

School of Computing and Mathematics

PRCO303

Final Stage Computing Project

BSc (Hons) < *Software Engineering* >

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< Online Grocery Store – Web Application/Mobile Application >

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# 1. ABSTRACT

Suggestions to Perform the Current Process of Buying and Selling Essential Goods by Online Grocery Store During the COVID-19 Period

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Today's society is moving forward with COVID-19 virus. It has been major factor to socialize the virus and spread it quickly. In a situation like this, it is dangerous to go to a crowded shop, market or fair to buy essential goods. Not only that but also exchanging money hand in hand between different people is very risky. During the lockdown, majority of people are helpless with no way to go out to buy essential goods and also the grocery shop owners and other small vendors are not able to run their business properly. Because of those problems, People are in a lot of trouble. As a technologically advanced society, a timely and a successful answer must be founded to overcome those serious problems.

As a good answer for that, Online grocery store web application and a mobile application are suggested by this project to perform the current system of buying and selling essential goods in an online platform. Online grocery store is an online platform for both customers and grocery shop owners. Essential goods can be bought by the people throughout the both web application and the mobile application very easily and a safeties way in any pandemic situation like this. Being protected from the Covid-19 virus, essential goods can be purchased online by the people using this online grocery store website or mobile application from anywhere in the country in anytime. Also, the business can be continued without any economic losses and a safeties way by the grocery shop owners or small vendors with the help of this online grocery store in any pandemic situation like this. According to the survey done by me on 20th November 2021 to 12th January 2022, there are lot of people (75%) faced some serious trouble during the lockdown session when buying an essential goods away from the home. Not only that but also, majority of people (80%) are scared to travel crowded places and the outside because of the severity of COVID-19 virus. Also, a considerable amount of people (70%) haven't a positive comment about the current process of buying and selling essential goods in a traditional grocery shop. According to the survey, there are impressive amount of people (78%) have a positive ideas and good recommendations about an online grocery store and online payments methods. So, as a result of the survey done by me this online grocery store project is very useful for every people, grocery shop owners and any other vendors to overcome those problems mentioned above and maintain their lives as normal in any pandemic situation.

Keywords: COVID-19, Online Grocery Store, Web API, Mobile Application

# 2. INTRODUCTION

## 2.1 Project Based Event

The Corona virus pandemic is an ongoing global pandemic. The first infected of corona virus was identified in the Chinese city of Wuhan in December 2019. Since then, the spread of the Covid-19 virus is

began to the other part of the China and all around the world quickly. The lockdown failed to contain the outbreak. In this situation the first Sri Lankan person, who infected with Covid-19 was identified on March of 2020. Since then, the virus is still spreading all around the country. Sometimes the country was closed time to time by the government for control the spread of the virus. Although, the first wave of the pandemic was controlled successfully by the Sri Lankan government. But, the increase of Covid-19 deaths since November 2020, second and third wave of the pandemic was failed to Controlled by them. After the effect of the Delta variant, Sri Lanka became the country with fourth-largest number of daily deaths in the world by population. In Sri Lanka, there have been 663,632 confirmed cases of Covid-19 and 16,510 confirmed Covid deaths from 3<sup>rd</sup> of January 2020 to 13<sup>th</sup> of May 20202.

(World Helth Organization, n.d.)

Also, there are more than 520,534,010 confirmed Covid cases are identified in 226 countries and territories. Not only that but also, 6,287,064 of deaths have been identified all over the world as of May 14 2022. (worldometer Corparation, n.d.)

Because of that, Corona virus pandemic became the most dangerous pandemic in the history. The following linear chart display the increase in the number of total deaths of Covid-19 virus from time to time.

Total Deaths



(worldometer Corparation, n.d.)

## 2.2 Problem Identification

Considering the above, The Covid-19 virus has become a serious threat to the people. So, obstacles are faced by people in day to day works. Foods are major requirement of each and every people in the

world. People cannot live without foods for a moment. At a time, the Covid-19 virus present in the society, the following problems are faced by people to buy essential goods.

