems similar to this. The project explores how the online platform for meat products offers several advantages over traditional methods of selling and purchasing goods, including increased profit and improved decision-making and transparency.

The study offers an online platform on how GARA may utilize analytics to keep track of the data and help them in their decision-making. Furthermore, the platform aids in reducing intermediaries, which is a significant concern for selling and purchasing meat products. The project explores how eliminating intermediaries might lead to greater profits, affordable meat products, and local economic growth.

The project involves a comprehensive review of literature, case studies, and interviews with experts in the field. Credible sources such as academic journals,

books, and research papers serve as the foundation for the review of the literature. The project culminates in the design and development of an online platform that addresses the issues faced by GARA and its customers in Puerto Galera.

The study is limited by the scope of its focus, the system only sells meat products, such as native chicken meat and pork. The adoption of the platform might be constrained by the accessibility of technology and internet connectivity. Additionally, maintaining the consistency and quality of the products sold through the platform may present difficulties. Producers may have to work harder to manage the products well. Furthermore, the development of an online platform for meat products requires significant resources and time to produce the desired results for the client.

### **Definition of Terms**

This section defines and clarifies the key terminologies associated with developing the online platform for GARA's meat products. A better understanding of the specific terms would be established by providing both operational and conceptual definitions.

**Framework.** It is referred to as the system's architecture and is made up of the code itself as well as functionalities that were created especially for the system.

**Intermediaries.** People who act as a link between customers and producers.



**Galerans Animal Raisers Association (GARA) - Puerto Galera.** It is a private sector under the government that is based in Puerto Galera, Oriental Mindoro which provides help to the meat providers to sell goods as a product of the organization.

**Online Hosting Service.** It is referred to as a service offered by web hosting companies that enable the entire system to be published and implemented online on the Internet and grant the system its unique domain.

**Online Listing.** It is referred to as the collection of available goods that are listed in an online store and are available for purchase.

## **CHAPTER II**

### **REVIEW OF RELATED STUDIES AND SYSTEMS**

This chapter presents relevant literature and systems from both domestic and international sources that the researchers considered when arguing for the significance of the current study. In order to properly comprehend the research and improve comprehension of the study, it also presents the synthesis of the art.

#### **Technical Background**

This section discusses the technical concepts and principles relevant to Gara Meat Shop and gives a fundamental understanding of the underlying technologies and principles that enable the development and execution of the suggested solution.

#### **E-commerce**

The system to be developed mainly deals with implementing a Gara Meat Shop. To adopt change, to properly utilize and apply electronic commerce (also known as E-commerce) for the advantage of its intended users, this notion must be understood. According to the study by AseanUp (2019), the Philippines, the second-most populous nation in Southeast Asia, is a sizable and quickly expanding market for e-commerce. With a digital population of over 67 million people and low-income but strong growth, the Philippines attracts both local and regional businesses that compete with a dominant player. The concept of Electronic Commerce is explicitly implemented in the Agri-Galera Online Platform to

improve and innovate the business of the local farmers of Puerto Galera, Oriental Mindoro. The operations of processes of the store can be more efficient and easier to access by the customers through desktops or smartphones. It would have a huge impact on the local farmers to innovate their sales performance as new opportunities and methodologies are offered by the system.

### **Web hosting**

Deployment of the system over the Internet is highly required since this was an Online Platform. It means that the System needs a web hosting service that can provide and host the system on the internet to access it online. Web hosting service is a service commonly provided by hosting companies at a certain fee relative to the client's desired plan that accommodates and meets the needs of the system deployed system. Subsequently, by availing of the desired plan, the hosting company would host the client's system, a web application, to permit all of its users to access it over the internet.

### **HTML**

The system must be coded in a markup language that is supported by web browsers and web explorers because it is a web application. Since Hypertext Markup Language is the common markup language used to create web pages, this is where it comes into play. In a review paper that was just released, Sharma (2019) reviewed HTML, in particular HTML tags, and claimed that it is the markup language that is primarily utilized to create web pages. According to the

report, HTML is used to describe the structure of online pages in a language that web browsers can read, understand, and display. Technically speaking, HTML is a language with a particular collection of tags and grammar that have various characteristics and features. Because these sets of tags and syntax are the only ones that browsers can comprehend, their proper and effective use would enable the system's developers to design a system that satisfies the needs of its user.

## **CSS**

To create the system for displaying HTML elements, a style sheet language is also required. Cascading Style Sheets (CSS) are useful in this situation. CSS is in charge of formatting HTML elements so that they appear as intended on screens. As per the study by Sharma (2019), CSS is a design that displays the HTML design on the system. Additionally, it enables the web page's content and layout to be kept separate for the developer. As a result, employing CSS and comprehending its functioning enables the system's developer to effectively manage the layout of the web page to be created and design it so that it satisfies the needs of the intended consumers.

## **JavaScript**

Another language employed by the system is JavaScript. It is a client-side scripting language for browsers that enables developers to create dynamic content. According to Jordana (2023), JavaScript is a scripting language for creating dynamic web page content. It creates elements for improving site visitors'

interaction with web pages, such as dropdown menus, animated graphics, and dynamic background colors. Additionally, unlike most programming languages, it is an interpreted language that is used at runtime rather than being pre-compiled into bytecode. Another goal of this language is to alter the real-time behavior of a function, method, or application written in a different language. This enables the system's creators to fully satisfy the needs of their users by maximizing the system's ability to be modified and customized during design and development.

## **PHP**

The Hypertext Preprocessor (PHP), formerly known as Personal Home Page, is another scripting language utilized in the creation of the system. Another scripting language that is primarily used for web development is PHP. Because PHP is a server-side scripting language, it can only be deployed and interpreted on a server that already has PHP installed on it. To provide features for the web page, it may also be integrated into HTML sites. (Sheldon, 2023) stated that for server-side scripting, PHP is added to a webpage to generate dynamic content when the page is accessed through a client browser. The web server runs the script before transmitting the page to the browser. To support this process, the web server requires PHP to be installed on the server, along with a PHP parser -- either a Common Gateway Interface (CGI) parser or a server module.

Furthermore, PHP offers security by only sending the HTML and output that has already been processed through the server using PHP, in contrast to

HTML and JavaScript which run client-side. This makes PHP the perfect choice for procedures that require security, such as system implementation, in this case, an online store.

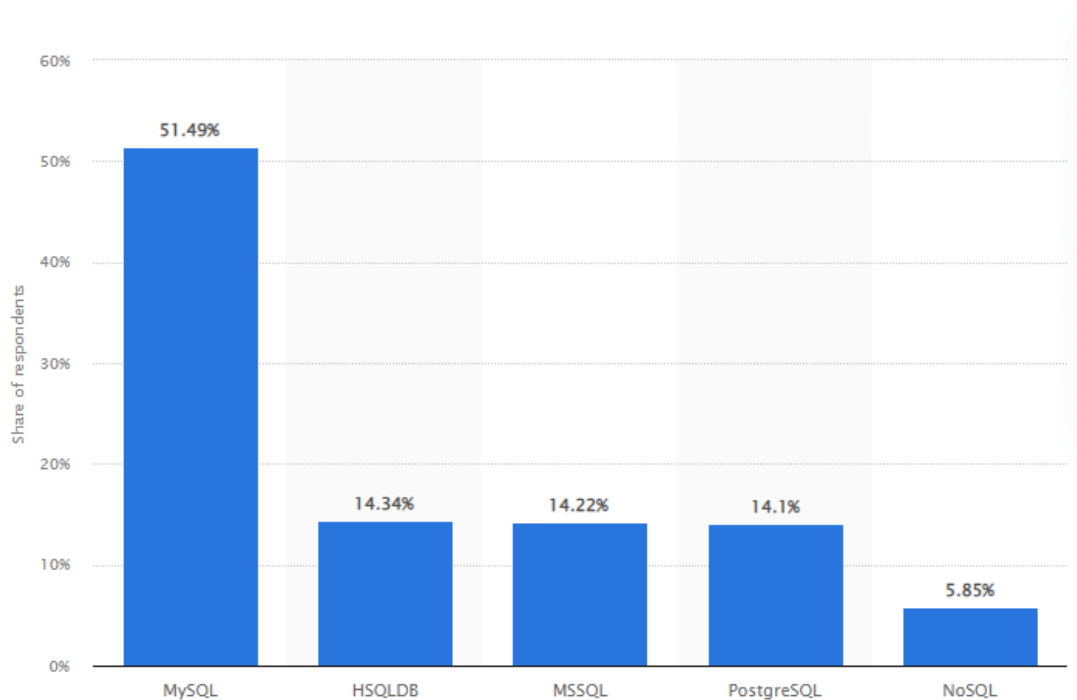
### **Bootstrap 5.0 Framework**

In the system, it is also clear that a CSS framework has been implemented. This must be suitable for reading on each platform, as the system is accessible via a variety of gadgets, from smartphones to desktop PCs. The Bootstrap framework becomes apparent in this situation. According to Inouye (2022), Numerous developers feel as though they are reinventing the wheel when they need to construct the most basic elements of a website. Bootstrap gives you everything you need to design a clean, effective site out of the box. It is planned that this would be completely accessible and available on whatever device that consumers choose to access and use the system on.

### **MySQL**

MySQL is a popular database technology used for ecommerce platforms. It is secure and scalable, making it ideal for businesses of all sizes. It is also fast and can be integrated with many other technologies, making it a powerful database platform no matter the size of the company (Clarity, 2020).

According to Kathuria (2022), MySQL is a well-liked SQL database for web applications given its maturity and open-source nature. In fact, has been in the top of many ranked lists for a long time as shown in the Figure 2



*Source: Statista*

*Figure 1. Popular Database in 2022*

Figure 1 demonstrates that, with more than 50% of respondents choosing it, MySQL is the most widely used database in 2022. HSQLDB, MSSQL, and PostgreSQL were chosen next with nearly identical percentages, and NoSQL came in last with only 5.85% of the respondents choosing it.

## **XAMPP**

The acronym XAMPP is made up of the letters X for Cross-Platform, A for Apache, M for MySQL, and Ps for PHP and Perl, respectively. It is an open-source

collection of online solutions that contains the Apache server, MariaDB, PHP, and Perl modules along with command-line executables for a variety of servers.

Before releasing a website to the primary server, XAMPP enables a local host or server to test its website and clients via desktop and laptop PCs. It is a platform that offers an appropriate setting for testing and confirming the operation of projects based on Apache, Perl, MySQL, and PHP through the host's system.

### **Visual Studio Code**

A tool that allows developers to enter the whole syntax and code necessary to build the system itself is required for system development. The software called Visual Studio Code becomes apparent in this situation. VS Code is a code editor that supports several languages used for web development, including JavaScript, PHP, CSS, and more. This is why the developers choose to use it even though there are many software programs available for editing and creating codes. The usage of VS Code's accessible extensions, which enable program editing and creation in any programming language, makes it possible. Due to its customizability and ability to change multiple types of code, it provides the necessary versatility. The system's developers can write and build the desired system using this program thanks to the features and functionalities of VS write.

In line with the e-commerce integration to the system's beneficiary, it also necessitates that its target user has fundamental competencies such as computer literacy, correct navigation, and understanding of software and systems to optimize



the system's possibilities. The system's users are guaranteed to receive quality service and effective system usage if they can use all of the system's features and functionalities. Through orientation and training designed specifically for the system's target user, namely the store staff that uses the system, these abilities and comprehension can be attained. This makes it possible for the person using it to fully utilize all of the system's resources by making the capacity of the system evident to users.

### **eCommerce testing**

According to Khandelwal (2023), eCommerce testing is the process of evaluating the functionality and sanity of various eCommerce website components, including design, specifications, functionalities, pages, and features, to make sure they won't adversely affect the site's performance in any way. Testing, when done effectively and consistently, may greatly boost conversions while also enhancing the overall experience of site users.

The Galera Agri Online Express undergoes various testing methods one at a time. First is the functional testing, which ensures that all the platform's features behave as they should and as required. Second, usability testing is the process of assessing a product or service using real users. Typically, participants attempt to execute standard tasks during a test while observers watch, listen, and take notes. The purpose of this study is to evaluate the product's usability, gather qualitative and quantitative information, and assess participant satisfaction. Lastly,

performance testing determines how the speed, scalability, and stability of the platform handle a given load.

Some of the features of the Galera Agri Online Express that undergo testing are search and navigation, homepage design and features, product pages, shopping cart and checkout process, and site performance across devices.

### **Sustainable Development Goal (SDG) 12**

SDG 12 focuses on ensuring sustainable consumption and production patterns (Mowery, 2021.). The design and development of Galera Agri Online Express can contribute to the achievement of SDG 12 by providing analytics that could aid GARA in their decision-making.

### **Agile Software Development Methodology**

Agile methodology is a method of project management mainly applied to the creation of software. It is applied in situations where consumer collaboration with self-organizing, cross-functional teams leads to the emergence of requests and solutions. The concepts of the Agile methodology place a high importance on adaptability and flexibility. Agile focuses on empowering teams to deliver in manageable chunks to improve responsiveness to shifting business needs. It is developed as a response to the shortcomings of conventional development approaches like the Waterfall method, drawing on the values and concepts of the Agile Manifesto. Due to software's ability to be updated regularly, the market for

software products is extremely competitive. This means that, in order to stay competitive, developers must constantly innovate and enhance their products, and the linear, sequential approach of the Waterfall method just isn't cutting it (Muslihat, 2018).

### **Local Related Studies**

In the present world, adaptation to every technical progress it gives is a requirement for development. In this situation, farmers must learn about the use of technology in contemporary commerce with the help of concerned governmental agencies. According to Secretaria (2019), as the cybersphere grows, so do market demands. Farmers must be introduced to the internet in order to meet these demands. Thanks to the development of e-commerce platforms, farmers may now sell to anyone, anywhere.

According to the research conducted by Llanto (2019), traditional marketing systems in the Philippines are inefficient, with high transaction costs, restricted market access, and low pricing transparency. Such inefficiencies result in bargains for producers and high costs for consumers, causing a market imbalance that impedes agricultural growth. In line with this, Santos et al. (2021) did research to investigate the viability of web-based agricultural stores in promoting sustainable agriculture and increasing farmer income in the Philippines. They discovered that the usage of web-based platforms had a favorable influence on farmer income and the promotion of sustainable agriculture methods. Furthermore,

the study discovered that web-based agricultural stores provide an efficient way for farmers to sell their products directly to customers, removing the need for intermediaries who frequently take a major amount of the farmers' income.

The study of iPrice Group (2021) gives insights into the present condition of e-commerce in the Philippines, including the factors that drive e-commerce adoption among Filipino customers. The study, based on data from over 1,000 online consumers in the Philippines, examines customer behavior, payment choices, and the influence of COVID-19 on e-commerce. According to the study, convenience and affordability are the most important reasons driving e-commerce adoption among Filipino customers. Furthermore, the study emphasizes the significance of confidence and safety in online transactions, with 48% of respondents referring to security concerns as a major barrier to e-commerce adoption. The study anticipates that e-commerce usage in the Philippines would continue to expand, due to the rising availability of low-cost cell phones and internet connection. Additionally, in the study of Cagas and Panolong (2019), it is shown that perceived utility, convenience of use, and trust are important variables influencing SMEs' adoption of e-commerce in rural regions. It underlines the necessity of government assistance and infrastructure development to encourage rural e-commerce adoption, as well as the need for capacity-building initiatives to improve SMEs' digital literacy and abilities. However, Tadeo and Baliuag Jr. (2021) sought to identify the variables influencing agricultural producers' adoption

of e-commerce in the Philippines in this study. According to the findings, perceived ease of use and utility have a considerable effect on e-commerce adoption, implying that farmers are more likely to utilize e-commerce if they believe it to be easy to use and beneficial. Furthermore, farmers who saw larger benefits from e-commerce adoption were more likely to use it, whereas farmers who felt higher costs were less likely to use it.

