E-Barter: Online Bartering System for Agricultural Products and Supplies

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Dedication

First and foremost, I would like to dedicate this capstone project to my family, Marites, Christopher, and Carlo, who's always been there to support and guide me in everything I do. To my friends, especially Meriel, Aia, Kyla, Gamel, and Mica, who's always with me in every failure and success I've experienced in my journey. To Bryan, who's been there supporting me nonstop, I am so grateful to have you. I also would like to acknowledge our hard-working thesis adviser, Ms. Cherry Collera, in extending her knowledge, advice, and guidance to finish this project. Lastly, I would like to recognize the efforts and hard work of my groupmates, Gamel, Elaisa, and Miguel. A great team really makes the dream work. This journey wasn't easy, but we've shared the same goal, determination, and dedication and it led to great success. Thank you everyone, without all of you, I would've never come this far.

- **Justine Marie R. Padilla**
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- **Elaisa Mae C. Magpantay**
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Abstract

The E-Barter: Online Bartering System for Agricultural Products and Supplies is a web application that helps farmers and other agricultural-related sectors manage and trade their excess products and supplies. The system was developed to innovate the process of bartering agricultural products and supplies. Users can access the system by registering and logging in. Users can view the available products and supplies for bartering by visiting their feed. Users can post their products and supplies as well as their preferred item to receive in exchange. The filtering options can help users find their desired products or supplies faster. The system has a messaging feature, allowing users to communicate and negotiate. Users can leave feedback to another user after every transaction. The system also supports account/post reporting. Lastly, users can monitor and manage their transaction history. The system requires an internet browser and a stable internet connection to access the system. The proponents used Agile Scrum as a framework for developing the application that increased the team's productivity without consuming too much time. The system was evaluated and tested in terms of usability, performance efficiency, and reliability, and assessed system's performance based on its Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability using the ISO 25010. The web application got a rating of 4.66 with an interpretation of "Excellent." It shows that the system can be practically applied to its target users as it provides an efficient way of trading their excess products and supplies using online technology.

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Chapter 1

INTRODUCTION

In today’s world, people are unable to manage their daily lives without the use of technology such as cell phones, laptops, and other devices. Basically, almost every transaction can be done online, which includes buying, selling, paying, and purchasing things. This is how technology impacts everyone's personal lives as well as the activities of every industry they are acquainted with. And out of all the industries that technology plays a crucial role in, agriculture is one of those.

The agricultural sector of the economy is responsible for the production of livestock, poultry, fish, and crops. It is a key sector that affects every nation's food security. Furthermore, considering it as an important economic sector, having numerous enterprises and businesses in the country.

Bartering is based on two basic concepts: the first is that two people negotiate on the relative worth of their products and services, and the second is that they sell them for a fair price. One of the benefits of bartering is it does not require the use of money. People can exchange any item that they do not really need and swap it for an item that they need that falls around on the same value of the items they can exchange for. Interested traders give offers in public to fairly facilitate the process. According to Kenton (2021), “Online barter exchange became especially popular with small businesses after the 2008 financial crisis,

which culminated in the Great Recession.” Small companies increasingly use barter exchange to raise their revenues.

According to Taculao (2020), “farmers play an important role in every country because they are the ones who make sure that people do not run out of food. Farmers have the responsibility of feeding people, they, too, encounter - hardships in acquiring their necessities due to lack of funds, inaccessible locations, etc.” He is part of the Farmers' Barter Community on Facebook. It is a community where a group of individuals trades products and services without using money as a means of exchange. Members of this community can trade more than just farm products; they can also trade supplements, school supplies, and other goods.

The main problem of the study was how to develop and implement a web application that can provide traders in the agricultural sector with an efficient way to trade agricultural products and supplies. The study sought answers to the way how users can access the system, how the traders can determine the availability and information of the agricultural products and supplies, how the traders can check the product’s integrity and quality, how the system can help traders to be updated with the latest products they prefer, how the traders can communicate with other users about the process of trading, how the traders can determine the reputation of other traders, how the traders can submit concerns and complaints about a certain trader, and how the system can monitor all the transactions.

E-Barter: Online Bartering System for Agricultural Products and Supplies is a web application focused on the process of exchanging agricultural goods and

supplies. The system can be a great solution to avoid wasting excess products, and have available resources for the people who lack agricultural supplies and needs.

The study developed a web application that can enhance the process of exchanging agricultural goods and supplies through the system's usability, reliability, and efficiency. It can help small to medium-scale farmers, agricultural entrepreneurs and other agricultural-related sectors to promote their products and supplies and innovate their means of finding potential consumers through online bartering.

Objectives of the Study

The main objective of the study was to develop an E-Barter: Online Bartering System for Agricultural Products and Supplies that is capable of providing traders in the agricultural sector an efficient way of trading agricultural products and supplies.

Specifically, the study aims to:

- Design a web portal system that is capable of:

    a. Allowing users to create an account through the registration module;

    b. Displaying the availability and information of agricultural products and supplies through a feed or timeline;

c. Requiring traders to add a detailed description, including the category, quantity and status of the products and supplies through posting module;

d. Allowing traders to filter posted agricultural products and supplies based on their preferences through filtering module;

e. Providing an easy way for traders to discuss and negotiate about their posted products and supplies using messaging feature;

f. Giving traders a privilege to write a review or post feedback through a feedback module;

g. Allowing the traders to report other traders through a report module; and

h. Monitoring all user transactions stored in a secured cloud database through the transaction history module.

- Create the system using Ubuntu 20.04 LTS, PHP, Visual Studio Code, Google Chrome, PostgreSQL, Composer, NPM and Yarn as software requirements, and a Computer Unit, a Mobile phone (Operating System: Android 5.0, Memory: 416 MB (minimum), Storage: At least 100 MB free) and router for the hardware requirements;

- Test and improve the system in terms of usability, performance efficiency, and reliability; and

- Evaluate the performance of the system based on functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.

Scope and Limitations of the Study

The developed system focused on bartering agricultural products and supplies that cater to the agricultural sector, ranging from farmers to agricultural entrepreneurs, to other agriculture-related groups.

The system permits the traders to create an account and log in to have access to the system. It can also display all the available products and supplies for trading and their detailed information. The system requires the traders to write a description and fill up details of their products and supplies, such as product name, quantity, quantity type, date created/produced and perished date, and its actual image. The traders can filter their feeds based on their preferred products or supplies. The developed system has a messaging feature where two traders can discuss, negotiate, and manage their bartering process. The traders can write a review and post feedback about their transaction with another trader whom they have transacted with. Traders can report accounts to encourage a fair and equal environment of trading. Once the trader's account has been reported, the system can notify them. The account of the traders can be banned in the system after they got three warnings.The system can store every transaction of the traders in a secured cloud database that can help traders monitor and manage their account transactions.

On the Admin side, the system gives them the ability to modify categories and quantity types of the accepted products and supplies, which the traders can barter. Administrators can also add and revoke moderator rights. While both Admin and Moderators have the privilege to view and verify reported accounts and posts, additionally, they can partake in the decision-making on reprimanding the accounts and posts depending on their violation of the negotiated agreement or the terms and condition.

The developed system was only intended for the bartering of agricultural products and supplies. Unregistered traders cannot access the system, and they can only access it after creating their account and logging in. The system can only accept registration for traders whose age is eighteen (18) and above. The quantity or measurement of the products are fixed and can only be transacted as a whole or as posted. The system is not capable of accepting online payments. Also, the delivery of products and supplies is not supported and only encourages meet-ups to guarantee the legitimacy of the transactions.

The developed system's software requirements were Ubuntu 20.04 LTS, PHP, Visual Studio Code, Google Chrome, PostgreSQL, Composer, NPM, and Yarn. A Computer Unit, a Mobile Phone (Operating System: Android 5.0, Memory: 416 MB (minimum), Storage: At least 100 MB free), and a router are the hardware requirements.

The ISO 25010 tested and improved the developed system in terms of usability, performance efficiency, and reliability; and evaluated the system's performance based on its Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. The respondents of the study consisted of twenty-five (25) students taking up agriculture-related program, eight (8) agricultural products supplier/distributor, seven (7) farmers, five (5) farm owners, and five (5) agricultural professionals who has knowledge in barter trading or have an overview of the barter process in relation to the agriculture industry for a total of fifty (50) respondents.

Chapter 2

CONCEPTUAL FRAMEWORK

This chapter provides information related to the topic which aids the researchers in developing the study. The research refers to all gathered information from books, journals, electronic sources, findings in thesis, and dissertations which provides sufficient background about the study.

Review of Related Literature and Studies

Bartering System

Based on the article entitled Guide to the Barter Economy & the Barter System History (2020), a barter system is an old method of exchange. Through bartering, people utilize their available or excess assets and services that they can dispose of or provide to exchange for other people's assets and services that they lack or need. It also supplements the economic system by helping people get by with their necessities, consumers, and businesses alike, especially those who do not have actual money or cash.

In addition, Corporate Finance Institute (2019) defined bartering as the process of exchanging one good or service for another without the use of a financial means of trade. This tells us that a bartering economy is different from a monetary economy. Bartering is identified as the direct trading of goods or services which both parties agreed upon, which means that each party receives goods or services of relatively equal value as that of what they are being traded.

An article entitled The History of Trade and Barter System (2021) cited that bartering is the process of trading services or goods between two parties without using money in the transaction. In bartering, every involved party benefit from each other because they would both receive goods or services that they prefer. It also helps people without money to get by their everyday needs, which they can trade their services for goods or items. In this case, people can save their money to buy other necessities.

To sum up, the Bartering System was used in the study to set the foundation of the system's process and workflow.

Online Bartering System

Murray (2019) stated that companies used to work on a barter system, in which goods and services were often traded but no money was used as a means of a trade before the invention of banking. Although those days are long gone, many business people still use bartering. The broad availability of the internet allows organizations to control and track bartering between companies and individuals.

According to Mint (2020), the use of strategies that are more state-of-the-art to resources in trading, such as the Internet, has made bartering a comeback. In the past, this system only dealt with people who were living in the same city, but nowadays, bartering takes place all over the world. The price of bartering products was discussed with the other group. One of the benefits of bartering is that it does not involve the exchange of money. They can purchase gadgets by exchanging an

item they already own but do not need or want. Buying and selling on this platform is usually done through online auctions and switch markets.

Additionally, Lexology (2020) explained that due to the persistence of quarantine restrictions, many Filipinos are familiar with online methods of obtaining goods. Web-based shopping has expanded beyond the traditional large web-based business sites such as Shopee and Lazada to small visit groups on different web-based social platforms such as Facebook and Viber. Normally, these chat groups allow people in similar places or areas to profit from the things of others nearby. Generally, they allow neighbors to share goods and services among themselves, reducing the need to travel long distances for family items and other necessities. Also, in recent months, an increase in deal sharing has been observed and noted. Individuals exchange one item for another of approximately equal value rather than paying for goods in money with trade. These circumstances were quickly explained at the start of the quarantine period when a few necessities turned out to be limited. For example, individuals with a load of liquor jugs would exchange them for canned products; individuals with an overflow of face masks would exchange them for rice, etc.

Overall, the Online Bartering System was used in the study to adopt the use of modern technologies, especially the internet and web application, in innovating the Bartering System to adapt to the modern world’s challenges.

Bartering System of Agricultural Products and Supplies

An article by Shelter farm (2017) stated that people were able to get what they wanted before the invention of money by negotiating with one another and selling goods and services without the use of money. Despite the global appeal of prepared economic systems, bartering with acquaintances has lasted hundreds of years of civilization and is still a staple of rural economies. Farms provide a variety of bartering opportunities, and they often provide a variety of one or more items in exchange for a variety of others. One of the most enjoyable aspects of visiting a farmer's market is the opportunity to trade with various vendors. They can sell any of their unused items and gain anything without having to spend any money.

In addition, an article entitled Barter Communities in the Philippines (2020) discussed those market sellers and small-scale farmers who found that many of their products, such as vegetables, went unsold as economic growth fell dramatically. Bartering not only helps the people in the community but it also brings opportunities to commercial enterprises that can provide different resources which the community needs, this is the initiative that they introduced to their group to help their fellow residents. Vendors and farmers can now exchange products for necessities including food and groceries. Furthermore, the Koronadal Barter Exchange Community encourages not only their local group but also supporters from other parts of the world, to assist and promote one another to the best of their abilities.

In addition, Wilson (2018) cited that the family-run farm has proven to be a stronghold for bartering goods and services over the years. Due to the struggles of farmers on having not enough wages and the decreased impact of farming on their lives and survival, agriculture in the United States is forced to depend on the buying and selling of agricultural services from each other. With this, farmers from almost around the country practiced the exchange of agricultural labor from cleaning fields and cabins to trading using their agricultural equipment and farm animals. One of the most popular methods for managing agriculture in the United States is bartering. It is one of the most inspiring possibilities for keeping it going. It also enabled the development of a wide range of amazing fruits, berries, grains, and vegetables.

In conclusion, the Bartering System of Agricultural Products and Supplies was used in the study to identify the specific goods and supplies to trade in the system.

Transaction Processing

According to the Inc newsletter (2020), the term transaction process concerns the manipulation of data such as adding, changing, deleting or searching a data file or database. Moreover, it also provides a way of ensuring that every information or data obtained as part of a transaction is saved at the same time. Furthermore, if a process takes a large number of transactions and is afterward stored to be handled sooner is known as batch processing.

Based on Howard (2018), transaction processing implies the partitioning of information into individual and indivisible operations known as a transaction. Moreover, it cannot remain in an incomplete or unfinished state. If so, other operations would not access the transaction data unless the transaction is completed or withdrawn. The main objective of transaction processing is to ensure and sustain the database integrity known as the consistent state.

Beal (2021) further explained transaction processing as a form of data processing where the computer instantly answers user requests. Any form of request is a transaction, and a great example of transaction processing is an automatic teller machine commonly seen in banks. Batch processing is different from transaction processing. In batch processing, a batch of requests is collected and implemented at the same time. Batch processing can operate without the requestor's presence, while transaction processing requires contact with a user.

Overall, transaction processing was used in the study to manage the data received from the traders. It also helped the proponents to sustain the integrity, reliability, and confidentiality of the data.

Web-based Application

Indeed, the Editorial Team (2021) defined a web application or web app as a software that can execute specific tasks using a web browser. It also stated that there are many websites with web applications, and a great example of it is a contact form. Web applications help businesses and their customers to

communicate effectively. It is an example of a client-server program that means it has both a client-side and a server-side.

Furthermore, Computer Hope (2019) explained that a web-based application is a program that can be executed using an internet browser. It can also be called a web application or web app. Web application, akin to desktop computer software or a mobile app, has a user interface, provides utility or entertainment, and allows users to access, create, store, or modify data. It is commonly developed using a combination of programming languages intended for the internet, and it requires minimal RAM to be executed.

Additionally, Essential Designs (2019) cited that web applications are functional and interactive websites. Most social media such as Gmail, Facebook, YouTube, Twitter, and other web apps are interactive and designed to encourage user interaction. Web applications are difficult to build, and it requires a qualified group of software developers because they are dynamic and can execute a wide variety of functions. It is a computer program that can be accessed via a web browser, and it is usually linked to a database to offer a more engaging experience for its user.

To summarize, the proponents were knowledgeable on how to create a web application. For this reason, the system was programmed as a web application.

ISO/IEC 25010

According to Codacy (2021), ISO/IEC 25010 is classified into two different categories: (1) Product Quality and (2) Quality in use. Product quality is concerned with the static and dynamic properties of the program and is categorized into eight characteristics: (1) Functional Suitability; (2) Performance Efficiency; (3) Compatibility; (4) Usability; (5) Reliability; (6) Security; (7) Maintainability; (8) Portability. While quality in use refers to the outcome of the user with the program and is also classified into five characteristics: (1) Effectiveness; (2) Efficiency; (3) Satisfaction; (4) Freedom from risk; (5) Context coverage.

Rebeś (2019) stated that ISO 25010 is an essential framework for defining important software metrics for a specific project. It is an exclusive and not a detailed map, but a guide that can be used depending on a particular situation. ISO 25010 provides the flexibility and freedom to work with different projects with different priorities and measurements.

Lastly, Mardjan (2016) clarified that ISO 25010 is widely used for controlling the quality aspects within a company's IT system. Functional suitability is concerned with which software meets the stated functional requirements. Reliability is about the software's ability to maintain its performance level for a specified period. Performance Efficiency is all about the relation between software performance and resource level used. Compatibility is the stage where it determines which programs can interact in sharing information with other systems or computer programs without failing and still perform its function. Usability is

related to identifying which system or program is suitable for a particular user to obtain and maintain effectiveness, efficiency, and satisfaction. Security is identifying which product can protect information and data to maintain confidentiality, integrity, and accountability. Maintainability is about identifying which product can be maintained or modified based on the effectiveness and efficiency of the programmer. Lastly, Transferability is distinguishing what system or computer program can be transferred from one system to another.

To sum up, the proponents utilized ISO 25010 to assess the system's performance depending on its functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability.

Barter App – Barter System

Barterama (2018) stated that one person's trash is another person's gold. It is one of the underlying concepts of BarterApp. There is no need to get rid of the old belongings. BarterApp allows the user to trade goods with others. BarterApp does all of the legwork for traders by matching users of similar interests. Tap the like button if the trader likes what the other party is selling, and if that person wants anything of similar value that other traders are trying to sell, make an offer, and both parties can receive a message. BarterApp is resurrecting the tried-and-true method of bartering goods and services and reinventing it. The best part is that using BarterApp to barter is free of charge.

Both systems can provide the users capability of making their own accounts to transact with each other. The user can post goods and services with detailed information of the things they want to barter.

In the existing application, the users can make their own advertisements on the items they want to barter, whereas, in the system, the users cannot create advertisements.

Swappiness

Swappiness (2021) explained that trading is one of humanity's oldest social events. The vision of this application is to be in a world where trading on the internet aids in the promotion of peace and social change. Swappiness' goal is to help realize that vision by offering a brilliant, user-friendly social forum for bartering and exchanging.

In both systems, users can register and log in to their accounts to barter with other users. They can also add items that they want to barter, make an offer, and transact with other people. The users can also give their feedback about their experience of bartering with other users.

In contrast, the traders in the system can receive notifications about their preferred items once someone posts something similar to it. Also, traders can report other traders who are not following their mutual agreement. In terms of scope, it focuses on agricultural products and supplies. While the existing system focuses more on personal needs.

Swapit

Kosiol et al. (2017) noted that Swapit is a marketplace that connects buyers and sellers of used goods. The shopping experience can be one-of-a-kind because of the innovative approach in creating a hyper-local marketplace. Swapit is completely free to use, sell, and purchase.

Both systems can give the users a fast and easy way of exchanging their products. It also has a feature where the traders can chat privately with sellers and buyers. It allows them to search for different items or products and post the items or products that they want to exchange.

For the differences, the existing application focuses on swapping pre-loved items like bags, shoes, etc. While in the system, the products for exchange focus on agricultural products and supplies.

Software Requirements

In developing the system, the proponents used Ubuntu 20.04 LTS as the operating system, PHP as the programming language, Visual Studio Code as the source code editor, Google Chrome as a tool for testing the web application upon developing the system, PostgreSQL as its database, Composer to automate dependency installation for the backend, NPM as dependency management for the frontend, and Yarn as its package manager.

Ubuntu 20.04 LTS

Wimpress (2020) clarified Ubuntu as a well-known Linux-based non-proprietary computer operating system and the best operating system they have released. Moreover, it also explained that Ubuntu 20.04 LTS is hugely utilized by companies, the government, and educational purposes. It likewise ensures a cost-effective and secure insight for its users like organizations and students.

Overall, the proponents used Ubuntu 20.04 LTS as its operating system in the study for the development of the web application because it is an open-source computer operating system that offers a cost-effective and secure environment.

PHP

Morris (2018) verified that PHP or Hypertext Preprocessor is a server-side scripting language commonly used in web development. A scripting language like PHP lets developers modify and manipulate instructions to the program while it is running, rather than executing it step-by-step every time a process occurs. PHP is different from markup languages such as HTML and CSS because HTML and CSS define the structure or layout and the appearance of the web pages, while PHP commands a static web page to perform specific actions. It also intended to integrate and communicate with other programming languages such as HTML, CSS, JAVASCRIPT, and even databases.

In conclusion, the proponents used PHP to create web pages such as homepage, newsfeed, account page, and etc.

Visual Studio Code

Microsoft (2016) stated that Visual Studio is a portable program that allows editing and manipulating code. It also supports scripting languages, runtimes, and core libraries. Additionally, it offers a lot of extensions of other programming languages and can be executed in Windows, Linux, and macOS.

As a whole, with its portability and wide range of extensions and functionalities, the proponents used Visual Studio Code as their source code editor upon developing the system.

Google Chrome

Moreau (2020) interpreted Google Chrome as a free web browser used for accessing web pages on the internet. It is one of the most used and popular web browsers. It allows developers to view the graphical representation and the post-computation output of the source code.

The latest stable release of Google Chrome is Version 89. It introduces support for new features such as WebHID, WebNFC, and Web Serial, which adds support for interacting with some hardware peripherals using a web browser that was impossible before this release. Other features include offline support for Progressive Web Apps and an API named Web Share and Web Share Target for Desktop, allowing user data sharing directly from the browser.

To summarize, the proponents used Version 89.0.4389.128 (Official Build) (64-bit) of Google Chrome as a tool in developing the system.

PostgreSQL

Obe et al. (2017) described PostgreSQL as an Enterprise-class relational database management system on par with the industry's best and leading database systems and its fast exceeding or on par with other database systems. PostgreSQL is an exception since it serves as both a database and an application platform. PostgreSQL also supports stored procedures and functions in languages such as C, SQL, and support for other programming languages are also easily enabled, such as Python, R, and Javascript.

In conclusion, the proponents prefer using PostgreSQL as its database to manage data that is stored in users, barters, offers, products, posts, comments, conversations, messages, feedback, and reports tables.

Composer

Heidi (2021) explained composer as an open-source dependency management tool for PHP. Its primary purpose is to facilitate the distribution and installation of PHP packages or libraries. It has a public repository called Packagist that holds a large number of open-source libraries that can be downloaded for free using composer.

Therefore, the system made use of composer to automate dependency installation for the backend, which used PHP as the programming language.

NPM

Singh (2020) explained NPM as one of the package managers available for the Javascript programming language. In addition to that, NPM helps automate the management of packages so that developers can focus more on development rather than spending time on mundane work. He also describes it as an assistant to the developer, similar to the assistant of doctors that gets specific tools the doctor requires. NPM also uses a repository of open-source packages for Javascript in general which is named NPM Registry.

To sum up, the system used NPM for the development of the system's front-end.

Yarn

Fernando (2018) explained Yarn as a fast, reliable, and secure dependency manager, which relies on NPM to run. Furthermore, Yarn is identical to NPM in terms of capabilities and usage. The only difference being Yarn is better in multiple aspects, which turns the favor for Yarn instead of NPM. He also discussed that Yarn has a ‘yarn.lock’ file, which locks the version of dependency to make sure that the same version of the package is installed every time, even on different machines reducing the chances for mismatched versions of dependencies.

In conclusion, the system utilized Yarn as its package manager for the system’s front-end.

Hardware Requirements

The hardware requirements consisted of a computer unit, mobile phone, and router.

Computer Unit

JavaTpoint (2018) explained that a computer is a programmable electronic system that takes raw data as input and processes it using a collection of instructions (a program) to generate an output. It generates output as soon as mathematical and logical operations are completed, and it can store the output for later use.

The system used a computer unit in developing, implementing, and testing the system. Also, the computer played an important part in the documentation part of this study.

Mobile Phone

Borth (2017) defined a mobile phone, also known as a cellphone, as a portable computer that connects to a telecommunications network to send and receive audio, video, and other data. Cellular telephone networks or global satellite-based telephony are the two most popular ways for mobile phones too the public switched telephone network (PSTN).

All in all, the camera in a mobile phone was used to capture the products of the traders. The proponents used the browser of mobile phones to use and test the system.

Router

Irei & Sacrpati (2017) defined a router as a network device that allows data to flow between two or more packet-switched computer networks. It examines the destination Internet Protocol address (IP address) of an information packet, identifies the shortest path to its destination, and then forwards it. The router is a typical entryway design, which can be seen on the internet at any point where two or more networks unite.

As a whole, the router gives internet access to the traders that enable them to post, trade, and communicate with other traders. The system cannot run without access to the internet. The proponents used the router for accessing the internet in order to search and cite the documents.

Conceptual Model of the Study

According to Airbrake (2017), a conceptual model is a structure that is formed by the application of concepts and ideas. Conceptual design was used in a variety of fields, including engineering, socioeconomics, and software development. At the same time as using a theoretical version to represent summary concepts, it's necessary to differentiate between a version of an idea and a hypothetical version. In other words, a version is an idea in and of itself, but it also has a description of what it represents — what a version is rather than what a version represents.

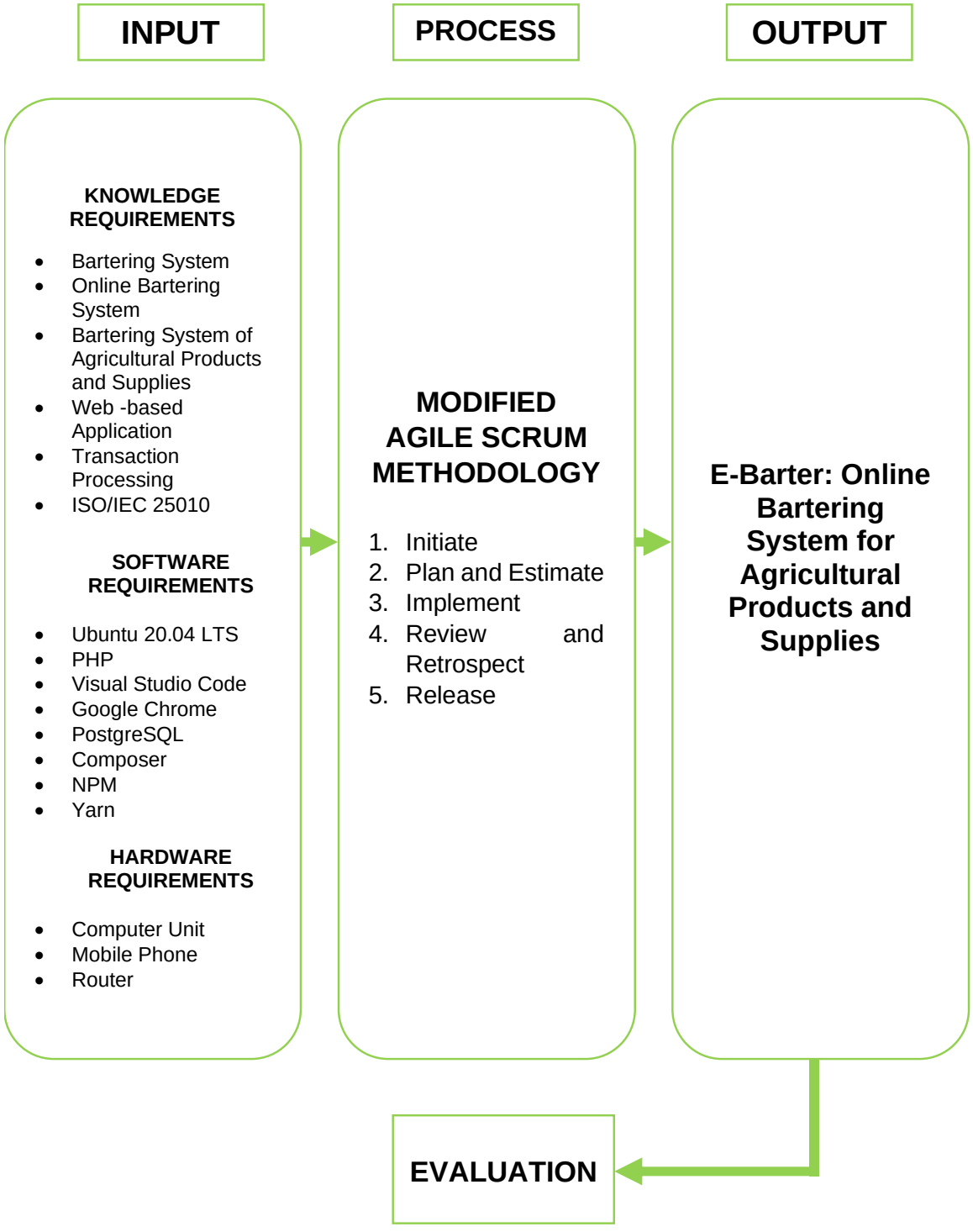

Figure 1 Conceptual Model of the Study

Figure 1 depicted the study's conceptual model, which is divided into four phases: input, process, output, and evaluation.

The input phase contains three requirements; knowledge requirements, software requirements, and hardware requirements which are used to develop the system. The knowledge requirements consist of Bartering System, Bartering System, Bartering System of Agricultural Products and Supplies, Transaction Processing, Web/Mobile -based Application, and ISO/IEC 25010. Furthermore, the software requirements are the Ubuntu 20.04 LTS, PHP, Visual Studio Code, Google Chrome, PostgreSQL, Composer, NPM, and Yarn. Lastly, Computer Unit, Mobile Phone, and a Router are the hardware requirements.

In the process phase, the Modified Agile Scrum Methodology is used to define the development stages of the system. The Modified Agile Scrum Methodology has five stages: Initiate, Plan and Estimate, Implement, Review and Retrospect, and Release.

The output phase is the combination of the input and process phase, which is the outcome of the system entitled E-Barter: Online Bartering System for Agricultural Products and Supplies. Moreover, the last phase of the conceptual model is the evaluation.

Operational Definition of terms

The following are terms that are operationally defined for a better understanding of the study:

E-Barter: Online Bartering System for Agricultural Products and Supplies- is a web-based system that enhances the process of exchanging agricultural goods and supplies of each trader.

Agriculture- refers to the specific products and supplies needed in the system.

Agricultural Entrepreneurs- refers to the person who engages in the management and development of agricultural products.

Farmers- refers to the person who manages the production of agricultural goods on the farm.

Traders- refers to the basic users of the system.

Moderators- refers to the user of the system that has additional capabilities (such as managing reports) on top of the basic functions of the Traders.

Administrator - refers to the user of the system who can manage its overall capabilities.

Terms and Condition- refers to the guidelines that users must follow in doing transactions in the system.

Chapter 3

METHODOLOGY

This chapter outlines the project design, database design, project development, operation, and testing procedures. It presents different diagrams and tables used in developing the system. Generally, this chapter discusses the process and method used and performed during the research study.

Project Design

The E-Barter: Online Bartering System for Agricultural Products and Supplies using Web Technology allows the user to create an account and log in order to access the whole function of the web application. The system provides a feed that contains the availability and information of agricultural products and supplies ready for bartering with different traders. The traders can manage their posts by filling out a form that consists of product name, quantity, quantity type, date created/produced and perished date, and the actual image of the products and supplies they intend to trade. The project also supports the filtering of posts in which the traders can customize their feeds to monitor and manage the products and supplies they are able to see on their feeds. The system also offers in-app messaging for the traders to address, negotiate, and manage the bartering of products and supplies. Traders can write a review and post their feedback to other traders based on their satisfaction. The system also supports reporting of accounts to prevent fraud and to promote an equitable environment. The system can

automatically save the past and present transactions of its traders in a secured cloud database.

Use Case Diagram

Lynch (2019) explained that the use case demonstrates and identifies the probable function of the system and not the particular way of modeling it. It is a group of potential outcomes of interactions within the program and its actors. Also, it is stated as the principal structure of the software requirements for new undeveloped software.