- It is not necessary to go to crowded grocery shop, market or crowded fair to buy essential goods because, this can be spread the virus with each other very quickly.
- Also, Money transactions are not appropriate by sharing money hand in hand between the different people coming from various part of the country.
- The people who go to the crowded super market, grocery shop or fair should be worn masked. It is very annoying thing.
- Also, they have to be waited in the long queues keeping the one-meter distance between each other and safeguarding measures need to be followed.
- It is not suitable to use the public transport methods to travel to the super market, grocery shop or fair at a time the Covid-19 virus present in the society. So, people have to be used their own vehicles. It costs a lot more.
- The grocery shop owners, and other small vendors had to be faced to the economies loses during the Covid-19 period and the business cannot be continued by them because the lock down, severity of the corona virus and the country situation.
- In the lock down period and the coronatine, most of the people are helpless with no way to go out from home to buy essential goods.

Considering the above problems, the society need to be a quick solution to overcome those problems and buy essential goods very easily.

### **2.3 Proposed System**

A good solution is presented by this project to the technologically advanced society to overcome above mentioned problems occurring when purchasing and selling essential goods during the Covid-19 period. The advantages of this project can be obtained both the clients and the vendors. The concept of “online grocery store” is introduced to the modern society to perform the current method of buying and selling essential goods in an online platform. By that, the essential goods can be brought by the people protecting their lives from the Covid-19 virus, Lockdown, coronatine period and any serious country situation like this. Not only that but also the business of grocery shop owners and other small vendors can be running continuously without any economic disaster. Following are some brief description about the proposed system of this project.

- In this project, a concept of “online grocery store” is introduced to the society by the author to make the current system of purchasing and selling essential goods in an online platform.
- Both the web application and the mobile application are produced to the end clients to do their task. Both systems are worked in a same way.
- The majority of focus in this project was on developing the web application and it was developed according to the MVC architecture and using ASP.NET.CORE programming language.
- Visual Studio 2019 IDE is used as a code editor for developing the web application and Microsoft SQL Server Management Studio 18 update is used as the database of the both systems.
- By this project, Search products, add to the cart, checkout products using online payment methods are the main facilities that are provided to the clients.

- There is an administration view of the both systems and by using it admin allows to mange the web application and the mobile application exactly.

Above are some brief introduction about the proposed system to get an idea about how its work. At the following topics of this report is described detailed information about the used technologies to develop this online grocery store and its features and functionalities.

### **3. BACKGROUND AND OBJECTIVES**

#### **3.1 What Is an “Online Shopping”**

Web based shopping is a type of electronic business which permits customers to straightforwardly purchase labor and products from a dealer over the Internet utilizing an internet browser or a portable application. The products that are interested by customers, can be found by visiting the site of the retailer straightforwardly or via looking among elective merchants utilizing a shopping search engine, which shows similar item's accessibility and estimating at various e-retailers. In the modern world, Online shopping can be done with help of different electronic devises such as desktop computers, lap tops, mobile phones, tablets etc. (Wikipedia, 2022)

#### **3.2 Popularity of “Online Shopping”**

In the modern society, Online shopping is growing so fast among all over the countries in the world. Online shopping helps to increase the global friendships between all over the world. The optimonster web site describe some valuable and important information about the popularity of the online shopping in the modern world. Among them, (optimonster Corporation, n.d.)

- the worldwide internet shopping market size almost hit 4 trillion in year of 2020.
- 300 million online shoppers are expected from them in 2023 only from America.
- There are 65% of American have shopped online.
- Once per month, at least there are 25% Americans shop online.
- Not only the Americans but also the other people all over the world use the online shopping because of its valuable benefits and advantages.

#### **3.3 What Is an “Online Grocery Store”**

Online grocery store is a grocery store that provide their services to the customers in an online platform. That allows to consumers to online ordering and online purchasing products using mobile phones, desktop computers, tablets and any other electronic devises by stay from home. The main purpose of an online grocery store is to permits you the joy of shopping from your lounge area table, your sofa, or your office, without exploring swarmed passageways and extensive cashier lines. That implies having an additional opportunity to do the things you love.

#### **3.4 Benefits of an “Online Grocery Store”**

The different kind of advantages and benefits can be got to the clients by using an online grocery store. It is very helpful for the peoples who spending a busy life in the all around the world. Following are described some of the important benefits in point form.