In order to manage its economic recovery following the Covid-19 outbreak, the Philippines continues to rely on e-commerce and the digital economy. In the middle of the pandemic, the e-commerce industry in the Philippines has experienced a boom as lockdown measures have hurt brick-and-mortar enterprises. The Philippines recognizes the value of e-commerce and the digital economy as major drivers of growth and economic recovery as a result (Hani, 2021). An analysis of So (2019), specifically targeting Filipino consumers, found that Filipinos prefer to purchase online due to the various benefits, including ease, time savings, and product diversity. As a result, the way Filipino customers buy online and the variables that motivate them to do so impact the marketing, entrepreneurship, and business community's tactics for using the internet to promote their products and services. Filipino shoppers have certain purchasing habits in their lives. Various personal, social, cultural, and psychological factors can significantly influence a consumer's behavior. These characteristics significantly impact online shopping behavior, shaping consumer product choices

and aiding marketers, business owners, and other professionals to grow their market share and profitability.

"Assessing the Potential of E-commerce for Agricultural Development in Mindoro: A Case Study of Selected Municipalities" by Santos and Garcia (2021) analyzes the possibilities of e-commerce in improving Mindoro's agriculture economy. The study examines the present condition of e-commerce adoption among farmers and companies in Mindoro's chosen communities. The authors highlight the opportunity of e-commerce to increase access to markets and profitability for smallholder farmers in Mindoro, and they urge more study into the use of e-commerce platforms for agricultural development. In this study, the researchers are developing the Gara Meat Shop, which seeks to address the challenges faced by the GARA in Puerto Galera in utilizing the traditional marketing strategy. Consistent with the studies, the platform is offering a range of advantages to both GARA and consumers, including time savings, ease of use, and a choice of products. The success of Galera Agri Online Express highlights the potential of e-commerce to improve smallholder animal raisers' access to markets and profitability while also advancing Puerto Galera's agricultural private sector.

### **Foreign Related Studies**

A study by Bhatti and Rehman (2019) shows that internet shopping is a phenomenon that is snowballing nowadays. Online stores give us the power to buy items around the clock and provide a new level of purchasing experience. There is

no more innovative way to purchase knowledgeable items, such as e-books, which are automatically available to consumers as the order is made. In fact, the study of Zhang & Berghall (2021) revealed that e-commerce is expanding quickly and has reached practically every industry. Due to its extreme fragmentation, agriculture is considered to be promising. E-commerce has many advantages, including the fact that it encourages market transparency and price discovery, increases the flow of agricultural products and development, makes communication easier and results in better experiences. In conclusion, there are several advantages to e-commerce for the agriculture industry, which have been optimistically forecasted for possible success in the AE field. Consumers are significant contributors to and primary users of the e-commerce sector, thus determining what makes them accept and want to utilize e-commerce services is another rising topic. Terms or situations like customer satisfaction, customer relationship management, or consumer shopping behavior (Wang et al., 2019) are only a few examples.

The analysis of Revinova (2021) shows that e-commerce is linked to 10 of the 17 UN Sustainable Development Goals. These outcomes are largely favorable. To have the biggest influence, though, both Internet businesses and users must be interested. Experts claim that e-commerce has made the biggest contribution to achieving goals 12 and 13, which are interconnected. Sustainable production and consumption strive to do more with fewer expensive resources. They also want to

increase resource efficiency, encourage more sustainable lifestyles, and break the link between economic expansion and environmental damage.

The analysis of Gomathy et al. (2021) confirms that E-commerce would help the farmers in a way that they achieve some profits for their hard work. The Ecommerce System is needed to improve farming in rural society to make them aware of crops and their market prices. This type of system is also helpful for the government to get the proper information about the crops available in their respective areas. The study has predicted that the development and transformation of E-commerce is a creative way of controlling and market access for smallholders. E-commerce platforms can assist farmers in selling their goods at more excellent prices, according to a study published by Wang et al. (2020). The study examined information from an online farmer's market in Indiana and discovered that, on average, farmers who sold their wares received 22% more money than they would have from regular calls. This occurred due to e-commerce platforms, which enable farmers to sell their goods directly to customers and cut out intermediaries who often take a part of the earnings. Farmers can negotiate better pricing and save money by dealing now with consumers rather than through intermediaries. E-commerce platforms can also give farmers access to new markets, enabling them to peddle to a larger audience and drive-up demand. Moreover, E-commerce can increase the number of marketing channels available to a company, as it offers year-round product availability and a steady presence. It



can also be used to suggest other or related products to customers who are one-time visitors or those who are unable to regularly visit (Cornelisse, 2023). The web-based system is an opportunity for businesses to market their goods or services innovative and modernly through technology (Dewi et al., 2021),

Furthermore, digital ecosystems in agriculture can lead to more environmentally friendly and sustainable farming practices (Sobirov et al., 2022). For instance, the application of machine learning and data analytics can assist farmers in making better decisions about crop management, resulting in a decrease in the usage of hazardous chemicals and pesticides. Digital ecosystems can also aid in enhancing agriculture's supply chain management. Digital ecosystems can aid in optimizing agricultural product distribution and transportation by offering real-time crop yields, quality, and logistics data. It may result in lower expenses, less waste, better traceability, and increased food safety. It may be applied to the current System of the developers working. Online shopping is significant today as the world transitions into the digital age and relies more on technology and the Internet. Most people today prefer a more effortless and convenient way of doing things, making online shopping relevant. The System, the developers, were working on allows consumers to buy directly from the seller without any third person on an internet browser.

The report by UNCTAD (2018) explores the potential opportunities and challenges of e-commerce for agricultural trade in developing countries. The

report discusses the benefits of e-commerce for agricultural trade, such as increased market access, reduced transaction costs, and improved supply chain efficiency. It also identifies the challenges faced by farmers in developing countries, such as limited access to technology and infrastructure, low levels of digital literacy, and lack of trust in e-commerce platforms.

However, it was revealed in the study of Sambhudas et al. (2018) that whether or not the supply chain's market participants are engaging in the E-commerce service platform, the internal business operations of the market organizations would be expanded to include management of the circulation of agricultural products. to the entire fruit and vegetable supply chain process. The E-commerce service platform can be used to implement supply chain management to coordinate the production and distribution of fruits and vegetables, reduce the time needed for distribution, and more benefits can be obtained.

Website analytics can be used to track customer purchases and product sales, and to adjust and enhance customers' online experiences (Cornelisse, 2023). The review conducted by Zhang et al. (2020) gives a thorough review of the current level of research on the use of big data analytics in agriculture. The report shows how big data analytics have been utilized to increase agricultural output and profitability in a variety of scenarios, including precision agriculture, crop management, and supply chain management. In the Big Data space, predictive analytics is becoming more and more popular. E-commerce companies can better

understand client preferences and habits thanks to predictive analytics. By executing focused campaigns, developing individualized suggestions, directing targeted promotions, and improving pricing models, it can assist e-commerce enterprises in increasing sales and conversions (IQLECT, 2018). Nowadays, with the vigorous development of e-commerce, Internet Finance and other business, a large amount of e-commerce data, transaction data and payment data of agricultural products are growing day by day. How to collect, store, analyze, process, retrieve and effectively utilize the value of these data, create benefits, and build core competitiveness are the challenges and opportunities. faced by current agricultural products e-commerce. When users use the agricultural products ecommerce platform to complete their business, the platform would record their trajectory of action, and the agricultural products e-commerce platform has comprehensive data information. Agricultural products e-commerce data includes browsing, purchasing and consumption records of all registered users, users' evaluation of commodities, and trading records of platform merchants, product trading volume, inventory, logistics information, and credit information of merchants, etc. It is necessary to apply big data technology to the in-depth analysis and utilization of this massive data (Chao & Defu, 2019). In line with this, Venkatesan et al. (2019) present a data-driven agricultural decision support system (ADSS) that may assist farmers in making educated crop management decisions. The ADSS analyzes agricultural data and makes crop management suggestions

using various data analytics approaches such as data mining, predictive modeling, and machine learning.

In the study of Wang et al. (2022), it was revealed that the development of rural e-commerce has great significance in promoting the transformation of the agricultural industry, activating the potential of the rural economy and enhancing farmers' income. According to the study of Gupta and Sharma (2018), 58 percent of the population in India depends on agriculture, with 80 percent of those being marginal and small farmers. In the study of Joshi and Pandey (2019), it was revealed that Indian agriculture is impacted by e-commerce, or online buying and selling. Consumer convenience improves, farmers have a broader market to sell into, and there may be better prices as a result of e-commerce. By evading conventional intermediaries like wholesalers and intermediaries and selling straight to customers, as offered by e-commerce, farmers can increase their revenues.

It was stated in the study of Liu (2022) that natural resources are abundant in China, where the majority of the country's unique agricultural goods are produced. However, the central listing of agricultural products would result in unsalable sales and price drops, which would result in significant economic losses for farmers and a significant decrease in their income due to the traditional sales channels' inability to sell agricultural products on time, as well as high distribution costs and poor sales of agricultural products. Positivity: Since people can now

easily acquire the products they want without ever leaving their homes thanks to the rapid delivery industry, e-commerce has grown in popularity. A crucial element of agricultural e-commerce is the trading platform for agricultural products because it has the potential to increase efficiency and cut costs. The research entitled "Research on E-commerce Strategy of Agricultural Products of Our Province under the Background of "Internet Plus" conducted by Wang (2018) reveals that Hunan Province has achieved a leading position in e-commerce development and construction in China due to the increased demand for fresh agricultural goods. The e-commerce platform doubles as a tight quality control system and connects supply chain links. It also supervises and controls the spot, growth, and processing procedures of agricultural products, ensuring the establishment of the credit system. Big data analysis can be done using e-commerce on customer order sales models to determine consumer preferences.

The study entitled "Online Sales: A Direct Marketing Opportunity for rural forms?" by Hara and Low (2020) mentioned focuses on how direct-to-consumer (DTC) farms, mainly rural farms, can compete with people making online food purchases. According to the study's findings, online marketplaces could lower in-person DTC transaction costs associated with searching for and traveling to potential customers and increase access to customers for remote farms. The study also discovered that while new metropolitan farms are less likely to have them, rural farms remote from urban counties new to DTC marketing are more likely to

have online markets than seasoned rural farms. It shows that rural farms may find reaching clients through Internet marketplaces easier than urban farms.

A review about e-commerce sites for agriculture conducted by Nayak (2019) offers a summary of numerous methods for the e-commerce platform to guarantee the farmer's exact profitability or to earn their goods at the moment's market. Several tactics used in this paper are chosen based on the technology used for implementation. It also provides insight of the key requirements to create the website and identify the missing sites and is developing an implementation plan.

In this study, the researchers would utilize analytics in developing Gara Meat Shop. According to the studies, the platform's analytics would enable animal raisers to better understand customers' choice and habits. Thus, resulting in their better decision-making when it comes to meat production. As a result, it helps to meet SDG 12, which assures sustainable production and consumption patterns while fostering local economic development.

### **Local Related Systems**

The Philippines' Department of Agriculture (DA) recently introduced Deliver-E, an integrated end-to-end e-commerce platform for agriculture and food items. The project's principal objective is to use new economic models to boost Philippine food production and guarantee supply stability for essentials and premium commodities. MSMEs, farmers, and farmers' cooperatives would benefit from Deliver-E's assistance in selling their goods to customers directly. By

eliminating "middlemen" who can drive down the price of agricultural products on the market, this can raise farmers' incomes. Deliver-E also seeks to construct a dashboard that would allow the government to collect and analyze real-time data to help with policy making, as well as efficient methods for the transportation and distribution of agricultural products. InsightSCS created the platform, which was initially intended to assist farmers in the Cordillera Administrative Region, Cagayan Valley, Central Luzon, and Bicol at the height of the epidemic when the supply chain was severely hampered by constraints (Komorek, 2020). Subsequently, the nation's DA also released the AgriKonek app, an online marketplace and inventory tool that aims to empower farmers and fishers by giving them the tools to effectively manage their agri-fishery businesses. Farmers and fishermen can more efficiently take control of their output with the AgriKonek by keeping an eye on inventories, keeping track of changes, and removing inefficiencies to better manage production costs. The app would assist them in creating their own brand and digital market. Additionally, the 'Farmer's Dashboard' feature of AgriKonek enables farmers and agribusiness owners to manage their production inventory and keep tabs on their production costs (Department of Agriculture- Agricultural Credit Policy Council, 2021).

Another system was named Fish 'n Chix (2020), as a result of the COVID-19 outbreak, there was an increasing demand for food supplies to be sent to residences in Metro Manila. People were not able to move out of their homes

and access fresh food supplies because of the Enhanced Community Quarantine measures in place. Fish 'n Chix is an online platform that gathers food supplies from trustworthy sources, such as fish farms, seafood marketplaces, farms for chicken and beef, processors, and importers, and delivers customers with high-quality, fresh products right to their door. To guarantee that the supply is current and safe for use, the company makes the most of its facilities, network, and resources. Overall, Fish 'n Chix accepts responsibility for providing consumers with high-quality food supplies during difficult periods when it is challenging to get fresh food supplies. The business makes it simple and convenient for consumers to get fresh and high-quality food goods by using an online platform that is accessible through laptops, tablets, and mobile phones. These products are delivered right to customers' homes.

A system named PICKAROO was created by Gonzalez and Tan (2020), the developers of the system's goal is to assist local producers and small farmers in the Philippines to sell their goods online so they may gain access to a larger market and competitive prices. Also, the platform features a wide range of products, including fresh fruits, vegetables, meat, and seafood, all sourced directly from local farmers and producers. The products are offered at competitive prices, and customers can choose from a variety of delivery options, including doorstep delivery or pickup at designated PICKAROO locations. But the main function of PICKAROO is to connect farmers and producers with consumers, thereby creating



a more sustainable and equitable food system. The platform allows farmers to reach a wider audience, sell their products at fair prices, and reduce waste by selling directly to consumers. However, an app called Session Groceries Farm to Table's focus is on selling fruits and vegetables that are obtained from Filipino farmers. It connects local farmers with consumers to support local agriculture, encourage a sustainable lifestyle, and inform the community about the advantages of eating freshly farmed food close to home. They distribute in and around Benguet, Rizal, Laguna, Cavite, and NCR. accessible for both online and cash-on-delivery payments. Customers can order everything from vegetables to rice and any other regional produce in between directly from the farmers, and they can have it delivered to their homes (Villareal, 2020).

Another system was created by Team Agriviz in 2018 known as e-Magsasaka. It is an online portal whose primary goal is to address challenges faced by farmers in the Philippines. Farmers may engage directly with their buyers via e-Magsasaka, lowering production costs by removing the need for intermediaries. Some of the features of e-Magsasaka include: a farming calendar where farmers may monitor daily duties, an updated inventory display, product price tracking, and a means to interact with suppliers and customers (Asian Institute of Management, 2018). Quadra-Balibay (2019) added that it is an online portal which offers fruits and vegetables directly from farmers' harvests to buyers.

The new website shortens the mass produce supply chain by directly connecting farm mass producers and buyers.

The system proposed by Parsa et al. (2021) enables farmers to establish connections with numerous potential customers interested in buying their commodities. With additional options, farmers can select the buyer who offers the best terms and price, enabling them to receive a fair wage for their labor. This seeks to address the problem faced by the farmers who are dependent on local traders for the disposal of their farm produce, which is sold at a very low price.