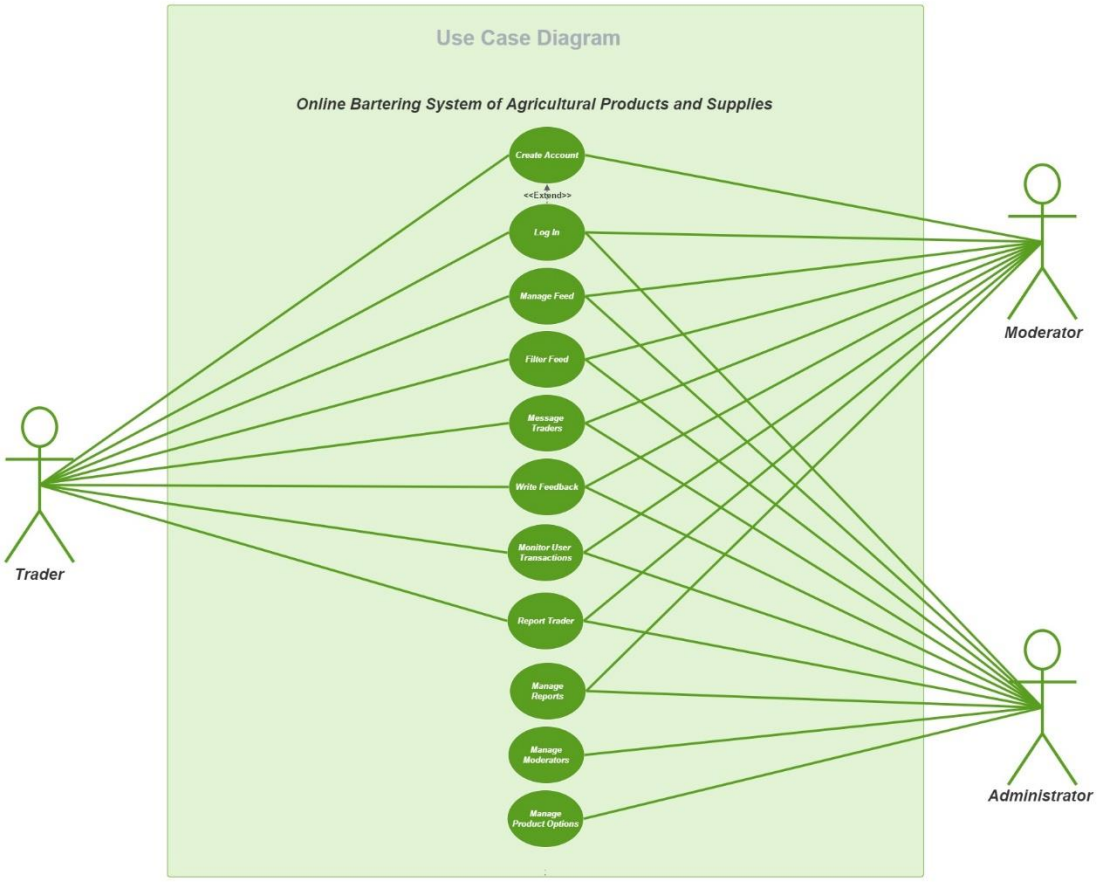

Figure 2 Use Case Diagram

Figure 2 illustrated the use case diagram. As seen in the figure, there are three levels of users in the system: the Trader, the Moderator, and the Administrator. The Trader is the most basic user, and to access the system, Traders must register first to log into their accounts. Traders can manage their feed where they can post and trade with other traders. They can filter their feed based on their preference. They can also message other traders for better communication while they're transacting with other traders. Traders can write feedback to other traders after every successful transaction. They can monitor and view every transaction they have made with other traders. They can also report other traders' accounts or their inappropriate posts. The second-level users of the system are the Moderators. Aside from having the ability to utilize the functions of the Traders, they are able to manage reports of the Traders and can take appropriate action for it. Lastly, the highest user level of the system is the Administrator. While they can also do what the Traders and Moderators can do, the Administrator can manage moderators where they can promote a trader to a moderator. They can also manage the product options such as the accepted categories, quantity, types, etc.

Activity Diagram

According to Rungta (2021), the activity diagram is a flowchart that illustrates the progress of one action to another action, which is also called an object-oriented flowchart. The activity diagram's objective is to apprehend the interactive design patterns of the system.

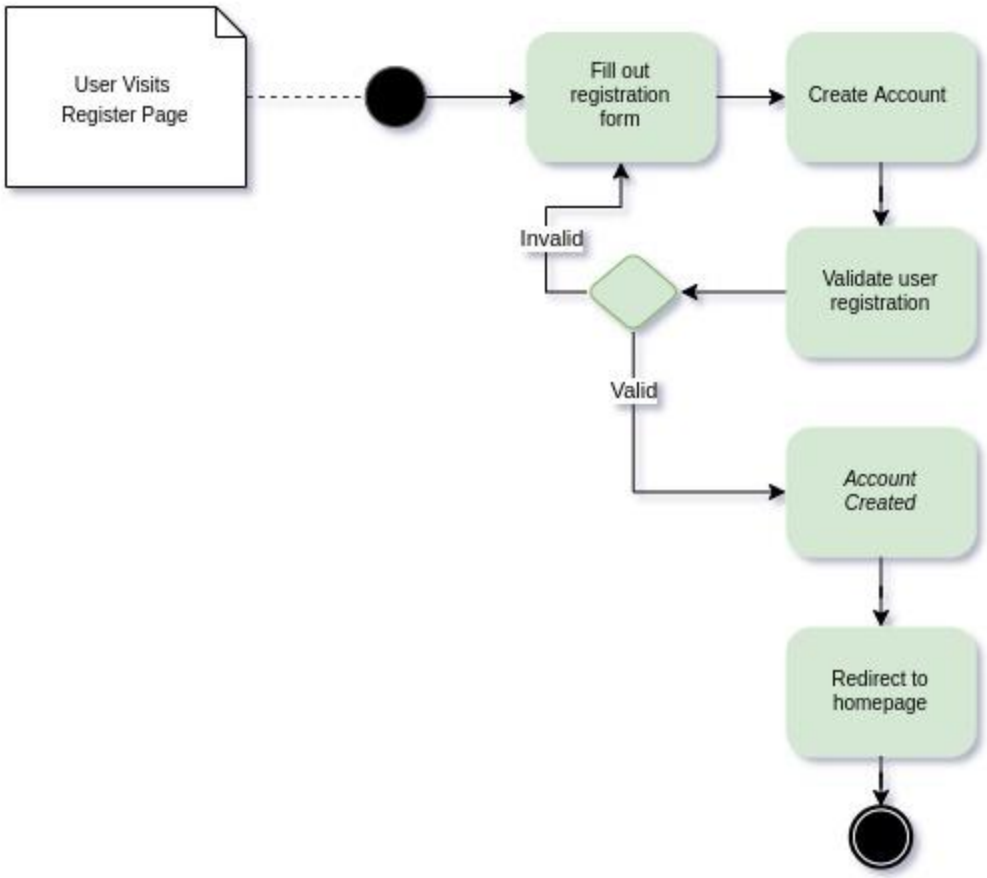

Figure 3 Activity Diagram of Create Account

Figure 3 presented the activity diagram of Create Account. Upon registering an account, the user must fill out the registration form by inputting their valid credentials. After filling out the form and clicking the create account button, the system will validate the user's registration. If the inputted credentials are invalid, the web application will prompt the user to fill out the registration form again. If the inputs are valid, the account will be created, and the user will be redirected to the homepage.

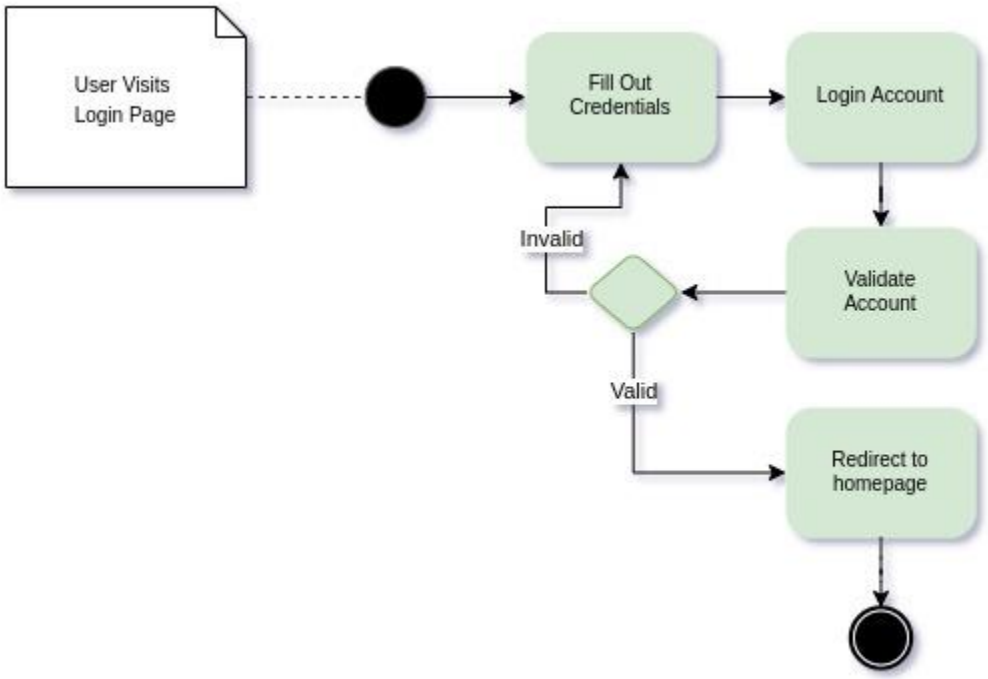

Figure 4 Activity Diagram of Log In

Figure 4 displayed the activity diagram of Log In. Upon logging in, the registered user must fill out the login form by inputting their login credentials. After filling out the form and clicking the login account button, the system will validate the user's account. If the inputted login credentials are invalid, the web application will prompt the user to fill out the login form again. If the inputs are valid, the user will be redirected to the homepage.

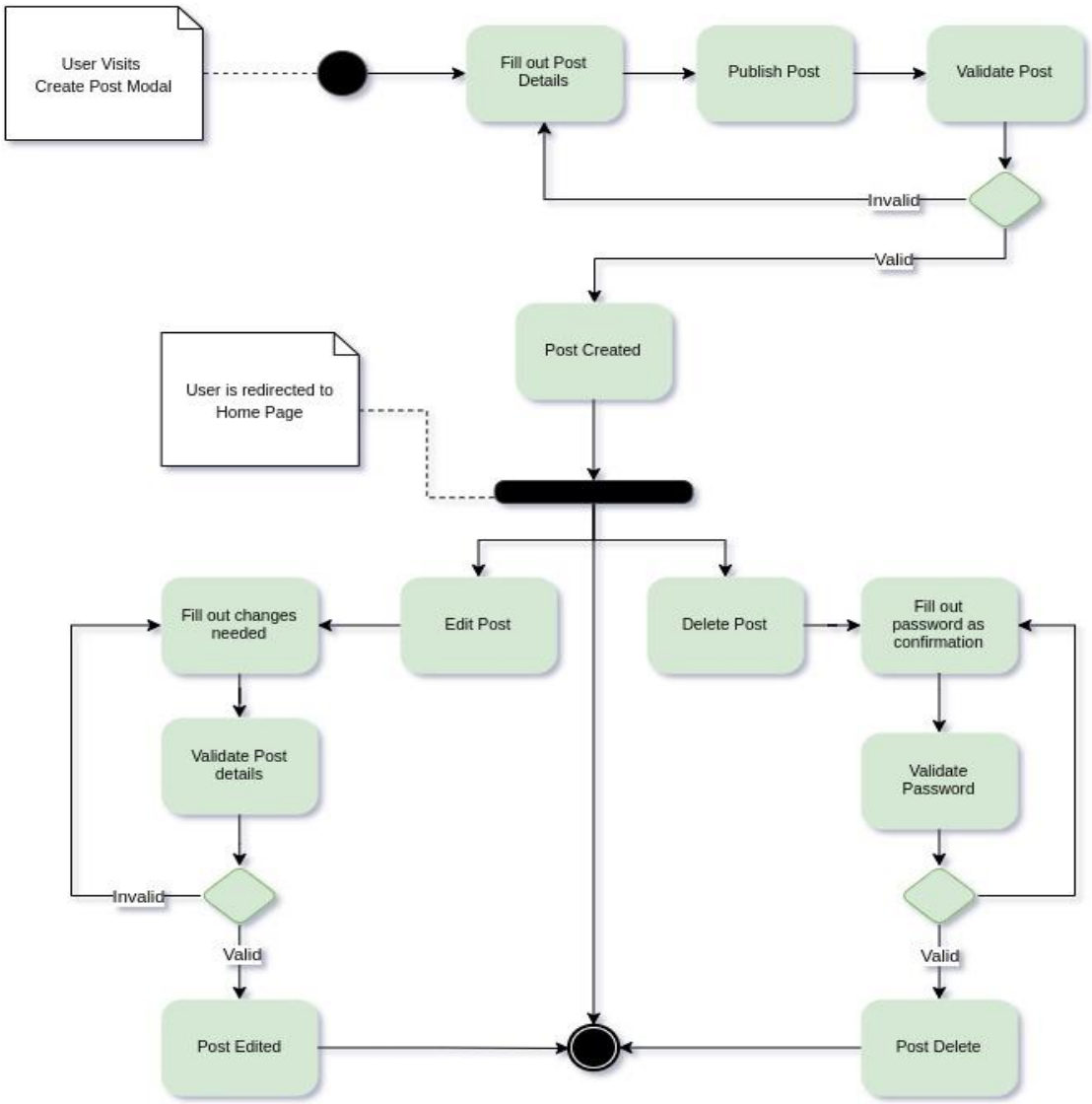

Figure 5 Activity Diagram of Manage Feed

Figure 5 presented the activity diagram of the Manage Feed. To create a post, the user must fill out the post details form. After filling out and clicking the publish post, the system will validate the user's post. If the post is invalid, the system will prompt the user to fill out the post details again. However, if the post is valid, the user's post will be created. To edit the posted post, the user must click the edit post button. Upon clicking the button, the user can now edit the information

that needs some changes. After editing the post details, the application will validate the changes made. If the information is invalid, the user will be required to fill out the form again. If the information is valid, the post will be successfully edited. To delete the post, the user must tap the delete post button. After tapping the delete post, the system will require the user to input their password as confirmation. Afterwards, the application will validate the password if it is correct or not. If the inputted password is incorrect, the action will fail, and the user must re-input their password again. If the password is correct, the post will be successfully deleted.

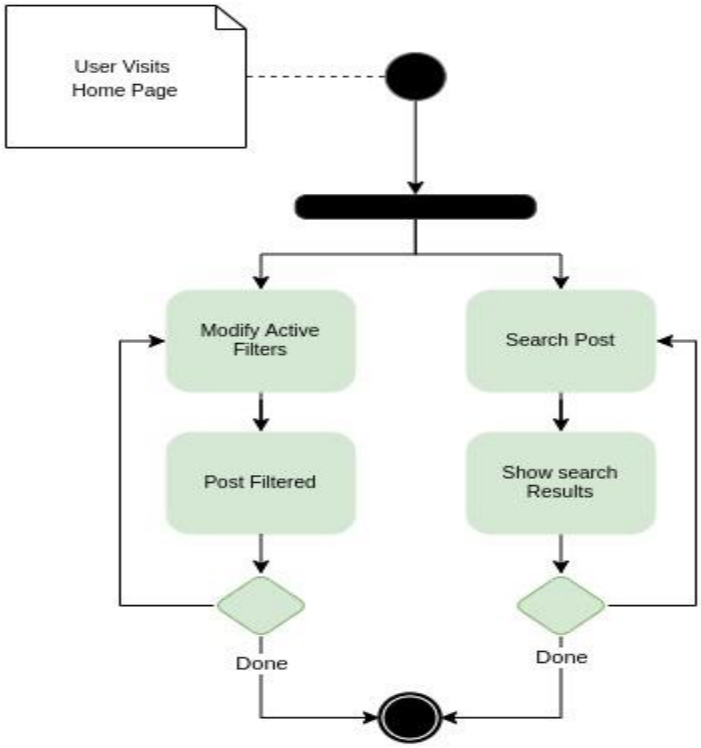

Figure 6 Activity Diagram of Filter Feed

Figure 6 showed the activity diagram of Filter Feed. There are two ways to filter their feed or timeline. The first one is by modifying the filter settings, and the second is by inputting specific words in the search bar. To filter the feed or timeline using the filter setting, the user must click or select their preferred filters in the filter options. After selecting, the system will automatically filter the feed based on the active or selected filter/s. To filter using the search bar, the user should input specific words in the search bar. After pressing enter on the keyboard, the system will automatically show products or supplies that match the inputted words in the search bar.

Database Design

Database design contained the entity-relationship model and data dictionary used in a system. Some of the major tables are Users, Offers, and Notifications Table.

Entity-Relationship Model (ERM)

Biscobing (2019) said that the entity-relationship model is a graphic illustration that portrays the relationships between the people, objectives, positions, and concepts in a system related to information technology. ERM presents a graphical foundation for the database design that also helps the company or organization determine the system requirement.

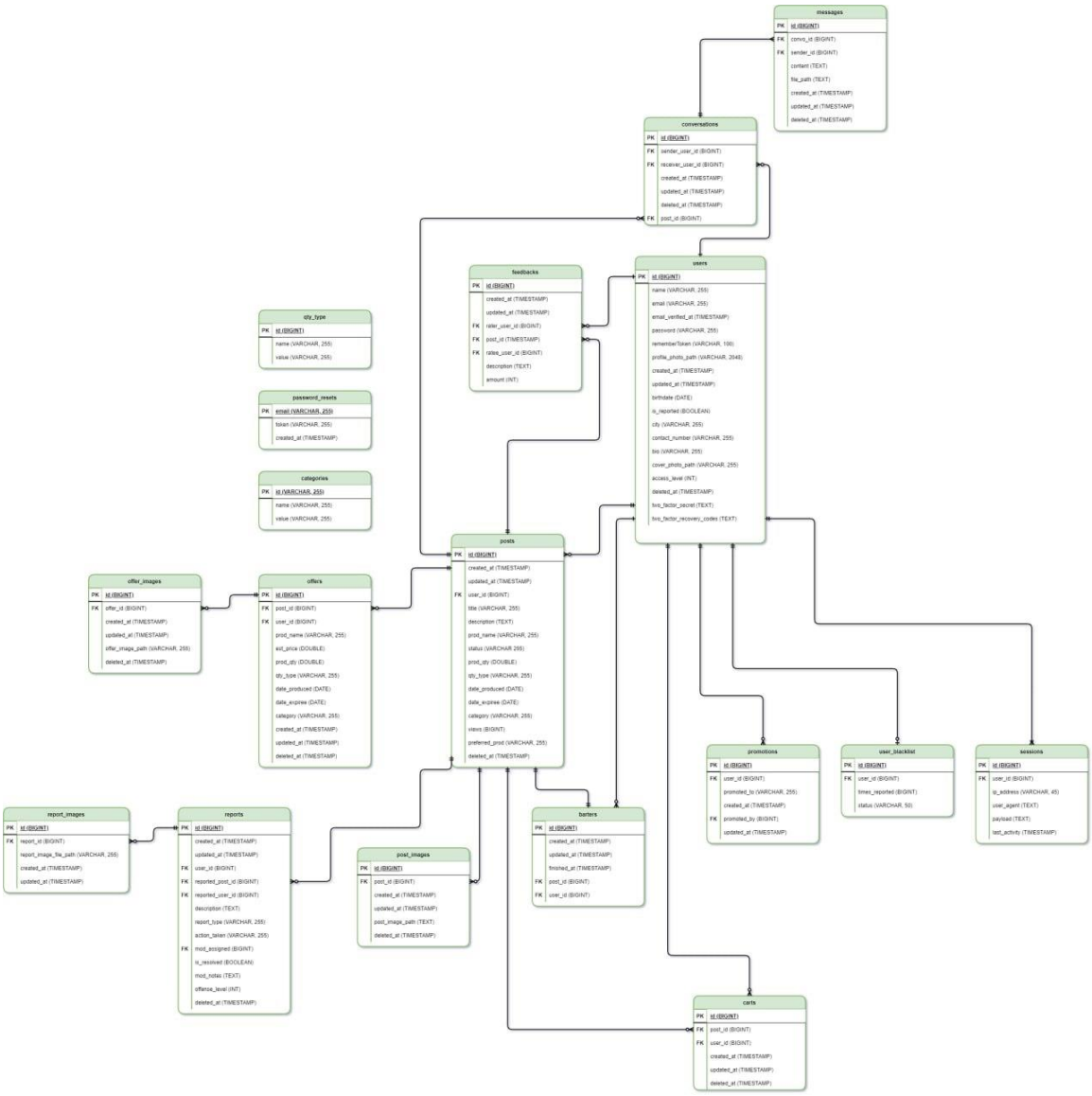

Figure 7 Entity-Relationship Model

Figure 7 exhibited the entity-relationship model of E-Barter: Online Bartering System for Agricultural Products and Supplies using Web Technology. It displays the relationship of eighteen (18) tables to one another in the web application database.

The table users contain the information about users and it has one mandatory-to-many optional relationships with the posts table. i t includes the id, name, email, email_verified_at, password, rememberToken, profile_photo_path, created_at, updated_at, birthdate, is_reported, city, contact_number, bio, cover_photo_path, access_level, deleted_at, two_factor_secret, and two_factor_recovery_codes. The table posts contain id, created_at, updated_at, user_id, title, description, prod_name, status, prod_qty, qty_type, date_produced, date_expiree, category_views, preferred_prod, and deleted_at. The post-images table consists of id, post_id, created_at, updated_at, post_image_path, and deleted_at. The users table and barters table have one-to-many optional relationship. Table barters contain id, created_at, updated_at, finished_at, post_id, and user_id. The table users and table feedbacks have a one-to-many optional relationship. It includes the id, created_at, updated_at, rater_user_id, post_id, ratee_user_id, description, and the number of products or supplies. The conversations table and users table have a one-to-many optional relationship. The table conversations consist of id, user_sender_id, receiver_user_id, created_at, updated_at, deleted_at, and post_id. The messages table includes id, convo_id, sender_id, content, file_path, created_at, updated_at, and deleted_at. The carts table contains id, post_id, user_id, created_at, updated_at, and deleted_at and it has one mandatory-to-many optional relationships with user's table. The reports table has the reports of every user and it has one mandatory-to-many optional relationships with the posts table. It consists of id, created_at, updated_at, user_id, reported_user_id, description, report_type, acton_token, mod_assigned,

is_resolved, mod_notes, offense_level, deleted_at. Table report_images table contains id, report_id, report_image_file_path, created_at, updated_at. The offers table contains id, post_id, user_id, prod_name, prod_qty, qty_type, date_produced, date_expiree, category, created_at, updated_at, deleted_at and it has one mandatory-to-many optional relationships with the posts table. Table offers_images include id, offer_id, created_at, updated_at, offer_image_path, and deleted_at. Promotions table and users table has one mandatory-to-many optional relationships. It consists of id, user_id, promoted_to, created_at, promted_by, and updated_at. Table user_blacklist has one mandatory-to-one optional relationship with user's table. It contains id, user_id, times_reported, and status. Sessions table contains one mandatory-to-many optional relationships with table users. It includes id, user_id, ip_address, user_agent, payload, and last_activity. Table qty_type contains id, name, and value. Table password_reset consists of email, token, and created_at. Lastly, the categories table contains id, name, and value.

Data Dictionary

Derda (2020) described the data dictionary as a set of names, descriptions, data types for the data elements. Data dictionary represents the elements of the data regarding the database and later on utilized as a part of it or to a capstone or research project.

Table 1. Users Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: users table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	User's identification number
No	No	name	VARCHAR	255	No	None	User's display name
No	No	email	VARCHAR	255	No	None	User's email
No	No	email_verified_at	TIMESTAMP		Yes	None	Identifies when the user's email was verified
No	No	password	VARCHAR	255	No	None	User's password
No	No	remember Token	VARCHAR	100	No	None	
No	No	profile_photo_path	VARCHAR	2048	Yes	None	Path of user's profile photo
No	No	created_at	TIMESTAMP		No	None	Date when the user created the account
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the account
No	No	birthdate	DATE		Yes	None	User's birthdate
No	No	is_reported	BOOLEAN		Yes	None	Identifies if a user has been reported.
No	No	city	VARCHAR	255	Yes	None	User's Location
No	No	contact_number	VARCHAR	255	Yes	None	User's contact number
No	No	bio	VARCHAR	255	Yes	None	User's bio

No	No	cover_photo_path	VARCHAR	255	No	None	Path of user's cover photo
No	No	access_level	INT		No	None	User access level
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the account
No	No	two_factor_secret	TEXT		No	None	User's two factor codes
No	No	two_factor_recovery_codes	TEXT		No	None	User's two factor recovery codes

Table 1 illustrated the users table of E-Barter: Online Bartering System for Agricultural Products and Supplies using Web Technology. This table stores the information of the users of the web application. The table's fields are: id, name, email, email_verfied_at, password, rememberToken, profile_photo_path, created_at, updated_at, birthdate, is_reported, city, contact_number, bio, cover_photo_path, access_level, deleted_at, two_factor_secret, and two_factor_recovery_codes. The field id acts as the primary key of the table.

Table 2. Offers Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: offers table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Offer identification number
No	Yes	post_id	BIGINT		No	None	Post identification number
No	Yes	user_id	BIGINT		No	None	User identification number

No	No	prod_name	VARCHAR	255	No	None	Product's name
No	No	prod_qty	DOUBLE		Yes	None	Product's quantity
No	No	qty_type	VARCHAR	255	Yes	None	Product's quantity measurement type
No	No	date_produced	DATE		Yes	None	Product's produced date
No	No	date_expiree	DATE		Yes	None	Product's expiry date
No	No	category	VARCHAR	255	Yes	None	Product category
No	No	created_at	TIMESTAMP		No	None	Date when the user posted the offer
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the offer
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the offer

Table 2 showed the offers table of E-Barter: Online Bartering System for Agricultural Products and Supplies using Web Technology. This table stores the information of the traders' offers. The table's fields are id, post_id, user_id, prod_name, prod_qty, date_produced, date_expiree, category, created_at, updated_at, and deleted_at. The field id is its primary key, and the post_id and user_id are foreign keys.

Table 3. Barters Table

Data Dictionary

System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: barters table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Barter identification number
No	No	created_at	TIMESTAMP		No	None	Date when the barter was created
No	No	updated_at	TIMESTAMP		No	None	Date when the barter was updated
No	No	finished_at	TIMESTAMP		Yes	None	Date when the barter was finished
No	Yes	post_id	BIGINT		No	None	Post identification number
No	Yes	user_id	BIGINT		No	None	User identification number

Table 3 displayed the barters table of E-Barter: Online Bartering System for Agricultural Products and Supplies using Web Technology. This table stores the information about the barter transactions of the Traders. The table's fields are id, created_at, updated_at, finished_at, post_id, and user_id. The field id is its primary key, while the post_id and user_id are foreign keys.

Project Development

According to Business News Daily Editor (2020), Agile Scrum Methodology is one of the known and used project management systems that depends on

gradual or progressive development. Any step in this approach can be broken down into many sprints, each of which aims to improve the most critical features first, followed by an assumably deliverable performance. Whereas other methodologies emphasize completing a project in a sequential manner, the agile scrum approach emphasizes moving to several phases to bring the best benefit to customers in the shortest amount of time.

The proponents used the Agile Scrum Methodology as a framework for software development. They have chosen the agile scrum methodology because this method promotes flexibility and adaptability where it also increases the productivity of the team without consuming too much time. Every goal and feature must result in the client's satisfaction before continuing the development of other features. Furthermore, agile scrum allowed the researchers to easily manage the development of the system because it helped them to break down the project into several phases or major features. This resulted in quality improvement of the system, group synergy, and customer satisfaction.

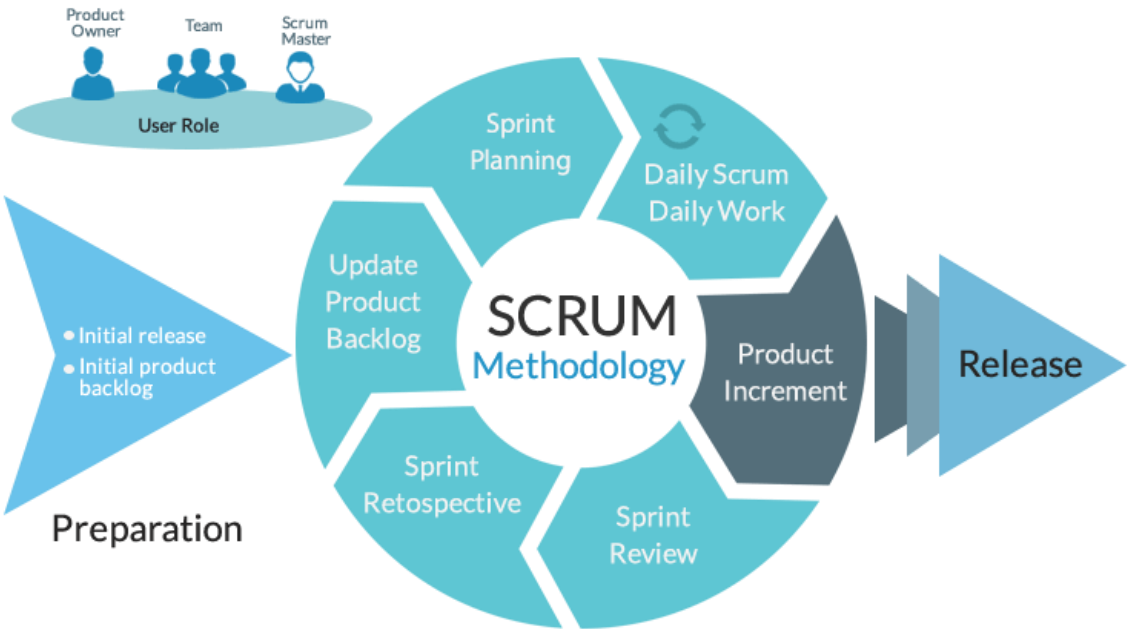

Figure 8 Agile Scrum Model

Reference: https://theinscribermag.com/tech-difference-between-agile-methodology-and-scrum-methodology/

Planning Phase

PhoenixNAP (2019) stated that in the planning phase, project leaders should first assess the terms and requirements of a project. This includes calculating the project costs from labor to the materials that are used, creating a timetable with objectives and attainable goals, and establishing the project composition and leadership structure. The planning phase clearly defined the project's purpose and scope. It directed the team's path and had established boundaries to ensure that the project is delivered effectively and that it does not distract from its original goal.

The first stage in the project development is the planning phase. In this phase, the proponents had brainstormed about the different problems that people encounter. They came up with different opinions and ideas and listed them down to assess their chosen thesis proposal titles. After that, they ended up choosing the capstone project entitled E-Barter: Online Bartering System for Agricultural Products and Supplies. The proponents started planning from the documentation to the system's features and capabilities to know the possible outcome of the system.

Requirements Analysis

According to Visual Paradigm (2020), requirement analysis is the process of determining the user's expectations for the development of new software being built or an existing software being modified. This phase is sometimes called requirements gathering or capturing. Furthermore, analyzing, recording, validating, and handling the project's specifications covers activities related to collecting the needs or conditions to complete a project in which researchers has also considered the possibility of disagreement in the requirements of different users.

The requirements analysis phase was about data gathering. This is where the researchers became engaged in collecting data and information that is needed in developing the system. The researchers conducted an interview with some farmers and agricultural entrepreneurs. They asked questions about how they manage their oversupply and undersupply of products and also their knowledge about bartering. After gathering data from their respondents, the researchers

analyzed what is the problem and how they developed a system that can help their respondents.

Design

Ghahrai (2018) explained that during the design phase, developers and technical architects start to design and create a digital representation of the system in order to smoothly deliver its requirements on the next phase. The architectural design that was identified defined all of the components developed. This also includes the outsourcing of the third-party services, creation of user flow and database as well as the actual design and behavior of each component.

In the designing phase, the system's interface, functionality, and design began to form. In this stage, the proponents determined the diagrams such as Use Case Diagram, Activity Diagram, Entity-Relationship Model, and Data Dictionary which were needed in the development of the system. This is where the researchers constructed the structure of the architectural process of the system.

Implementation, coding, or development

Project Management Training (2021) cited that the implementation phase is where the project takes its shape. The programmers focused on coding the system, designers made graphic materials, and other role players did their work - this is where the actual system development took place. Also, it was during this phase that the system became available to external stakeholders and users for testing and further evaluation.

The implementation phase was the most important and critical part of developing the system. In this phase, the requirements needed for the system were translated and developed into code. The diagrams presented in the design phase were the basis for implementing the system's design, features, and capabilities.

Testing

Tutorialspoint (2021) cited that testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. As such, testing is the process of running a system to find any defects, bugs, or incomplete specifications that are not met by the actual requirements.

In this phase, the proponents conducted different testing stages to check the functionality of the system. They tested the system's capabilities one by one, and after that, they tested the overall system performance to see if the system can meet the identified requirements for each module.

Deployment

Gartner (2019) explained that deployment helps with the setup and implementation of new systems or technology. Hardware or software acquisition, configuration, staging, implementation, and integration testing were the activities done.

In this phase, the proponents presented the system to the users. Maintenance is also a part of deployment; when users find a problem, it is up to the proponents to resolve it.

Gantt Chart

Grant (2021) defined the Gantt chart as a visual representation of a project's timeline. It's a kind of graph that illustrates the beginning and end of various project components, such as resources, objectives, tasks, and system development requirements.

eBarter : Online Bartering System for Agricultural Products and Supplies

GANTT CHART

Legend

Ongoing:

Accomplished:

No.	Task Name	Duration	Date Start	Date Finished
	Planning			
1	Brainstorming	6 days	2/24/2021	3/2/2021
2	Propose Thesis Titles	7 days	3/3/2021	3/10/2021
3	Title Proposal	1 days	3/10/2021	3/11/2021
4	Overview of the System's Features and Capabilities	7 days	3/11/2021	3/18/2021
	Requirements Analysis			
5	Data Gathering from the respondents	13 days	3/31/2021	4/13/2021
6	Questionnaire for the interview	7 days	4/14/2021	4/21/2021
7	Letter for Virtual Interview	3 days	4/27/2021	4/30/2021
8	Interview	1 days	5/1/2021	5/2/2021
	Design			
9	Topical Outline	7 days	3/17/2021	3/24/2021
10	Chapter 1 Draft	7 days	3/24/2021	3/31/2021
11	Chapter 1 Revision	7 days	4/7/2021	4/14/2021
12	Chapter 1 Finalized	7 days	4/14/2021	4/21/2021
13	Chapter 2 Draft	7 days	4/15/2021	4/22/2021
14	Chapter 2 Revision	7 days	4/22/2021	4/29/2021
15	Topical Outline Revision	7 days	4/22/2021	4/29/2021
16	System Wireframe	7 days	4/22/2021	4/29/2021
17	Database Design	10 days	4/20/2021	4/30/2021
18	ERD	10 days	4/20/2021	4/30/2021
19	Chapter 3 Draft	7 days	4/28/2021	5/5/2021
20	Chapter 2 Finalized	7 days	5/5/2021	5/12/2021
21	Chapter 3 Revision	7 days	5/5/2021	5/12/2021
22	Chapter 3 Finalized	7 days	5/12/2021	5/19/2021
	Implementation, Coding or Development			
23	Registration/Login	7 days	4/7/2021	4/14/2021
24	User's Feed/Timeline	7 days	4/7/2021	4/14/2021
25	User's Profile	7 days	4/15/2021	4/22/2021
26	Messaging	11 days	4/22/2021	5/3/2021
27	User's Feedback/Report	11 days	5/3/2021	5/14/2021
28	Transaction History	7 days	5/14/2021	5/21/2021
	Testing			
29	Unit Testing	15 days	5/21/2021	6/5/2021
30	Integration Testing	5 days	6/5/2021	6/10/2021
31	System Testing	4 days	6/11/2021	6/15/2021
32	Acceptance Testing	2 days	6/16/2021	6/18/2021

FEBRUARY | MARCH | APRIL | MAY | JUNE

W1 W2 W3 W4 | W1 W2 W3 W4 W5 | W1 W2 W3 W4 W5 | W1 W2 W3 W4 W5 | W1 W2 W3 W4 W5

Figure 9 Gantt Chart

Figure 9 showed the Gantt Chart which represented the activities done by the proponents such as Planning, Requirement Analysis, Design, Implementation,

and Testing. The system development started on February 24, 2021, and ended in January 2022. The proponents started with the planning phase where they brainstormed several thesis topics, listed them down, and presented them. After the thesis title was finalized and approved, they started to determine the features and capabilities of the system. Followed by the requirements analysis, the researchers gathered data that they needed in developing the system. They made a questionnaire and sent letters to the identified respondents first before they conducted an interview with them. After gathering enough data, the next stage was the design phase. In this stage, the researchers began to start documenting from chapters 1 to 3 then they analyzed the software and hardware requirements that are needed in the system. The next stage in developing the system is the implementation, it is the most crucial and important part of the development. This is where the researchers combined the first three stages as they developed the system. After completing the implementation stage, they have undergone the testing phase to ensure that all of the requirements were accomplished. The potential users tested the system if it is running smoothly and if they can access it free of bugs. This phase consists of Unit Testing, Integration Testing, System Testing, and Acceptance Testing.

Operation and Testing Procedure

In this section, the operation procedure and testing procedure are discussed. The different testing procedures such as unit testing, integration testing, system testing, and performance testing are also explained.

Operation Procedure

E-barter: Online Bartering System of Agricultural Products and Supplies was designed to trade different agricultural products and supplies, giving the users an idea of how bartering works and introducing the users to a modern way of bartering.

There are three types of users in the system: the Traders, Moderators and an Administrator. Each user has certain capabilities which they can utilize by their level. The Traders are the most basic user, while the Moderators have additional capabilities that they can use, and the Administrator is the overall manager of the system.

In order for Traders to access the system, they are required to fill up the information needed in the registration to create their account. When the registration is done, the Trader can log in using the email account and password they provided upon registration. Upon logging in to the system, the first thing that the Trader can see is the feed where they can filter the agricultural products and supplies based on their preferences. If the Trader wants to trade a product, they can post it to trade. When there is a posted product that can match the value of the product that they have, the Trader is allowed to make an offer to it. Traders can also receive

notifications when other Traders make an offer. Once the Trader accepts the offer, they can proceed to the messaging feature of the system where they can negotiate and make a deal with each other. After they get the product that they have traded, the posted product is marked as sold. Then they can write feedback after the transaction and they can also see the history of their transactions in their Trader profile. Lastly, the Trader has the right to report other Traders if they violate the negotiated agreement or the terms and condition.

For the Moderators, they have two options to access the account. First is that they can also register an account in the system like the Trader then the Administrator can give them Moderator rights, and second is that the Administrator can create an account for them and automatically be designated as a Moderator. They can also do what the Traders can do in the system. In addition, they can see an option to view the reports of the Traders, review it then respond to it depending on the system's terms and condition. They have the option to reprimand the reported account or not.

Lastly, for the Administrator, being the overall manager of the system, can utilize every capability which the Trader and the Moderators can utilize. The Administrator's account is predefined so they don't have to register an account in the system and can directly log in as Administrator with its predefined credentials. Upon accessing the system, they can see the general interface same as what the Trades and Moderators can see. In addition, they can choose the option to view the list of Moderators, add Moderator rights to other Traders or to remove rights to

existing Moderators. They can also select to modify product categories and quantity types.

Testing Procedure

The testing procedure shows how the proponents performed the testing using unit testing, integration testing, system testing, and performance testing.

1. Unit Testing

According to Lab (2019), individual components of a software program or framework are tested in unit testing. The key goal is to ensure that all of the individual components are functioning properly. The smallest possible part of the software that can be evaluated is known as a unit. It usually has a few inputs and just one output.

The proponents used unit testing in checking the system errors. By doing this, the proponents made sure that every capability of the system functioned accordingly. The proponents continued developing, testing, and revising the program until they achieved the expected outcome.

2. Integration Testing

Rungta (2021) said that integration testing is a method of testing in which software modules are logically connected and evaluated as a unit. A typical software project is made up of many software modules written by various programmers. The aim of this level of testing is to find flaws in the way these software modules work when they are combined.

In integration testing, the proponents used this to test if every module functioned properly once they are all set up. Also, the proponents conducted integration testing to evaluate the compliance of the system with the requirements.

3. System Testing

GeeksforGeeks (2019) explained that system testing is a form of software testing that is carried out on an entire integrated system in order to assess the system's compliance with the corresponding specifications. System testing looks for bugs in both the individual units and the whole system. The observed behavior of a module or a system, when it is evaluated, is the outcome of system testing.

The proponents used the system testing to detect if there are errors or bugs. This testing unit was the basis of the proponents if the system meets the major capabilities before doing the performance testing.

4. Performance Testing

Rungta (2021) stated that performance testing is a software testing method for evaluating a software application's speed, responsiveness, consistency, reliability, usability, and resources used under a specific workload. The system’s quality testing objective is to identify and fix performance problems in software applications.

Through the performance testing, the proponents were able to test the system’s responsiveness, reliability, and usability. Moreover, the proponents also determined how the system responded under a particular load.

These procedures utilized the below test script form.

Table 4. Test Script Form

Date			
Tested By			
Test Case Number			
Test Case Name			
Test Case Description			
Item(s) to be tested			
Procedural Steps			
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Output/Result**

Evaluation Procedure

These are the following activities that the researchers performed during the evaluation.

1. The proponents set up the system.
2. The proponents distributed the survey form to the respondents.
3. The proponents explained the flow of the system and how it works.
4. The proponents tested the system based on the criteria under ISO 25010.
5. The respondents evaluated the system's performance using the survey form.

6. The proponents collected the evaluation forms from the respondents and analyzed the data that they gathered from it.
7. The proponents computed the data using the weighted formula.
8. The overall rating was transcribed using the numerical range and equivalent descriptive interpretation using the Likert scale.

Table 5. Likert's Scale

Rank	Numerical Scale	Interpretation
5	4.51 – 5.00	Excellent
4	3.51 – 4.50	Very Good
3	2.51 – 3.50	Good
2	1.51 – 2.50	Fair
1	1.00 – 1.50	Poor

Chapter 4

RESULTS AND DISCUSSION

This chapter discusses the project description, project structure, project capabilities and limitations, test results, and project evaluation for the developed system.

Project Description

E-Barter: Online Bartering System for Agricultural Products and Supplies is a web application that helps people in the agricultural sector to have an efficient way of trading agricultural products and supplies. Its target users are the farmers, farm owners, and agricultural entrepreneurs who are willing to engage with bartering. The developed system allows users to post and trade items related to the agriculture industry, there are also moderators who will check and review user reports, and an admin to manage the overall process of the system.

The developed system allows traders to exchange their products to the products that other traders have offered upon their own preference. With this, users are able to post their product or supply, make an offer to other posted items, accept offers and negotiate with other users. Also, they can give feedback after a successful trade and it will reflect on the trader's rating. Lastly, the developed system authorizes users to report other users who violate its community standards.

The developed system is only intended for the bartering of agricultural products and supplies. Unregistered traders cannot access the system; thus, they

need to create an account and log in to enter it. The system can only accept registration from traders whose age is eighteen (18) and above. The quantity or measurement of the products are fixed and can only be transacted as a whole or as posted. Users can only message other users if they are currently on a trading transaction. The system is not capable of accepting online payments as bartering only operates without the use of money. Also, the delivery of items is not supported and only encourages meet-ups between users to guarantee the legitimacy of the transactions.

Project Structure

This section presents the project structure of the developed system. It contains the system's main capabilities with a corresponding screenshot. This includes the user's registration, login module, timeline, posting module, filtering module, messaging feature, feedback module, report module and transaction history module.

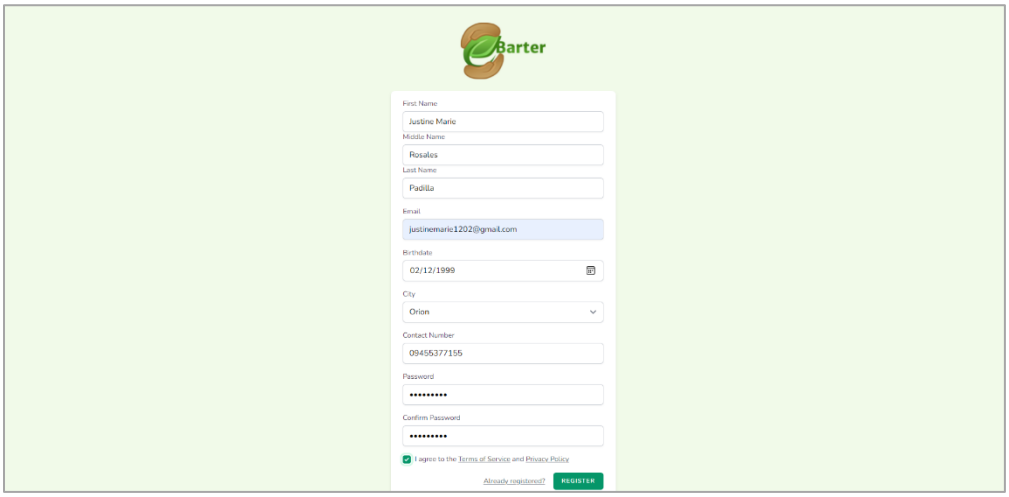

Figure 10 User's Registration

Figure 10 shows the registration form where traders can create their account. They need to fill it up with necessary information to proceed with logging in to the system.

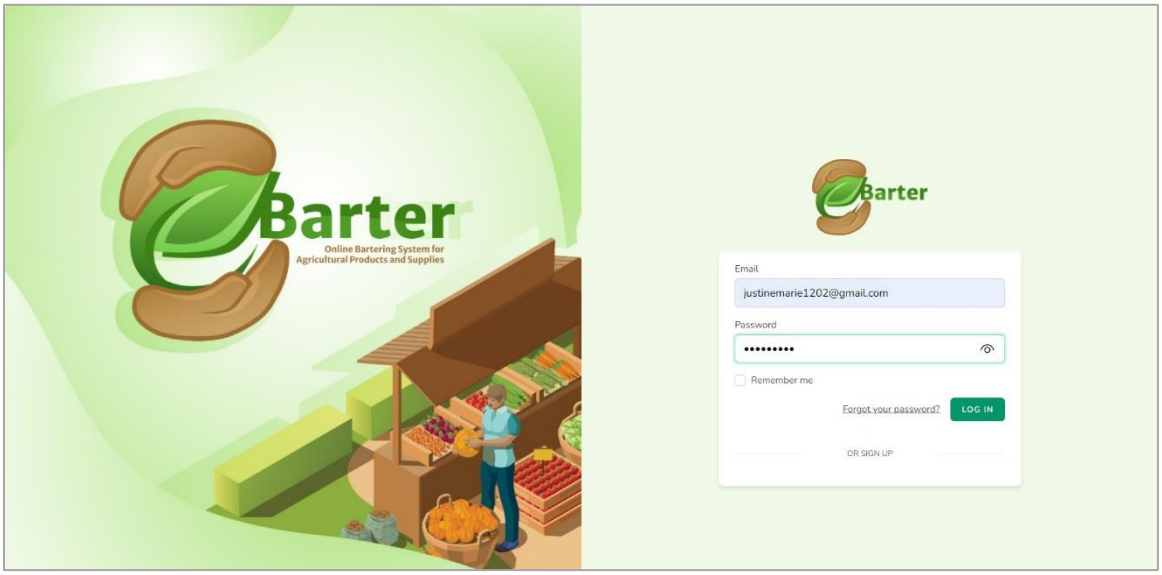

Figure 11 Login Module

Figure 11 presents the login module in which the traders need to put their credentials such as the username and password to access the system.

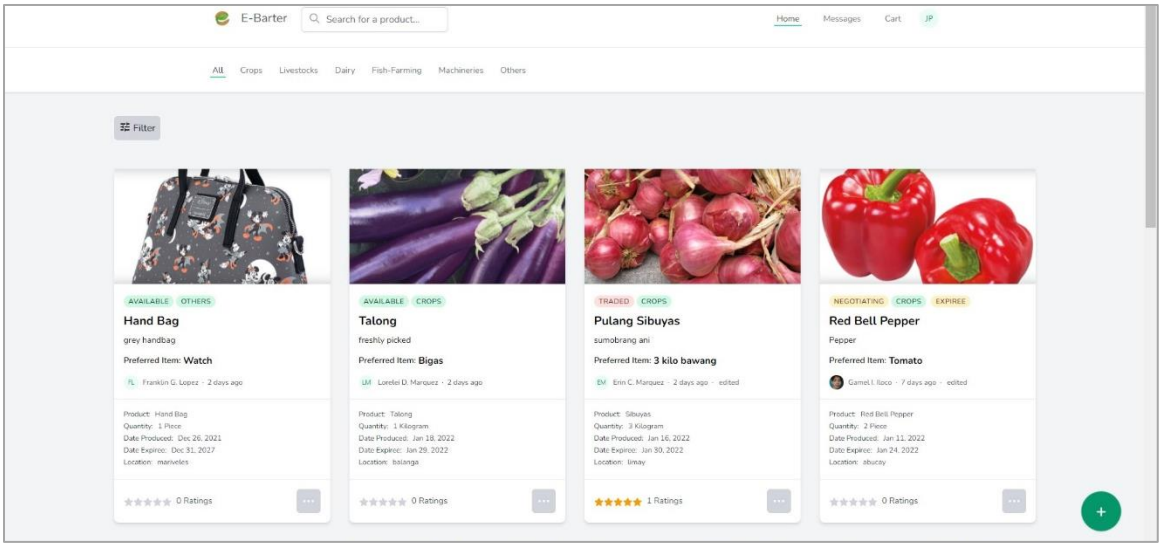

Figure 12 Timeline

Figure 12 displays the feed or timeline where the users can view the overview of the posted agricultural products and supplies open for bartering/offers.

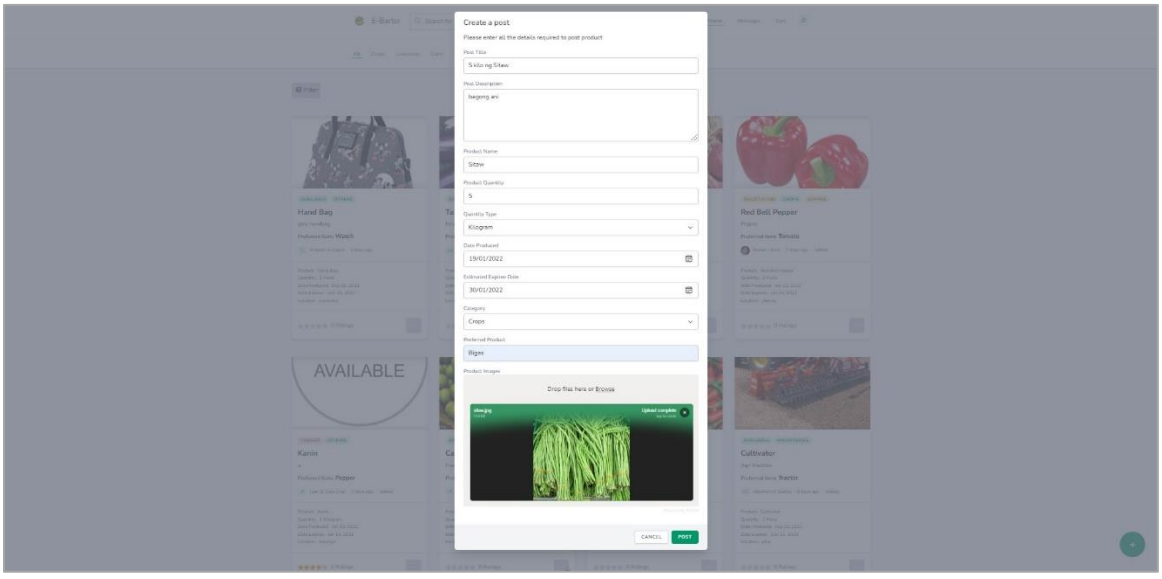

Figure 13 Posting Module

Figure 13 presents the creation of a post in which the users can publish the agricultural products or supplies they wanted to barter with other users.

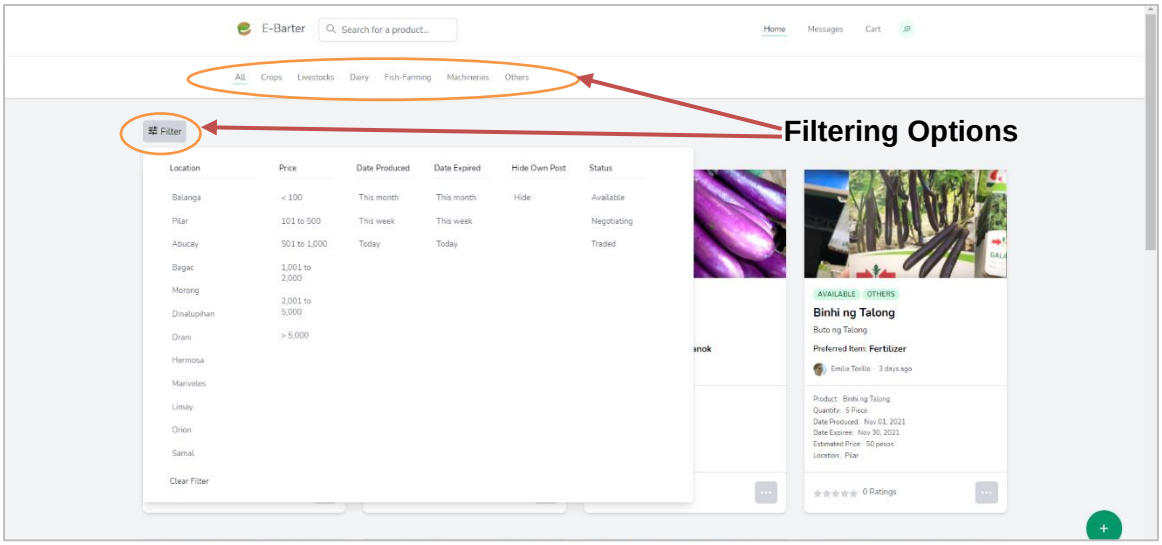

Figure 14 Filtering Module

Figure 14 displays the filtering module where the users can filter posted agricultural products and supplies based on their preferences.

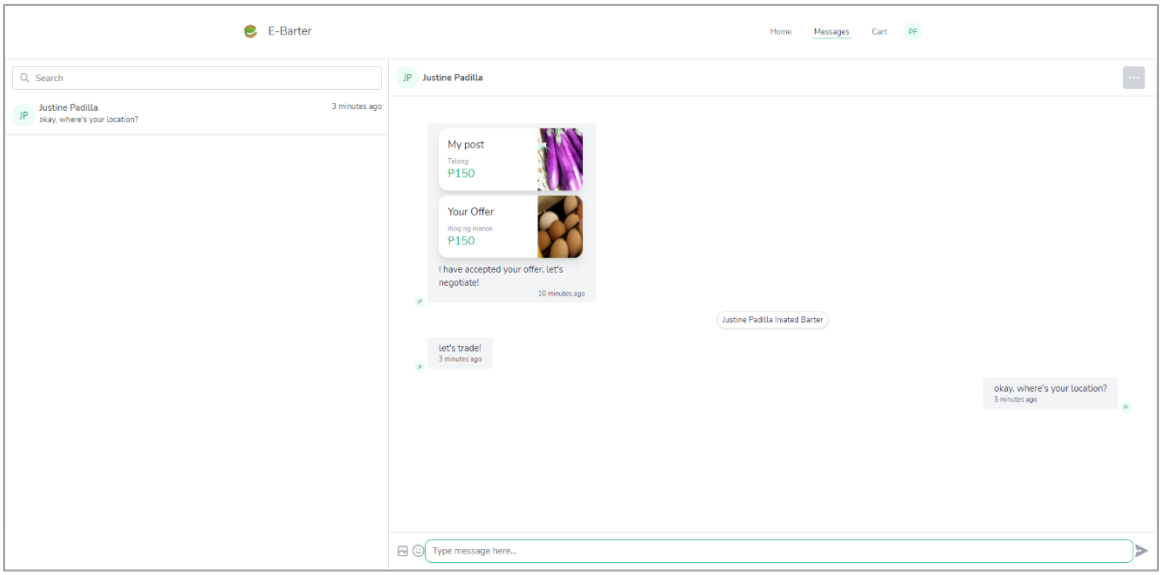

Figure 15 Messaging Feature

Figure 15 shows the messaging feature of the system in which the users can negotiate with each other regarding their transaction.

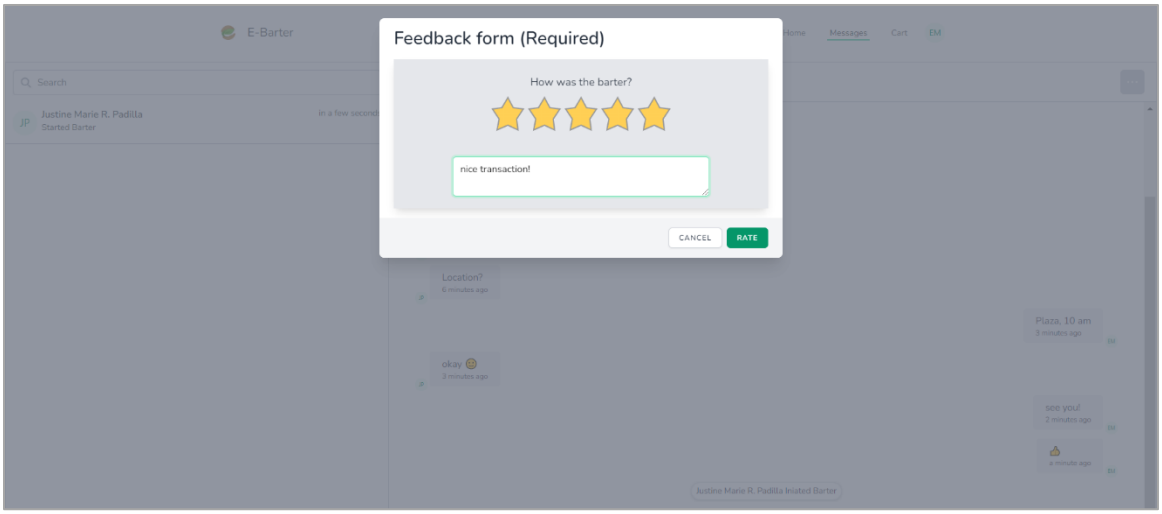

Figure 16 Feedback Module

Figure 16 presents the feedback module where the users can give comments or feedback to another user after a successful transaction.

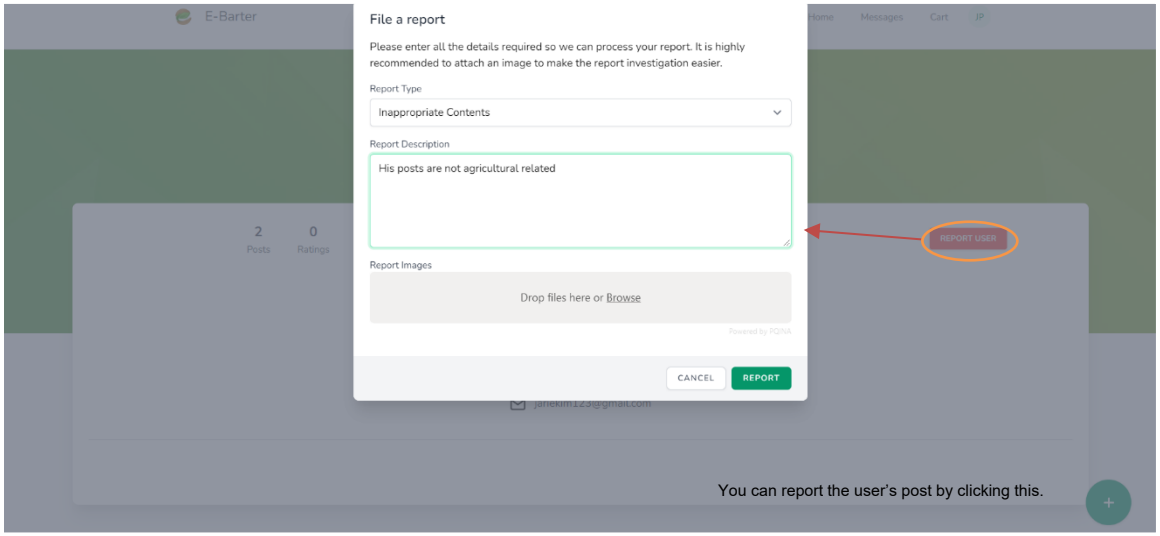

Figure 17 Report Module

Figure 17 displays the report module in which a user can report another user when they violate the system's community standards.

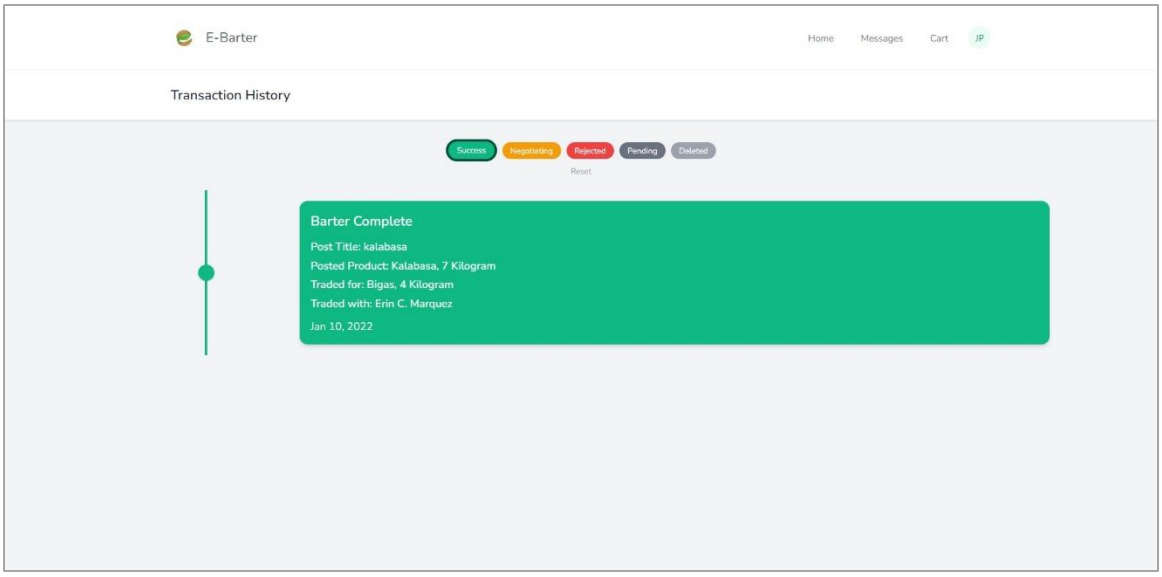

Figure 18 Transaction History Module

Figure 18 shows the page where users can check the history of their transactions. This includes successful trades, negotiation and rejected offers.

Project Capabilities and Limitations

The following are the capabilities of the developed E-Barter: Online Bartering System for Agricultural Products and Supplies:

1. Allowing users to create an account through the registration module;
2. Displaying the availability and information of agricultural products and supplies through a feed or timeline;
3. Requiring traders to add a detailed description, including the usage, quantity, and actual condition of the products and supplies through posting module;

4. Allowing traders to filter posted agricultural products and supplies based on their preferences through filtering module;
5. Providing an easy way for traders to discuss and negotiate about their posted products and supplies using messaging feature;
6. Giving traders a privilege to write a review or post feedback through a feedback module;
7. Allowing the traders to report other traders through a report module; and
8. Monitoring all user transactions stored in a secured cloud database through a user profile account.

The following are the limitations of the developed E-Barter: Online Bartering System for Agricultural Products and Supplies:

1. The developed system was only intended for the bartering of agricultural products and supplies;
2. Unregistered traders cannot access the system, and they can only access it after creating their account and logging in;
3. The system can only accept registration for traders whose age is eighteen (18) and above;
4. The quantity or measurement of the products are fixed and can only be transacted as a whole or as posted.
5. The system is not capable of accepting online payments;
6. The delivery of products and supplies is not supported and only encourages meet-ups to guarantee the legitimacy of the transactions; and

7. The web application required the user to have an internet browser and a stable internet connection.

Test Results

The test results demonstrate the different testing procedures that the respondents will perform. The table below shows the items that will be tested, and its expected and actual output. With this, all buttons and inputs in the system will be checked if they are performing their designated functions.

Table 6. Registration and Log-in Form Test Script

Date	October 31, 2021		
Tested by	Justine Marie Padilla		
Test Case Number	001		
Test Case Name	Registration and Log-in		
Test Case Description	This will allow the user to register and log-in into the web application.		
Item(s) to be tested			
1	Register Button		
2	Login Button		
Procedural Steps			
1	Visit the web page of the application		
	Input Name, Email, Birthdate, City, Contact Number, Password, and Confirm Password		
	Check the box if you agree with the Terms of Service and Privacy Policy		
	Click the Register Button		
2	Visit the web page of the application		
	Input Username and Password		
	Click the Login Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Register Button	If the Register Button is clicked, the account will be registered.	Y	Home Page

	If the credentials are not valid, the system will prompt the user to input valid credentials.	Y	Register Error
Login Button	If the Login Button is clicked, the user will be logged in.	Y	Home Page
	If the credentials are not valid, the user will be required to re-enter username and password.	Y	Login Error

Table 6 shows the Registration and Login Form Test Script. As presented, the system registration and login form are tested and successfully passed the expected result. The user registration will be successful if the inputted credentials are valid, and if not, the system will prompt the user to enter valid credentials. Also, the user can log in to the system by inputting the correct username and password. And if the credentials are incorrect, the web application will require the user to re-input valid credentials.

Table 7. Feed or Timeline Form Test Script

Date	October 31, 2021
Tested by	Justine Marie Padilla
Test Case Number	002
Test Case Name	Feed or Timeline
Test Case Description	This will allow the user to view the available products and supplies to barter.
Item(s) to be tested	
1	Home Button
2	Add to Cart Button
3	User Profile Button
Procedural Steps	
1	Click Home Button
2	Click Add to Cart Button
3	Click the button named after the user's name

Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Home Button	If the Home button is clicked, the user will be redirected to the Feed or Timeline.	Y	User is redirected to the Feed or Timeline.
Add to Cart Button	If the Home button is clicked, the user will be redirected to the Add to Cart page.	Y	User is redirected to the Add to Cart page
User Profile Button	If the Home button is clicked, the user will be redirected to the User Profile page.	Y	User is redirected to the User Profile page.

Table 7 displays the Feed or Timeline Form Test Script. As shown in the table, the home, add to cart, user profile buttons are tested and passed the test. The buttons got and met its expected output to redirect the user to their feed or timeline.

Table 8. Posting of Products or Supplies Test Script	
Date	October 31, 2021
Tested by	003
Test Case Number	Gamel Iloco
Test Case Name	Posting Products or Supplies
Test Case Description	This will allow the user to post the products or supplies they want to barter.
Item(s) to be tested	
1	Add Post Button
2	Click Drop Files Here or Browse
3	Upload Button
4	Post Button
Procedural Steps	
1	Click Add Post
	Input Post Title, Description, Product Name, Product Quantity, Date Produced, Estimated Expiry Date, Category, and Preferred Product

	Click Drop Files Here or Browse Button		
	Select Image		
	Click Upload Button		
	Click the Post Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Add Post Button	If the Add Post Button is clicked, the Create a post form will appear.	Y	Create a post form appeared.
Drop Files Here or Browse Button	If the Choose File Button is clicked, the user can select a photo to upload.	Y	Images format file saved in PC can be selected.
Upload Button	If the Upload Button is clicked and the selected file is valid, the photos will be uploaded within the post.	Y	Selected photo will be uploaded
	If the file is not valid or no file was not inserted.	Y	Error Message “File must be in image format.”
Post Button	If the Post Button is clicked, the user post will be posted in the feed/timeline.	Y	The created post was posted in the feed/timeline.

Table 8 exhibits the Posting of Products or Supplies Test Script. In the posting module, the users can post detailed information and upload images of the products or supplies they want to barter. All of the buttons in the posting modules were tested and passed. Hence, it got the expected results.