One more system is FarmNow, an e-commerce platform for Philippine agricultural goods. It includes services such as product catalogue, order management, payment processing, and customer feedback. The platform increased agricultural market efficiency by lowering transaction costs, boosting market access, and enhancing pricing transparency. Policymakers and stakeholders, according to the researchers, should encourage FarmNow adoption through capacity-building initiatives and regulatory incentives. According to the study, web-based farm stores have the potential to increase the efficiency and competitiveness of the Philippine agriculture industry (Corpuz et al., 2020).

### **Foreign Related Systems**

An e-commerce platform for smallholder farmers was proposed by Chavan et al. (2018). Farmazon, the platform, includes capabilities such as goods listing, electronic payment, tracking of orders, and shipment scheduling. To ensure

scalability and cost-effectiveness, they employed a cloud-based architecture, as well as machine learning algorithms to deliver customized product suggestions to clients. Field experiments with smallholder farmers in India were conducted as part of the study, which demonstrated that the platform considerably enhanced farmers' market access and profitability while also lowering transaction costs. The authors suggested more study on using blockchain technology in order to improve the platform's security and transparency. Overall, the study indicated that e-commerce platforms have the ability to empower smallholder farmers.

Another system is proposed by Weerasooriya et al. (2022) known as FarmCare. It is an android application which seeks to address numerous key issues faced by farmers when planting crops in Sri Lanka. First, absence of understanding about upcoming market pricing is the second issue. The system provides a 12-month forecast of pricing. Second, the inability to sell their products for a fair price. The application proposed would provide a direct farmer to consumer process cutting out middlemen. The final issue is the challenge of identifying crop-damaging pathogens. By submitting an image to the app, farmers can use the mobile app to determine whether disease impacted their crops. Furthermore, Abiodun et al. (2019) highlights the creation of a smartphone app named Farmster that attempts to improve the agricultural supply chain and boost farmers' profitability. Farmers may use the app to input crop yield, location, and harvest date data, which is then utilized to forecast market demand and propose

the optimum timing and price to sell their crops. The system also links farmers with potential customers and offers a forum for pricing negotiations and order management. The software also reduced food waste by reducing the quantity of unsold crops and gave vital data insights to assist farmers make more educated crop management choices. Also, RegoPantes is an e-commerce application launched in 2018 that sells agricultural goods like fruits, vegetables, grains, herbs, and more. With guaranteed product quality and fair prices for all parties, RegoPantes is an online market solution for agricultural products that links farmers directly to end users and industry. Farmers can sell their harvests on the site for fair prices, and buyers would receive fresh goods. The mechanism determines the fair prices for farmers and customers by establishing a new equilibrium between farmer prices and consumer prices in the market. The final result of this new equilibrium would be an increase in farmer income and a relatively decrease in consumer pricing. Through this platform, it is anticipated that all parties would obtain the ideal quality and pricing, which would then promote the improvement of farmers' welfare (Romadona, 2020).

Singh et al. (2020) developed AgroSense, an integrated precision agriculture system which utilizes a mix of data analytics and IoT technologies to maximize productivity and profitability for farmers. The system contains sensors and cameras that collect data on weather, soil moisture, and crop development, which is then processed to deliver real-time insights and crop management advice.

The platform also offers an online marketplace where farmers can sell their products directly to customers and interact with food industry consumers.

Motha and Venter (2019) created a crop farming digital platform in South Africa with the goal of providing farmers with real-time information and analytics to enhance crop yield and increase profitability. The platform combines weather information, soil moisture sensors, and crop growth monitoring devices to give farmers with crop management suggestions. The system also incorporates an e-commerce platform, which enables farmers to sell directly to consumers, eliminating intermediaries and enhancing profitability. In similar to this, Ouma (2021) discusses the development of the SokoMkononi platform, an agricultural e-marketplace in Kenya. The platform is a web-based marketplace that connects farmers with buyers, allowing them to sell their agricultural goods directly to customers. The platform also includes real-time pricing updates, a payment system, and a chat system for buyers and sellers to communicate. The author performed a field study to evaluate the platform's performance, and discovered that it significantly improved farmers' access to markets while also improving their profitability.

Another system named Agrofy was developed in Argentina by Larosa and Landrein. Farmers and agribusinesses can use the platform to purchase and sell products and services online. Agrofy provides a variety of items such as seeds, fertilizers, insecticides, machinery, and equipment. The site also includes finance,

insurance, and consultation services. The platform is available via desktop and mobile devices, allowing farmers and agribusinesses to utilize it from any location at any time. Overall, Agrofy improves the efficiency and profitability of the agriculture sector through e-commerce (Burwood-Taylor, 2018).

Ramteke et al. (2020) proposed a system known as Farmer E-Marketplace which is a web application that would assist Indian farmers in selling their goods to without the aid of brokers or agents, different city marketplaces sell straight to clients. For better and more transparent sales, a computerized system is used. Farmers would discover a special interface where they can do anything from reading market information to marketing, controlling product status, looking at product reviews and ratings, viewing monthly sales, gathering data for various programs, and working. Families can browse a variety of blogs, including those with gardening advice, news, and invention ideas. This website would act as a distinctive and secure approach to market agricultural products. It would help farmers create agricultural marketing that leads to increased success and increased their standard of living.

Another system is E-Mandi, an online store that sells fruits and vegetables and has made services available to help consumers shop online. It is an internet platform that would make it simple for consumers to purchase produce while still preserving openness between the farmer and consumer. This software assists users in finding the greatest prices on fruits and vegetables. The system has a

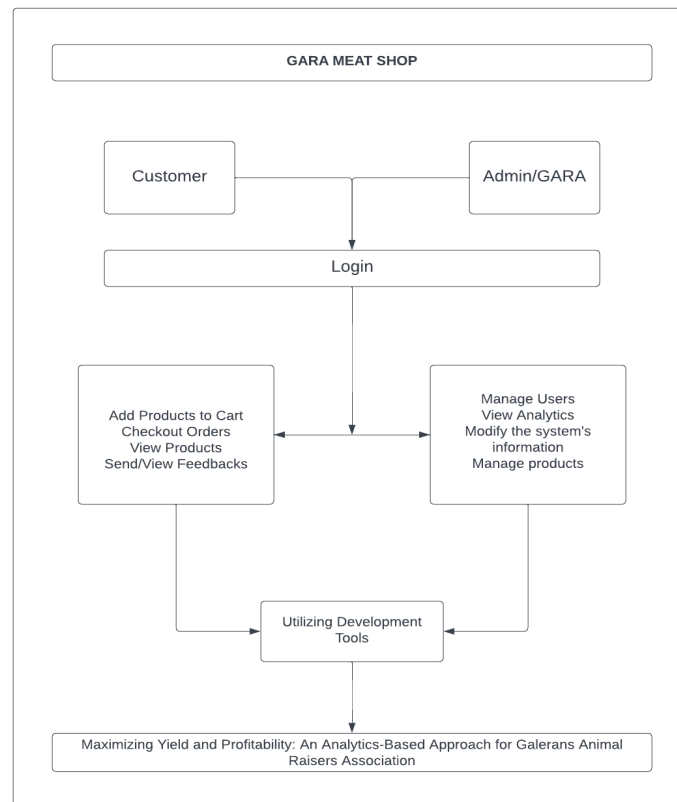
well-defined user interface that makes it simple for the consumer to browse through all of the accessible things. With this platform middlemen, distributors, and other agents involved in the marketing process would be cut out from the process enabling the farmers to receive the appropriate share of their yield (Behera et al., 2020).

A web-based platform was developed to connect smallholder farmers with potential buyers, improving market access and reducing transaction costs. The results showed that the platform provided farmers with access to a wider range of buyers and improved price transparency, while reducing transaction costs (Debele et al., 2019). Related to this is another system named eAGRO. eAGRO is the go-to online-to-offline marketplace for farmers and agriculture smallholders in Malaysia. It was created to also help smallholders boost their agriculture production yield with premium quality fertilizers at below-market prices; e-agro is driven to improve the visibility of information, best practices, and the latest industry news for greater awareness and support for the agriculture industry (theSunDaily, 2021).

### **Conceptual Framework**

The study aims to design and develop a Gara Meat Shop that addresses challenges faced by the agricultural sector of Puerto Galera, such as GARA's loss of track records due to traditional marketing strategies. It also contributes to the achievement of SDG 12, which emphasizes the need for ensuring sustainable

consumption and production patterns. In this regard, the researchers create a conceptual framework, as shown in Figure 3, to have an initial idea of the input, process, and output that take place within the system.



*Figure 2. Gara Meat Shop's Conceptual Framework*

The conceptual framework of the study focuses on developing an innovative online platform to maximize the yield and profitability of GARA in the Municipality of Puerto Galera, Oriental Mindoro. This study focuses on two primary user roles: customers and the Galerans Animal Raisers Association



(GARA), which serves as the system's administrator, responsible for its efficient operation. GARA would be the system's administrator, in charge of overseeing the system's operations and guaranteeing its smooth operation. Figure 2 depicts the system's inputs, operations, and outputs. Customers would enter their information to create an account, which would allow them to add products to their cart, check out, give reviews, and use the benefits. As the administrator, GARA would enter the necessary information to establish accounts, change system information, manage users, add product categories, and review analytics. GARA would also handle products and receive customers' orders. All of the information provided by customers and admins would be handled using development tools to design and manage the system.

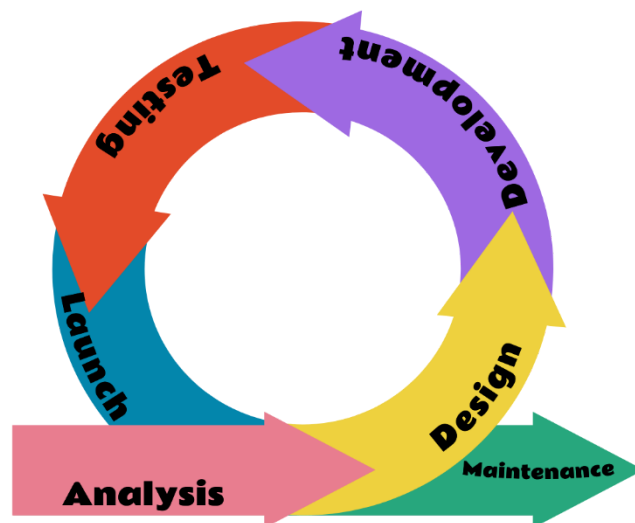
## CHAPTER III

### METHODOLOGY

This chapter presents the methods and processes involved in the development of the Gara Meat Shop. This would serve as a guide in the following step-by-step procedures needed to acquire the best results.

#### Software Methodology Model

The Agile Development Approach is being used to design and develop the Gara Meat Shop, as depicted in Figure 3. This framework, which is frequently used to develop systems, has a number of phases that show the value of system analysis and design work, allowing process modifications to be made to fulfill objectives. Relatively, the system's development is focused on automating the traditional marketing strategy of the GARA in Puerto Galera.



*Figure 3. Agile Development Model*

The researchers thought that the Agile Development Model was the best strategy because it was based on the fundamental strength of frequent and continuous revisions that came from the client regularly. Given that, the phases and associated sub-processes that the researchers used throughout the study are described below:

**Analysis** entails identifying and capturing the needs and objectives for creating and deploying the system. In order to ensure that the system is created to suit the needs and requirements of all stakeholders and that its deployment is feasible, the following processes are involved:

*Understanding the Requirements.* The researchers collaborate with the Galerans Animal Raisers Association of Puerto Galera, Oriental Mindoro to understand the client's expectations. This aids the team in determining the objective of the project.

*Project Planning.* Documentation of the project plan takes place in this process wherein project deliverables, costs, responsibilities, specifications, and even the project schedule, were all defined. Additionally, the development of a set of guidelines that guided the project's researchers through the implementation and closure phases is required in this process.

*Stakeholders involvement.* In order to make sure that the project plans created by the researchers are realistic and conform to the needs of the client, consultations with relevant stakeholders were held.

**Design,** involves outlining the project's features, structure, criteria, and deliverables. The researchers would design first the two major interfaces of the project namely the customer's interface and admin's interface. Modules and other interfaces under the three major interfaces would then be developed after. Processes involved in this phase are the following:

*Requirements Analysis and Prototyping.* The researchers evaluated the appropriate components for the project's actual implementation after giving pertinent considerations, restrictions, and maintenance-related concerns a lot of thought. As the researchers and stakeholders arrived at a consensus in addition to reaching early-phase agreement, it was crucial to develop a thorough grasp of the appropriate technological approaches. Similar to this, it was just necessary for the researchers of the novel ideas produced over the last few weeks to put a lot of work into understanding the system and translating the needs of the users to get the best result as a product. Consequently, during this process, a requirements analysis was placed.

*System Design.* In this process, the researchers translated the conceptual design into physical design through utilization of various tools

and techniques such as Use-Case Diagram, Sequence Diagram, Database Diagram, and the Data Flow Diagram.

**Development**, involves the creation of the actual system through the utilization of various automation tools. This phase involves the following processes:

*Coding.* In this process, utilization of the programming tools in order to translate the requirement of the program into the machine instructions as understood by the computers is involved. The researchers would make use of the programming tools such as native PHP, MySQL, Bootstrap 5.0, HTML and CSS in creating the project.

*UI Design.* This phase involves elements of a project's interface such as buttons, color schemes, and icons. The researchers have considered the guidelines of the User-Centered Design in order to create an interface that would established an intuitive experience for the users.

*Database Design.* Due to the fact that this process involves designing, developing, the study's researchers decided what information needed to be processed and how the information's components should be related before deciding on the adoption and upkeep of data management systems.

**Testing**, in this phase, the researchers concentrated on raising value to the customer in the form of enhanced system performance and quality, as well as value to the project team in the form of decreased operational expenses and accelerated reaction times. The steps involved in this phase are listed below in connection to that:

*Data Synchronization.* The researchers synced information between two or more devices while automatically updating changes between them to ensure system continuity because they respect the significance of data quality, consistency, and privacy.

*Quality Assurance.* The researchers provide assurance that the online platform would function without any issue in accordance with the client's expectation.

**Launch**, the system is put into practice in a real setting in order to use it and accomplish the objectives of developing the web platform. Under the direction of GARA, the Gara Meat Shop would be launched in Puerto Galera.

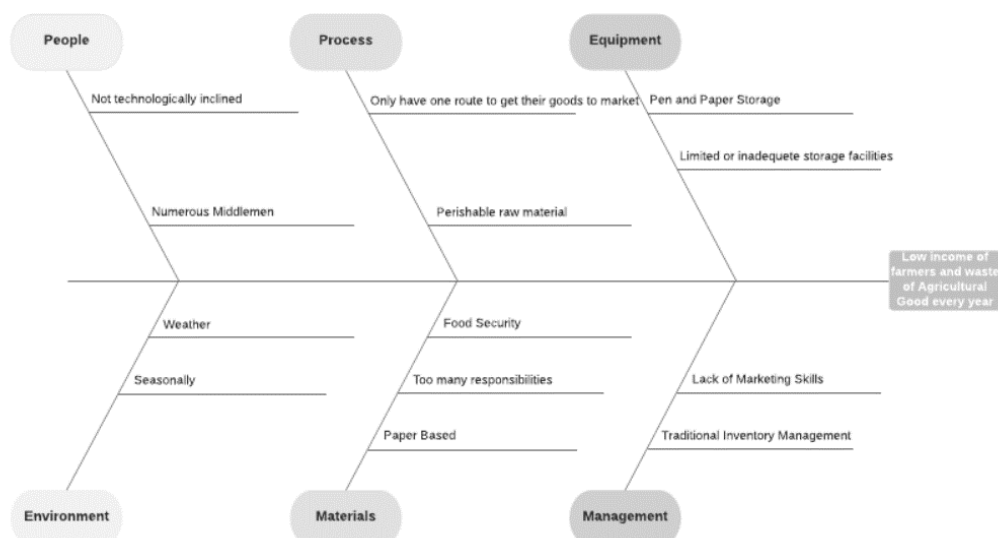
**Maintenance**, the system was periodically inspected by the researchers in an effort to spot any irregularities and identify solutions as soon as possible to prevent system harm. In this stage, the system's operational lifespan is being watched to spot any issues that may arise and assures that the system still has the same operating life as at the time of implementation.