Table 9. Filtering of Post Form Test Script

Date	October 31, 2021
Tested by	Gamel Iloco
Test Case Number	004
Test Case Name	Filtering Products or Supplies

Test Case Description	This will allow the user to filter their feeds or timeline		
Item(s) to be tested			
1	Filter Button		
2	Clear Filter Button		
3	All Button		
4	Crops Button		
5	Livestocks Button		
6	Dairy Button		
7	Fish-Farming Button		
8	Machineries Button		
9	Others Button		
Procedural Steps			
1	Click Home Button		
	Click Filter Button		
2	Click Clear Filter Button		
3	Click All Button		
4	Click Crops Button		
5	Click Liveproposal stocks Button		
6	Click Dairy Button		
7	Click Fish-Farming Button		
8	Click Machineries Button		
9	Click Others Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Filter Button	If the Filter Button is clicked, the user's timeline will be filtered based on their preferred filter settings.	Y	Posted products or supplies in the timeline are filtered based on the filter settings.
Clear Filter Button	If the Clear Filter Button is clicked, all of the selected categories in the filter settings will be unselected.	Y	Selected filter settings are cleared
All Button	If the all is clicked, the system will display all products or supplies with different categories in the user's feed or timeline.	Y	All categories of products or supplies are displayed in the feed or timeline.

Crops Button	If the Crop Button is clicked, the system will display all products or supplies belonging to the crop category in the user's feed or timeline.	Y	Products or Supplies belonging to the crops category are displayed in the feed or timeline.
Livestocks Button	If the Livestocks Button is clicked, the system will display all products or supplies belonging to the livestocks category in the user's feed or timeline.	Y	Products or Supplies belonging to the livestocks category are displayed in the feed or timeline.
Dairy Button	If the Dairy Button is clicked, the system will display all products or supplies belonging to the dairy category in the user's feed or timeline.	Y	Products or Supplies belonging to the dairy category are displayed in the feed or timeline.
Fish-Farming Button	If the Fish-FarmingButton is clicked, the system will display all products or supplies belonging to the fish-farming category in the user's feed or timeline.	Y	Products or Supplies belonging to the fish-farming category are displayed in the feed or timeline.
Machineries Button	If the Machineries Button is clicked, the system will display all products or supplies belonging to the machineries category in the user's feed or timeline.	Y	Products or Supplies belonging to the machineries category are displayed in the feed or timeline.
Others Button	If the Others Button is clicked, the system will display all products or supplies belonging to the others category in the user's feed or timeline.	Y	Products or Supplies belonging to the other category are displayed in the feed or timeline.

Table 9 represents the test script for the Filtering Module. In this form, Filter, Clear Filter, All, Crops, Livestocks, Dairy, Fish-Farming, Machineries, Others Buttons were both tested and passed. The ten buttons regarding the filtering module met the expected results.

Table 10. Messaging Form Test Script

Date	October 31, 2021		
Tested by	Elaisa Mae Magpantay		
Test Case Number	005		
Test Case Name	Messaging Feature		
Test Case Description	This will allow the user to discuss and negotiate with another user.		
Item(s) to be tested			
1	Messages Button		
2	Add Photo Button		
3	Emoji Button		
4	Send Button		
Procedural Steps			
1	Click Messages Button		
	Click a Conversation		
	Input messages in messages text box		
	Click Add Photo Button		
	Input emojis in the message.		
	Click Send Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Messages Button	If the Messages Button is clicked, the user will be redirected to the Messages Form.	Y	User is redirected to the Messages Form.
Add Photo Button	If the Add Photo Button is clicked, the user can select a photo to be sent.	Y	Images format file saved in PC can be selected.
Upload Button	If the Upload Button is clicked and the selected file is valid,	Y	Selected photos will be uploaded.

	the photos will be uploaded.		
	If the file is not valid or no file was not inserted.	Y	Error Message “File must be in image format.”
Send Button	If the Send Button is clicked, the message inputted in the message bar will be sent.	Y	Messages are sent.

Table 10 shows the Messages Form Test Script. In this form, buttons such as; Messages Button, Add Photo Button, Upload Button, and Send Button were tested. The four (4) buttons regarding the Messaging Feature reached and met the expected output.

Table 11. Feedback Form Test Script			
Date	October 31, 2021		
Tested by	Elaisa Mae Magpantay		
Test Case Number	006		
Test Case Name	Feedback		
Test Case Description	This will allow the user to send feedbacks		
Item(s) to be tested			
1	Submit Button		
Procedural Steps			
1	Choose and Click a Post that the user has transacted with.		
	Choose and Click the desired amount of stars you want to give to the user.		
	Click Add Feedback		
	Input feedback messages into the Feedbacks text box		
	Click Submit Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Submit Button	If the Submit Button is clicked, the system will prompt the user that the feedback has	Y	Written feedback posted in the feedback section of the selected post.

	been successfully uploaded. Also, the written feedback will be shown in the feedback section of the selected post.		

Table 11 exhibits the test script form of the Feedback module. As expected, the submit button was tested and successfully passed the test. The submit button got its expected result and executed its proper function.

Table 12. Report Form Test Script			
Date	October 31, 2021		
Tested by	John Michael Miguel		
Test Case Number	007		
Test Case Name	Reporting of Accounts or Posts		
Test Case Description	This will allow the user to send feedbacks		
Item(s) to be tested			
1	Report Button		
2	Submit Button		
Procedural Steps			
1	Visit the profile account of the user or visit timeline and select a post you want to report.		
	Click the Report Button.		
	Input a statement of why you want to report the user.		
	Click Submit Button		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Report Button	If the Report button is clicked, a pop-up window will appear, where the user can explain why they want to report the user or post.	Y	Pop-up window appeared
Submit Button	If the Submit button is click, a pop-up alert will	Y	Successful Message of “Report sent.”

	appear saying, “Report sent”		

Table 12 represents the test script form of the Report module. In this form, Report Button and Submit Button were tested. The two (2) buttons passed and got the expected output of its functionality.

Table 13. Transaction Form Test Script

Date	October 31, 2021		
Tested by	John Michael Miguel		
Test Case Number	008		
Test Case Name	List of Transactions		
Test Case Description	This will allow the user to view their transaction history		
Item(s) to be tested			
1	Transaction Button		
Procedural Steps			
1	Visit your profile account.		
	Click the Transaction Button.		
Specifications			
Input	**Expected Output/Result**	**Pass Y/N**	**Actual Result/Output**
Transaction Button	If the Transaction button is clicked, the user will be redirected to their transaction list.	Y	User is redirected to the transaction list.

Table 13 represents the test script form of the Transaction list feature. In this form, the button tested allows the users to view all of past and present transactions. The button passed and met its expected functionality.

Project Evaluation

This section illustrates the formulated evaluation procedures and its result to assess the success of the project. The respondents of the study consisted of twenty-five (25) students taking up agriculture-related program, eight (8) agricultural products supplier/distributor, seven (7) farmers, five (5) farm owners, and five (5) agricultural professionals who has knowledge in barter trading or have an overview of the barter process in relation to the agriculture industry for a total of fifty (50) respondents. The testing process was used to determine if the system's functionality is working smoothly and can be used by its target users. The researchers followed the evaluation procedures to assess the project where the they set up the system; distributed the survey form to the respondents; explained the flow of the system and how it works; tested the system based on the criteria under ISO 25010; the respondents evaluated the system's performance using the survey form; the researchers collected the evaluation forms from the respondents and analyzed the data that they gathered from it; then computed the data using the weighted formula; and the overall rating was transcribed using the numerical range and equivalent descriptive interpretation using the Likert scale.

Table 14. Evaluation of Software Quality: Functional Suitability

Functional Suitability	Mean Rating	Descriptive Interpretation
A. Functional Completeness	**4.70**	**Excellent**
B. Functional Correctness	**4.64**	**Excellent**
C. Functional Appropriateness	**4.66**	**Excellent**
MEAN	**4.67**	**Excellent**

Table 14 exhibits the evaluation of the system in terms of the Functional Suitability. The system got the mean rating of 4.67 with the descriptive interpretation of Excellent. Majority of the respondents showed a positive response towards the system. They thought that the concept of bartering online through a specific web application is unique and its functions complement the real bartering process.

Table 15. Evaluation of Software Quality: Reliability

Reliability	Mean Rating	Descriptive Interpretation
A. Maturity	**4.74**	**Excellent**
B. Availability	**4.72**	**Excellent**
C. Fault Tolerance	**4.60**	**Excellent**
D. Recoverability	**4.58**	**Excellent**
MEAN	**4.66**	**Excellent**

Table 15 presents the evaluation of the system in terms of Reliability. The system got the mean rating of 4.66 with the descriptive interpretation of Excellent. The respondents agreed that the system works well under normal operation as it acts as intended by the researchers. The test result showed that the system is reliable but it needs an internet or data connection as it can only be accessed online.

Table 16. Evaluation of Software Quality: Compatibility

Compatibility	Mean Rating	Descriptive Interpretation
A. Co-existence	**4.54**	**Excellent**
B. Interoperability	**4.74**	**Excellent**
MEAN	**4.64**	**Excellent**

Table 16 displays the evaluation of the system in terms of the Compatibility. The system got the mean rating of 4.64 with the descriptive interpretation of Excellent. Most of the respondents, especially the agricultural products distributors, commended the way the system can handle and display the users' posts about the different products and supplies they want to trade in, as it provides them an easy way to barter with other users.

Table 17. Evaluation of Software Quality: Usability

Usability	Mean Rating	Descriptive Interpretation
A. Appropriateness Recognizability	**4.70**	**Excellent**
B. Learnability	**4.62**	**Excellent**
C. Operability	**4.54**	**Excellent**
D. User Error Protection	**4.76**	**Excellent**
E. User Interface Aesthetics	**4.60**	**Excellent**
F. Accessibility	**4.56**	**Excellent**
MEAN	**4.63**	**Excellent**

Table 17 shows the evaluation of the system in terms of Usability. The system got the mean rating of 4.63 with the descriptive interpretation of Excellent. The system got a positive rating from the respondents because of its appropriateness for the overall concept of the system. They’re satisfied with how

they can easily use the system and manage their transactions. Thus, the usability of the system passed as it met the targeted requirements.

Table 18. Evaluation of Software Quality: Performance Efficiency

Performance Efficiency	Mean Rating	Descriptive Interpretation
A. Time Behavior	**4.68**	**Excellent**
B. Resource Utilization	**4.62**	**Excellent**
C. Capacity	**4.60**	**Excellent**
MEAN	**4.63**	**Excellent**

Table 18 exhibits the evaluation of the system in terms of the Performance Efficiency. The system got the mean rating of 4.63 with the descriptive interpretation of Excellent. The respondents gave a positive response towards the system's performance as they have experienced effective and efficient resource utilization upon testing the trading process in the web application.

Table 19. Evaluation of Software Quality: Security

Security	Mean Rating	Descriptive Interpretation
A. Confidentiality	**4.60**	**Excellent**
B. Integrity	**4.78**	**Excellent**
C. Non-repudiation	**4.72**	**Excellent**
D. Accountability	**4.56**	**Excellent**
E. Authenticity	**4.62**	**Excellent**
MEAN	**4.70**	**Excellent**

Table 19 depicts the evaluation of the system in terms of the Security. The system got the mean rating of 4.70 with the descriptive interpretation of Excellent. Some respondents mentioned that the idea where users who don't have an

account cannot access the system is good because it can lessen or prevent digital issues from arising such as scamming and identity thefts.

Table 20. Evaluation of Software Quality: Maintainability

Maintainability	Mean Rating	Descriptive Interpretation
A. Modularity	**4.56**	**Excellent**
B. Reusability	**4.70**	**Excellent**
C. Analyzability	**4.72**	**Excellent**
D. Modifiability	**4.60**	**Excellent**
E. Testability	**4.70**	**Excellent**
MEAN	**4.66**	**Excellent**

Table 20 shows the evaluation of the system in terms of the Maintainability. The system got the mean rating of 4.66 with the descriptive interpretation of Excellent. The respondents agreed that the system can be easily maintained and managed as they have actually tested and navigated the web application. Some mentioned that the process is like that of an online shopping site but instead of buying and selling products, trading is its primary transaction.

Table 21. Evaluation of Software Quality: Portability

Portability	Mean Rating	Descriptive Interpretation
A. Adaptability	**4.64**	**Excellent**
B. Installability	**4.70**	**Excellent**
C. Replaceability	**4.72**	**Excellent**
MEAN	**4.69**	**Excellent**

Table 21 displays the evaluation of the system in terms of Portability. The system got the mean rating of 4.69 with the descriptive interpretation of Excellent.

Some respondents suggested that the system should have a mobile application because they think that it would be more streamlined for most of them as smartphones are handier nowadays. Regardless, the test result still showed that the system passed in terms of portability.

Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains the discussion of the summary of findings of different tests, conclusions about the different surveys, and the recommendations for the system's progress.

Summary of Findings

Based on the analysis of data, the findings are as follow:

1. On the result of the evaluation of the E-Barter: Online Bartering System for Agricultural Products and Supplies.

    1.1 The Functional Suitability characteristic got a mean rating of 4.67 with the descriptive interpretation of Excellent. The result got a positive rating from the respondents where they showed great interest in the concept of online bartering through a specific web application. They thought that it was unique and its functions complement the real bartering process, which includes the posting of items in a public space, letting the public make an offer to the posted item, waiting for offers which interest the trader, and exchanging the items being bartered and offered.

    1.2 The Performance Efficiency characteristic got a mean rating of 4.63 with the descriptive interpretation of Excellent. The result showed

that the system's performance is great as the respondents experienced effective and efficient resource utilization upon testing the trading process in the web application.

1.3 The Compatibility characteristic got a mean rating of 4.64 with the descriptive interpretation of Excellent. The result showed that most of the respondents, especially agricultural products distributors and vendors, commended the way on how the system is compatible with any web browser on desktop and on mobile.

1.4 The Usability characteristic got a mean rating of 4.63 with the descriptive interpretation of Excellent. Majority of the respondents commended the system because they are satisfied with the ability to manage their posts. They can easily trade by posting the products or supplies they want to barter; they can also edit or delete it in their feed when they desire to.

1.5 The Reliability characteristic got a mean rating of 4.66 with the descriptive interpretation of Excellent. The respondents agreed that bartering using the system is efficient. Its messaging feature during the negotiation process gives an additional value in tracking the status of their trade where it displays if their offer is rejected, in the process of negotiating, or if the product is already traded.

1.6 The Security characteristic got a mean rating of 4.70 with the descriptive interpretation of Excellent. The evaluation showed that

the system gives the user an assurance with regard to the security of their account and information. Where users must verify their account first using their email address to fully access the system. Also, some respondents mentioned that the idea where people who don't have an account cannot access the system is good, because it can help lessen or prevent digital issues from arising such as scamming and identity thefts.

1.7 The Maintainability characteristic got a mean rating of 4.66 with the descriptive interpretation of Excellent. The result showed that the system can be easily maintained and managed. The respondents were pleased with the capability to add and update their profile information, edit their posted products or supplies, and filter their feeds by their preferred items. Some respondents added that the process is like that of an online shopping site but instead of buying and selling products, trading is its primary transaction.

1.8 The Portability characteristic got a mean rating of 4.69 with the descriptive interpretation of Excellent. The respondents shared that reviving bartering through the use of an online platform is a great idea. The respondents can also access the web application through their mobile phone browser which makes it easier to access the system since most of them use smartphones.

Conclusions

The following conclusions are gathered based from the evaluation:

1. The E-Barter: Online Bartering System for Agricultural Products and Supplies was developed to provide traders in the agriculture sector with an efficient way of trading their agricultural products and supplies. The system allows users to create and manage their accounts. It is capable of displaying the availability and the information of all posted agricultural products and supplies. The web application also requires users to provide a detailed description, including the usage, quantity, and actual condition of the products and supplies upon posting. The system is also capable of filtering all the products and supplies posted by its users. In addition, it also has a messaging feature that provides an easy way for two negotiating users to communicate. Users can also write a review or leave feedback to other users after every transaction. They can also report other users, especially if they violated the negotiated agreement and the website's term of service. The web application stores the details of the users' transactions in a secured cloud database through their account's profile.

2. The web application was developed using Ubuntu 20.04 LTS, PHP, Visual Studio Code, Google Chrome, PostgreSQL, Composer, NPM and Yarn as software requirements, and a Computer Unit, a Mobile phone (Operating System: Android 5.0, Memory: 416 MB (minimum), Storage: At least 100 MB free), and a router for the hardware requirements.

3. E-Barter: Online Bartering System for Agricultural Products and Supplies was tested and improved in terms of usability, performance efficiency, and reliability. The system met the expected result and passed the requirements after it was tested with the identified evaluation criteria and test script forms.

4. E-Barter: Online Bartering System for Agricultural Products and Supplies was evaluated using ISO 250110 that follows the following criteria: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. It got an overall mean of rating of 4.66 with an interpretation of "Excellent" through the help of twenty-five (25) students taking up the agriculture-related program, eight (8) agricultural products supplier/distributor, seven (7) farmers, five (5) farm owners, and five (5) agricultural professionals. This proved that the web application was considered as a great application that would be very beneficial in providing an online platform to its target users, such as farmers and entrepreneurs, to promote and trade their excess products and supplies using online technology.

Recommendations

Based on the foregoing conclusions, the following are recommended for the further improvement of the project:

1. To develop a mobile application version of the system built for smart phones with Android or iOS.

2. To include a 2D mapping feature in the system to identify the exact location of the user.

3. To include a community forum to help users in their agriculture-related problems through sharing of experiences using articles made by the admin and other users.

4. To include a notifications feature in the system.

5. To allow the users select quantity or measurement of the products they want to trade.

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APPENDIX A

TITLE PROPOSAL

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Project Title: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies

Summary

Bartering is one of the traditional ways of trading goods and services where two or more entities enter into a process of exchanging without the use of money. This type of trading has been revived when COVID-19 struck the world. The convenient way of utilizing money to buy our necessities was temporarily halted because of the effect of the pandemic. Industries and businesses shut down and it impacted the way of living of everyone. Little by little, concerned groups have tried to revive the process of bartering due to the lack of utilization of money, especially those who cannot do monetary transactions. Due to this, different types of people engage in bartering through social media - not just to trade their unused items but also to help those who are in the marginalized sectors like our farmers. Given all of these scenarios, the proponents want to create an Online Bartering System for Agricultural Products and Supplies which will be called E-Barter that aims to provide a systematic way of consolidating, displaying, and fulfilling the bartering process through the power of technology and the internet. Its development will be intended for the agricultural sector, especially farmers and agricultural entrepreneurs, as it will also help them create networks within their industry.

Project Background

Agriculture, being one of the major industries in the Philippines, has been badly hit by the COVID-19 pandemic. Due to the concerns arising from the current situation and to protect the health of the people, many farms and other agricultural-based businesses have temporarily halted their operations and it greatly affected the livelihood of our farmers. Since the agricultural sector is responsible for the production of most of the foods that we eat every day and knowing that it was affected by the situation, concerned groups started to revive bartering. People tried to exchange goods and services with other people without using money. They mostly use social media sites like Facebook through creating groups to facilitate the bartering process in their area or community. Most of these social media groups were created to barter almost anything under the sun, which means that the majority of them are doing it for their own interests or enjoyment only while some are engaging with the trading process with the hope to meet their daily needs. There are also groups where people in the agricultural sector, or in other specific sectors or interests, share their resources with one another through trading. Due to the pandemic, the use and development of different technologies and the internet are becoming more inclusive and its access has been greatly widened, even reaching the unreached areas in the past years. This innovation has also been extended to the agricultural sector, giving them opportunities to learn and expand their skills not just in agriculture but also in digital entrepreneurship leaning towards inclusive growth in all of the Philippine's economic industries.

Current State of Technology

Bartering is one of the established ways of trading in the past that people have adopted with the use of technology. Until just recently, barter trading is not a term that we usually see in our everyday activities because it is more convenient for us to use money to buy or get things or services we needed or wanted. When the COVID-19 pandemic started, all of us were affected by its impact not just in terms of health, but also our livelihood and economy. Many people lost their jobs that are vital for their survival. In this case, barter trading has been revived, especially in the Philippines. While online bartering systems are currently in place in other countries, in the Philippines, bartering has almost just been brought back from the past. The main platform that people are using is facebook through facebook groups. People create groups within their community for bartering purposes only, and other people who are also interested are invited to join. Some groups focus on a certain industry, like agriculture, but many are trading for anything that they could ever think of. At present, while facebook or other social media pages can cater almost all of the things that we need to do, there are still some things that could distract us from finding what we need to find especially when it's about bartering. Also, when we use these platforms, we can only moderate its process but cannot customize the whole thing.

Project Problem Statement

Online bartering is being done through social media pages, specifically facebook. People who are interested in barter trading are creating facebook groups and inviting other people to join them to expand their choices. Most of these groups are catering only to a certain area or community and members post things to trade which they do not need anymore. On the other hand, some people are bartering to help our industries which are heavily affected by the COVID-19 pandemic, especially when it comes to livelihood. Our agricultural sector which includes farmers are having a hard time to sell their products and it greatly affects the provision of their daily needs. But through barter trading, concerned people are exchanging goods for the farmers' products as if they are buying them and this is helping our farmers survive in these trying times. While facebook groups are the most known and reachable way to do these kinds of transactions, sometimes people can have trouble with its efficiency and reliability. Furthermore, its community reach is limited to a specific area only. While we can also designate group administrators and moderators, it is sometimes hard to moderate postings and comments that are against our own community standards which may lead to losing the integrity of the group. Given all of these identified problems in the current situation, the proponents intend to develop an E-Barter: Online Bartering System for Agricultural Products and Supplies which aims to improve the barter trading process for the agricultural sector with the use of technology and internet. It also aims to make bartering more efficient, organized, reliable, and easy to browse for its users.

Project Assumption

E-Barter: Online Bartering System for Agricultural Products and Supplies will be developed to enhance the process of exchanging agricultural goods and supplies between two traders making bartering more efficient and reliable for its users. Interested traders from the agricultural industry will register through the web application with their personal information which is vital for the bartering process. Registered users can browse and modify their feed or timeline which contains all of the currently available items for trading and its registered information. They can also bookmark those items that they are interested in before making an offer but they can also make a direct offer to their desired item. Users will have their own profiles which they can post the items they want to barter including detailed information about it. When two users agree to an offer, they can message each other to discuss the next steps. There will be a community standard where users must adhere to, and if it will not be followed during the bartering process, they have the ability to report the irregularities to the system moderators and administrator. The moderators will check and validate all of the reports and moderate the system's action towards it while the administrator oversees and implements the whole process of the web application.

The following are the benefits that will be gained from the proposed system:

- Users can easily browse for the items that they are looking for.
- Users will be provided with complete item details to help them with their decision-making process.
- The system will help users to find reliable offers to their items.

- The bartering process will not be abused by those who spam and scam other users.
- Users will be able to check their transaction history to easily backtrack their activities.
- Users will be informed of activities concerning their transactions.
- The system will help provide users with networks in the agricultural industry.

Proponents:

Padilla, Justine Marie R.

Iloco, Gamel I.

Magpantay, Elaisa Mae C.

Miguel, John Michael C.

Approved by:

Cherry A. Collera, PhD

APPENDIX B

Adviser's Commitment

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STUDENTS' AND ADVISER

THESIS COMMMITMENT and AGREEMENT

This agreement is binding the Student/s and their thesis adviser for the duration and completion of their research project. As an agreement, the following will be expected from both parties:

- Student/s is/are expected to put his/her work into their thesis.
- Faculty advisers are expected to guide students to produce their best work.
- Both jobs are time-consuming and must be carried out by students and faculty members working together in a disciplined way over a sustained period.
- Both parties have the responsibility to see the necessary work is completed on time. A clear schedule should be made and agreed by both parties for their meetings to supervise the progressive elaboration of the research project.

Whereas, the thesis adviser is expected to perform the following duties:

- The thesis adviser is expected to mentor the students throughout the project development by providing guidance for he preparation and completion of the project.
- Periodic meetings and performance reviews are expected to be given out by the thesis adviser to their advisee/s to monitor the status of the research project.
- The thesis adviser shall be the source of encouragement and support for the students to ensure that the objectives of the system will be achieved.

The signature below indicates that the both parties agree to the duties and responsibilities set forth as stipulated in the Thesis/Research Methodology Manual.

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Title: E-Barter: Online Bartering System for Agricultural Products and Supplies

Course/Section: BSIT NW 4C

Advisee/s Full Name Signature/s/Date	Adviser's Full Name Signature/Date
Padilla, Justine Marie R.	Cherry A. Collera
Illoco, Gamel I.	
Magpantay, Elaisa Mae C.	
Miguel, John Michael C.	

APPENDIX C

Milestone Contract and Checklist

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Thesis Milestone Contract and Checklist

This contract is authorized in the Regulations for four-year BS Information Technology, BS Computer Science and BS Entertainment and Multimedia Computing. The student shall submit this contract for approval at the college responsible for the thesis in accordance with the deadlines stipulated. Any changes to the contract during its duration (e.g., syllabus, adviser, leave of absence/extension, etc.) should be processed by the college.

1. STUDENTS DETAILS (Last Name, First Name, Middle Initial)

Member 1:

Padilla, Justine Marie R.

Member 2:

Iloco, Gamel I.

Member 3:

Magpantay, Elaisa Mae C.

Member 4:

Miguel, John Michael C.

2. ADVISER(S)

State the name of the principal adviser and any co-adviser(s) or external adviser(s). The principal adviser has the overall responsibility for following up the contract on behalf of the college and ensuring the student receives academic supervision for the entire duration of the contract. The student has the right to receive academic supervision during the period he/she shall work on their undergraduate thesis (in accordance with the programme description). If the adviser plans to have a sabbatical during the duration of the contract, the student should be informed of this at the time of entering into the contract.

Principal adviser:

Cherry A. Collera, PhD

Office address / Phone / E-mail:

Co-/external adviser:

3. THESIS PROJECT

a.) Working Title: E-Barter: Online Bartering System for Agricultural Products and Supplies

The copy of the approved Title Proposal should be attached. It should include:

- ☐ Research Problems
- ☐ Objectives
- ☐ Methodology
- ☐ Schedule/timetable
- ☐ Technical/scientific partners (if any)

b.) Implementation of Thesis Project:

Each group member takes responsibility for the project's objectives. All students are entitled to implement their theses on a group basis which will consist of 2-4 members. However, 5 members will be permitted if the class populations exceeded the grouping requirements.

Group project with 4 members.

c.) Timetable for Thesis Project:

- ☐ **Date of Approval – Title Defense** March 11, 2021
- ☐ **Date of Approval – Proposal Defense** May 20,2021
- ☐ **Date of Approval – Final Defense** January 13, 2022
- ☐ **Date of Book Submission** _____

d.) Planned Progress:

For part-time students, the academic progress must constitute a minimum _____ %. Undergraduate theses of 30 credits should normally implemented on a full-time basis. Students who have engagements as part-time lab assistants and equivalent may apply for the length of study to be adjusted.

- ☐ Full-time student (100%)
- ☐ Part-time student _____ %

4. REQUIREMENTS FOR EQUIPMENT/RESOURCES

In the event that resources at an external institution shall be used, this must be specified

in point 6 b).

a) The student's place of work (office/lab):

b) Requirements for equipment/resources:

Will, there be a requirement for (any of) the following resources during the thesis project:

Access to/purchase of equipment or software	**Please specify:**
Access to systems	**Please specify:**
Access to background information and data(set)	**Please specify:**
Expenses (if any):	

Approved by the person responsible for resources at the college:

Approved by the person responsible for resources at the external institution:

5. NOTES

6. SIGNATURES

The student, principal adviser, other advisers, and college dean have reached agreements concerning all points covered in the contract.

Student/Date:

Padilla, Justine Marie R.

Iloco, Gamel I.

Magpantay, Elaisa Mae C.

Miguel, John Michael C.

Principal Adviser/Date:

Cherry A. Collera, PhD

Co-/External Adviser/Date:

Co-/External Adviser/Date:

College Dean:

Cristina G. Rivera, MSCS

APPENDIX D

LETTER OF INTENT

BATAAN PENINSULA STATE UNIVERSITY
MAIN CAMPUS
College of Information and Communications Technology
City of Balanga, 2100 Bataan
(047) 237 2010
www.bpsu.edu.ph
bpsu.cict2016@gmail.com

April 30, 2021

Mr. Christopher Lauro DL. Sarili
Agricultural Entrepreneur
Balanga City, Bataan

Dear Sir:

Good day!

We, the 3rd year students of Bachelor of Science in Information Technology major in Network and Web Application, are currently enrolled in ICTC2023 (Capstone Project I) course. The final requirement of this course is to create an **E-barter: Online Bartering System for Agricultural Products and Supplies.**

At this moment, we are looking for a company, an agency or an organization which will help us to explore our study and to start with the development of the system.

In this regard, we humbly ask your good office to allow us to conduct a Virtual Interview during your available time this week. A Virtual Invitation to Interview link will be sent to your email once you have agreed to our request.

You can rest assured that any information you share with us will be treated confidentially. We are looking forward that we can be partners in this endeavor. Thank you very much and more power!

Very truly yours,

Padilla, Justine Marie R.

Ilocos, Gamel I.

Magpantay, Elaisa Mae C.

Miguel, John Michael C.

Endorsed by:

Cherry A. Collera, PhD
ICTC2023 Instructor

Noted by:

Cristina G. Rivera, MSCS
Dean, CICT

Approved by:

Mr. Christopher Lauro DL. Sarili
Agricultural Entrepreneur

Email: buanot221@gmail.com

Date and Time of Virtual Interview:
May 1, 2021 (Saturday) 3:00 pm

APPENDIX E

TRANSCRIPT OF INTERVIEW

Transcript of Interview

Title of the Study: E-barter: Online Bartering System for Agricultural Products and Supplies.
Name of Respondent: Christopher Lauro DL. Sarili
Date & Time: May 1, 2021/ 2:00 pm
Venue: Virtual Meeting (Google Meet)

Interviewer: Good Day sir! We are 4th year students from Bataan Peninsula State University Main Campus po.

Respondent: Magandang tanghali rin!

Interviewer: Sir, we are currently conducting a thesis entitled E-barter: Online Bartering System for Agricultural Products and Supplies and isa po kayo sa magiging respondent namin for our thesis.

Respondent: Okay sige sige.

Interviewer: Before we begin sir, May I ask you what your name is?

Respondent: Christopher Lauro DL. Sarili

Interviewer:What is your job or occupation? For how many years? Ano ang inyong trabaho o hanapbuhay? Gaano na kayo katagal sa inyong trabaho o hanapbuhay?

Respondent: Entrepreneur Farmer for 7 years tsaka programmer for 5 years

Interviewer: Have you experienced harvesting products or getting supplies more than you expected? If yes, what did you do? Nakapag ani na ba kayo ng mga produkto o nagkaroon ng panustos na higit sa inaasahan niyo? Kung oo, anong ginawa niyo?

Respondent: Hindi, Binebenta ng Buuan ang mga palay, bigas,sibuyas at singkamas, Nagtitira ng pangkain at balik puhunan sa pagsasaka, sobrang

ganda ng ani may savings.

Interviewer: Are you familiar with the Bartering of Products and Supplies? Pamilyar ba kayo sa pag papalitan o barter ng mg produkto o panustos?

Respondent: Yes, Pamilyar naman sa pakikipagpalitan ng kalakal o produkto.

Interviewer: Have you tried bartering products? If yes, what are the products or supplies you have traded, and how is the process? If not, are you willing to try it? Nasubukan niyo na bang makipagbarter? Kung oo, Ano-ano ang mga produkto o panustos na inyong pinagpalit, at papaano ang proseso? Kung hindi, kayo ba ay payag na subukan ito?

Respondent: Hindi pa, pero wala naman masama subukan lalo na kung magkakaroon naman ng magandang benipisyo ito sa akin/samin.

Interviewer: What do you think are the advantages of Bartering Products and Supplies? Sa inyong palagay, ano ang kalamangan ng pag babartering ng mga produkto at panustos?

Respondent: you can get what you need agad tsaka mas okay kasi nakakakuha ka ng mga bagay na gusto o kailangan mo ng hindi gumagamit ng pera.

Interviewer: How about the disadvantages of bartering? Ano naman ang tingin mong disadvantage ng pakikipag barter?

Respondent: pagbarter din di lahat ng kailangan mo na doon tsaka sa pano kapag ala ka naming mai babarter? Edi wala ka ring makukuha hahaha.

Interviewer: Do you have a smartphone? If none, how about a relative who owns a gadget? Kayo ba ay may selpon? Kung wala, kayo ba ay may kamag-anak na may selpon?

Respondent: Yes, may phone naman hightect farmer here haha

Interviewer: Since you have a smartphone or have a relative who owns a gadget, are you/your relative mobile device proficient? Kung meron kayong selpon o kamag-anak na may isang gadget, ikaw ba ay o ang inyong kamag-anak ay maalam sa pag gamit nito?