## Analysis of the Existing System

As the GARA of Puerto Galera haven't utilized any system in marketing their product, they are stuck on utilizing the traditional marketing strategy, which brought serious issues. With only pen and paper as the sales tracker, a high likelihood of missed sales records is unavoidable, leading to additional issues with the reliability of the data they have when making decisions. Before reaching the clients, the meat products went through several middlemen in the prior process. The GARA made little money from this method, while consumers paid a high price for the meat products. The researchers looked for a remedy in an effort to automate the manual operations and address these issues.

## Fishbone Analysis

The fishbone diagram shown in Figure 4 below was created through a process of brainstorming by the researchers to systematically discover a wide variety of probable causes and further classify these potential causes of issues or problems in an ordered fashion. Additionally, by examining evidence and reaching consensus regarding which bones are implausible, the researchers evaluated the liveliness of each bone.



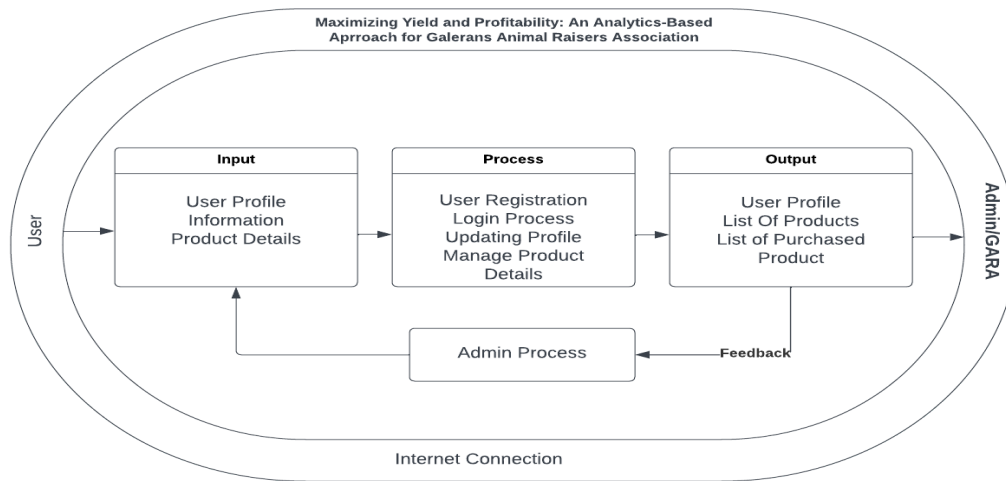
#### *Figure 4. Fishbone Diagram*

Figure 4 shows a fishbone diagram of the main problem faced by GARA's, which is categorized into six key areas: people, process, equipment, materials, environment, and management. People include not technologically inclined users, middlemen in the supply chain, restricted possibilities for GARA's to market their produce, and logistics issues. Equipment includes reliance on pen and paper storage systems, which can lead to mistakes and inefficiencies. GARA have limited or inadequate storage facilities, materials issues, reliance on paper-based management systems, lack of marketing abilities, and dependence on traditional inventory management procedures. These factors can lead to inability to satisfy demand during peak seasons.

#### **System Boundary**

The Gara Meat Shop provides several features and functionalities as illustrated in Figure 5. Accordingly, it is also assumed that this system has boundaries, and defining them enables it to be more effectively utilized while also knowing its scope of control and impact. When the system's boundaries are well understood, the interface of the system is designed appropriately to meet the needs of its intended users.





*Figure 5. System Boundary*

The system's boundaries in terms of the components, processes, and relationships include the followings: implementation of the Gara Meat Shop, which is accessed by users like customers, and the admin of the system, which is the Galerans Animal Raisers Association (GARA) – Puerto Galera, Oriental Mindoro, a database which holds all the data to be processed by the system, implementation of an access-level based interface to separate the features and functionalities for a different type of users like customers, and the admin. At the same time, it allows the GARA to manage data of the sales, and inventory that provides generated reports for customer's orders, implementation of the transaction that allows the feature to showcase to the customers to do transactions through the system, such as browsing availability of the meat products, placing orders. The system above boundaries makes sure that the features and functionalities of the system, along with its components, processes, and

relationships, are clearly defined, which eliminates any potential conflicts about the system's operational level and performance, particularly when considering potential system integration.

## Hardware Requirements

The hardware requirements intended to suit the needs of the system ranged from minimum to recommended requirements for optimal efficiency and a better online platform, depending on various factors, such as the type of platform. In addition, the researchers specified these requirements to hold the number of users expected to use the Gara Meat Shop simultaneously and the level of performance required. In general, these basic requirements for an online platform are shown in the table 1:

**Table 1**  
***System's Hardware Requirements for Laptop/Desktop***

Hardware	Description
Processor	A processor with a clock speed of 2 GHz or higher is recommended for optimal performance
RAM	4 GB of RAM is minimum, 8 GB or more is recommended
Storage Space	20 GB of free disk space
Network	Minimum speed of 10 Mbps

Due to facts, the Gara Meat Shop can also be used with the browser on mobile phone devices. The minimum system specifications for a smartphone should meet the following requirements shown in Table 2.

**Table 2**  
***System's Hardware Requirements for Smartphones***

Hardware	Description
Processor	Qualcomm Snapdragon 805 And equivalent or higher
RAM	2 GB of RAM
Storage Space	1 GB or Higher
Network	2G or above

### **Software Requirements Specifications**

The entire system's specifications are defined in the software requirements. This part of the document includes the functional and non-functional requirements that provide additional system information. As the system requires specific specifications for functions, procedures, and data storage, software requirements specifications were categorized into functional and non-functional requirements. Moreover, the requirements included the programming languages to be used and the knowledge of the end user's familiarity with the system.

### **Software Requirements**

In line with the hardware requirements, different software requirements and types are used to organize requirements meant to meet the purposes of the system. These conditions were defined as operating by the researchers. The recommended operating systems are Windows 8 and 10 standards, with 32-bit and 64-bit varieties. Alternatively, using a 64-bit version of OS X 10.7 or later on Mac computers is also recommended. However, Ubuntu, a 64-bit Linux distribution, is suggested. Considering the web browser, the suggested specification for Microsoft Edge, Mozilla Firefox, Google Chrome, and Safari is from 2016 and up. As a result, the suggested database for the version of MySQL (MariaDB) accredits the system.

## **Functional Requirements**

This section specifies the functional requirements of how the system must behave, including its features and functions. The functions are the software system's inputs, behavior, and outputs.

### **1. Customers**

1.1. The customers shall create and log in with their account within the system.

1.2. The customers shall have access to view the availability of the meat products on the online platform.

1.3. The customers shall be able to check out and add to cart the meat products.

1.4. The customers shall be notified that this is a pre-order shop.

## **2. Galerans Animal Raisers Association (GARA) - Puerto Galera**

2.1. The Galerans Animal Raisers Association (GARA) - Puerto Galera shall have an account to log in to the system.

2.2. The Galerans Animal Raisers Association (GARA) - Puerto Galera shall have access to all system functionalities.

2.3. The Galerans Animal Raisers Association (GARA) - Puerto Galera shall be able to see the sales reports and add their products

2.4. The Galerans Animal Raisers Association (GARA) - Puerto Galera shall be able to edit or delete if the meat products are out-of-stock.

## **Non- Functional Requirements**

The non-functional elements that show how the system ought to act and were thought to constitute limitations on the system's behavior are listed below. As a result, the following are listed as the system's non-functional requirements:

### **1. Accessibility**

1.1. The system shall ensure system access authorization and accessibility from any location with an internet connection.

1.2. The system shall provide complete information which illustrates self-reflections and growth of customers.

1.3. The system shall be able to, as some users might be able to utilize a mouse or a touch of the hands when using smartphones, make it possible for users to browse the platform using only a keyboard.

## **2. Scalability**

2.1. The system must be scalable to support expansion in the future and have the flexibility to add new features and products as required.

## **3. Compatibility**

3.1. The system must be to ensure that consumers can access from a variety of platforms, the website must be compatible with a wide range of hardware and web browsers.

## **4. Performance**

4.1. The system must be capable of handling a lot of traffic and transactions, especially in peak times.

## **5. Reliability**

5.1. The system must be constantly functional and available with little downtime or problems. For meat products, which may have a limited shelf life or be time-sensitive, this is crucial.

## **6. Security**

6.1. The system must be secure, with safeguards in place to safeguard sensitive data, financial activities, and user data.

## **7. Usability**

7.1. The system must be easily navigable and user-friendly, with precise product descriptions, photos, and pricing details.

## 8. Compliance

8.1. The system must obey all applicable laws and rules, including those governing data privacies, consumer safety, and product labeling.

## 9. Performance under varying network conditions

9.1. The system must be able to operate efficiently in a variety of network environments because the meat products might be sold in locations with spotty internet service or slow internet connection.

## Constraints

The preceding tables cover the numerous software design restrictions, whereas ratings were obtained by an independent and intentional participation in assessing and criticizing each choice based on the researchers' experience and prior knowledge.

In order to come up with the languages to be used in the server-side, the ratings of each language based on different design constraints is shown in Table 3.

**Table 3**  
***Server-side Scripting Languages***

Design	PHP	RUBY	JAVA	C#	Node.js
Constraints					
Performance	5	3	4	4	5

Dependability	5	3	4	4	5
End User	5	3	4	4	5
Reliability	5	3	4	4	5
Usability	5	3	4	4	4
Availability	5	3	4	4	5
Security	5	3	4	4	5

---

In accordance with the ratings presented in table 3, Php was selected as the server-side programming language of the researchers. Since it could connect with MySQL databases in addition to other options, the researchers think it would be quite helpful to utilize other languages such as JavaScript.

As stated in Table 4, the researchers proposed three database options: MySQL, PostgreSQL, and Oracle. The databases described above were evaluated based on their Php resource availability. As a result, MySQL was chosen by its supporters because it features a database server that is appropriate for information queries and it works with any operating system, and supports a variety of development interfaces, including Php.

**Table 4**  
***Database***



design constraints	MySQL	PostgreSQL	Oracle	Microsoft sql server	mongodb
Performance	5	4	4	4	5
Dependability	5	4	5	4	4
End User	5	4	4	4	4
Reliability	5	4	5	4	4
Usability	5	4	3	4	4
Availability	5	5	4	4	5
Security	5	5	5	4	3

MYSQL and Oracle both have a login and password, making them more secure than MS Access. While MS Access only works on Windows, MYSQL and Oracle are cross-platform. While Oracle has many features that are useful, MYSQL has a number of advantages that Oracle lacks and offers greater functional performance, making it the most well-known database in terms of usability.

The researchers present a variety of well-known text and picture editors, including Adobe Photoshop, Visual Studio Code, and Sublime Text as shown in Table 5.

**Table 5**  
***Text and Image Editor***

design constraints	NetBeans	vs code	photoshop
Performance	3	5	4
Dependability	4	4	4
End User Criteria	4	4	4
Reliability	4	4	4
Usability	4	5	4
Availability	4	4	4
Security	3	5	3

Table 5 presents text and image editor's ratings based on various design constraints. Despite NetBeans' analysis of the codes, its researchers claim that it is excessively sluggish based on their knowledge of text editors. In contrast, the source code editor in Visual Studio Code is quick and ready for use right away. Additionally, with support for many different languages, VS Code consistently made its users more productive by providing features like syntax highlighting, bracket matching, auto-indentation, box selection, snippets, and more. On the other hand, Photoshop produces better images because it has tools like scaling,

color correction, and HDR imaging. In relation to this, the supporters preferred Adobe Photoshop and Visual Studio Code due to prior experiences.

The researchers would utilize testing tools in order to test the behavior of the system. They came up with three testing tools as shown in Table 6.

**Table 6**  
***Testing Tools***

design constraints	XAMPP	WAMP	MAMP
Performance	4	3	3
Dependability	4	3	3
End User Criteria	3	3	3
Reliability	3	3	3
Usability	4	4	4
Availability	4	3	3
Security	3	3	3

Table 6 demonstrates the behavior of the proposed testing tools based on different design constraints. Because XAMPP is user-friendly and includes PHP error reporting by default, which would help with script debugging, the researchers chose it above the alternatives. MAMP, on the other hand, can only be used with

Mac computers, which is why its creators decided against it. WAMP and XAMPP are nearly equivalent, however XAMPP provides more sophisticated functionality.

### **Multiple Design**

Since it mostly affects how well the system functions when it comes to offering its services to its customers, the process of establishing the system's design is essential. In order to describe the system's appearance and make it easier to recognize its features and functionalities, a design must first be made. The developer chose to use Nicepage Desktop as the design software since it is cost-free and provides prototype features that increase productivity, facilitate teamwork, and foster efficiency in the building of the system.

### **Trade-Offs**

The study of trade-offs through the study is one of the primary topics that the researchers emphasized in order to reach the competitive objective and further commit resources to increase performance. Various halo effects would also be implicated considering these related to the cognitive biases researchers directly or indirectly had, in which the overall perception of the researchers influences decision-making. As such, provided in Table 7 are the sets of designs with their respective technological stack.

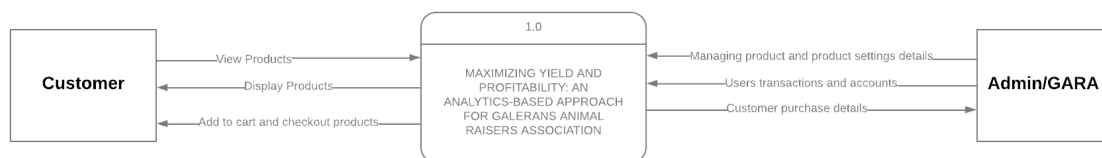
**Table 7**  
***Multiple Technology Stacks***

Design	Technology Stack
Design A	HTML, CSS, PHP, Bootstrap 5.0, MySQL, XAMPP
Design B	FLASK, PYTHON
Design C	JAVA

Based on table 7, all the technology stacks shown above would be very valuable to the creation of the system. Moreover, Design A is the Top-priority technology stack as the researchers are familiar with utilizing it, while Design B would be the second option to use by the researchers in creating the online platform; this would serve together with Design C as the alternative option.

### System Design/Architecture

For a better understanding of the system to be developed, illustration of the interfaces of customers and admin is needed. Relationship of each entity and how they interact is shown in Figure 6.



*Figure 6.* Context Diagram

Figure 6 displays the proposed system's context diagram. It illustrates the complete system's operation graphically. Processes and connections between three major entities are shown in this figure.

## Link Architecture

The researchers demonstrate the user's and administrator's capability that would be used to create the system's flow as shown in Figure 7.