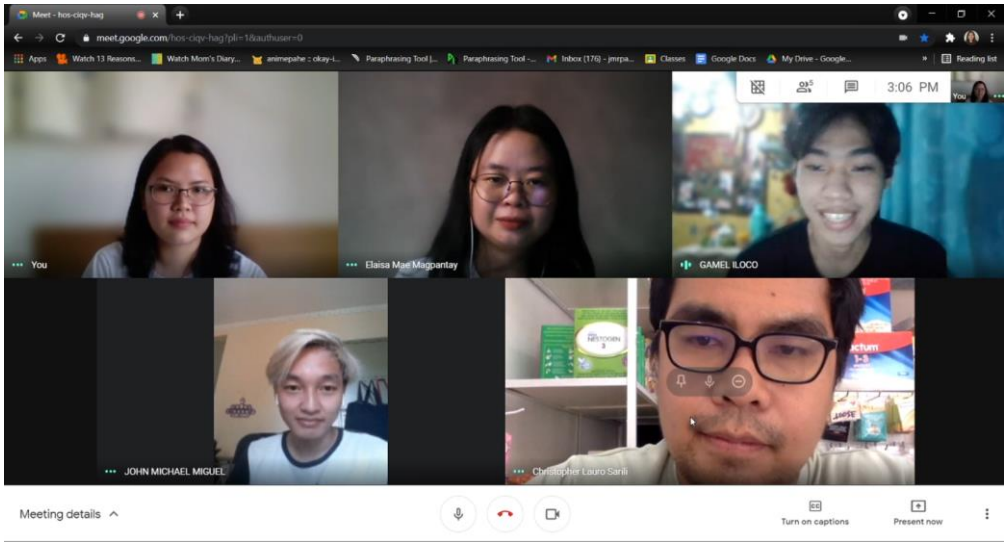
Respondent: May alam naman, kahit papano nakakasabay sa mga modern apps or social meadia platforms.

Interviewer: What are your thoughts if Bartering will be available online? If Bartering will be available on smartphones, will you try downloading or give the application a try? Ano ang inyong pagtingin kung magkakaroon ng Bartering App? Kung magkakaroon, susubukayan niyo ba itong gamitin? Bakit?

Respondent: Yes, might be useful in the future, kung na grow at kapwa ko farmer ung nandoon might be an interesting app.

Interviewer: Thank you po sa paglalaan niyo ng time para sa interview namin.

Respondent: Welcome.



APPENDIX F

TOPICAL OUTLINE

Title of the Project Study: E-Barter: Online Bartering System for Agricultural Products and Supplies

1. **INTRODUCTION**
    - 1.1 Bartering System
    - 1.2 Online Bartering System
    - 1.3 Bartering System of Agricultural Products and Supplies
2. **BASIC CONCEPTS**
    - 2.1 Transaction Processing
    - 2.2 Web/ Mobile-based Application
3. **EVALUATION SCHEME**
    - 3.1 ISO/IEC 25010
        - Functional Suitability
        - Performance Efficiency
        - Compatibility
        - Usability
        - Reliability
4. **SIMILAR MACHINES / APPLICATIONS**
    - 4.1 **BarterApp - Barter System**

One man's trash is another man's treasure. This is one part of the premise that is behind BarterApp. You no longer need to throw away your old stuff. Now, we make it easy for you to exchange them for other stuff that you like. BarterApp does all the hard work of matching users who share

common interests. Simply like a good or service that someone is offering and if that person likes something of equal value that you are offering, a match is made and an email is sent to both parties. BarterApp is bringing back the old tried and tested way of bartering goods and services and making it new again. The best part is that bartering via BarterApp is completely free and costs you nothing. It doesn't cost you anything to list ads and we don't take a cut whenever an exchange is made. Don't pay, just barter! Open an account and start bartering today!

The similarity of this application in our developing system is the users are capable of doing their account for the transactions. The user can post what are the things he/she is bartering and the information of the items.

The difference is that the user can do his/her own ads about the item. This application focuses more on the things that are commonly found in the house like cars.

4.2 **Swappiness**

Trading is one of the oldest social activities of human beings. Our vision is a world in which trading, through the internet, helps promote peace and social change. Our mission at Swappiness is to play a key role in that vision by providing a fantastic, easy to use, social platform for bartering and swapping. Our name refers to that feeling of satisfaction when in the course of a trade, all parties are happy.

The similarity of the application in our system is that the user

can register and login their account for the bartering purposes. They can also add the items they are bartering, make an offer, and have a transaction with other people. The user can also give their feedback about their experience.

The difference of this application in our system is that the user can receive notification about their preferred items once someone posts something similar to it. They can report the people who are not following the agreement they agreed. Our system is focused on agricultural products and supplies while this application is more on personal needs.

4.3 **Swapit**

Swapit brings buyers and sellers together to trade pre-loved items. Our unique approach to create a hyper-local marketplace, makes your shopping experience one of a kind. Swapit is free to use, free to sell and free to buy.

The similarities of this application and our system are the users can create their account and view the buyer's or seller's profile. It also has a feature where you can chat privately with sellers and buyers. Search for different items/ products. And post the items/products you want to exchange.

For the differences the Swapit application is focused on swapping pre loved items like bags, shoes etc. In our application the main products you exchange are agricultural goods or products. Also, our application

can display information about the products and you can filter it for your own product preference. Using our system you can also avoid being scammed by reporting the users account and giving feedback about their post.

5. DESIGN CONSIDERATIONS / CRITERIA IN TERMS OF RELIABILITY

5.1 **Software**

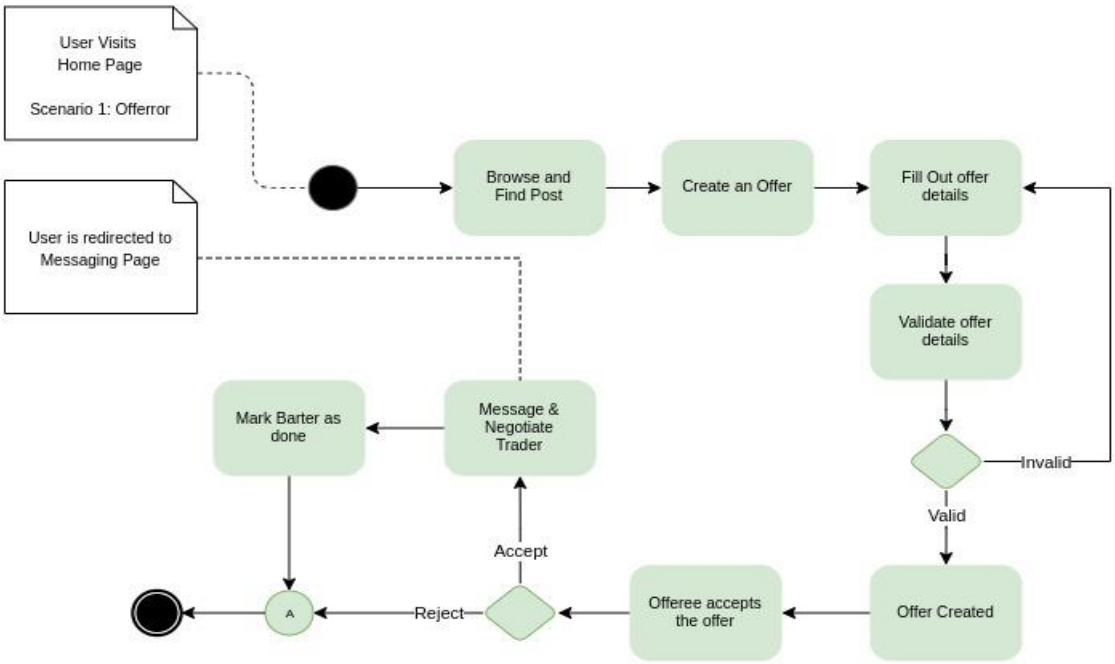
- Ubuntu 20.04 LTS
- PHP
- Visual Studio Code
- Google Chrome
- PostgreSQL
- Composer
- NPM / Yarn

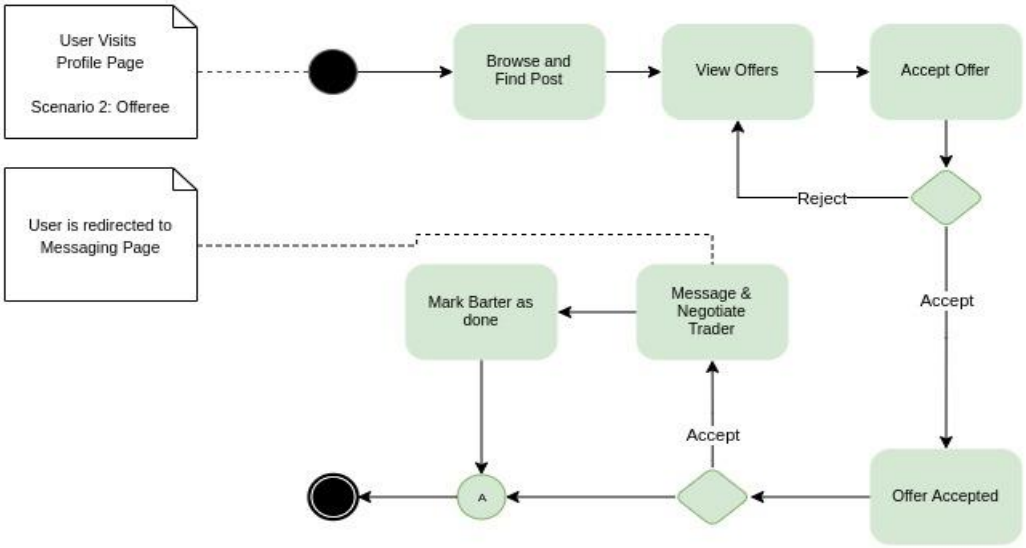
5.2 **Hardware**

- Computer Unit
  - Processor: Pentium 4 or later
  - Memory: 1 GB (minimum) 4 GB (recommended)
  - Storage: At least 100 MB free
- Mobile phone
  - Operating System: Android 5.0
  - Memory: 416 MB (minimum)
  - Storage: At least 100 MB free
- Router

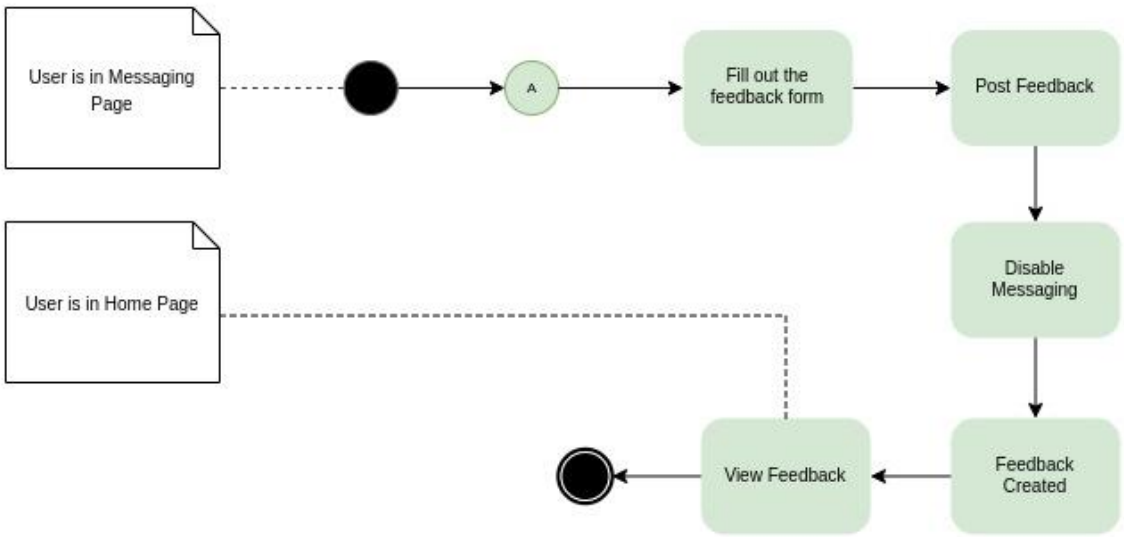
APPENDIX G

ADDITIONAL DIAGRAMS

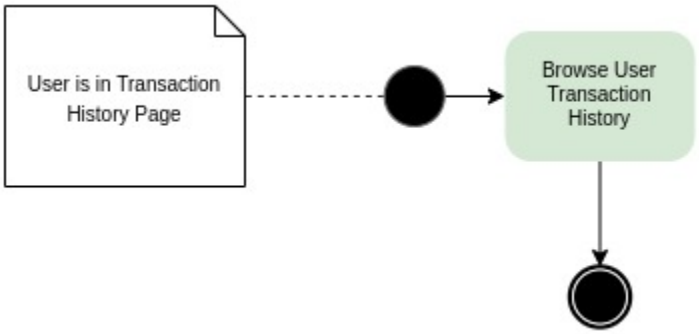




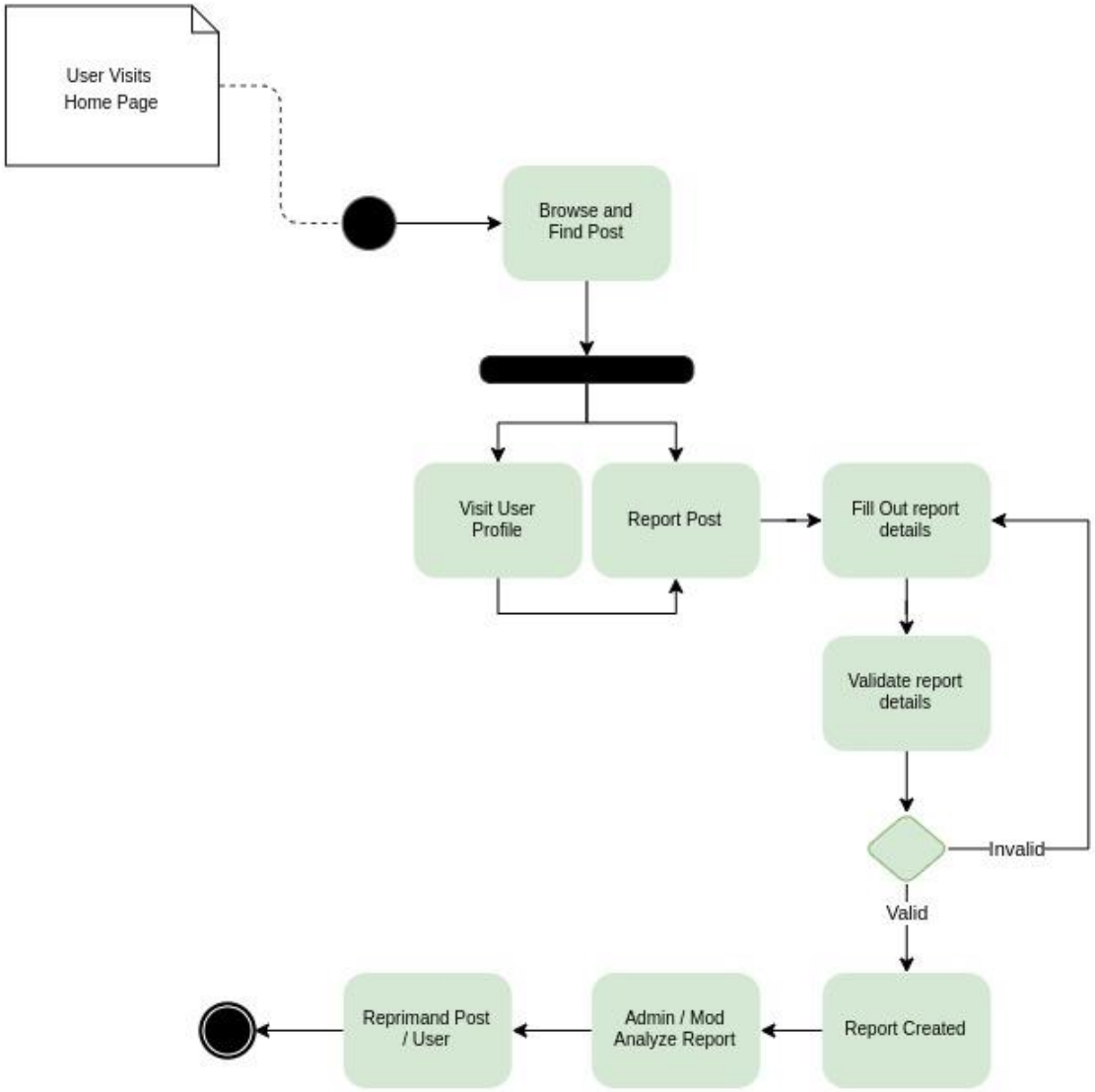
Activity Diagram of Message Traders



Activity Diagram of Write Feedback.

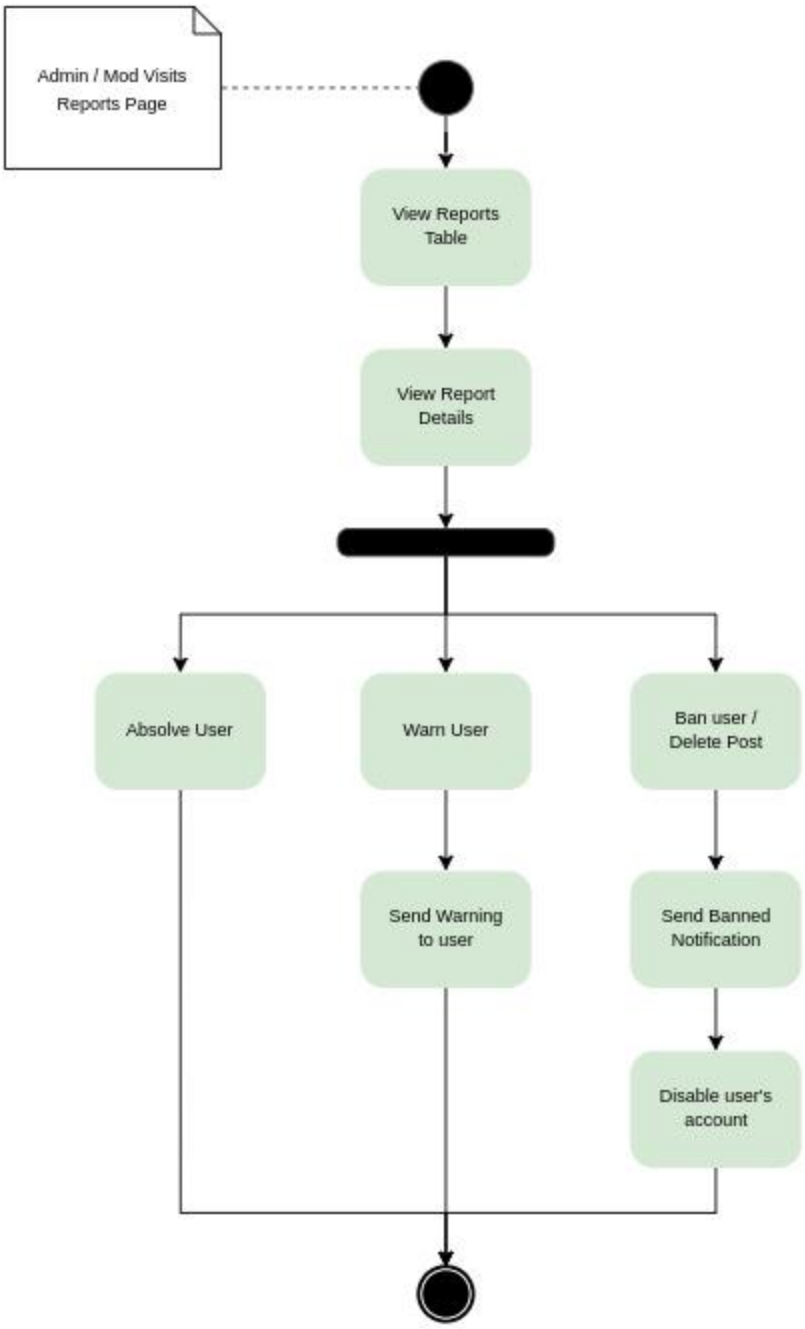


Activity Diagram of Monitor User Transactions

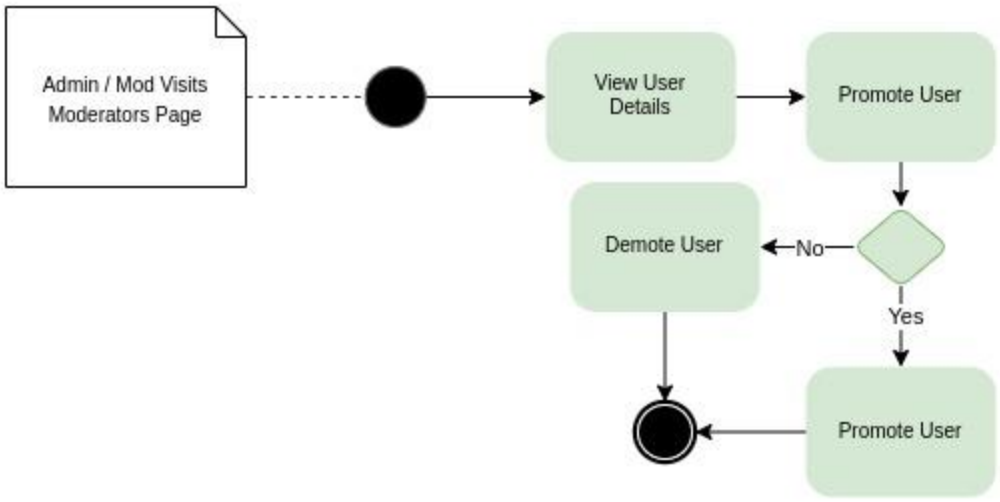


Activity Diagram of Report Trader

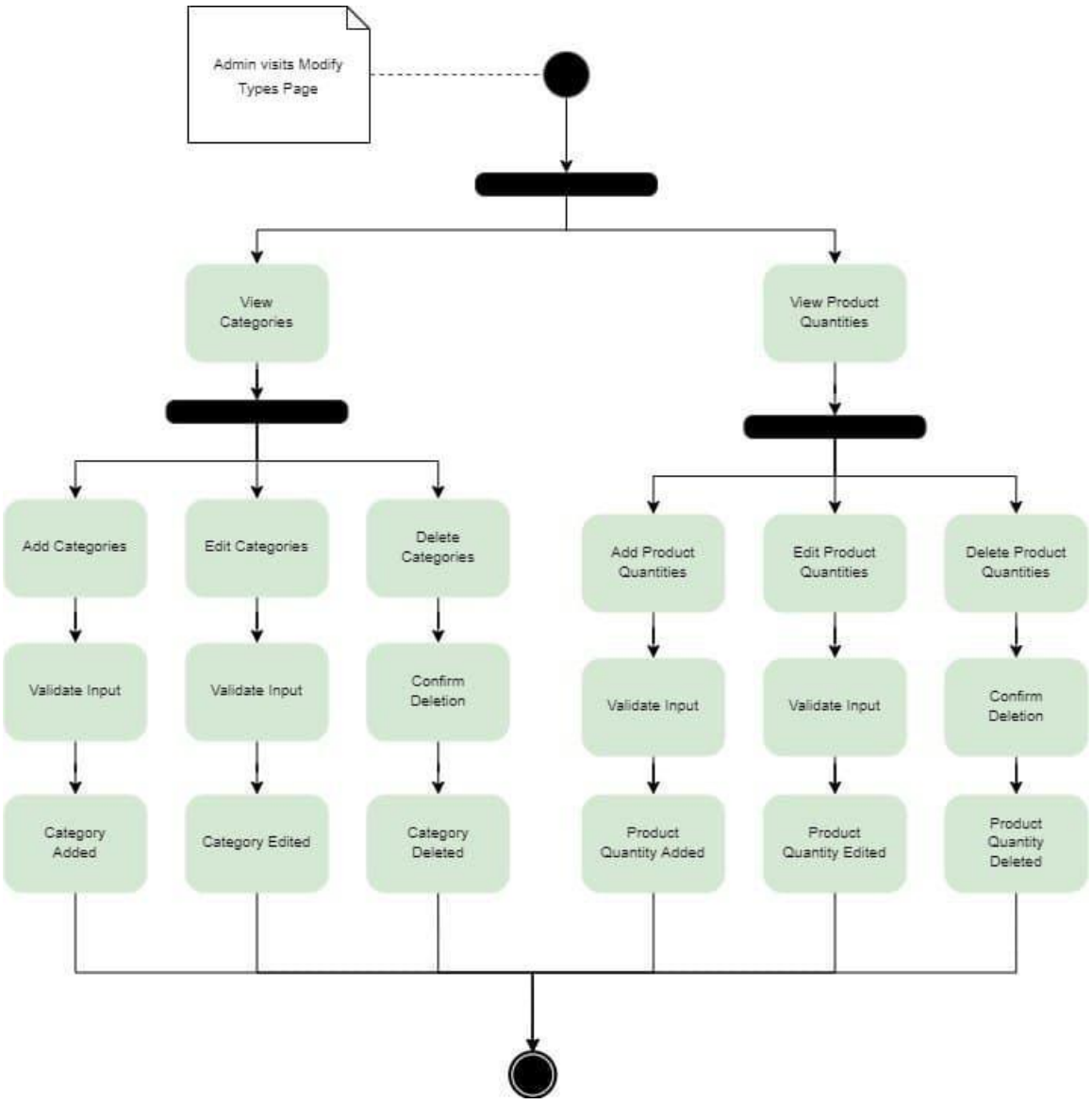
.



Activity Diagram of Manage Reports



Activity Diagram of Manage Moderators



Activity Diagram of Manage Product Options

APPENDIX H

DATA DICTIONARY

Categories Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Categories Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	VARCHAR	255	No	None	Category identification number
No	No	name	VARCHAR	255	No	None	Category name
No	No	value	VARCHAR	255	No	None	Category value

Carts Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Carts Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Cart identification number
No	Yes	post_id	BIGINT		No	None	Post identification number
No	Yes	user_id	BIGINT		No	None	User identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user inputted items in the cart
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the cart
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted items in the cart

Conversations Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Conversations Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Conversation identification number
No	Yes	sender_user_id	BIGINT		No	None	Identification number of the sender
No	Yes	receiver_user_id	BIGINT		No	None	Identification number of the receiver

No	No	created_at	TIMESTAMP		No	None	Date when the user created the conversation
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the conversation
	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the conversation
No	Yes	post_id	BIGINT		No	None	Post Identification number

Password_resets Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Password_resets Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	email	VARCHAR	255	No	None	Email
No	No	token	VARCHAR	255	No	None	User's token
No	No	created_at	TIMESTAMP		Yes	None	Date when the user requests a password reset

Feedbacks Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Feedbacks Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Feedback identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user posted the feedback
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the feedback
No	Yes	rater_user_id	BIGINT		No	None	Identification number of the rater
No	Yes	post_id	BIGINT		No	None	Post identification Number
No	Yes	ratee_user_id	BIGINT		No	None	Identification number of the ratee

No	No	description	VARCHAR	255	No	None	Feedback description
No	No	amount	INT		No	None	Amount of feedback

Posts Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Posts Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Post identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user uploaded the post
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the post
No	Yes	user_id	BIGINT		No	None	Identification number of the poster
No	No	title	VARCHAR	255	No	None	The title of the post
No	No	description	VARCHAR	255	No	None	Post Description
No	No	prod_name	VARCHAR	255	No	None	Product’s name
No	No	status	VARCHAR	255	No	None	Product’s status
No	No	prod_qty	DOUBLE		Yes	None	Product’s quantity
No	No	qty_type	VARCHAR	255	Yes	None	Product’s quantity type
No	No	date_produced	DATE		Yes	None	Product's produced date
No	No	date_expiree	DATE		Yes	None	Product's expiree date
No	No	category	VARCHAR	255	Yes	None	Product category
No	No	views	BIGINT		Yes	None	The number of views of the product
No	No	preferred_prod	VARCHAR	255	Yes	None	User’s preferred product
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the post

Sessions Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Sessions Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Session identification number
No	Yes	user_id	BIGINT		Yes	None	Identification number of the user in the session
No	No	ip_address	VARCHAR	45	Yes	None	User's IP address
No	No	user_agent	TEXT		Yes	None	Addition information about the session
No	No	payload	TEXT		No	None	Storage of user's session data
No	No	last_activity	TIMESTAMP		No	None	Date when the session was last active

Reports Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Reports Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Report identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user created the report
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the report
No	Yes	user_id	BIGINT		No	None	Identification number of the reporter

No	Yes	reported_post_id	BIGINT		No	None	Identification number of the reported post
No	Yes	reported_user_id	BIGINT		No	None	Identification number of the reported user
No	No	description	VARCHAR	255	No	None	Report's description
No	No	report_type	VARCHAR	255	No	None	The type of report
No	No	action_taken	VARCHAR	255	Yes	None	The type of action taken
No	Yes	mod_assigned	BIGINT		Yes	None	Identification number of the assigned moderator
No	No	is_resolved	BOOLEAN		Yes	None	Identifies if the report was resolved
No	No	mod_notes	VARCHAR	255	Yes	None	Moderator's note
No	No	offense_level	INT		Yes	None	The severity of offense
No	No	deleted_at	VARCHAR	255	No	None	Date when the user deleted the report

Report_images Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Report_images Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Report image identification number
No	Yes	report_id	BIGINT		No	None	Report identification number
No	No	report_image_file_path	VARCHAR	255	No	None	The file path of the report's photo
No	No	created_at	TIMESTAMP		No	None	Date when the user uploaded the image

No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the image

Messages Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Messages Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Message identification number
No	Yes	convo_id	BIGINT		No	None	Conversation identification number
No	Yes	sender_id	BIGINT		No	None	Identification number of the sender
No	No	content	VARCHAR	255	Yes	None	Message content
No	No	file_path	VARCHAR	255	Yes	None	The file path of the message sent file
No	No	created_at	TIMESTAMP		No	None	Date when the user sent a message
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated a message
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted a message

Offer_images Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Offer_images Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Offer image identification number
No	Yes	offer_id	BIGINT		No	None	Offer identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user uploaded the image
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the image
No	No	offer_image_path	VARCHAR	255	No	None	The file path of the offer's photo
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the image

Post_images Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Post_images Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Post image identification number
No	Yes	post_id	BIGINT		No	None	Post identification number
No	No	created_at	TIMESTAMP		No	None	Date when the user uploaded the image
No	No	updated_at	TIMESTAMP		No	None	Date when the user updated the image
No	No	post_image_path	VARCHAR	255	No	None	The file path of the offer's photo
No	No	deleted_at	TIMESTAMP		No	None	Date when the user deleted the image

Promotions Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Promotions Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Promotion identification number
No	Yes	user_id	BIGINT		No	None	The identification number of the subject of promotion
No	No	promoted_to	VARCHAR	255	No	None	The level of the user's promotion
No	No	created_at	TIMESTAMP		No	None	Date when the user was promoted
No	No	promoted_by	BIGINT		No	None	The user's promoter
No	No	updated_at	TIMESTAMP		No	None	Date when the user's promotion was updated

Qty_type Table

Data Dictionary

System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: Qty_type Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	Quantity type identification number
No	No	name	VARCHAR	255	No	None	Quantity type's name
No	No	value	VARCHAR	255	No	None	Quantity type's Value

User_blacklist Table

Data Dictionary							
System Name: E-Barter: A Proposed Online Bartering System for Agricultural Products and Supplies using Web Technology							
Subject: User_blacklist Table							
PK	**FK**	**Field Name**	**Data Type**	**Length**	**Nullable**	**Default Value**	**Description**
Yes	No	id	BIGINT		No	None	User blacklist identification number
No	Yes	user_id	BIGINT		No	None	Identification number of the user
No	No	times_reported	BIGINT		No	None	Times the User being Reported
No	No	status	VARCHAR	50	No	None	User's Status

APPENDIX I

Evaluation Instrument

Good day!

We are currently developing our project entitled *E-Barter: Online Bartering System of Agricultural Products and Supplies*. Please evaluate our system based on the criteria below. Thank you.

NAME:_____	AGE:_____
COMPANY/SCHOOL:_____	COURSE/POSITION:_____

INSTRUCTION: Read each question carefully and check (*I*) the corresponding number of choice.

5 – EXCELLENT 4 – VERY GOOD 3 – GOOD 2 – FAIR 1 – POOR

* Please use appropriate ratings for acceptance testing

FUNCTIONAL SUITABILITY	5	4	3	2	1
The system covers all the specified tasks and user objectives.					
The system provides the correct results with the needed degree of precision					
The system facilitates the accomplishment of specified tasks and objectives.					
PERFORMANCE EFFICIENCY					
The response and processing times of the system meet the requirements.					
The amounts and types of resources used by the system meet requirements					
The maximum limits of the system meet requirements.					
COMPATIBILITY					
The system can perform its required functions efficiently while sharing a common environment and resources with other systems.					
The system or system components can exchange information to other systems.					
USABILITY					
The system is appropriate to the needs of the user.					
The system can be used by specified users with effectiveness, efficiency, freedom from risk and satisfaction.					
The system has attributes that make it easy to operate and control.					
The system protects users from making errors.					
The user interface enables pleasing and satisfying interaction for the user.					
The system can be used by people with the widest range of characteristics and capabilities.					
RELIABILITY					

The system meets needs for reliability under normal operation.					
The system is operational and accessible when required for use.					
The system operates as intended despite the presence of hardware or software faults.					
The system can recover affected data and re-establish the desired state.					
SECURITY					
The system ensures that data are accessible only to those authorized to have access.					
The system prevents unauthorized access to, or modification of, computer programs or data.					
The actions or events can be proven to have taken place and cannot be rejected later.					
The actions of users can be traced.					
The identity of a user can be authenticated and proved to be the one claimed.					
MAINTAINABILITY					
The system is composed of modules such that a change to one component has minimal impact on other components.					
A system component can be used in more than one system, or in building other components.					
The system can be assessed and diagnosed for deficiencies or errors.					
The system can be effectively and efficiently modified without introducing defects or degrading quality.					
The system can be tested to determine whether test criteria have been met.					
PORTABILITY					
The system can effectively and efficiently be adapted for different or evolving hardware or software environments.					
The system can be successfully installed and/or uninstalled in a specified environment.					
The system can replace another specified software product for the same purpose in the same environment.					