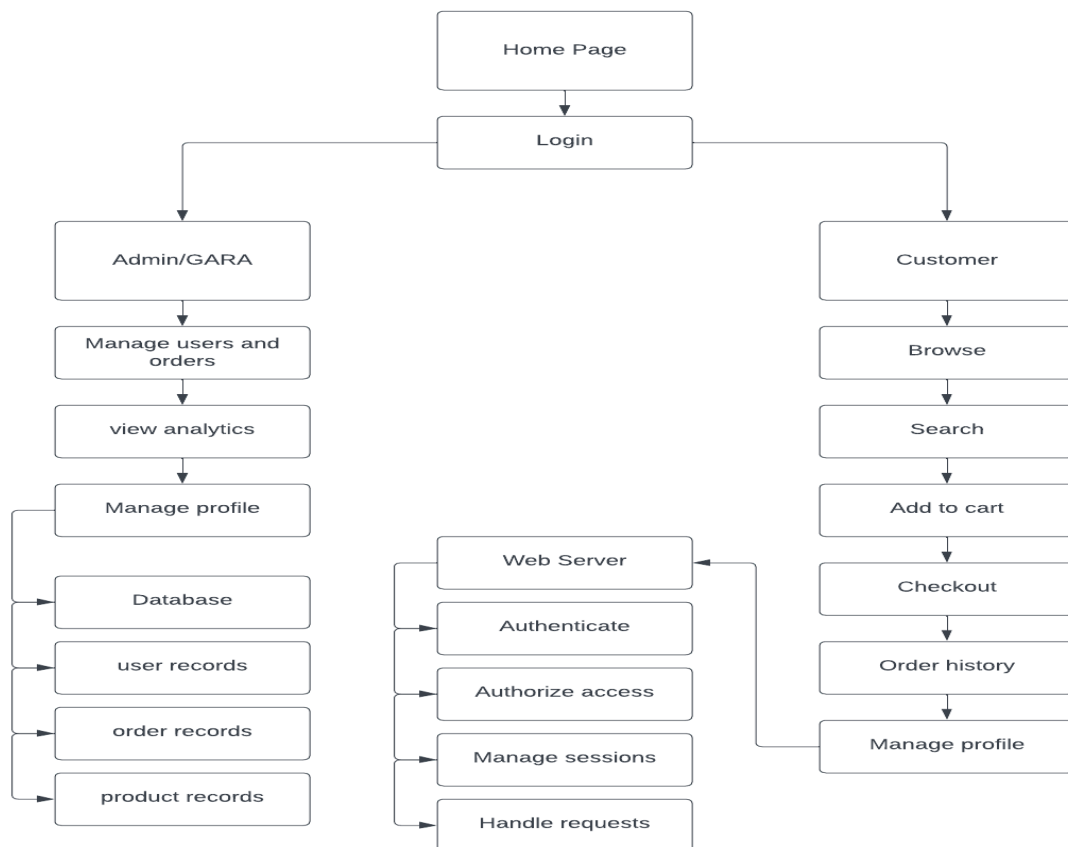


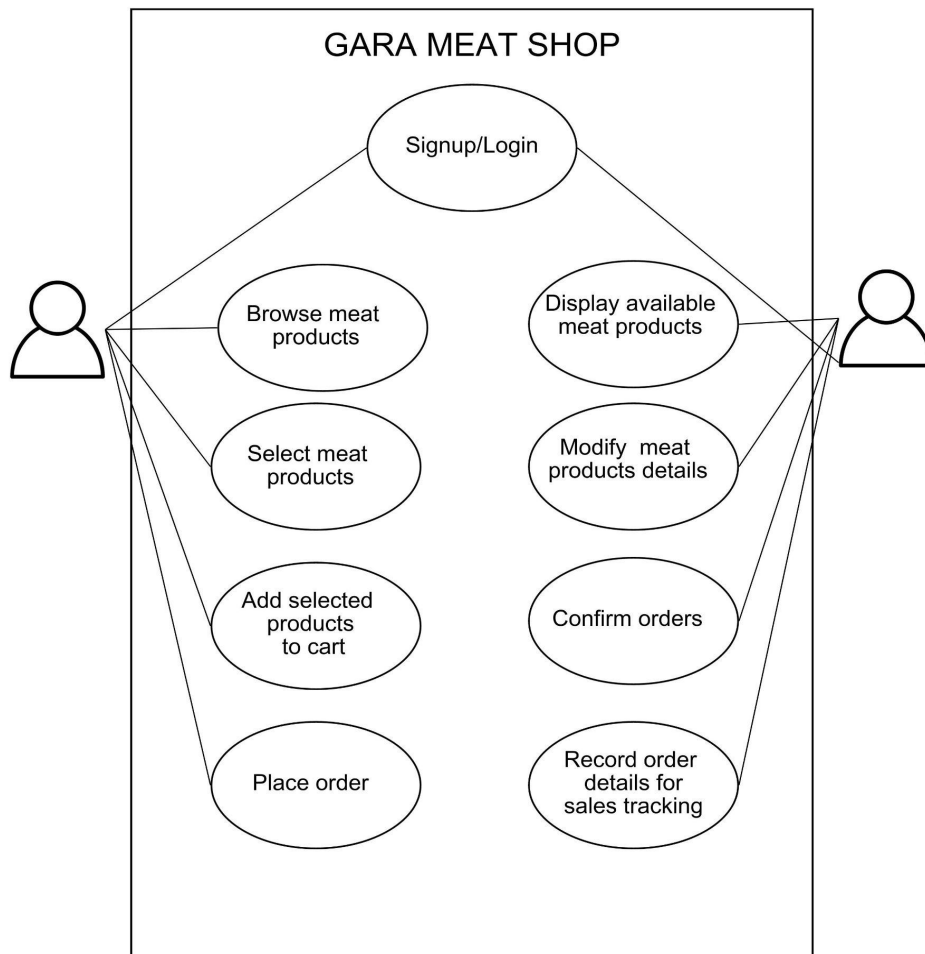
Figure 7. Link Architecture

Figure 7 illustrates the link architecture diagram of the Gara Meat Shop wherein tasks and linkage of the two major entities is shown. Specific tasks that

each major entity can be performed within the system is illustrated in this figure as well.

### Use Case Diagram

In order to display connections between the involved users and the admin as well as show how the actors would interact with one another and the appropriate behavior, the researchers developed the use case diagram shown in Figure 8.



*Figure 8.* Use Case Diagram

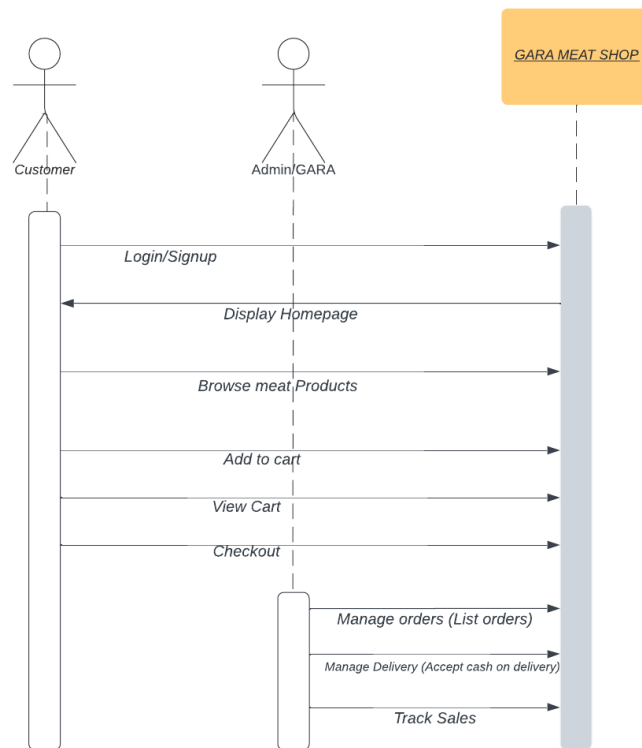
Figure 8 depicts the use case diagram of Gara Meat Shop which involves interactions and functionality of two primary actors: the GARA (Galerans Animal Raisers Association) or admin, and customers. GARA, who is in charge of administering the online platform, is important. They have access to a variety of activities, including database administration, list their items in inventory, change product information, handle payment and delivery, manage sales, sales and product performance monitoring, and analytics optimization. The admin's principal purpose is to provide efficient and effective supply chain management, optimize productivity, and boost the profitability.

Customers, another key actor, have their own interactions as well. They may go through product lists, search for particular products, add items to their shopping carts, and then check out. Customers have easier access to fresh produce thanks to the platform, which allows them to browse available items and make purchases online.

### **Sequence Diagram**

An interaction diagram that describes how activities would be carried out in the Gara Meat Shop is shown in Figure 9.





*Figure 9. Sequence Diagram*

Customers engage with the "Gara Meat Shop" system to place meat product orders in the sequence diagram, which includes actions such as browsing products, adding things to the cart, and finishing the checkout procedure. Simultaneously, the system's administrator, represented by the letter "GARA," maintains a different line of interface with the system, indicating their administrative position. GARA's tasks include monitoring client orders and tracking sales, ensuring the online meat ordering platform runs smoothly and efficiently. This figure depicts the coordinated interactions between consumers, the system, and its admin,

demonstrating that GARA controls the administrative activities of the system while customers engage in the ordering process.

## Database Design

Figure 10 provides a thorough representation of the data to be processed, highlighting their complex linkages and connections. This graphical representation serves as a key road map for effortlessly integrating this data into particular software applications in addition to serving as a visual reference. This comprehensive data map serves as the foundation for researchers and developers as they work to provide a seamless and efficient data integration procedure. They can decide how to organize and work with this information in their software programs by thoroughly comprehending the relationships within the data.

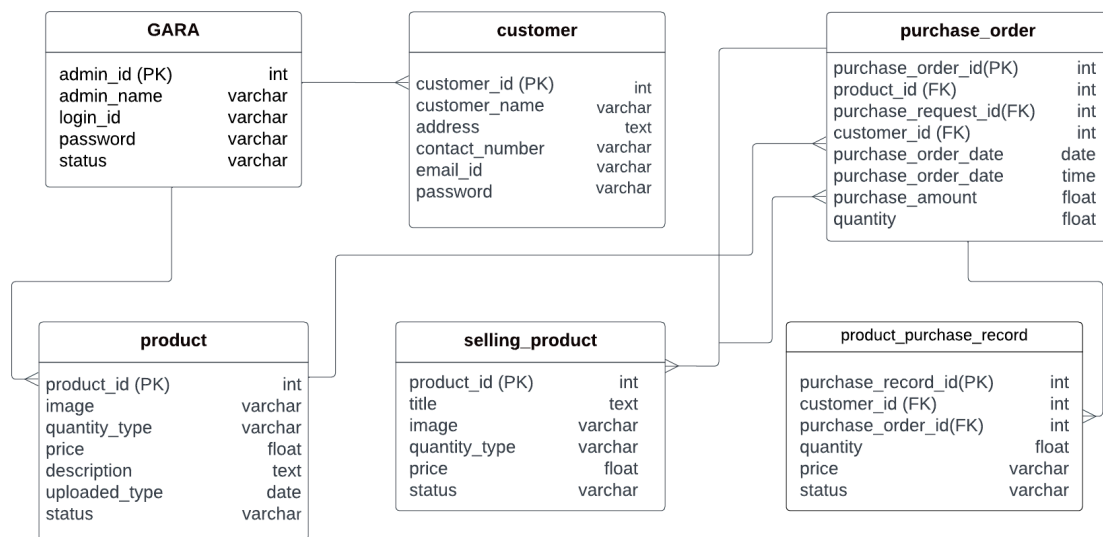


Figure 10. Entity Relationship Diagram

On the other hand, the Entity-Relationship (ER) diagram plays a crucial part in improving understanding of the data that would reside in the database. Supporters use this graphical representation as a crucial tool to obtain a deeper understanding of the details of the data structure. Stakeholders can identify the entities, their attributes, and the connections that connect them in the database using the ER diagram. This clarifies the rationale behind the database system and makes it easier to understand how data is stored and retrieved, which eventually strengthens and improves the data management strategy. In essence, these visual aids empower the team as a whole, guaranteeing that database design and data integration are carried out precisely and clearly.

## **Software Development Tools**

### **Operating System**

The system's development platform was the Windows operating system. A PC or laptop running the Windows operating system, ideally Windows 9 or higher, or a laptop running the Windows operating system, preferably Windows 9 or higher, would be utilized to use the system. Because Windows is the most widely used operating system and because it is readily available and reasonably priced, it was decided to base the system on it. The system requires a browser and Android 9.0 or higher for smartphones.

Furthermore, there are now three possibilities for choosing the best operating system for development:

- Given that familiarity generally increases productivity, the operating system that the researchers are most accustomed to.
- the team's collective operating system.
- the operating system in which are stored all of the crucial instruments needed for system development.

As a result, from a technological standpoint, the researchers can currently select from a variety of operating systems for their PHP development work, depending on how well these options fit the predetermined criteria, including Ubuntu, Linux, Windows, and macOS.

### **Web/Application**

Through its user-friendly interface and cross-platform interoperability, Visual Studio Code not only excels at PHP coding but also provides an amazing user experience. Because of its smooth interface with Git and other version control systems, developers can easily manage their code repositories. Furthermore, the vibrant community that surrounds VS Code provides ongoing upgrades, bug fixes, and the creation of new extensions, ensuring PHP developers have access to state-of-the-art features and capabilities. In essence, Visual Studio Code is more than just a code editor; it's an environment that meets the many demands of PHP developers and is constantly expanding, making it the best option for building reliable and effective PHP applications.

### **Database**

The system's foundation for storing and managing data on the web is the MySQL database management system. MySQL is a great option for this because of its strong and dependable data storage capabilities, which guarantee that the system can effectively manage and retrieve the information it needs to operate without interruption. With MySQL's assistance, the system is able to safely store data, provide quick data access, and uphold data integrity, all of which considerably improve the system's overall performance and dependability in the online environment.

### **Subscriptions**

Researchers methodically assembled the necessary data to reinforce the system after thoroughly examining the project requirements. Researchers then used a wide range of premium subscription services to create and host the system. This strategic approach aims to take advantage of the wide range of connectivity that already exists between system administrators and users.

Researchers used WebLab, an internet hosting interaction, to create the necessary web presence. The wide range of WebLab's capabilities perfectly matches the needs of this project, making it the best option for the researchers' hosting requirements. Additionally, it effortlessly connects with PHP, ensuring an inherent balance between the system and the hosting infrastructure.

### **Testing**

## **Testing Evaluation Process**

Evaluation standard or criteria used: ISO/IEC 2510:2011 which defines the following concepts:

1. A quality in use model in the given context consists of five separate qualities, some of which are further broken down into sub-characteristics. These characteristics relate to the interactions that occur when a product is actively used in a certain setting. It is crucial to remember that this paradigm covers the complete human-computer system, including not only software and hardware, but also the larger environment in which they function.
2. Currently, a product quality model consists of eight essential characteristics, each of which has a different set of supporting characteristics. These eight qualities collectively cover both the static software attributes and the dynamic characteristics of computer systems. This idea is applicable to a wide range of technological fields, including computer hardware and software. It acts as a thorough framework for assessing and guaranteeing the performance and quality of these technological entities in various circumstances.

Both models now specify traits that are common to all software applications and computer systems. These qualities establish a defined terminology for properly defining, measuring, and evaluating the quality of both system and

software products, together with the sub-characteristics that correspond to them. Additionally, they provide a thorough collection of quality attributes that can be used to rigorously validate stated quality criteria.

Although software and computer systems are the primary emphasis of the product quality model, it is important to note that many of these qualities are applicable to more sophisticated systems and services as well. This adaptability highlights how these quality assessment frameworks are applicable and versatile in a variety of technology scenarios.

It's vital to note that, in addition to these models, ISO/IEC 25012 includes a model specifically for data quality, increasing the overall framework for assessing and assuring quality across many information technology elements.

The quality model's field of application continues to be broad and includes a variety of tasks that fall under the umbrella of software and software-intensive computer systems. It offers standards and guidelines for describing and assessing software and software-intensive computer systems from various angles, making it a valuable resource for those involved in acquisition, requirements analysis, development, usage, evaluation, support, maintenance, quality assurance, control, and audit. This open-ended approach means that these models can be actively used by developers, purchasers, quality assurance and control staff, as well as independent evaluators, particularly those in charge of defining and evaluating the quality of software products. In order to maintain the highest levels of quality

throughout the software development lifecycle, it is very helpful to use quality models in a variety of product development activities:

- Determining the software and system requirements.
- Validating the thoroughness of a requirements definition 79
- Determining software and system design goals.
- Determining the goals of software and system testing
- Establishing quality control criteria as part of quality assurance
- Determining acceptance criteria for a software product and/or a software-intensive computer system
- Establishing quality characteristic measures to support these activities

The ISO 25010 principles have been adopted by researchers as their primary measure for evaluating the created framework. This extensive set of standards, which considers aspects like Maintainability, Efficiency, Portability, Reliability, Functionality, and Usability, continues to serve as the cornerstone for assessing the performance and quality of the framework moving forward.

With the methodical and organized approach, the ISO 25010 rules have proven to be an invaluable resource for these devoted researchers. They ensure that the framework's Maintainability is upheld to allow quick adjustments and modifications by carefully following these criteria. The efficiency component ensures optimal resource use, while portability ensures that the framework moves across different contexts without any noticeable hiccups. To ensure that the system



operates consistently and dependably, reliability is a crucial factor, whereas functionality.

### **Testing Procedure**

The Researchers are commencing a thorough evaluation schedule as part of our commitment to guaranteeing the system's efficient and seamless operation. A battery of test cases is currently being actively conducted, providing immediate real-time data, and the painstakingly developed system is currently going through rigorous testing procedures. These results act as a litmus test, clearly demonstrating the success—or, in some cases, the lack of success—of each unique test case. This ongoing, iterative testing procedure is not just a formality; it is a crucial element in our mission to constantly improve the system's usability. The constant commitment is motivated by the desire to ensure that the system performs to the best of its ability, successfully satisfying the requirements and expectations set out by its users and stakeholders.

**Table 8**  
***Testing Procedures***

User Type	Testing Procedure
Create Account	Test if user can create account successfully
Account Login	Test if user can access the system by inputting their created account Test if the user can access the system using different account

User Type	Testing Procedure
	Test if the system would show a message if the user inputted wrong detailed
Add to Cart	<p>Test if the user can add to cart the products</p> <p>Test if the user can remove the added products to cart</p>
Pre-Order	Test if the user can pre-order a product to the GARA
Viewing Products	Test if the user can scroll and click the products on the system
Check Out	<p>Test if the user can check out the products</p> <p>Test if the user can cancel their orders from the system</p>

## Data Gathering

The researchers started an expertly organized interview procedure to thoroughly collect the information necessary for the development of the system. The Galerans Animal Raisers Association (GARA) office is where this face-to-face interview took place. The location was selected to guarantee an atmosphere that was favorable for thoughtful conversations and idea sharing. The President and other officers who were heavily involved in the association's

operations were on the interview panel, along with the developers and other important parties.

The researchers conducted a series of focused questions during this in-depth interview session that were expertly crafted to elicit the precise demands, requirements, and issues faced by GARA. This strategy allowed for a thorough investigation into the details of their business, assisting us in identifying and capturing the most important data. The interview served as a crucial tool in developing a close working relationship between the developers and I, aiding in the development of a system that not only met their immediate demands but also laid the groundwork for long-term efficacy and efficiency.

## **Deployment**

### **Deployment Plan**

The deployment plan acts as a thorough road map to guarantee a project's smooth and effective transition from development to operational status. Its main goal is to provide an overview of the numerous crucial elements and procedures necessary to ensure a successful deployment and a seamless transition into normal operations. Preparation, training, stabilization, and the actual transfer of solutions into practical use are all part of this complex process' many facets. Additionally, it entails careful attention to system stability monitoring and thoroughly testing the dependability of the implemented solution, laying the groundwork for a trouble-free operational phase.

The researchers make sure the system is perfect before moving on to the key phase of talking about deployment projects with end users. To ensure that the system is fully functional and free from any hidden flaws or issues that could potentially impede the deployment process, this necessitates stringent testing and quality assurance procedures. This thorough planning is a key component of the deployment strategy because it creates the conditions for a successful deployment by removing any barriers or potential sites of failure that may otherwise impair the system's functionality.

The researchers outline their deployment strategy in the deployment plan, paying particular attention to how they would promote proper sign-ins. This stage entails making the system accessible to authorized users, streamlining the access procedure, and allowing instructors to use the accounts that were issued by the system administrator. The approach emphasizes the value of accessibility and user-friendliness by resolving this issue, making it simpler for instructors to incorporate the system into their workflow. Table 9 shows the hardware requirements used when deploying the system.

**Table 9**  
***Hardware matrix for System Deployment***

Hardware	Requirements
Disk Space	2GB - 4GB storage

Memory	4GB RAM or more
Processor	1.9 gigahertz (GHz) x86- or x64-bit dual core processor

The software requirements that are currently being used for the ongoing system rollout are shown in Table 10. The list also includes several operating systems, such as Windows 10, Windows 8, and Windows 7, which support both 32-bit and 64-bit versions, in addition to these specifications. These operating systems are essential elements of the software matrix and are essential to the system's smooth implementation.

**Table 10**  
***Software Matrix for System Implementation***

Operating System	Bit
Windows 10	32-64bit
Windows 8	32-64bit
Windows 7	32-64bit

## **Maintenance**

In order to guarantee a continuous and seamless user experience, the researchers are actively working to construct a streamlined and effective approach

for discovering, prioritizing, and quickly addressing any issues that may arise. This dedication to continuous improvement is still essential as the web system develops and adapts to changing user preferences and requirements. This continuing upkeep includes a multidimensional strategy that includes bug repairs, updates, feature improvements, and thorough system optimization.

Another important aspect of any continuous maintenance project is the requirement for regular updates. In order to maintain the application's effectiveness, security, and general quality, it is crucial to keep the web system up to date with the most recent technology developments, security updates, and user interface design improvements. In essence, the web application's maintenance is a continuous duty that extends much beyond its initial creation stage. It requires a complex strategy that includes quick problem solving, ongoing upgrades, and proactive optimization efforts. The researchers make sure that the web system is dependable, secure, and in line with user expectations by taking these regular maintenance steps.

## **Risk Management**

**Risk identification** is the first step in an effective risk management process which involves the identifying of risks that the system could possibly face or be a hindrance in achieving the system's goal or objectives. By identifying risks, the project team can get themselves ready for potentially dangerous situations that the system would encounter and take some actions in order to withstand the effects

before they happen. Table 11 shows the identified risks that the system might encounter and a brief description about those risks.

**Table 11**  
***Identified Risks***

<b>RID</b>	<b>Type of Risk</b>	<b>Description</b>
RID 001	SQL Injection	An SQL injection is a type of vulnerability in which an attacker can access potentially important data by manipulating a database using a piece of SQL (structured query language) code.
RID 002	Data Breaches	A cyberattack that results in a data breach is one in private, 42 sensitive information that should have been kept private has been accessed or disclosed without authorization.
RID 003	Fake Orders	The perpetrators attempted to use false credentials to place an order.
RID 004	Internet Connection	No access/loss of internet connection

**Analyzing the Risk,** is the process which involves understanding and assessing the magnitude of risk and the type of risk that are most likely to occur. The project team would be analyzing how likely these risks are to appear in the system. Table 12 conveys the risk assessment control measurement of each risk.

**Table 12**  
***Risk Measurement***

<b>RID</b>	<b>Risk Assessment Control Measurement</b>
RID 001	Med Risk
RID 002	Med Risk
RID 003	Low Risk
RID 004	Med Risk

**Evaluating the risk involves** making decisions based on the severity and making ways on how to deal with it. In this part, the researchers try to define the likelihood of the identified risks to occur as well as the level of impact that it can create. The impact and likelihood as well as the equivalent value of each can be perceived in Table 13. The product of impact and likelihood which would determine the risk measurement can also be seen.

**Table 13**  
***Risk Impact and Likelihood***

<b>RID</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Score</b>
RID 001	Moderate	Possible	3	3	9
RID 002	Moderate	Possible	3	3	9
RID 003	Negligible	Rarely Occur	1	2	2
RID 004	Extreme	Rarely Occur	5	2	10

**Treating the risks** involves taking actions or providing solutions to the identified risks once those risks were encountered by the system in order to



eradicate or mitigate the aforementioned risks. It can be discerned from Table 14 the different ways of controlling the respective risks once it has been encountered by the system.

**Table 14**  
***Risk Control***

<b>RID</b>	<b>CONTROL</b>
<b>RID 001</b>	<ul style="list-style-type: none"> <li>• Harden your OS and Applications.</li> <li>• Continuous monitoring of SQL Statements.</li> <li>• Make the Website Temporarily Unavailable.</li> </ul>
<b>RID 002</b>	<ul style="list-style-type: none"> <li>• Change password into strong man.</li> <li>• Remove any Incorrectly uploaded personal information from the website.</li> </ul>
<b>RID 003</b>	<ul style="list-style-type: none"> <li>• Confirm the number entered by customer through phone call before processing the order.</li> <li>• Verify the IP address and email addresses.</li> </ul>
<b>RID 004</b>	<ul style="list-style-type: none"> <li>• Employ a Backup Internet Connection</li> <li>• Have a Redundant Internet Connection</li> <li>• opts for enterprise-level network infrastructure</li> </ul>

**Monitoring and checking the risk** is the last step in an effective risk management process wherein regular checking and surveillance is involved.

Outcomes must be documented and communicated both internally and externally. It can be depicted from Table 15, 16, and 17 the action taken and the researcher involved in doing so.

**Table 15**  
***Reviews of Risk and Issues***

<b>Review Frequency</b>
The system's development-related risks and challenges are periodically examined in order to classify them as low, medium, or high-level risks and to offer appropriate solutions to reduce their impact or reduce the likelihood that they would recur.
<b>Parties Responsible for Reviewing</b>
Fancubit, Angel Joy Suzara, Pete Andrei

**Table 16**  
***Monitoring of Risk and Issues***

<b>Review Frequency</b>
Risks and potential issues are monitored by accountable parties when each system feature is developed. They continually remind developers to be aware of the dangers and problems they encounter when creating new features. The committee also regularly assesses risks that have been resolved.
<b>Parties Responsible for Reviewing</b>
Aniag, Angeline

**Table 17**  
***Reporting of Risk and Issue***

<b>Review Frequency</b>
It is crucial to record risks and hazards from their identification to their resolution. The reporting of all the actions that have been taken in risk-related duties works in the same way. After each stage of development, they are required to report on the situation and have a group discussion about it.
<b>Parties Responsible for Reviewing</b>
Fancubit, Angel Joy
Suzara, Pete Andrei

**Risk Assessment Matrix** is a tool used in the project planning stage of risk assessment that recognizes and records the likelihood of project risks and assesses the possible harm or disruption those risks could cause. Figure 10 shows the risk assessment matrix used by the researchers.

<b>Risk Assessment Control Measure</b>	<b>Severity</b>				
From 1-4 = Low Risk					
From 5-10 = Med Risk	Negligible	Minor	Moderate	Major	Extreme
From 12-25 = High Risk	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

Likelihood (Probability)	Very Unlikely	<b>1</b>	1	2	3	4	5
	Rarely Occur	<b>2</b>	2	4	6	8	10
	Possible	<b>3</b>	3	6	9	12	15
	Likely Occur	<b>4</b>	4	8	12	16	20
	Occurs Frequently	<b>5</b>	5	10	15	20	25

*Figure 11. Risk Assessment Matrix*

## **CHAPTER IV**

### **RESULTS AND DISCUSSION**

In the present chapter, the results and discussions are currently being presented, encompassing the final layout and system features of the development of the Gara Meat Shop. The interpretation of the results of the objectives are being consolidated and listed accordingly for comprehensive analysis and understanding.

#### **Online Platform for Galerans Animal Raisers Association (GARA)**

The system was created for the Galerans Animal Raisers Association (GARA) by tracking the sales reports in the online platform. This can be accessed by the GARA. Moreover, the admin can add, delete, and modify the meat products on the admin interface.

Upon clicking on the system, in order to access the admin system, the GARA would be given a registered account. Afterward, the admin can access the given account through <https://ats-community.com/Shop/admin/>.

After entering the Admin Portal, it would show an alert box that shows that you successfully login in the admin portal. Then, it would redirect inside the admin portal where different modules are integrated. The modules included in the admin portal are Dashboard, Report, Products, Order, User Management, and Logout.

#### **View sales reporting in admin dashboard**

Upon completion of login process, the first module is the Dashboard which composed of Total number of success clients, Total number of Orders, Total amount of sales, and Total number of items. This module is to help the GARA to easily view the analytics report of the system while being used by the customers, and the admin itself. It provides a real time report on everything that takes place in the system.

### **Adding and deleting the meat products in admin**

The admin can add new items to the client interface through the buttons in the item's module, which is linked into the admin site. It consists of the product name, price, quantity, description, and image when you click Add New Products. The close button and the save this data button are the two alternatives that allow you to view the newly added product in the client interface. The entries that can be examined based on how they would be viewed are then located beneath the product list. It would then show the picture, item, cost, amount, details, and actions. The search bar appears above the action word, making it simple to access the products that are mentioned in this module.

### **Modifying the products in Admin**

The GARA can be able to modify the availability of the product in the admin site. The search bar is included to permit the admin to easily look for and modify the product. An product list that displays the image, product, category, description, price, quantity, and action.

### **Customer Interface**

The system was created for the customers of GARA to provide them with an easy and smooth transaction when ordering meat products, instead of having a hard time and consuming time just to have a meat product. The system can only be accessed by the residents of Puerto Galera. Thus, the residents of Puerto Galera would be able to login and register their accounts in the system, giving them access to the customer's interface of the system.

Upon completion of the registration process by the customer, it would allow the customer to view, add to cart, and checkout the meat products available in the system. Though the customer would be able to view the products even without signing in or registering, they are prohibited from adding them to their cart and checking out the meat products.

The features that are integrated in the customer interface are product availability, add to cart, check out, account interface.

### **Product Availability**

This allows the customer to view the availability that can be seen in the website created by the researchers by providing an easy and reliable way to check out their orders by simply clicking on their phones or scrolling on the desktop.

### **Add to cart, and checking out the meat products**

The web system ensures that clients can access and manage their orders with exceptional convenience by providing a streamlined and mobile-responsive purchasing experience. By utilizing the functionality of their smartphones, clients have the ability to effortlessly add items to their virtual shopping carts, evaluate

their choices, and subsequently initiate the process of finalizing their purchases. Mobile shopping or desktop shopping offers a range of secure and efficient payment solutions, thereby affording clients the ability to finalize their transactions with a sense of assurance. Moreover, subsequent to the placement of an order, patrons have the convenience of effortlessly monitoring its progress, receiving prompt notifications regarding shipping and delivery. The degree of accessibility and response at this level significantly alters the consumer experience, cultivating a sense of trust and contentment throughout the purchase process.

### **Pre-order**

The customer will be able to notice that this shop is a pre ordering shopping.