Are you in favor in implementing the *E-Barter: Online Bartering System of Agricultural Products and Supplies*?

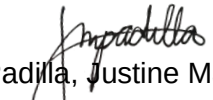
_____YES _____NO

Comments and Suggestions:_____

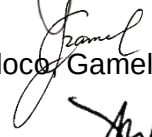
_____

_____

Proponents:

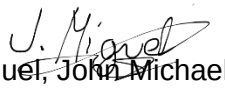


Padilla, Justine Marie R.



Iloco, Gamel I.

Magpantay, Elaisa Mae C.



Miguel, John Michael C.

BSIT-NW4C

APPENDIX J

Summary of Evaluation

SUMMARY OF EVALUATION RESULTS

CRITERIA	5	4	3	2	1	TOTAL RESPONDENTS	SUB CRITERION MEAN	CRITERION MEAN	DESCRIPTIVE INTERPRETATION
Functional Suitability									
Functional Completeness	35	15	0	0	0	50	4.70		Excellent
Functional Correctness	32	18	0	0	0	50	4.64		Excellent
Functional Appropriateness	33	17	0	0	0	50	4.66		Excellent
								4.67	Excellent
Reliability									
Maturity	38	11	1	0	0	50	4.74		Excellent
Availability	36	14	0	0	0	50	4.72		Excellent
Fault Tolerance	30	20	0	0	0	50	4.60		Excellent
Recoverability	30	19	1	0	0	50	4.58		Excellent
								4.66	Excellent
Compatibility									
Co-existence	29	19	2	0	0	50	4.54		Excellent
Interoperability	38	11	1	0	0	50	4.74		Excellent
								4.64	Excellent
Usability									
Appropriateness Recognizability	36	13	1	0	0	50	4.70		Excellent
Learnability	33	15	2	0	0	50	4.62		Excellent
Operability	30	17	3	0	0	50	4.54		Excellent
User Error Protection	38	12	0	0	0	50	4.76		Excellent
User Interface Aesthetics	32	16	2	0	0	50	4.60		Excellent
Accessibility	30	18	2	0	0	50	4.56		Excellent
								4.63	Excellent
Performance Efficiency									
Time Behaviour	36	12	2	0	0	50	4.68		Excellent
Resource Utilization	32	17	1	0	0	50	4.62		Excellent
Capacity	33	14	3	0	0	50	4.60		Excellent
								4.63	Excellent
Security									
Confidentiality	42	7	1	0	0	50	4.60		Excellent
Integrity	39	11	0	0	0	50	4.78		Excellent
Non-repudiation	36	14	0	0	0	50	4.72		Excellent
Accountability	29	20	1	0	0	50	4.56		Excellent
Authenticity	32	17	1	0	0	50	4.62		Excellent
								4.70	Excellent
Maintainability									
Modularity	28	22	0	0	0	50	4.56		Excellent
Reusability	35	15	0	0	0	50	4.70		Excellent
Analysability	39	8	3	0	0	50	4.72		Excellent
Modifiability	31	18	1	0	0	50	4.60		Excellent
Testability	35	15	0	0	0	50	4.70		Excellent
								4.66	Excellent
Portability									
Adaptability	33	16	1	0	0	50	4.64		Excellent
Installability	35	15	0	0	0	50	4.70		Excellent
Replaceability	36	14	0	0	0	50	4.72		Excellent
								4.69	Excellent
Overall Result								**4.66**	**Excellent**

APPENDIX K

PROGRESS REPORT

Weekly Progress Report

DATE: March 29, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (5%)

Date:	March 28, 2021
Finished Activity:	Entity Relationship Diagram
Description:	Entity Relationship Diagram (ERD) consists of symbols that represents the important entities within the system and its relationships among each other. It is the basis for the database design.

Date:	April 07, 2021
Finished Activity:	Database Design
Description:	Database Design is the symbol and connectors representation of the Database. It is the blueprint of the actual Database Model.

DOCUMENTATION: (25%)

Date:	March 29, 2021
Finished Activity:	Chapter 1
Description:	Chapter 1 consist of background of the study, statement of the problem, objectives of the study, scope and delimitation, and the significance of the study.

Date:	April 07, 2021
Next Activity:	Chapter 2
Description:	Chapter 2 is consists of Review of Related Literature. It showcase the previous studies and publications related to the study.

Weekly Progress Report

DATE: April 20, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (20%)

Date:	April 20, 2021
Finished Activity:	Entity Relationship Diagram
Description:	ERD contains the Entities in the System and its relationship between each other. It is used in creating a Database Design.

Date:	April 20, 2021
Finished Activity:	UML Use Case Diagram
Description:	Use Case Diagram includes the actors and their capabilities. It is used when designing access for multiple users

Date:	April 20, 2021
Finished Activity:	Registration Sub-System
Description:	It consists of the Sign-In and Sign-Up features. It is a major part of the system.

DOCUMENTATION: (50%)

Date:	April 20, 2021
Finished Activity:	Chapter 2
Description:	Chapter 2 consist of Review of Related Literature. It showcase the previous studies and publications related to the study.

Date:	April 27, 2021
Next Activity:	Chapter 3
Description:	Chapter 3 will be the Methodology. This section outlines the research mechanisms, the types of data required to address the research questions, and the specifics of how this would be accomplished in practice.

Weekly Progress Report

DATE: May 20, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (50%)

Date: May 19, 2021
Finished Activity: ERD, UML, Registration Sub-System
Description: Completion of ERD, UML, and Registration of the system.

Date:
Next Activity:
Description:

DOCUMENTATION: (60%)

Date: May 20, 2021
Finished Activity: Chapter 3
Description: Chapter 3 is about the Methodology. This section outlines the research mechanisms, the types of data required to address the research questions, and the specifics of how this would be accomplished in practice.

Date:
Next Activity:
Description:

Weekly Progress Report

DATE: September 25, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (59%)

Date: September 25, 2021
Finished Activity: Feedback Feature
Description: Allows the user to leave feedback upon ending a barter. It also allows other users to see that feedback.

Date: October 1, 2021
Next Activity: Barter History
Description: Allows the user to have a list of previous barter transactions and offers other users have sent a specific user.

DOCUMENTATION: (60%)

Date: May 20, 2021
Finished Activity: Chapter 3
Description: Chapter 3 is about the Methodology. This section outlines the research mechanisms, the types of data required to address the research questions, and the specifics of how this would be accomplished in practice.

Date: September 30, 2021
Next Activity: Revision of Chapter 1, 2, and 3
Description: Revision of chapter 1, 2, and 3. Updating other parts of the document for the revised copy.

Weekly Progress Report

DATE: October 05, 2021

FROM: **Group 1**
NW4C

E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (69%)

Date: October 03, 2021
Finished Activity: Feedback Capability
Description: A capability for the user to give a feedback once the barter is done.

Date: October 11, 2021
Next Activity: Report Capability
Description: Allowing the user to report other user with unethical behavior which should be verified by the moderator.

DOCUMENTATION: (65%)

Date: September 30, 2021
Finished Activity: Revision of Chapter 1, 2, and 3
Description: Revision of chapter 1, 2, and 3. Updating some parts of the document for the revised copy.

Date: October 07, 2021
Next Activity: Preliminary Pages
Description: Completion of Title Page, Dedication, Acknowledgement, Abstract, and Table of Contents.

Weekly Progress Report

DATE: October 07, 2021

FROM: **Group 1**
NW4C

E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (84%)

Date:	October 07, 2021
Finished Activity:	Transaction History Feature
Description:	Completion of the Transaction Feature of the system which allows the user to view all the user's previous barter transaction history

Date:	October 13, 2021
Next Activity:	Admin Feature
Description:	Adds admin functionality to the system which allowed to add categories.

DOCUMENTATION: (70%)

Date:	October 07, 2021
Finished Activity:	Preliminary Pages
Description:	Completion of Title Page, Dedication, Acknowledgement, Abstract, and Table of Contents.

Date:	October 13, 2021
Next Activity:	Completion of Documents
Description:	Revision of Chapter 1, 2, and 3. Bibliography pages.

Weekly Progress Report

DATE: October 26, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (91%)

Date: October 21, 2021
Finished Activity: Transaction History
Description: Shows all the transaction types in the transaction history.

Date: October 31, 2021
Next Activity: Admin
Description: Giving permission to monitor and manage the system by the admin.

DOCUMENTATION: (85%)

Date: October 20, 2021
Finished Activity: Chapter 4
Description: Results and Discussion. It includes the Project Description, Project Structure, Project Capabilities and Limitation, Test Results, and Project Evaluation.

Date: October 25, 2021
Next Activity: Chapter 4
Description: **Finalizing chapter 4.**

Weekly Progress Report

DATE: November 27, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (100%)

Date: November 25, 2021
Finished Activity: Admin and Moderator
Description: Giving permission to monitor and manage the system by the admin. Allowing the moderator to review the reports done by the users.

Date:
Next Activity:
Description:

DOCUMENTATION: (92%)

Date: November 27, 2021
Finished Activity: Chapter 5
Description: Draft of chapter 5.

Date: December 9, 2021
Next Activity: Completion of Chapter 5.
Description: Finalizing the chapter 5 and compilation of appendices.

Weekly Progress Report

DATE: December 11, 2021

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (100%)

Date: November 25, 2021
Finished Activity: Admin and Moderator
Description: Giving permission to monitor and manage the system by the admin. Allowing the moderator to review the reports done by the users.

Date:
Next Activity:
Description:

DOCUMENTATION: (92%)

Date: December 11, 2021
Finished Activity: Chapter 5
Description: Complete documentation of Chapter 5.

Date: January 4, 2022
Next Activity: Appendices.
Description: Completion of the appendices needed.

Weekly Progress Report

DATE: January 9, 2022

FROM: **Group 1**
NW3C
E-Barter: Online Bartering System for Agricultural Products and Supplies

RE : **PROGRESS STATUS REPORT**

SOFTWARE: (100%)

Date: November 25, 2021
Finished Activity: Admin and Moderator
Description: Giving permission to monitor and manage the system by the admin. Allowing the moderator to review the reports done by the users.

Date:
Next Activity:
Description:

DOCUMENTATION: (100%)

Date: January 9, 2022
Finished Activity: Appendices
Description: Complete documentation of Appendices.

Date:
Next Activity:
Description:

APPENDIX L

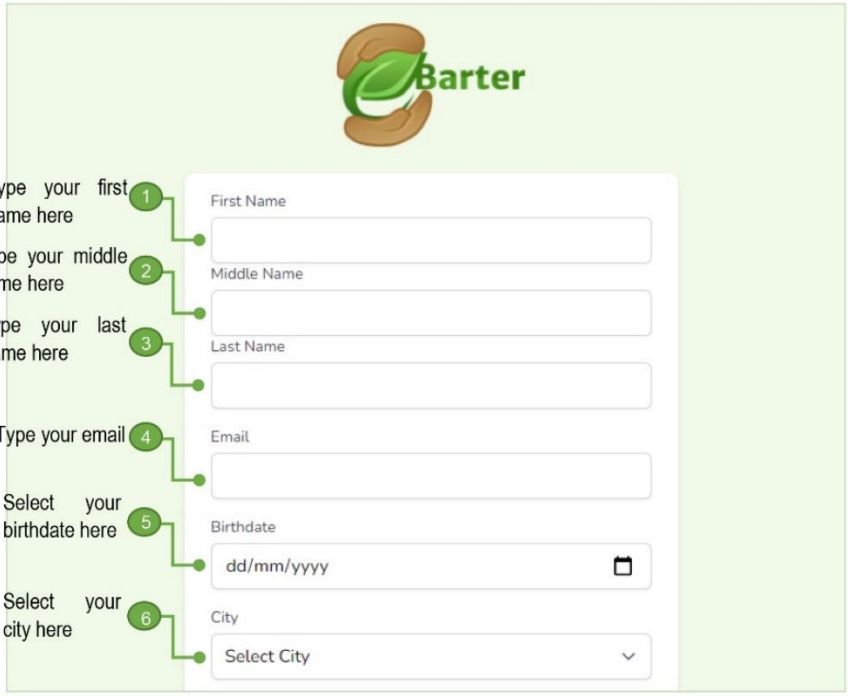
USER'S MANUAL

Barter Online Bartering System for Agricultural Products and Supplies

USER'S MANUAL

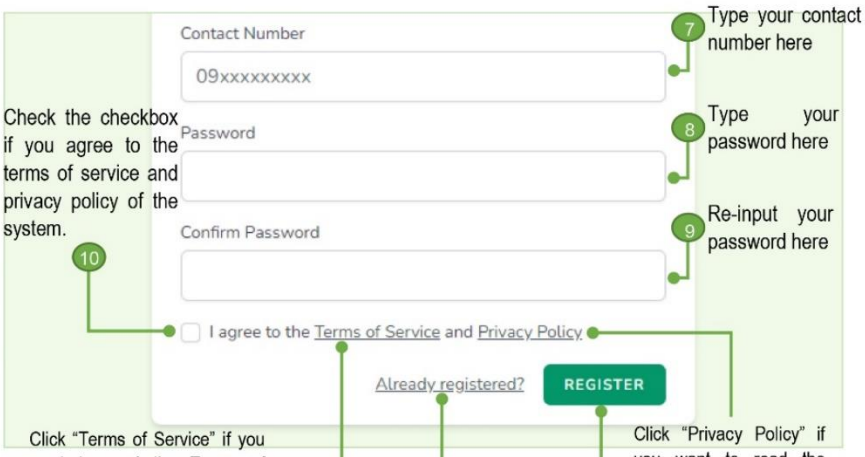
REGISTER

- The user needs to input their name, email, birthdate, city, contact number, password, confirm password, and must agree to the terms of service and privacy policy of the system to register an account. Before the user can proceed to the system, the system will send a verification link to the email address that the user-provided. Clicking the verification link in the email will redirect the user to the system.



Barter

Online Bartering System for Agricultural Products and Supplies



7 Type your contact number here

8 Type your password here

9 Re-input your password here

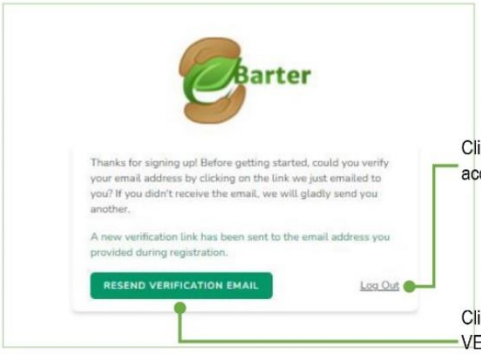
10 Check the checkbox if you agree to the terms of service and privacy policy of the system.

Click "Terms of Service" if you want to read the Terms of Service of the system.

Click "Privacy Policy" if you want to read the Privacy Policy of the system.

Click "Already registered?" if you already have an account to be directed to the log-in page.

11 Click the "Register" button to register.



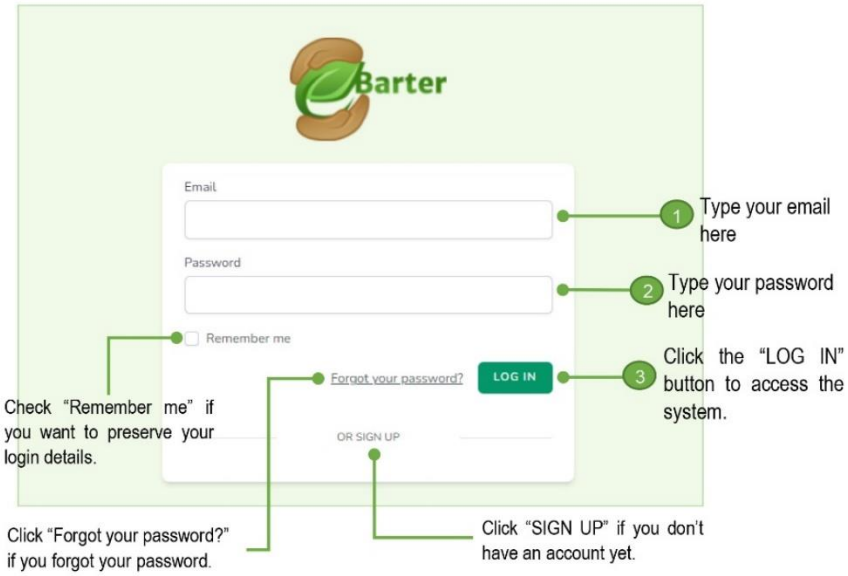
Click "Log Out" to end the user's access to the application.

Click the "RESEND VERIFICATION EMAIL" button to resend a new verification email.

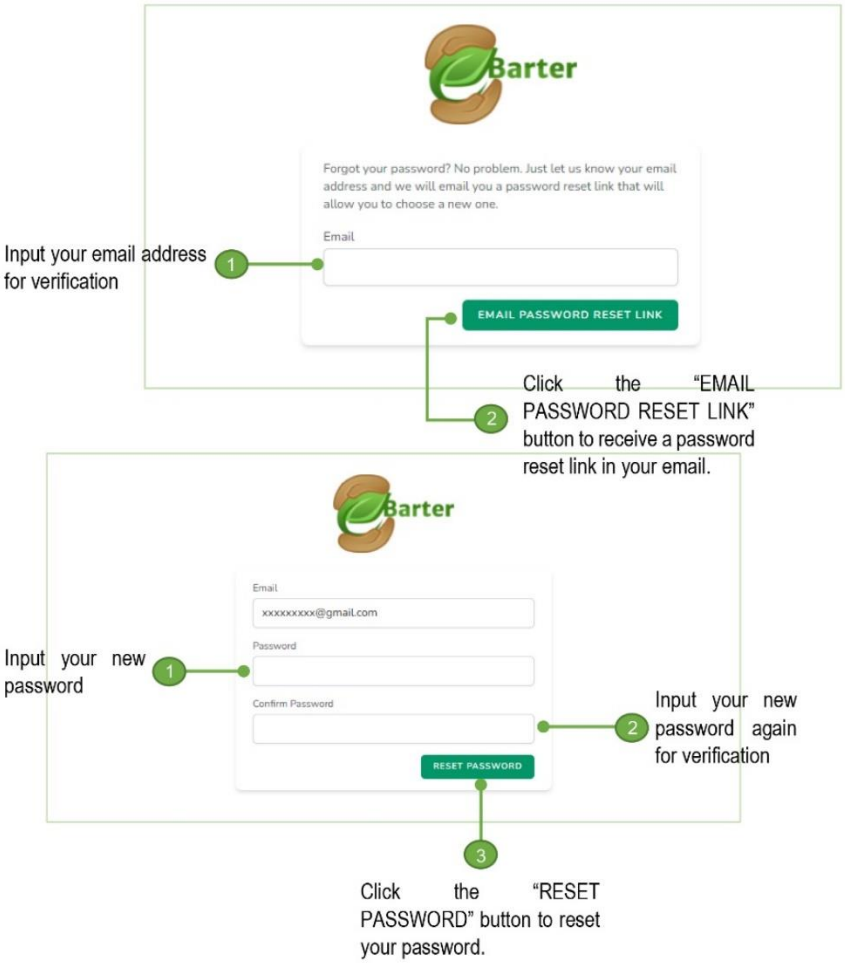
Barter Online Bartering System for Agricultural Products and Supplies

LOGIN

- The user needs to input their email and password to access the system.



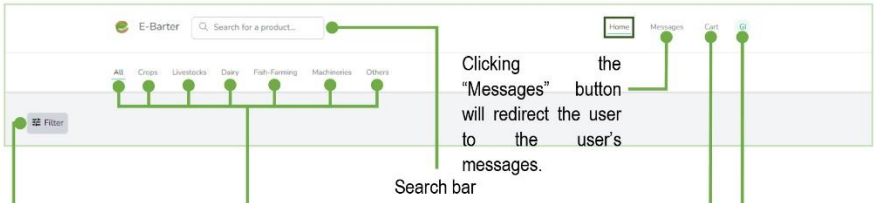
- To reset the password, the user needs to input the email address that the user provided during the registration for verification. After clicking the "EMAIL PASSWORD RESENT LINK" button, the user will receive a password reset link in their email. Upon clicking the link inside the email, the user will be redirected to the reset password page and needs to input a new password and confirm the password.



Barter Online Bartering System for Agricultural Products and Supplies

HOMEPAGE

- This is the homepage of the system. The user can view all of the posted products and supplies here. The user can also filter the items by using the filter settings or the search bar. Also, capable of adding or creating a post on the homepage.



Clicking the "Messages" button will redirect the user to the user's messages.

Search bar

Click the "Filter" button to view all the available filters.

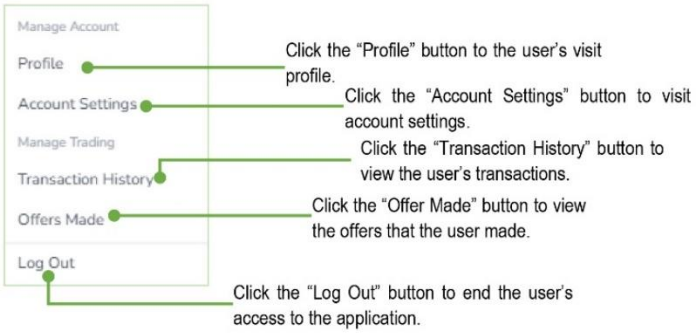
Clicking the "Cart" button will redirect the user to the user's cart.

These are the available categories. Clicking one of them will filter the feed based on the selected category.

Click your profile to view other options such as profile, account settings, transaction history, offers made, and log out.

- Clicking the "Filter" button will display these filter options. The user can select one option per Location, Date Produced, Date Expired, Hide Own Post, and Status.

- Under your profile, there are two (2) buttons under Manage Account, the Profile, and the Account Settings. Under the Manage Trading, there are two (2) buttons, the Transaction History, and the Offers Made. Lastly, the Log out button.



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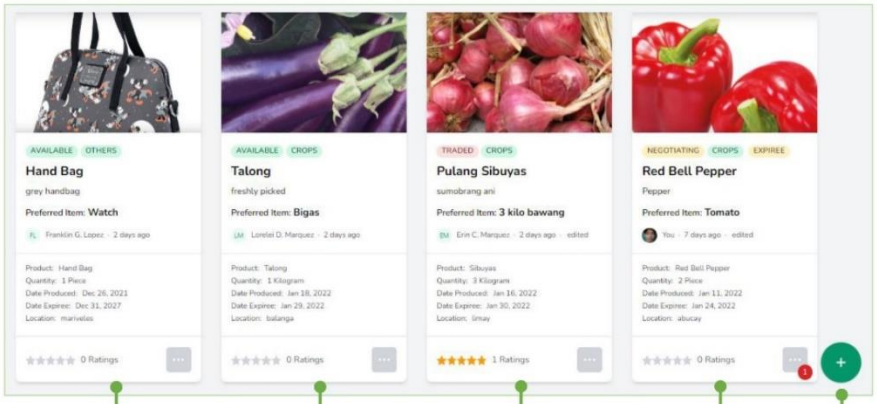
Online Bartering System for Agricultural Products and Supplies



These are the posted products and supplies in the web application.

Click the "+" button if you want to create a post.

Click the "Previous" button if the user wants to go back to the previous page.

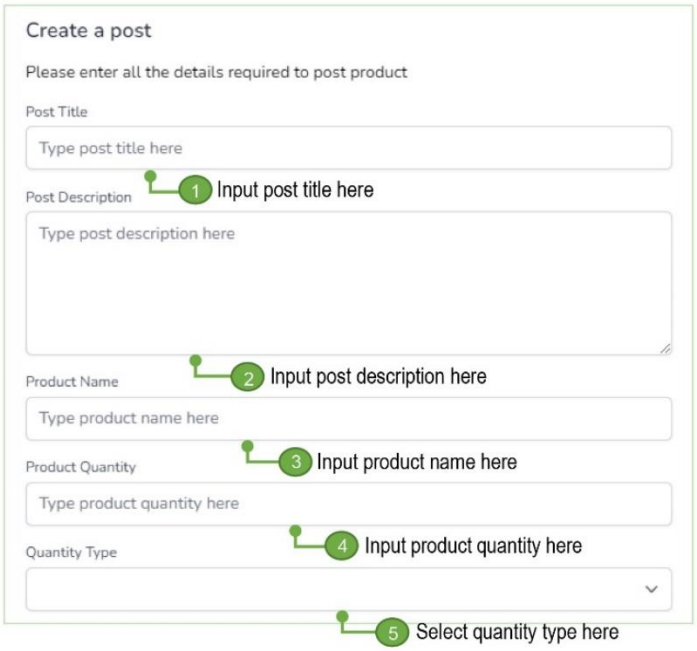
Click the "Next" button if the user wants to switch to the next page.

The number of pages. Click one of them to switch on a specific page.

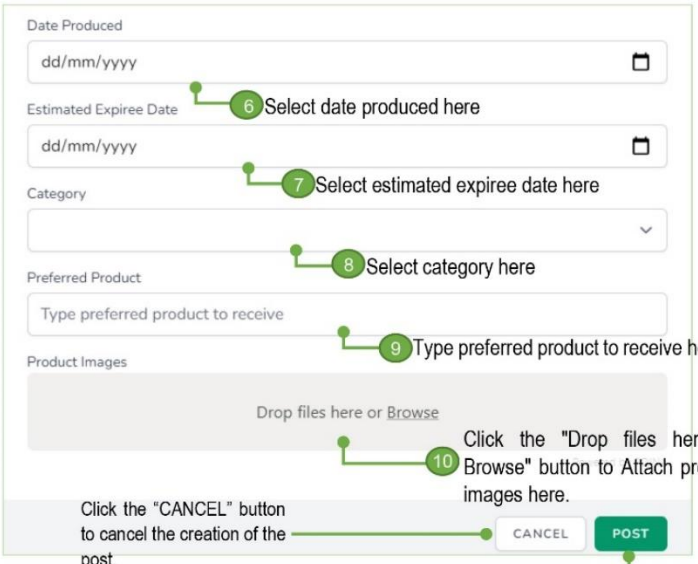
Barter Online Bartering System for Agricultural Products and Supplies

CREATE A POST

- The user needs to input post title, post description, product name, product quantity, quantity type, date produced, estimated expiree date, category, preferred product, and attach product images to create a post.



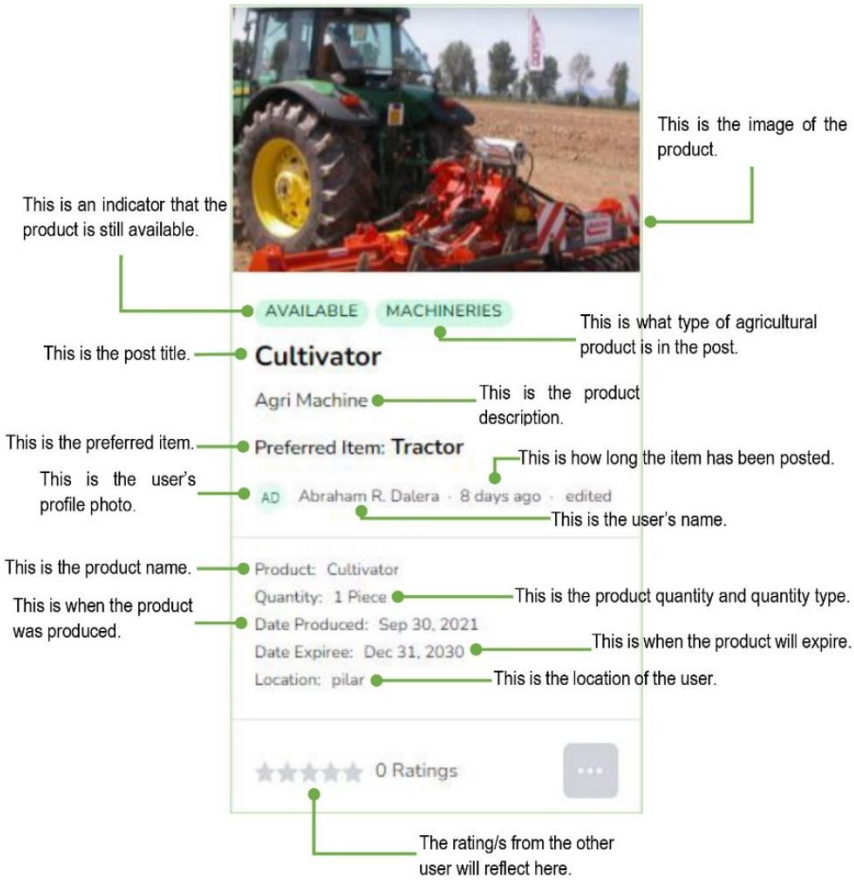
Barter Online Bartering System for Agricultural Products and Supplies



Barter Online Bartering System for Agricultural Products and Supplies

MANAGE POST

- A single post may contain different labels like available, negotiating, traded, expiree, expired, and what category under that product. It also contains the product image, post title, post description, preferred item, user's profile photo, user's name, how long it has been posted, product name, product quantity, date produced, estimated expiree date, location, and rating.



eBarter

Online Bartering System for Agricultural Products and Supplies

This is an indicator that the product is under negotiation with another user.

This indicates that the product will soon expire.

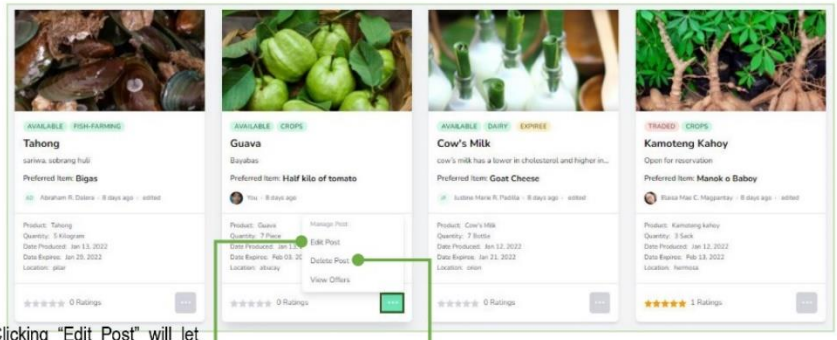
This is an indicator that the product is already traded.

This is an indicator that the product is already traded.

Barter Online Bartering System for Agricultural Products and Supplies

This indicates that the product is already expired.

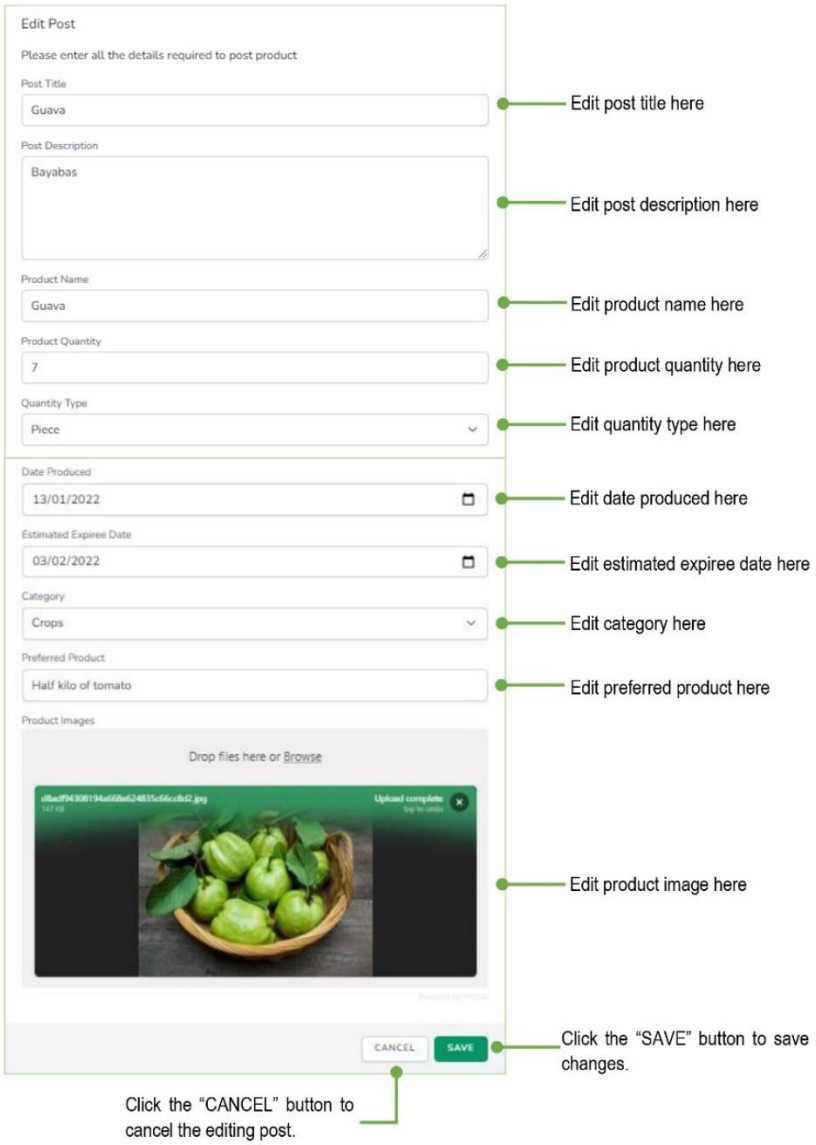
- Clicking the "…" button in the lower part of the user's post, the user can edit and delete the post.