### **Dashboard with Analytics**

The analytics and dashboard features of the admin portal are an effective means of obtaining important information and coming to data-driven decisions. It offers comprehensive reports that give a comprehensive picture of the system's operation, going beyond simple data tracking. Admin have instant access to data on the quantity of successfully registered clients, which helps with user acquisition and marketing strategy customization in addition to providing insight into the system's growth. In addition, the analytics give useful insights into the platform's



operational performance by revealing the quantity of orders that have been delivered successfully.

The dashboard with the analytics features of the admin site provides a thorough picture of financial performance, including total sales. This information is crucial for determining the platform's profitability and can help with financial decision-making. GARA is able to track revenue patterns and establish long-term financial goals. The GARA are able to evaluate the popularity and relevance of the inventory by using the analytics tool, which also offers insights into the total number of products presented in the client interface. By using this data to inform inventory management tactics, the client interface may be kept current and user-friendly. In conclusion, the admin portal's dashboard and analytics functionality give administrators the means to both track and improve the operation of their system for increased success.

## **CHAPTER V**

## **Summary, Conclusion and Recommendation**

This chapter summarizes the continuing research initiatives made by the developers in this chapter, highlighting the ongoing development and expansion of our knowledge. We give a thorough overview of our research's findings, highlighting its current state, the major findings that came from our analysis, and our well-informed suggestions for taking the system to new levels of performance and efficiency. This chapter acts as a dynamic space for continual contemplation and investigation, encouraging a mindset of constant development in our pursuit to increase the system's functionalities.

### **Summary of Findings**

The primary objective of this study is to leverage analytics in the development of an online platform that enhances meat product profitability for the Galerans Animal Raisers Association (GARA) while also contributing to the achievement of Sustainable Development Goal (SDG) 12. There are various related studies and systems that further strengthen the developed system.

The use of software development tools was thought to be necessary in order to fulfill the established system's criteria. The researchers utilized the agile technique for the study, which underwent multiple adjustments, which also made it possible for the researchers to work together constantly. In order to assess, pinpoint, and understand the flow, many diagrams were created, as well as the

system's functional requirements. Using this, the researchers were able to fulfill the study's requirements and goals.

The implemented system has offered GARA an efficient method to monitor sales, monitor meat product inventory, and promptly modify product specifications. The improved effectiveness has resulted in heightened profitability for GARA, in accordance with the main goal of maximizing the profitability of meat products.

The online platform that was developed offered customers an interface that was easy to use and had features that were useful. The implementation of pre-order and check-out capabilities provided customers with the opportunity to plan their purchases of meat products ahead of time. Users have the option to conveniently access and browse a selection of meat goods, enabling them to make well-informed choices by considering up-to-date information on product availability and pricing. In addition, the feedback system implemented by the platform provided customers with the ability to express their experiences and preferences, allowing GARA to consistently enhance their offers and fulfill customer expectations. The implemented system has significantly enhanced customer satisfaction by facilitating the adding to cart and intuitive checkout process for meat items, providing up-to-date information on product availability, and enabling customers to provide feedback on their purchases.

By integrating analytics via a dashboard within the website, the developed system has increased GARA and its consumers' transparency. As a result of this transparency, GARA is now able to obtain timely and accurate information on the pricing and availability of products, which enables them to make decisions based on data.

## **Conclusions**

The researchers came up with the Galera Agri Online Express, intended for the Galerans Animal Raisers Association (GARA) and the residents of Puerto Galera. The system could benefit the Admin/GARA and customers residing in Puerto Galera.

The developed system provides the Galerans Animal Raisers Association (GARA) beneficial tools to increase the profitability of meat products. With the ability to manage product inventory, view sales information, and make real-time modifications to product details, GARA can enhance operational efficiency and increase financial performance.

The developed system enables customers to pre-order, check out, and provide feedback on meat products, significantly enhancing their overall experience. This increases customer satisfaction and not only encourages loyalty but also empowers customers to make informed decisions, contributing to more sustainable production and consumption.

The Galerans Animal Raisers Association (GARA) has found it quite beneficial to incorporate analytics through a dashboard. By giving current updates on product availability and price, it has improved transparency in their business operations. By encouraging right consumption and production within the meat sector, this transparency not only helps GARA but also supports a larger goal of supporting Sustainable Development Goal (SDG) 12.

### **Recommendations**

The researchers appear to offer a series of insightful and well-informed recommendations, each having a significant amount of weight and significance based on the thorough examination of the study's findings and the well-considered conclusions. Their thorough investigation and thought resulted in these pragmatic and strategic proposals, with the main objective of improving the field of study.

1. To further enhance the system, a notification system for when the products are ready for delivery would be included, allowing the customers to be automatically informed by SMS.

2. Another thing to persist is to be competitive with other e-commerce platforms by offering applications that make it simple for users to access orders placed through the system via both the website and the application.

3. Future researchers may add more features like payment options like a payment center or e-wallet, a linked bank account, and a credit or debit card.



## BIBLIOGRAPHY

- Abiodun, D., Mbarika, V., Ayo, C., Emebo, O., & Mbarika, I. (2019). Farmster: A Mobile App for Agricultural Supply Chain Optimization. *Journal of Information Technology in Agriculture*, 2(1), 1-12
- About us. (2020, March 23). Fish N' Chix. <https://fishnchix.ph/pages/about-us>
- Arora, P. (2023, April 26). Why Developers Choose Python for Website Development; Is it Relevant in 2022? *iTechnoLabs*. <https://itechnolabs.ca/why-developers-choose-python-for-website-development/>
- Asmo. (2018). Agile Methodology: An Overview. *Zenkit*. <https://zenkit.com/en/blog/agile-methodology-an-overview/>
- Bacon, M., & Contributor, T. (2021). security. *Security*. <https://www.techtarget.com/searchsecurity/definition/security>
- Behera, R., Singh, A., Singh, K., & Gawade, S. (2020). E-Mandi Farm. *International Journal of Current Microbiology and Applied Sciences*.
- Bhatti, A., & Ur Rahman, S. (2019). Perceived benefits and perceived risks effect on online shopping behavior with the mediating role of consumer purchase intention in Pakistan. *International Journal of Management Studies*, 26(1), 33-54.
- Burwood-Taylor, L. (2019). Agrofy Founders: We Have Great, Creative Entrepreneurs in Argentina, But This is a Long Race. *AFN*. <https://agfundernews.com/agrofy-founders-we-have-great-creative-entrepreneurs-in-argentina>
- Cagas, J. C., & Panolong, M. R. (2019). E-Commerce Adoption in Rural Areas of the Philippines: The Case of Bukidnon Province. *Journal of Asian Finance, Economics and Business*, 6(4), 215-223.
- Chavan, S., Dixit, S., Jadhav, A., & Lahoti, P. (2018). Farmazon: A Cloud-Based E-Commerce Platform for Smallholder Farmers in India. In 2018 IEEE Global Humanitarian Technology Conference (GHTC) (pp. 1-8). IEEE. DOI: 10.1109/GHTC.2018.8601999input.
- Cornelisse, S. (2023). E-Commerce for Ag Business: Advantages and Challenges. <https://extension.psu.edu/e-commerce-for-ag-business-advantages-and-challenges>
- Corpuz, R. B., Collado, F. A. V., Robles, R. J. C., Rosete, F. O. R., & Balangue, Z. R. (2020). FarmNow: An e-commerce platform for Philippine agricultural

products. *International Journal of Business, Humanities and Technology*, 10(4), 35-41.

*DA-ACPC intensifies efforts to accelerate digitalization in agri-fishery finance* | *acpc.gov.ph*. (2021, April 27). <https://acpc.gov.ph/da-acpc-intensifies-efforts-to-accelerate-digitalization-in-agri-fishery-finance/>

Debele, S. Z., Gebremedhin, B., Kassa, B. G., & Kanel, T. (2019). A web-based platform for smallholder agriculture market linkage in Ethiopia. *Journal of Agribusiness in Developing and Emerging Economies*, 9(1), 61-78. doi: 10.1108/JADEE-07-2017-0072.

Department of Agriculture. (2020). Farmers, consumers to enjoy hassle-free shopping and trading via Deliver-E. *Official Portal of the Department of Agriculture*. <https://www.da.gov.ph/farmers-consumers-to-enjoy-hassle-free-shopping-and-trading-via-deliver-e/>

Department of Agriculture. (2021). New AgriKonek online market brings young agripreneurs closer to consumers. *Official Portal of the Department of Agriculture*. <https://www.da.gov.ph/new-agrikonek-online-market-brings-young-agripreneurs-closer-to-consumers/>

Dewi, L. J. E., Wijaya, I. N. S. W., & Seputra, K. A. (2021). Web-based Buleleng regency agriculture product information system development. *Journal of Physics*, 1810(1), 012029. <https://doi.org/10.1088/1742-6596/1810/1/012029>

Dyouri, A. (2022). How To Make a Web Application Using Flask in Python 3. *DigitalOcean*. <https://www.digitalocean.com/community/tutorials/how-to-make-a-web-application-using-flask-in-python-3>

E-Agro, first e-commerce platform for agri-inputs launched today. (2021, January 11). *Thesundaily*. <https://www.thesundaily.my/home/e-agro-first-e-commerce-platform-for-agri-inputs-launched-today-HK8518548>

Gomathy, C. K., Reddy, V. J., & Venkatesh, P. (2021). A Study on Ecommerce Agriculture. *ResearchGate*. [https://www.researchgate.net/publication/356217307\\_A\\_Study\\_on\\_Ecommerce\\_Agriculture](https://www.researchgate.net/publication/356217307_A_Study_on_Ecommerce_Agriculture)

Gupta, R., & Sharma, P. K. (2018). Scope of e-commerce in agri-business in India: An overview. *International Journal of Advanced Scientific Research and Management*, Special Issue I.

Halton, C. (2023). Predictive Analytics: Definition, Model Types, and Uses. *Investopedia*. <https://www.investopedia.com/terms/p/predictive-analytics.asp#:~:text=how%20to%20invest.->



,What%20Is%20Predictive%20Analytics%3F,are%20likely%20to%20emerge%20again.

Hayes, A. (2022). Crop Yield Definition, Formula, Statistics. *Investopedia*. <https://www.investopedia.com/terms/c/crop-yield.asp>

Hopkins, M. (2021). The Power of Predictive Analytics in Agriculture. *Global Ag Tech Initiative*. <https://www.globalagtechinitiative.com/digital-farming/the-power-of-predictive-analytics-in-agriculture/>

*Innovation Students Present Agriculture e-Commerce Platform | Asian Institute of Management*. (2018). <https://aim.edu/news/innovation-students-present-agriculture-e-commerce-platform>

Inouye, J. (2022). What is Bootstrap? Pros and Cons Of This Framework. *Hackr.io*. <https://hackr.io/blog/what-is-bootstrap-framework>

*Integrated MySQL Database with eCommerce | Clarity*. (2020). <https://www.clarity-ventures.com/resources/business-e-commerce/e-commerce-and-mysql-integration#:~:text=High%2Dperformance%20%26%20Scalable&text=The%20scalability%20of%20MySQL%20makes,many%20other%20technologies%20besides%20e-commerce.>

iPrice Group. (2021). The State of E-commerce in the Philippines. Retrieved from <https://iprice.ph/insights/mapofecommerce/en/>

IQLECT. (2018, November 14). The Importance of Predictive Analytics for E-commerce Stores. Medium; The Startup. <https://medium.com/swlh/the-importance-of-predictive-analytics-for-e-commerce-stores-d7ef0ce2d32e>

Joiner, J., & Okeleke, K. (2019). E-commerce in agriculture: new business models for smallholders' inclusion into the formal economy. *GSMA*. <https://data.gsmainelligence.com/api-web/v2/research-file-download?id=42565642&file=2761-280519-Agri-e-commerce.pdf>

Jordana, A. (2023). What Is JavaScript? A Basic Introduction to JS for Beginners. *Hostinger Tutorials*. [https://www.hostinger.com/tutorials/what-is-javascript#What\\_Is\\_JavaScript](https://www.hostinger.com/tutorials/what-is-javascript#What_Is_JavaScript)

Joshi, B. C., & Pandey, A. (2019). Impact of e-commerce on Indian agriculture. *Journal of Agribusiness in Developing and Emerging Economies*, 9(2), 166-181. doi: 10.1108/JADEE-06-2018-0089.

Kapoor, A. (2023). What Is Traditional Marketing? &#8211; Channels &#038; Examples. *Feedough*. <https://www.feedough.com/traditional-marketing/>

- Kathuria, H. (2022). The Most Popular Databases for 2022. *LearnSQL.com*. <https://learnsql.com/blog/most-popular-databases-2022/#:~:text=The%20open%2Dsource%20aspect%20of,semi%2Dstructured%20data%20like%20JSON>
- Khandelwal, A. (2023). What is eCommerce Testing? Why and How Should You Do It? *Blog*. <https://vwo.com/blog/e-commerce-testing/>
- Komorek, C. (2020). *Deliver-E launched in Philippines*. Fruitnet. <https://www.fruitnet.com/asiafruit/deliver-e-launched-in-philippines/183838.article>
- Laravel. (2021). The PHP Framework for Web Artisans. <https://laravel.com/>
- Liu, L. (2022). Research on the Operation of Agricultural Products E-Commerce Platform Based on Cloud Computing. *Mathematical Problems in Engineering*, 2022, 1–8. <https://doi.org/10.1155/2022/8489903>
- Llanto, G. M. (2019). E-commerce in the Philippines: Enhancing agricultural marketing efficiency. *Philippine Journal of Development*, 46(2), 81-102.
- Milne, A. (2022). The Agile Development Methodology Explained. *Insights - Web and Mobile Development Services and Solutions*. <https://www.netsolutions.com/insights/agile-development-methodology/>
- Motha, R., & Venter, H. S. (2019). Digital platform for crop farming to enhance yield and profitability. In 2019 IST-Africa Week Conference (IST-Africa) (pp. 1-8). IEEE.
- Nayak, S. (2019). A review on e-commerce site for agriculture. *International Journal of Engineering and Advanced Technology*, 8(6), 6-9.
- O'Hara, J., & Low, S. A. (2020). Online Sales: A Direct Marketing Opportunity for Rural Farms? *Journal of Agricultural and Applied Economics*, 52(2), 222–239. <https://doi.org/10.1017/aae.2019.44>
- Otwell, T. (2021). Laravel Documentation. <https://laravel.com/>
- Ouma, W. K. (2021). Development of an agricultural e-marketplace in Kenya: A case of SokoMkononi platform. *Journal of Agribusiness in Developing and Emerging Economies*, 11(3), 360-372. doi: 10.1108/JADEE-07-2019-0149
- Parsa, S. (2021) Crop Exchange in Digital-Agriculture. IEEE Conference Publication | IEEE Xplore. <https://ieeexplore.ieee.org/document/9591744>
- Patel, D. (2022). Why Choose Python for eCommerce Platform? *www.linkedin.com*. <https://www.linkedin.com/pulse/why-choose-python-e-commerce-platform-dhruv-patel?trk=pulse-article>

Picardy, J., Cash, S. B., & Peters, C. J. (2020). Uncommon Alternative: Consumers' Willingness to Pay for Niche Pork Tenderloin in New England. *Journal of Food Distribution Research*, 51(2), 61–91. <https://doi.org/10.22004/ag.econ.305>

483

PICKAROO — About Us. (2020). Pickaroo Home. <https://blog.pickaroo.com/about-us>

Puerto Galera | Agri-Profile. (n.d.). <http://orminagri.com/puertogalera#:~:text=Though%20most%20of%20the%20farm,gourd%2C%20tomato%2C%20and%20others.>

Priya. (2020). Top 5 reasons why technology is important in business. Them You & Me. <https://theyouandme.com/blog/top-5-reasons-why-technology-is-important-in-business#:~:text=Technology%20helps%20increase%20the%20efficiency,the%20business%20to%20grow%20rapidly.>

Quadra-Balibay, A. (2019). E-Magsasaka online portal offers buyers mass produce straight from farmers. *Good News Pilipinas*. <https://www.goodnewspilipinas.com/e-magsasaka-online-portal-offers-buyers-mass-produce-straight-from-farmers/>

Ramteke, P., Pathak, S., Raut, P., Sarade, P., & Palandurkar, N. (2020). Development of Web Based System for Farmer to Consumer Product Selling Through Direct Marketing. *International Journal of Creative Research Thoughts*, 2320–2882. <https://ijcrt.org/papers/IJCRT2003308.pdf>

Revinova, S. (2021). E-commerce effects for the sustainable development goals. *SHS Web of Conferences*, 114, 01013. <https://doi.org/10.1051/shsconf/202111401013>

Romadona, W. (2020, July 27). *Regopantes-Fair price by simplify the value chain directly from farmers - ITU Innovation Challenges Community*. ITU Innovation Challenges. <https://cocreate.itu.int/post/3483590>

Sachs, J. D., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2022). Sustainable Development Report 2022. *Cambridge University Press*. <https://doi.org/10.1017/9781009210058>

Sambhudas, M., Altaf, P., Shah, T., & Sharma, P. (2018). INTEGRATING E-COMMERCE IN AGRICULTURAL SECTOR FOR PROMOTION OF ORGANIC FARMING. *IJIRMPS*, 6. <https://www.ijirmps.org/special-issues/1/14.pdf>

Santora, J. (2021). What is an eCommerce Platform and How to Choose the Right One. *Influencer Marketing Hub*. <https://influencemarketinghub.com/what-is-an-ecommerce-platform/>

Santos, J., & Garcia, R. (2021). Assessing the potential of e-commerce for agricultural development in Mindoro: A case study of selected municipalities. *Journal of Rural Studies*, 82, 200-209.

Singh, A., Dutta, S., Saha, S., Chakraborty, D., & Chattopadhyay, A. (2020). AgroSense: An Integrated Precision Agriculture Platform for Yield and Profit Optimization. *IEEE Transactions on Instrumentation and Measurement*, 70, 1-10. doi: 10.1109/TIM.2020.2996604

Sharma, R. (2019). Html Css And Php. *Lbsitwece*. [https://www.academia.edu/38383275/Html\\_Css\\_And\\_Php](https://www.academia.edu/38383275/Html_Css_And_Php)

Sheldon, R. (2023). PHP (Hypertext Preprocessor). *WhatIs.com*. <https://www.techtarget.com/whatis/definition/PHP-Hypertext-Preprocessor>

Sobirov, B., Yekimov, S., Sitkovska, A., Iushchenko, L., & Dmytrenko, R. (2022). Using Digital Ecosystems in Agriculture. In *Lecture notes in networks and systems* (pp. 171–176). Springer International Publishing. [https://doi.org/10.1007/978-3-031-05778-6\\_18](https://doi.org/10.1007/978-3-031-05778-6_18)

Statista. (2023, April 13). *Most used technologies in the database tech stack worldwide 2022*. <https://www.statista.com/statistics/1292367/popular-technologies-in-the-database-tech-stack/>

Tadeo, R. R., & Baliuag Jr., A. C. (2021). Factors Affecting Agricultural Producers' Adoption of E-Commerce in the Philippines. *Journal of Asian Finance, Economics, and Business*, 8(2), 289-296. doi: 10.13106/jafeb.2021.vol8.no2.289

*THE 17 GOALS | Sustainable Development*. (n.d.). <https://sdgs.un.org/goals>

UNCTAD. (2018). E-commerce and Agricultural Trade: Opportunities and Challenges for Developing Countries. United Nations Conference on Trade and Development. [https://unctad.org/system/files/official-document/dtlstict2018d1\\_en.pdf](https://unctad.org/system/files/official-document/dtlstict2018d1_en.pdf)

Up, A. (2019). Insights and trends of e-commerce in the Philippines [market analysis]. *ASEAN UP*. <https://aseanup.com/insights-trends-e-commerce-philippines/>

Venkatesan, S., Srinivasan, S., & Vijayalakshmi, V. A. (2019). Agricultural Decision Support System Based on Data Analytics. *Journal of Advanced Research in Dynamical and Control Systems*, 9(3), 1037-1043.

- Villareal, M. (2020). Session Groceries: Fruits and Vegetables Delivered at the Comfort of your Home. *Out of Town Blog*.  
<https://outoftownblog.com/session-groceries-fruits-and-vegetables-delivered-at-the-comfort-of-your-home/>
- Wang, E., An, N., Geng, X., Gao, Z., & Kiprop, E. (2021). Consumers' willingness to pay for ethical consumption initiatives on e-commerce platforms. *Journal of Integrative Agriculture*, 20(4), 1012–1020.  
[https://doi.org/10.1016/s2095-3119\(20\)63584-5](https://doi.org/10.1016/s2095-3119(20)63584-5)
- Wang, H., Hao, N., Zhou, Q., Wetzstein, M. E., & Wang, Y. (2019). Is fresh food shopping sticky to retail channels and online platforms? Evidence and implications in the digital era. *Agribusiness*, 35(1), 6–19.  
<https://doi.org/10.1002/agr.21589>
- Wang, Y., Jing, Z., & Lyu, J. (2022). Study on Sustainable Development Strategy of Rural E-Commerce in the Northeast of China—A Case Study of 11 Villages, 11 Towns and 4 Counties. *Sustainability*, 14(24), 16610.  
<https://doi.org/10.3390/su14241661>
- Wang, Z. (2018). *Research on E-commerce Strategy of Agricultural Products of Our Province under the Background of qInternet Plusq*.  
<https://doi.org/10.2991/meess-18.2018.11>
- Weerasooriya, W. M. Madusha. S., Wanigaratne, A. D., Silva, H. Gayan. O. D., Hansaka, S. A. Hiran., Perera, J., & Rukgahakotuwa, L. (2022, December 1). FarmCare: Location-based Profitable Crop Recommendation System with Disease Identification. *IEEE Xplore*.  
<https://doi.org/10.1109/ICAC57685.2022.10025220>
- What Is Predictive Analytics? 5 Examples | HBS Online*. (2021, October 26). Business Insights Blog. <https://online.hbs.edu/blog/post/predictive-analytics>
- Why to Choose Java as a Career Option*. (n.d.).  
<https://www.tutorialspoint.com/why-to-choose-java-as-a-career-option#:~:text=Java%20is%20a%20secure%20and,range%20of%20libraries%20and%20APIs>
- XAMPP Tutorial - javatpoint*. (n.d.). [www.javatpoint.com](http://www.javatpoint.com).  
<https://www.javatpoint.com/xampp>
- XIE Chao and HE Defu 2019 J. Phys.: Conf. Ser. 1314 012151
- Zhang, M., & Berghäll, S. (2021). E-Commerce in Agri-Food Sector: A Systematic Literature Review Based on Service-Dominant Logic. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(7), 3356–3374.  
<https://doi.org/10.3390/jtaer16070182>

Zhang, S., Li, Y., & Li, Z. (2020). Application of Big Data Analytics in Agriculture: A Review. *Agricultural Research*, 9(3), 233-246.

## APPENDIX A

For a better understanding of the tasks all throughout the project development and its respective durations, the researchers utilize the Gantt Chart as shown in Figure 18.

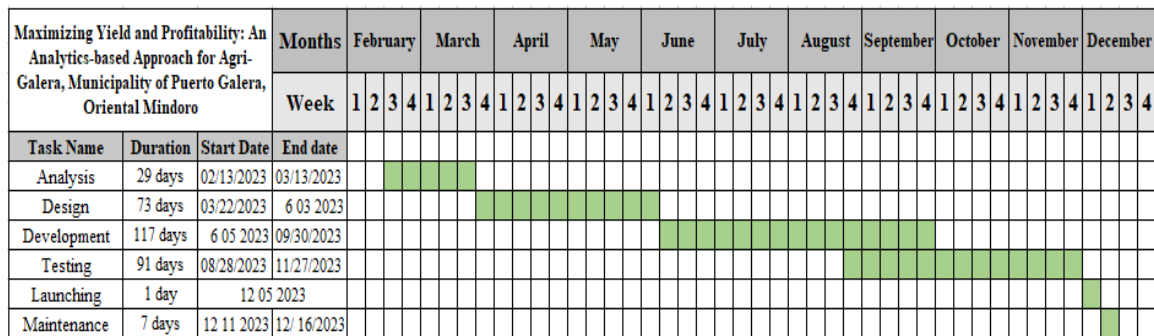


Figure 15. Gantt Chart

Figure 15 depicts the breakdown of the project's operations along with its period as it was developed. The project began with an analysis that took 29 days to complete. It was followed by the design phase, which took 73 days. Then comes system development, which the researchers hope to complete in 117 days. The developed system would then be tested, which is expected to take 91 days. This is followed by the system's launch, which lasts for one day. The final procedure, maintenance, would last for 7 days.

## ***APPENDIX B***

### **Project Roles and Responsibilities**

The involvement of the study's proponents is compiled in this table 18. Each project proponent is responsible for fulfilling their own duties and responsibilities.

**Table 18**

#### ***Project Roles and Responsibilities***

<b>Name of the Researchers</b>	<b>Task/Responsibility</b>
Angeline S. Aniag	Documenter, Quality Assurance
Angel Joy F. Fancubit	Lead Programmer
Pete Andrei A. Suzara	Documenter, UI/UX Designer

**Lead Programmer.** The person that develops the system using a variety of programming languages.

**UX/UI Designer.** The person responsible for creating the system's overall user interface and making sure the graphical user interface is easy to use.

**Quality Assurance.** The person responsible for assessing the quality of the whole system.



**Documenter.** The person responsible for documenting the objectives, definitions, and other details that are required for development of the system.

## *APPENDIX C*

### **Budget and Cost Management**

Table 19 lists the space and tools required for the project's advancement. All of the resources required for the system's development are also included in the table.

**Table 19**

***Budget Cost Management Plan***

	<b>Cost</b>
<b>Hosting</b>	Php 834.00 x 3 members = Php 2,500.00

In order to implement the system on the website, hosting facilities are needed for the project's development. The hosting service has a stated price of PHP 2,500.00. It is also mentioned that each team member would receive Php 834 from the cost, which is split equally among the members.

Furthermore, the hosting service is good for a full year. This suggests that the Php 2,500.00 charge includes hosting for a full year, which includes all infrastructure needed to support the project during that time.

***APPENDIX D***  
***Relevant Source Code***

## ***APPENDIX E***

### ***Users' Manual***

#### **USERS' MANUAL FOR CUSTOMERS OF ANIMAL RAISER ASSOCIATION (GARA)**

##### **I. REGISTER**

- A. The customers need to register an account to enable login.
- B. The customers need to input their first and last name, email, number, and their strong password when registering their account.

##### **II. LOGIN**

- A. The customers need to enter their email and password to enable login.
- B. The customers are enabled to change their password when they want to change the password. They just need to click their account then update their password.
- C. After logging in, the customer is enabled to view, add to cart, and check out the meat products available in the online shop.

##### **III. GALERA AGRI ONLINE EXPRESS**

- A. Customers can fill up the required information.
- B. Customers can enable reports to the admin for them to instantly action the problem.
- C. Customers can view their history of purchase and their status in the submitted orders in their respective accounts.

- D. Customers can change their current password into a new password by means of clicking their accounts.

## **USERS' MANUAL FOR GALERANS ANIMAL RAISER ASSOCIATION (GARA)/ ADMIN**

### **I. LOGIN**

- A. The Admin would be given a created account for them to access the admin portal site.
- B. Upon logging in the admin site, they would be redirected to the admin portal.

### **II. VIEWING THE DASHBOARD**

- A. The GARA/Admin can view the dashboard.
- B. It allows users to see the total number of clients registered in the system, total number of orders, total amount of sales, and total number of items displayed in the user interface.
- C. The changes when orders, number of customers, numbers of order, amount of sales can automatically reflect in the dashboard.

### **III. MODIFYING, ADDING, AND REMOVING THE PRODUCTS**

- A. The GARA/Admin can add new products by means of completing the product name, price, quantity, product image, and the description before saving the data.
- B. It allows you to view the products listed in the product list.

- C. It allows you to take action whether the product is available or not by simply clicking the status then choosing whether it is active or in active, change the total quantity available and the name itself, then click the update product to see the changes.

#### **IV. VIEWING THE ORDER REPORTS**

- A. After the customer reports to the admin, it would be directed to the request report list where all the reports would be listed.

#### **V. PREPARING THE ORDERS OF THE CUSTOMERS**

- A. After the customer checks out their orders, it would be directed to the order report list of the admin portal their orders wherein the GARA/Admin can take action to the orders and update the customers for their products status.
- B. By selecting the update status this would provide information that the order of the customer is currently under process by providing an update to the customers by checking their accounts.

#### **VI. VIEWING THE USER MANAGEMENT LIST**

- A. The GARA/Admin can see how many customers were registered in the system.
- B. It also shows how many customers' entries by means of clicking the down icon.

## **VII. MAINTENANCE**

- A. To maintain the website experience for clients, it is essential to consistently refresh and enhance product descriptions, photos, prices, and other relevant content. This encompasses the incorporation of fresh meat products.
- B. The responsibility involves the maintenance and monitoring of user accounts, with the objective of guaranteeing their accurate registration and authentication. To mitigate the risk of unauthorized access to sensitive data, it is imperative to effectively administer user authorization and access privileges.
- C. It is imperative to consistently maintain and upgrade the software of the shopping platform, encompassing the website, thereby the content, and any additional third-party plugins or modules. Frequent software updates typically encompass rectification of software defects, implementation of security enhancements, and introduction of novel functionalities.

## ***APPENDIX F***

### ***Bio note***

#### **PETE ANDREI A. SUZARA**



He is currently living at Sta. Rita Karsada, Batangas City, Batangas. Originally living at Tabinay, Puerto Galera, Oriental Mindoro. He was born on June 18, 2002, in the City of Dasmarinas, Cavite. He is a Filipino citizen and is a Roman Catholic. He is currently studying at Batangas State University - The National Engineering University at Alangilan Campus, taking Bachelor of Science in Information Technology with specialization track in Business Analytics from 2020 up to 2024. He received his diploma of Senior High School at Puerto Galera National High School - Main Campus from 2018-2020 with the strand of Science, Technology, Engineering, and Mathematics (STEM) and moved up his Junior High School at Puerto Galera Academy from 2014-2018. Then, graduated elementary school at Isidoro Suzara Memorial School - Model School (ISMS) from 2008-2014. He has excellent persuasive skills, great communication skills, analytical skills, and problems solving.





She is currently living in San Antonio, San Pascual, Batangas. She was born on January 27, 2002, in Coliat, Ibaan Batangas. She is a Filipino citizen and a member Iglesia ni Cristo. She is currently studying at Batangas State University - The National Engineering University-Alangilan Campus, taking Bachelor of Science in Information Technology with specialization track in Business Analytics from 2020 up to 2024. She received her diploma of Senior High School at AMA Computer College-Batangas from 2018-2020 with the strand of TVL-ICT and moved up to Junior High School at San Pascual National High School from 2014-2018. Then, graduated elementary school at Mataas Na Kahoy Elementary School) from 2008-2014.