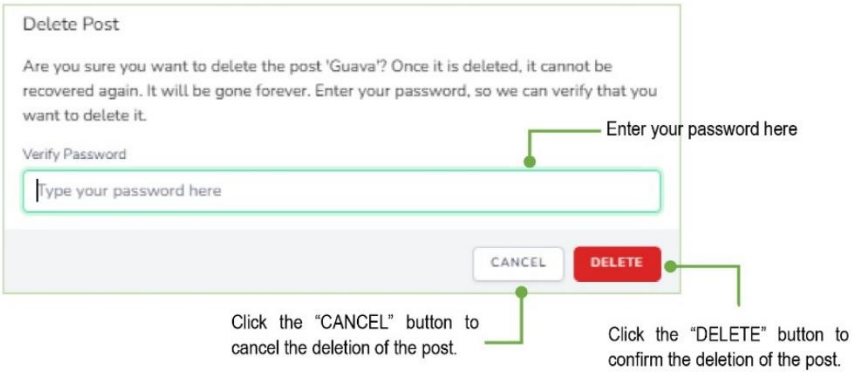
Clicking "Edit Post" will let you edit your post.

Clicking "Delete Post" will let you delete your post.

- By clicking the “Edit Post”, a form will pop up where the user can edit the post.



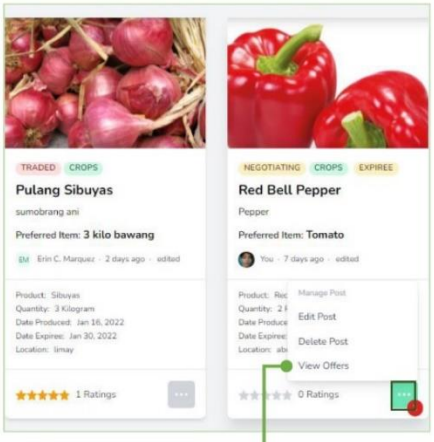
- By clicking the “Delete Post”, a confirmation will pop up where the user should enter his/her password to delete the post.



Barter Online Bartering System for Agricultural Products and Supplies

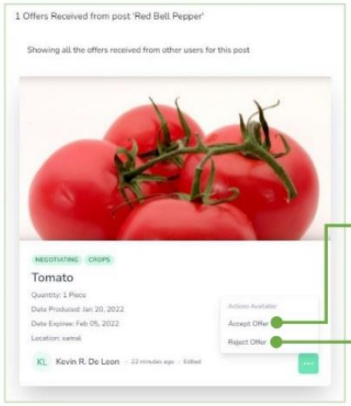
VIEW OFFERS

- Clicking the "..." button in the lower part of the post, the View Offers will be displayed.



Click "View Offers" it will be redirected to the offers made.

- Clicking the "..." button to see the "Accept Offer" and "Reject Offer" buttons.



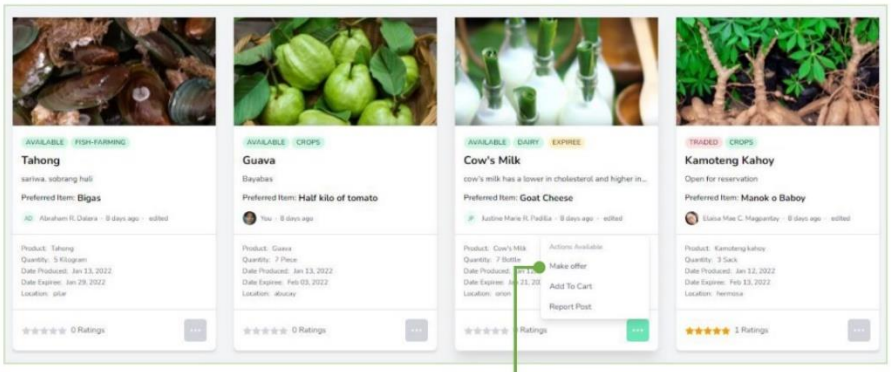
Click "Accept Offer" if you want to accept the offer. Once the offer is accepted, you will be redirected to the messaging feature.

Click "Reject Offer" if you want to reject the offer.

eBarter Online Bartering System for Agricultural Products and Supplies

MAKE AN OFFER

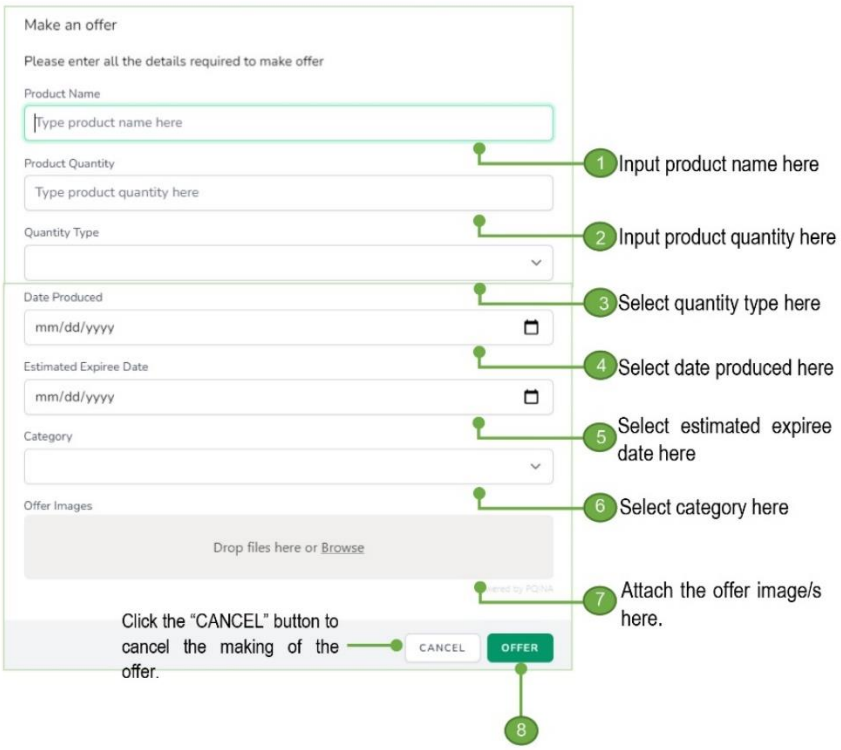
- By clicking the "…" button in the lower part of the post, the Make offer will be shown.



Click "Make offer" if you want to make an offer to another user.

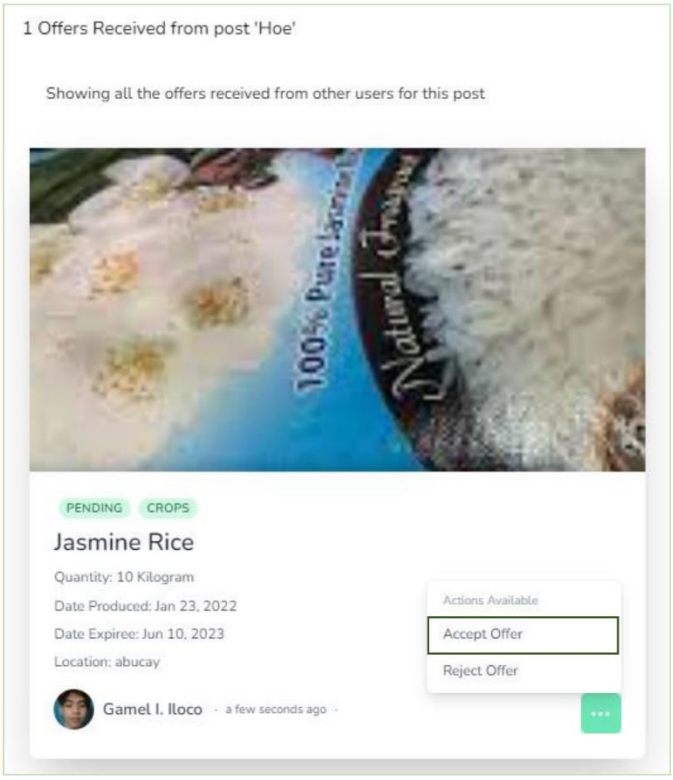
To make an offer, click the "Make Offer." The user needs to input the product name, product quantity, quantity type, date produced, estimated expiree date, category, and provide offer image/s.

Barter Online Bartering System for Agricultural Products and Supplies

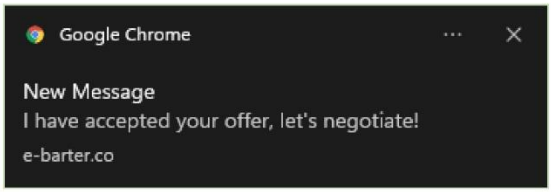


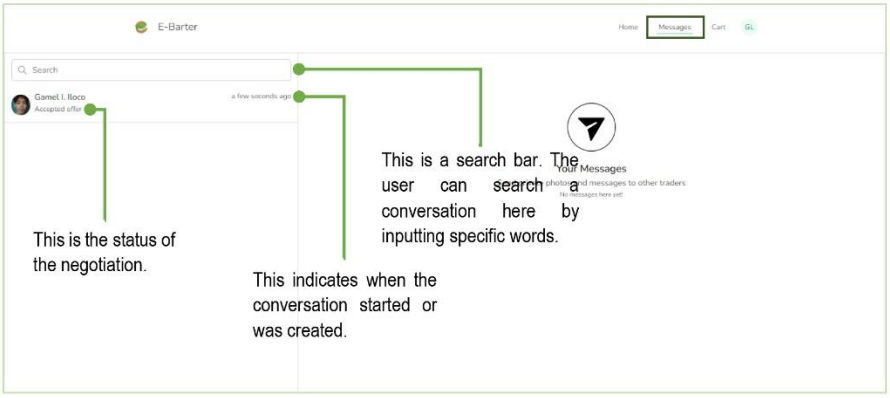
MESSAGES

- Upon clicking the “Messages” button, the user will be redirected to messages. The user can view all of the user’s conversations from another user here. To start a conversation with another user for negotiation, the user must first accept an offer from his/her posted product or supply.

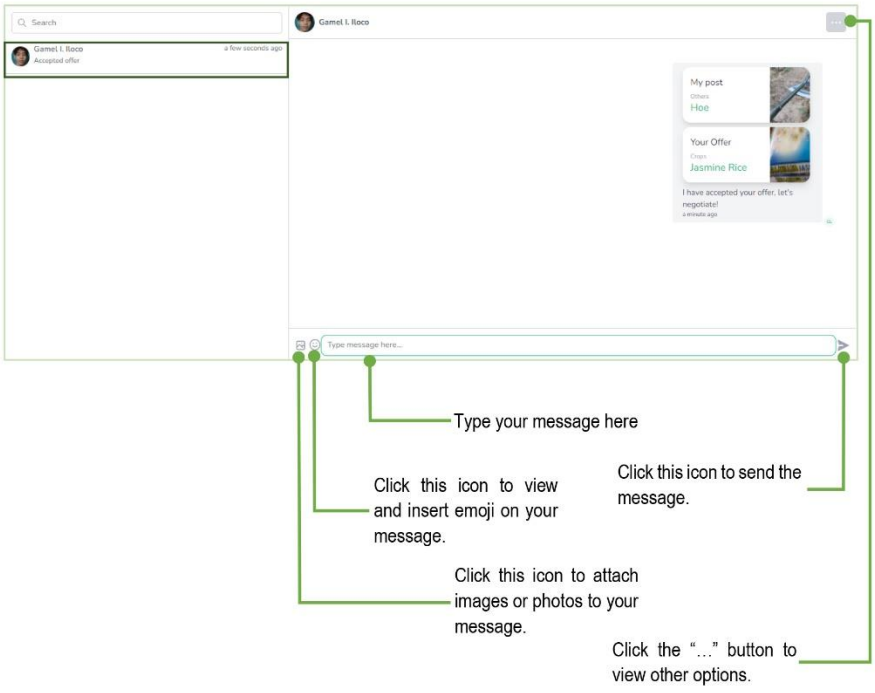


- Upon accepting an offer, the offeror will receive a notification. Also, a conversation will be created where the two users can negotiate with the owner of the accepted offer.

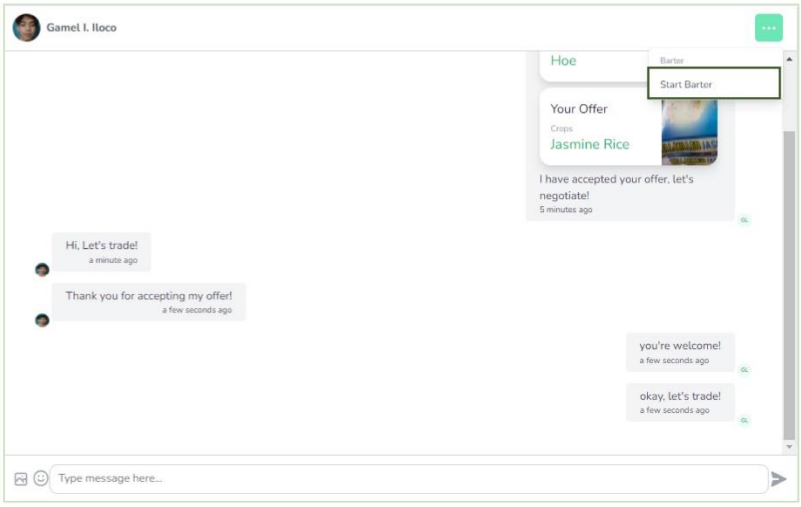


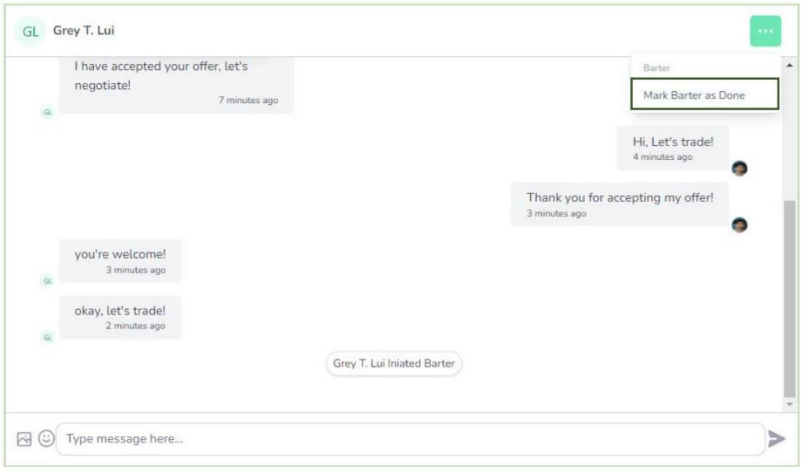


- After clicking an existing conversation, the whole conversation will appear on the right side of the webpage.



- Under the "…" button, there are two options the start barter and the mark barter as done. Mark barter as done will appear after clicking start barter. Only offerees can click the start barter, and only offerors can click mark barter as done. Click start barter if you have made up your mind to barter with the offeror. And click mark barter as done if the negotiation is done and already received the item.

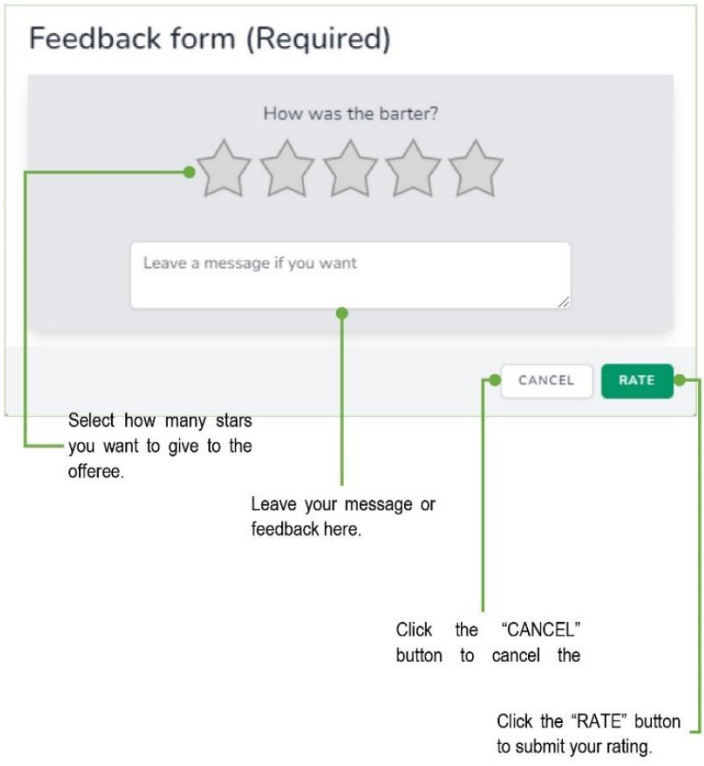




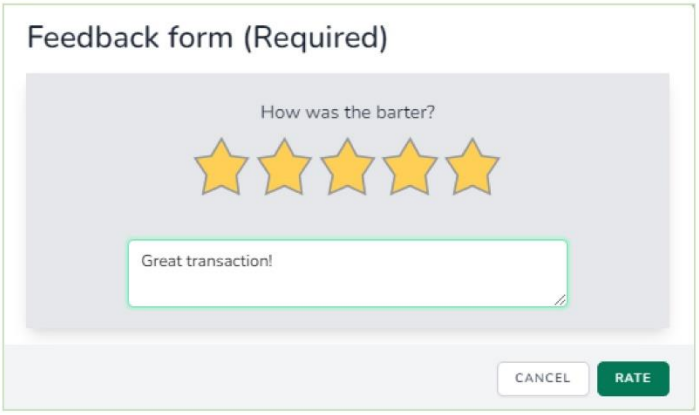
eBarter Online Bartering System for Agricultural Products and Supplies

FEEDBACK

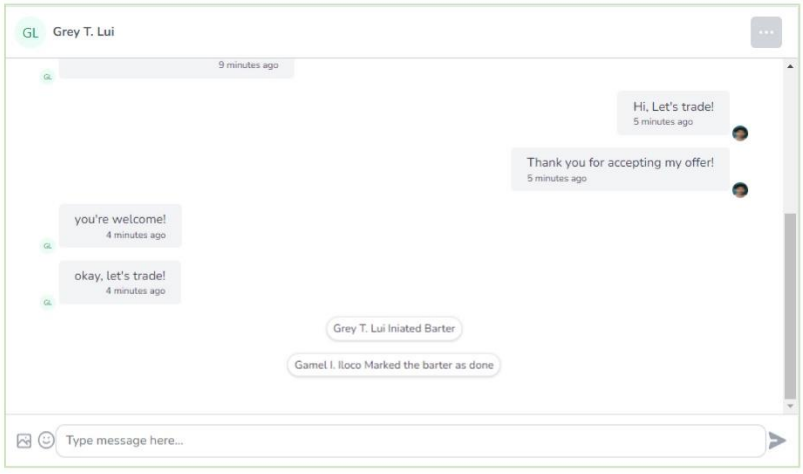
- After clicking the mark as done, the offeror can rate and provide feedback to the offeree.



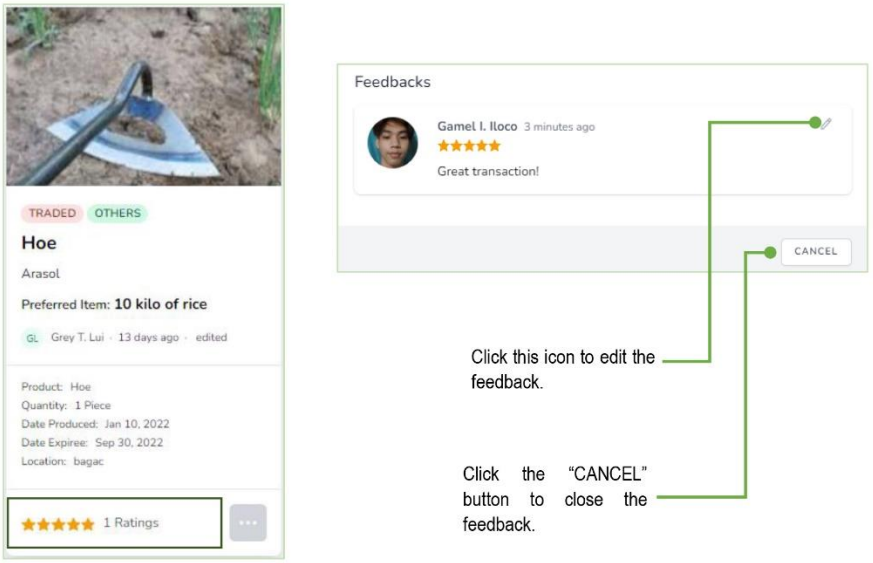
- This is an example of user feedback and rating.



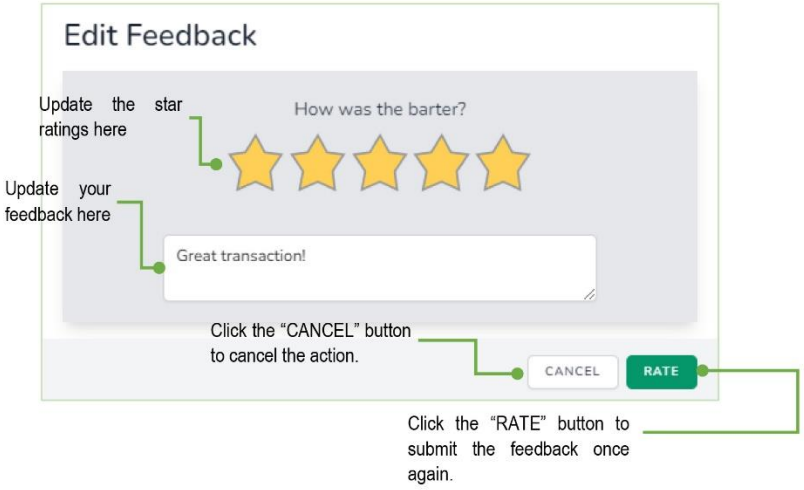
- After clicking the “RATE” button, the barter will be officially marked as done.



- The rater must find the rated item to edit the submitted feedback. The user needs to click the rating section and click the pencil icon.



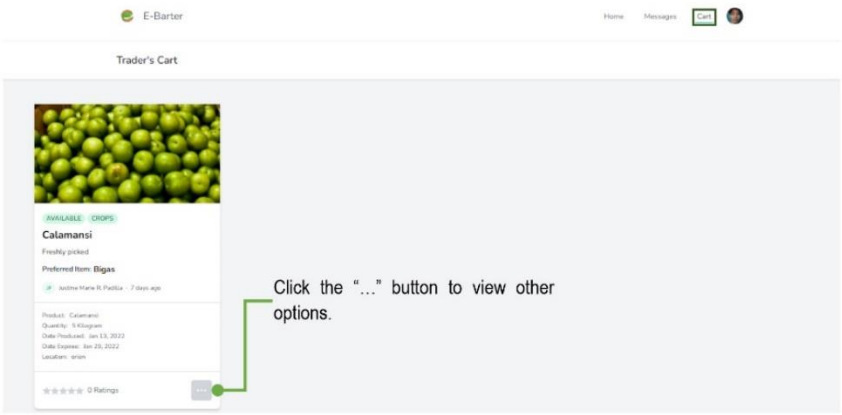
- After clicking the pencil icon, the feedback form will pop again, and the user will be able to update the feedback



Barter Online Bartering System for Agricultural Products and Supplies

CART

- Clicking “Cart” will redirect the user to the cart page. The user can see all of the products or supplies he/she added to the cart.

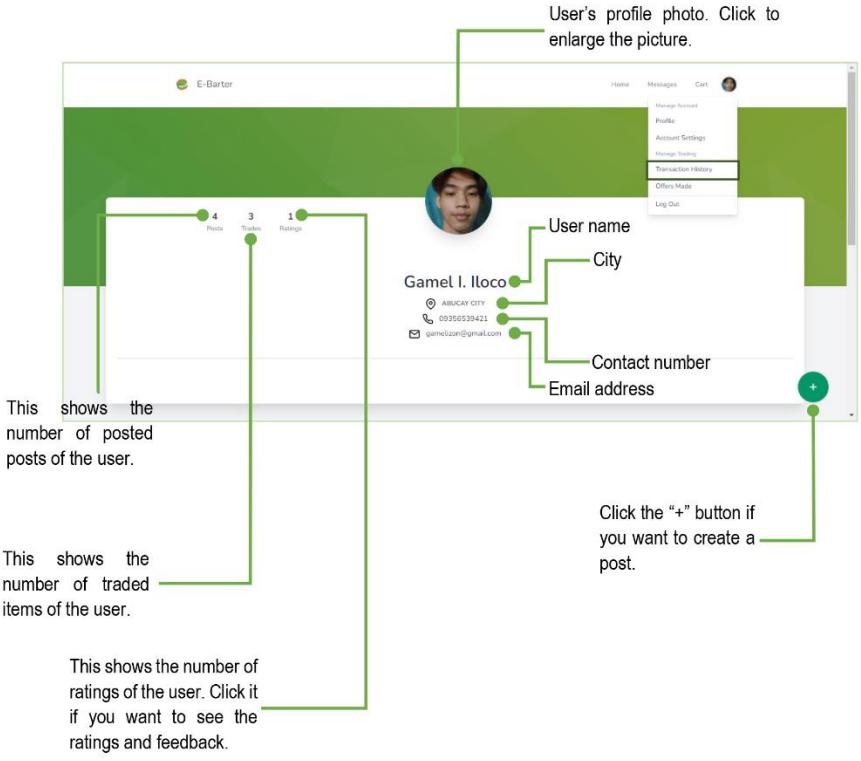


- Under the “…” options, there are three (3) buttons, the “Make offer”, “Remove from cart”, and “Report Post”.

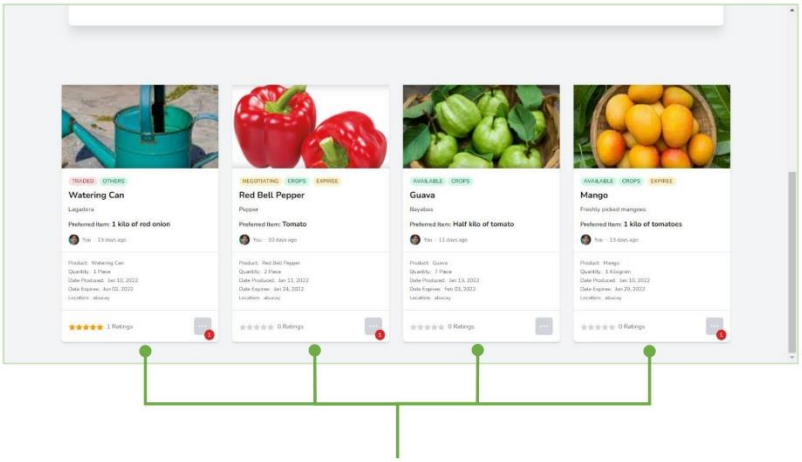
Barter Online Bartering System for Agricultural Products and Supplies

PROFILE

- Clicking the “Profile” button under the manage account will redirect the user to the user profile page. The profile page displays the user’s name, city, contact number, and email address. The posted items of the user, the number of traded products or supplies, and the number of posts and ratings can be viewed here.



eBarter Online Bartering System for Agricultural Products and Supplies

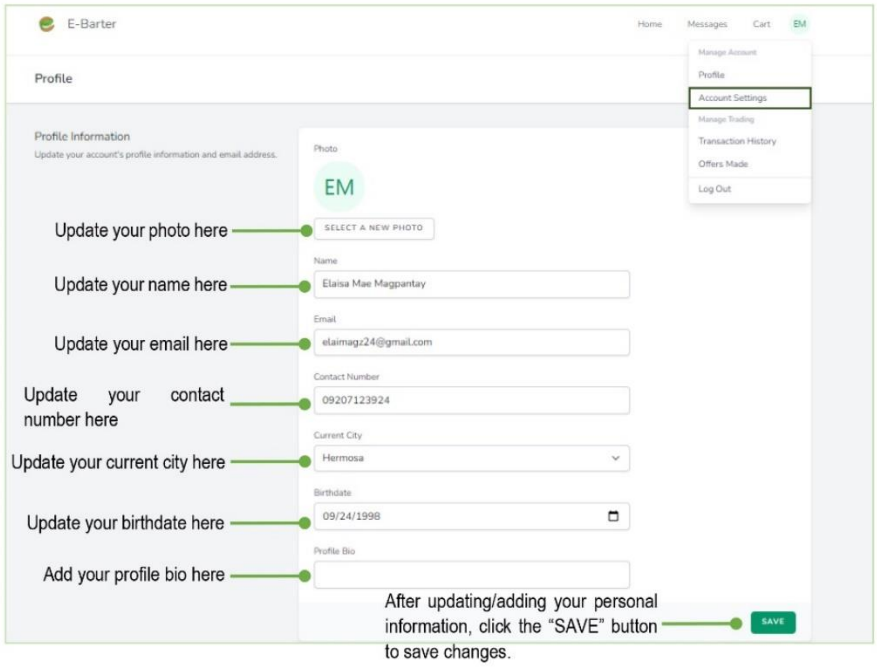


These are the posted products and supplies of the user.

Barter Online Bartering System for Agricultural Products and Supplies

ACCOUNT SETTINGS

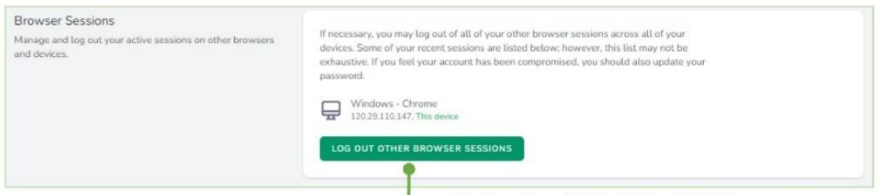
- Clicking the "Account Settings" button under the manage account will redirect the user to the account settings. It will display the profile information, update password, two-factor authentication, browser session, and delete account.



- The "update password" is for updating the password to ensure the security of the account.

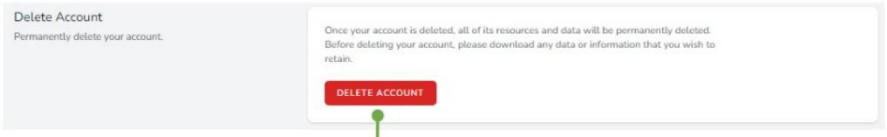
- The two-factor authentication is for additional security of the account.

- The use of the browser sessions is to monitor all the active sessions of the account.



Clicking the "LOG OUT OTHER BROWSER SESSIONS" button will log out all the active sessions.

- Delete account is for the deleting of account permanently.

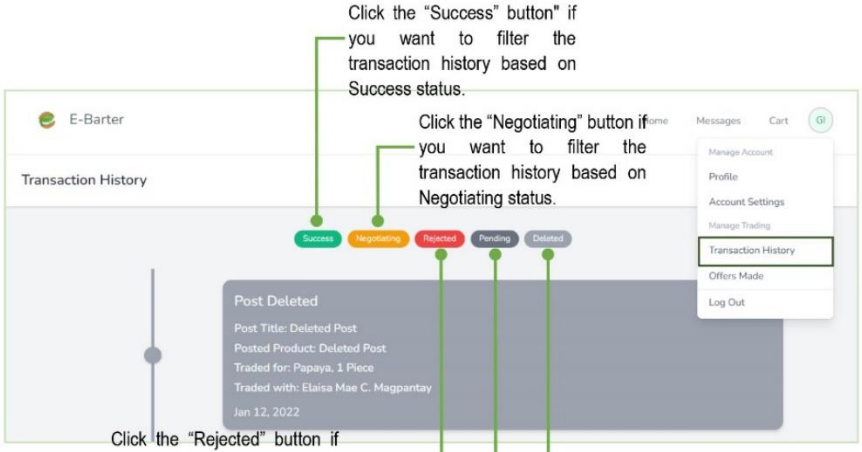


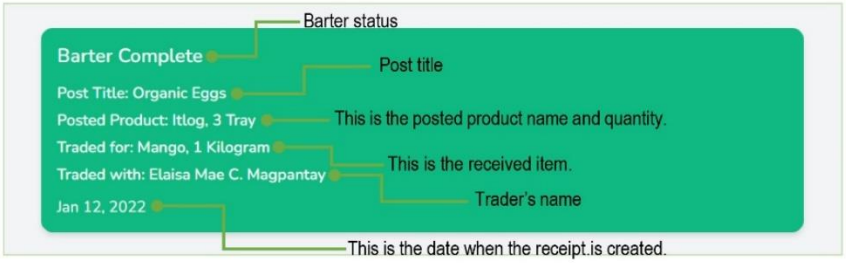
Clicking the "DELETE ACCOUNT" button will delete your account permanently.

Barter Online Bartering System for Agricultural Products and Supplies

TRANSACTION HISTORY

- Clicking the "Transaction History" button under manage trading will redirect the user to the transaction history page. The user can view and filter the transactions here from past-up to present.

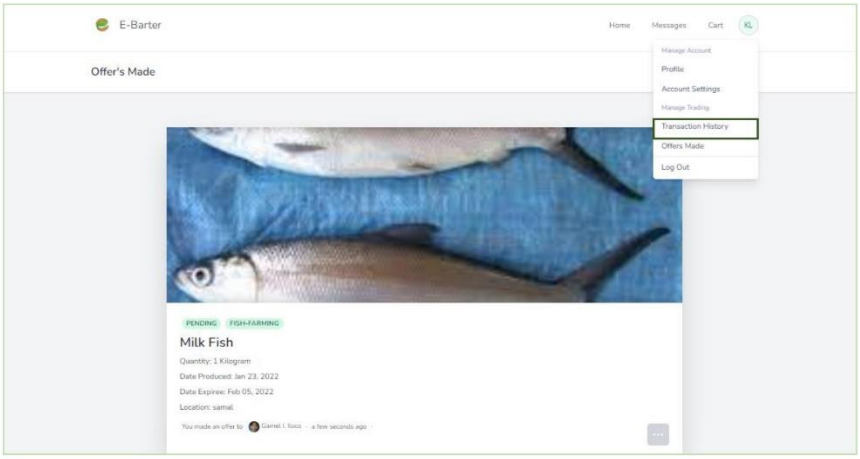



Barter status
Barter Complete
Post title
Post Title: Organic Eggs
Posted Product: Itlog, 3 Tray
This is the posted product name and quantity.
Traded for: Mango, 1 Kilogram
This is the received item.
Traded with: Elaisa Mae C. Magpantay
Trader's name
Jan 12, 2022
This is the date when the receipt.is created.

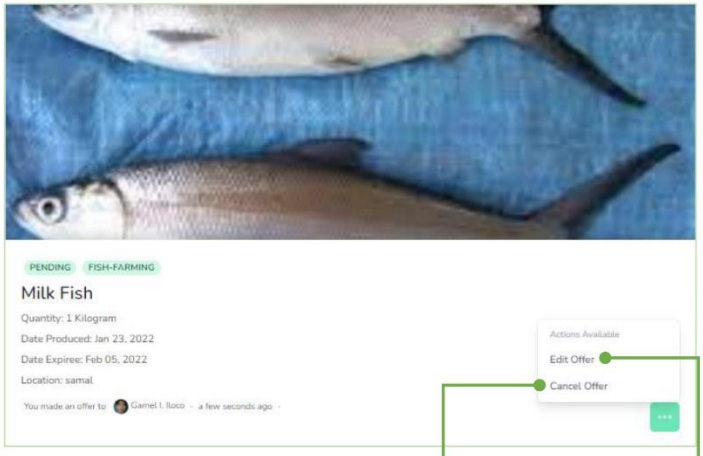
Barter Online Bartering System for Agricultural Products and Supplies

OFFERS MADE

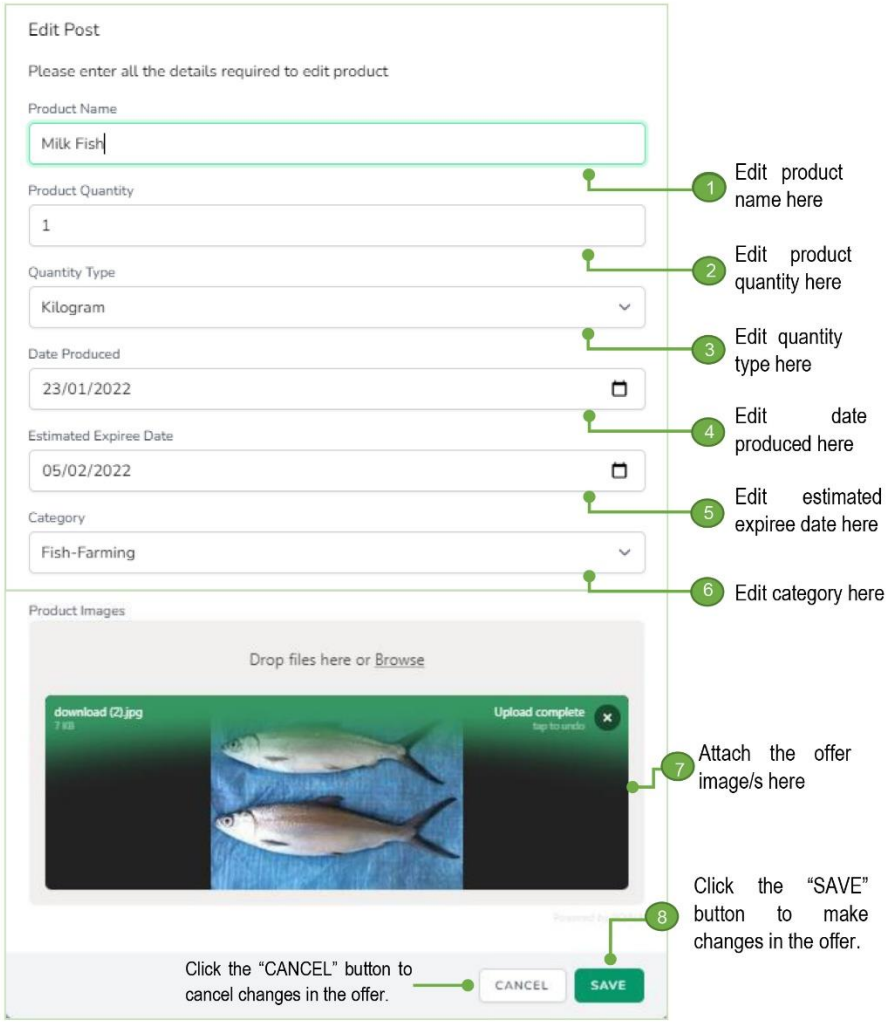
- Clicking the “Offers Made” button under manage trading will redirect to a list of offers made by the user.



- Clicking the "…" button in the lower right of the offer, the user can edit or cancel the offer.



- To edit an offer, the user needs to update or input another product name, product quantity, quantity type, estimated price, date produced, estimated expiree date, category, and provide offer image/s.



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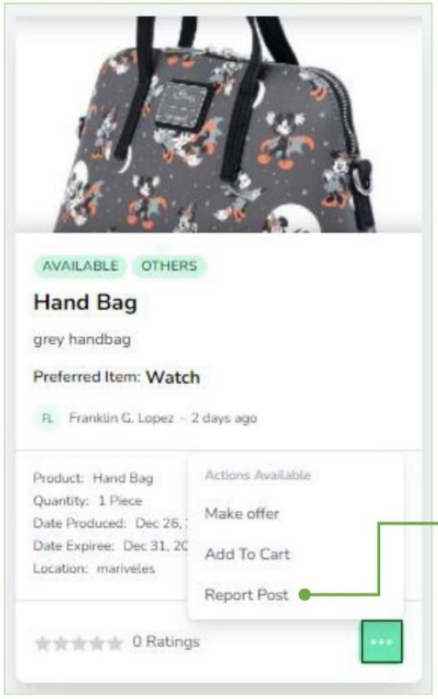
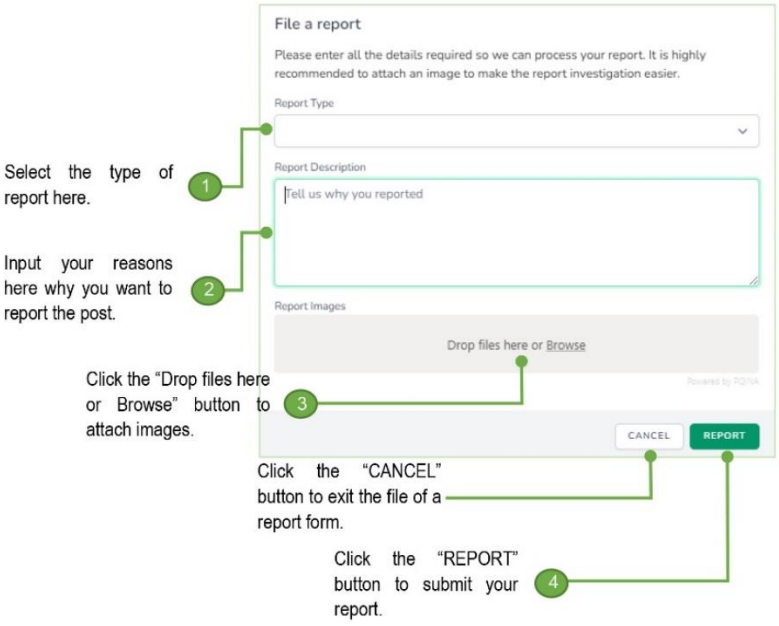
REPORT

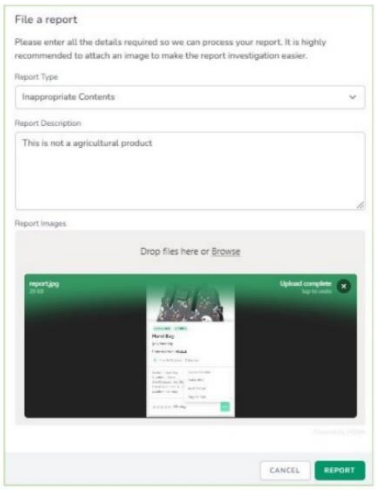
- To report a post, the user must click the "…" button at the lower part of the post, then must click report post.



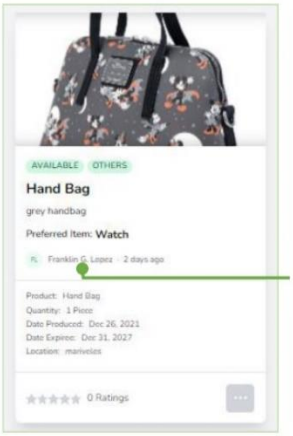
- Upon clicking the "Report Post" button, file a report form will appear.



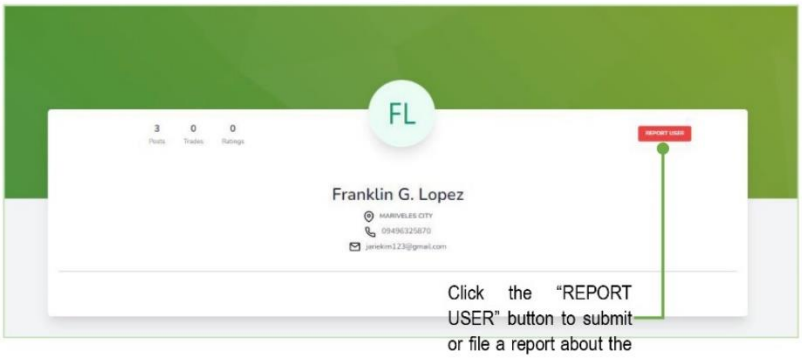
- This is an example of filing a report.



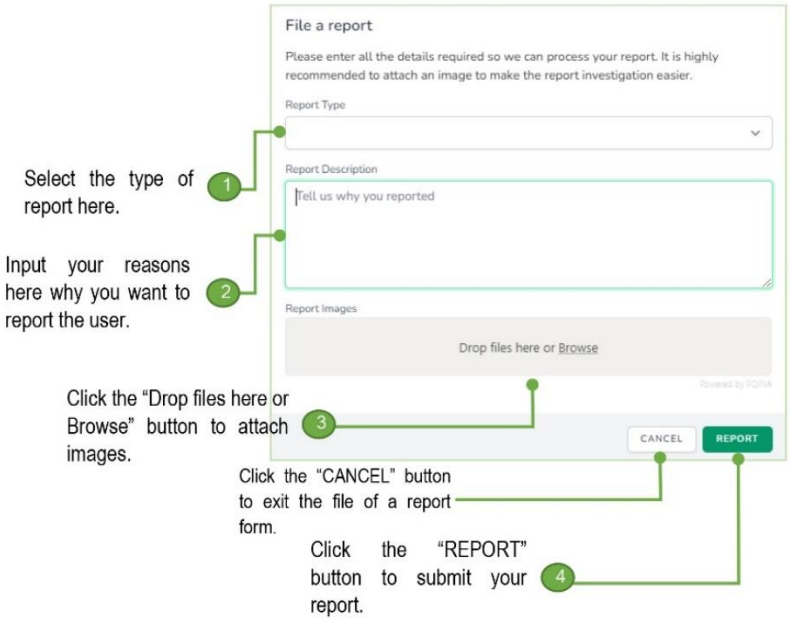
- To report a violator, the user must visit the profile page of the violator. On the profile page of the violator, the user must click the "REPORT USER" button to report.



Click the user's name to be directed to his/her profile page.

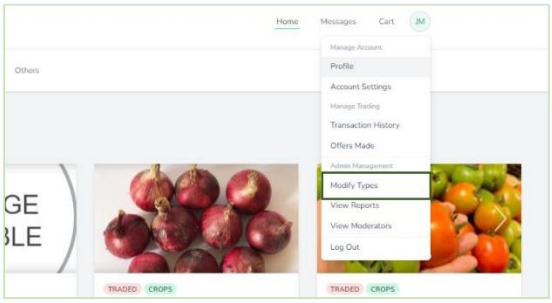


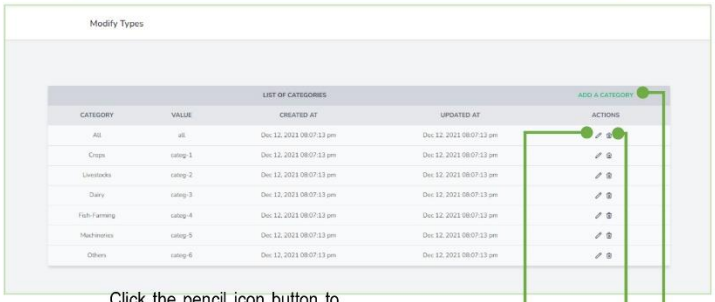
- Upon clicking the "REPORT USER" button, file a report will appear.



MODIFY TYPES

- The administrator must click the “Modify Types” button under admin management to modify the available types. Clicking the “Modify Types” button will redirect the administrator to the list of categories and quantity types.



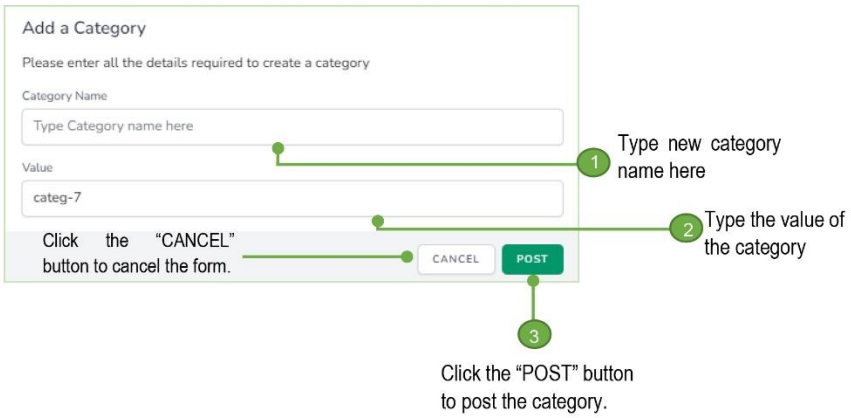


Click the pencil icon button to edit the existing category.

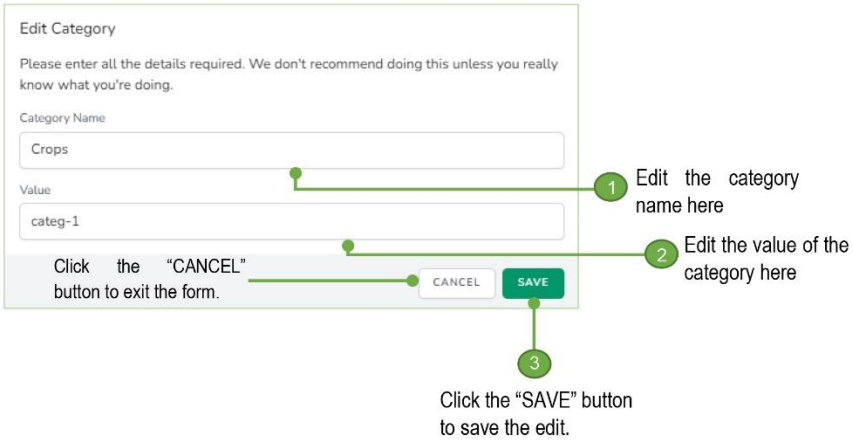
Click the trash icon button to delete the existing category.

Click the “ADD A CATEGORY” button to add another category in the system.

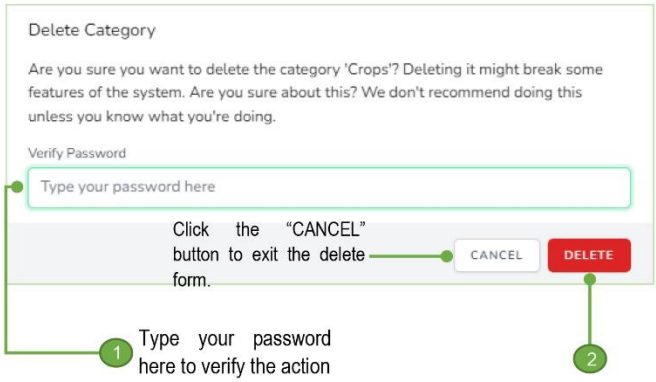
- By clicking the pencil icon button, the edit category form will appear. The administrator must type the new category name and value.

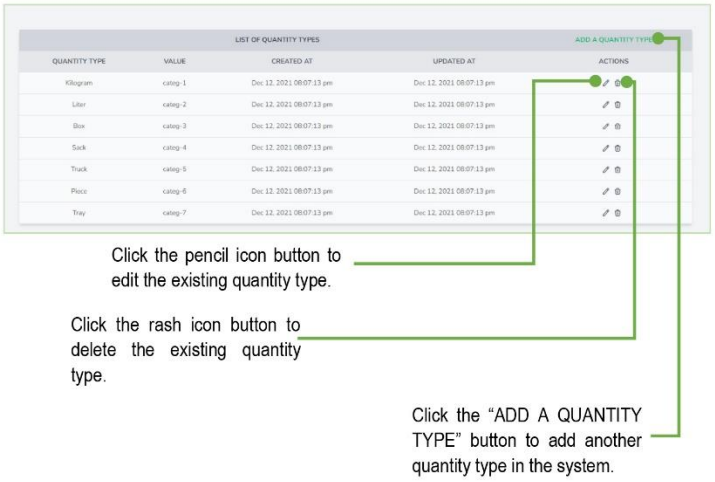


- By clicking the pencil icon button, the edit category form will appear. The administrator must type the new category name and value.

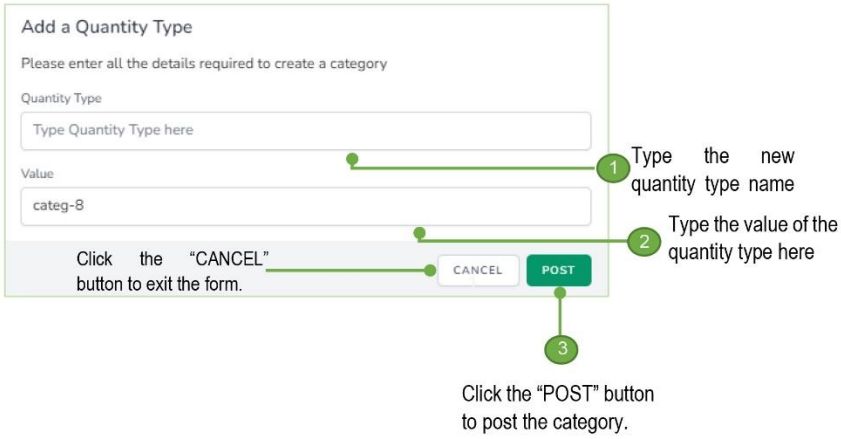


- By clicking the trash icon button, the delete category form will appear. The administrator can delete the existing category after verifying by using his/her password.



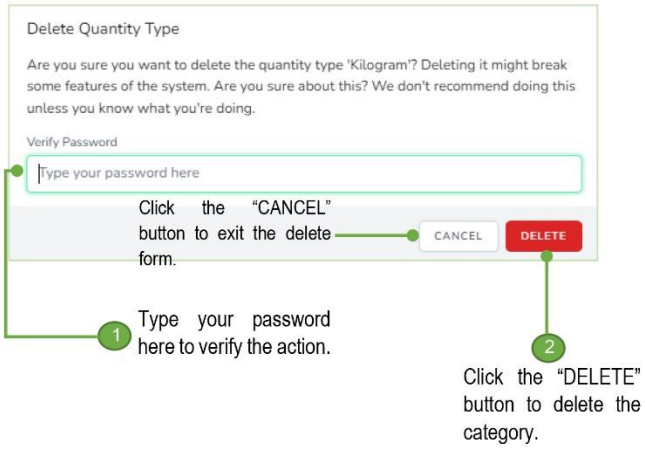


- By clicking the "ADD A CATEGORY" button, add a quantity type form will appear. The administrator must type the quantity type name and the value.



- By clicking the pencil icon button in the existing quantity type, the edit quantity type form will appear. The administrator must type the new quantity type name and value.

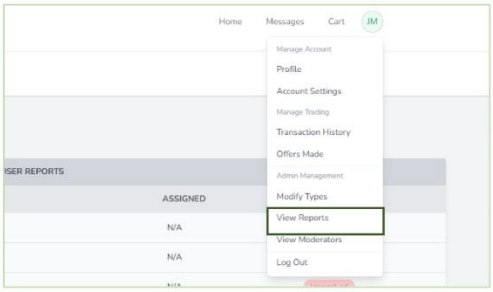
- By clicking the pencil icon button, the edit quantity type form will appear. The administrator must type the new quantity type name and value.

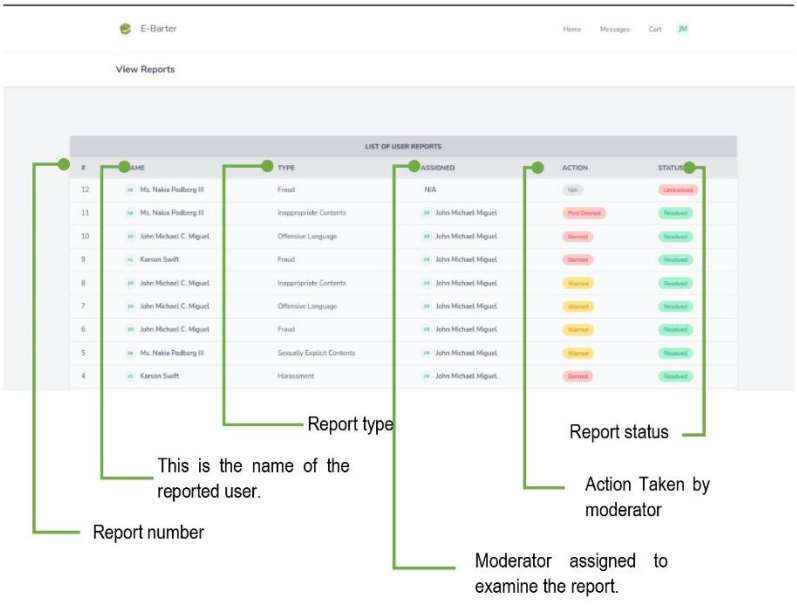


Online Bartering System for Agricultural Products and Supplies

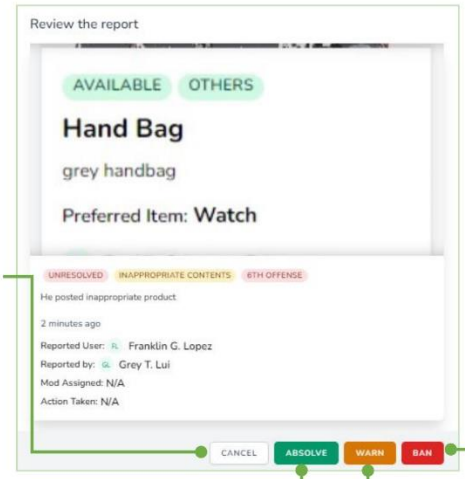
VIEW REPORTS

- The administrator must click the “View Reports” button under admin management to view reports. Clicking the “View Reports” button will redirect the administrator to the list of user reports.





- Upon clicking a report, the administrator and moderator will be able to view the detailed information of the report. It contains different labels such as report status, report type, report level, report description, date when the report is created, reported user, reported by, and moderator assigned.



Click the "CANCEL" button to exit the review the report form.

Click the "BAN" button to remove the post from the website. If a user is reported, the user will be banned. Upon banning, the report will be resolved.

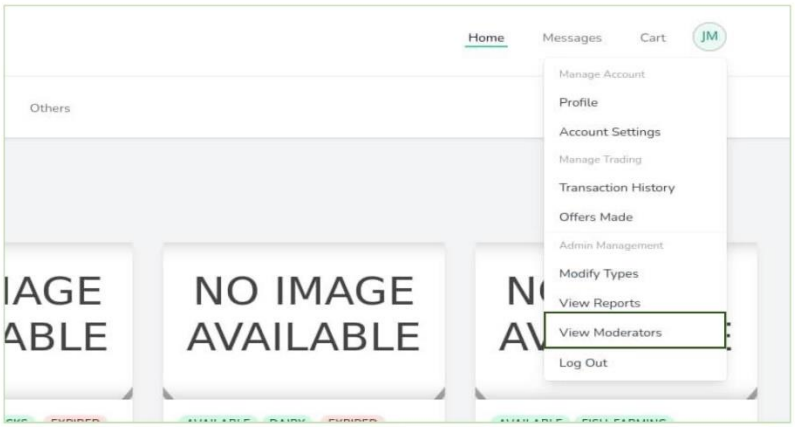
Click the "ABSOLVE" button to dismiss the report without removing the post or banning a user. Doing this will mark the report as resolved.

Click the "WARN" button to send a warning to the user. Doing this will mark the report as resolved.

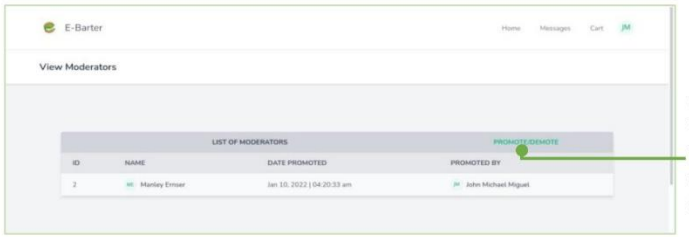
Barter Online Bartering System for Agricultural Products and Supplies

VIEW MODERATORS

- The administrator/moderator must click "View Moderators" under the Admin Management Menu to view moderators. Clicking the "View Moderators" button will redirect to the list of moderators.

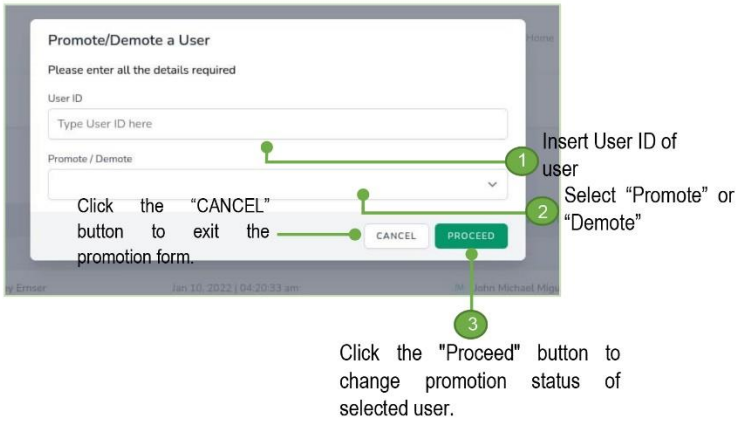


- This table shows the list of current moderators. The administrator/moderator can see details of the list of moderators. It contains different text labels such as User ID, User Name, Date Promoted, and Promoted By.

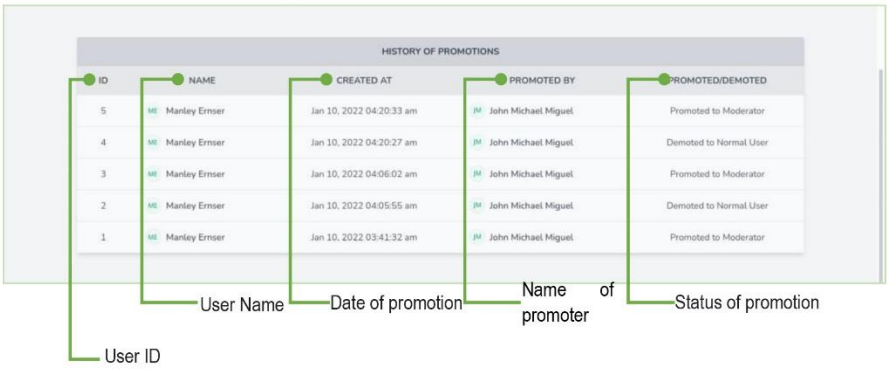


Click the "PROMOTE/DEMOTE" button to change the moderator status of other users.

- When the promote/demote button is pressed, a modal pops up. It contains a textbox asking for User ID and to select whether the action is to promote/demote a user. When proceed button is clicked, the data will reflect in the "List of Moderators" table.



- This table shows the history of promotions/demotions of users. It contains different text labels such as User ID, Name of the User Promoted, the date the promotion was created, promoted by, and Status whether it was Promoted or Demoted.



RESEARCHER'S PROFILE

JUSTINE MARIE R. PADILLA

#518 Pound St., Hill Crest Village
Brgy. Cataning, Balanga City, Bataan
0945-537-7160
padillajustinemarie@gmail.com

PERSONAL DATA

Civil Status	:	Single	Religion	:	Catholic Christian
Sex	:	Female	Nationality	:	Filipino
Date of Birth	:	December 2, 1999	Height	:	160 cm.
Place of Birth	:	Balanga, Bataan	Weight	:	60 kg.

EDUCATIONAL BACKGROUND

TERTIARY
Bataan Peninsula State University - Main Campus
Bachelor of Science in Information Technology
Major in Network and Web Application

SECONDARY
Tomas Del Rosario College
Junior High School - Senior High School
Brgy. San Jose, Balanga City, Bataan

PRIMARY
Cataning Elementary School
Brgy. San Jose, Balanga City, Bataan

SEMINAR ATTENDED

NYC AsiaReady Exposure Program
Cognizant V-Work Program
Webex Platform
July 10 - July 30, 2021

WORK EXPERIENCE

Remotask
Freelancer
May 2021 - Present

AWARDS/RECOGNITIONS

Third Place - AsiaReady Exposure
Cognizant V-Work Program
July 2021

BPSU CICT Dean's Lister
2018 - 2021

COMPUTER SKILLS

- Proficient in Microsoft Office (Word, Excel, Powerpoint)
- Familiar with Adobe Photoshop
- Document and File Management

GAMEL I. ILOCO

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0935-653-9421
gamelizon@gmail.com

PERSONAL DATA

Civil Status	:	Single	Religion	:	Roman Catholic
Sex	:	Male	Nationality	:	Filipino
Date of Birth	:	August 29, 2000	Height	:	178 cm.
Place of Birth	:	Balanga, Bataan	Weight	:	55 kg.

EDUCATIONAL BACKGROUND

TERTIARY
Bataan Peninsula State University - Main Campus
Bachelor of Science in Information Technology
Major in Network and Web Application

SECONDARY
Bonifacio Camacho National High School
Junior High School - Senior High School
Calaylayan, Abucay, Bataan

PRIMARY
Mabatang Elementary School
Dominguez Street, Mabatang, Abucay, Bataan

SEMINAR ATTENDED

NYC AsiaReady Exposure Program
Cognizant V-Work Program
Webex Platform
July 10 - July 30, 2021

WORK EXPERIENCE

Remotask
Freelancer
July 2021 - Present

AWARDS/RECOGNITIONS

BPSU CICT Dean's Lister
2018 - 2021

COMPUTER SKILLS

- **Proficient in Microsoft Office (Word, Excel, Powerpoint)**
- **Basic knowledge in Adobe Photoshop**

ELAISA MAE C. MAGPANTAY

#91 Purok 2, Pandatung,
Hermosa, Bataan
0920-712-3924
elaisamaemagpantay@gmail.com

PERSONAL DATA

Civil Status	:	Single	Religion	:	Roman Catholic
Sex	:	Female	Nationality	:	Filipino
Date of Birth	:	Sept. 24, 1998	Height	:	160 cm.
Place of Birth	:	Hermosa, Bataan	Weight	:	60 kg.

EDUCATIONAL BACKGROUND

TERTIARY

Bataan Peninsula State University – Main Campus
Bachelor of Science in Information Technology
Major in Network and Web Application

SECONDARY

Saint Peter of Verona Academy
Junior High School
Poblacion, Hermosa, Bataan

Hermosa National High School
Senior High School
Brgy. Culis, Hermosa, Bataan

PRIMARY

Pandatung Elementary School
Brgy. Pandatung, Hermosa, Bataan

WORK EXPERIENCE

Remotask
Freelancer
September 2021 – Present

AWARDS/RECOGNITIONS

MTA Security Fundamentals Passer
June 4, 2021

BPSU CICT Dean's Lister
2018 – 2021

COMPUTER SKILLS

- **Skilled in Microsoft Office**

JOHN MICHAEL C. MIGUEL

San Carlos St. Brgy. Sibacan,
Balanga City, Bataan
0939-953-7899
johnmichaelmiguel.c@gmail.com

PERSONAL DATA

Civil Status	:	Single	Religion	:	Roman Catholic
Sex	:	Male	Nationality	:	Filipino
Date of Birth	:	June 5, 2000	Height	:	163 cm.
Place of Birth	:	Balanga, Bataan	Weight	:	55 kg.

EDUCATIONAL BACKGROUND

TERTIARY

Bataan Peninsula State University – Main Campus
Bachelor of Science in Information Technology
Major in Network and Web Application

SECONDARY

Bataan National High School
Junior High School
Roman Superhighway, Balanga City, Bataan

Eastwoods Academy of Science and Technology
Senior High School
Brgy. Ibayo, Balanga City, Bataan

PRIMARY

Balanga Elementary School
Brgy. Talisay, Balanga City, Bataan

COMPUTER SKILLS

- **Full Stack Modern Web Development**
- **Computer Systems Servicing**