- No need to waited long ques near the cashier for checkout products.
- Save your valuable time.
- 24-hour service, that means you can shop any time in the day.
- No need of traveling to the supermarket or fair to by essential gods.
- Save your additional costs.
- Allows you to shop stay from your home by using electronic devices such as mobile phones, computers etc.
- No additional stopping bothers.

### **3.5 The importance of the “Online Grocery Store” during the Corona Season**

Covid-19 virus is a big threat to the each and every country in the world. After the first infected of Covid-19 virus was identified in china, “Covid-19” became the major topic of the world. The virus started to spread all around the world very quickly. The millions of people fell victim to the Covid-19 virus for nearly three years. Not only that but also, millions of people died all around the world because of this Corona pandemic. It is not still over. Today’s general public is pushing ahead with the Covid-19 infection. It has been a main consideration to mingle the infection and spreading it rapidly. At the moment, there are not clear lack of Covid-19 virus all around the world. Time to time the covid-19 virus is come up with different kind of variants and it is still spreading all around the world. “Omicron” is the newest variant of the Covi-19 virus. It is a very dangerous variant and without any lack many people became infected of it.

Because of the severity of Covid-19 virus, every country has started to follow the safety measures to prevent from the virus. So, every people had to wear a mask to go to the outside of the home, they had to used hand sanitizer to clear theirs’ hands in every moment when they touch external surface. In a circumstance like this, it is perilous to go to a crowded grocery shop and purchase fundamental merchandise. That as well as trading cash with each other is exceptionally hazardous. During the lockdown, individuals are vulnerable with no real way to go out to purchase fundamental merchandise and staple retailers can't maintain their organizations appropriately. Due to those issues, People are in a tough situation. Food is a major need of every people in the world. During the pandemic of Covid-19, grocery shops are crowded by the people for buy essential goods. Because of that it is a very dangerous case to both sellers and customers. Thus, it is exceptionally hazardous to go to a packed basic food item shop to purchase fundamental products in a circumstance like this. That as well as, there is cash in the staple shop coming from all over the place. Due to the utilization of cash contacted by various individuals, the infection can be spread with each other's without any problem. At a time when the Corona epidemic was spreading rapidly, many countries around the world-imposed travel restrictions for the safety of the people. As a result of that Sri Lankan government also imposed curfews and travel restrictions on the entire island to control the epidemic. In this time period normal people faced some serious kind of difficulties to move their life forward with this Covid 19 pandemic. During this quarantine period, many poor people as well as all other people had some difficulty in fulfilling their basic needs. Wealthy people were tempted to stockpile as much food and other essentials as they could in their homes. As a result, ordinary people could not afford to stockpile such essentials, much to their chagrin. So many problems arose in the society. Not only that, many ordinary people use public transport services to come to the grocery shops to buy essential goods. It is not advisable to use public transport during such periods. Public transport services carry unidentified people from various parts of the

country, which greatly aids the spread of the corona virus. Also, the use of such public transport services wastes a lot of people's time and effort.

Not only that but also, there are several other major issues that consumers face in a typical store. Let us now turn our attention to that. In a traditional grocery shop or a super market, the customer has to walk all over the store with their luggage to buy the product they want. Sometimes they have to touched and buy goods touched by different kind of peoples. It is not a good thing and its help to spread the virus each other's. Not only that but also, in a large supermarket, Customers have to get help from the staff for select their items and grocery shop owners also have to deployed many staff around the shop. So, it is waste lot of time to buy essential goods in a grocery shop. sometimes customers have to be waited in a long queue near the cashier for do the payments. Because of staying lot of time in the shop virus can be infected easily.

In this Covid situation, the business cannot be continued by the grocery shop owners in a proper way. Economic losses have to be incurred by the shop owners because shop have to be closed from time to time. So, During the Covid-19 Pandemic, the current method of buying and selling essential goods is not necessary. If the people cannot buy essential goods because of the Covid 19 pandemic and resulting of lockdown, protests can be arisen against the government through the society. Also, because of the lost working hours and due to job losses, the country's economy is declining. All of those problems are really affected for the future of the country. These are some serious problems facing society now a days because of this Corona pandemic. So, this project definitely solves all these kinds of problems. Considering the above, the importance of the online grocery store is arisen.

### **3.5.1 Business Objectives**

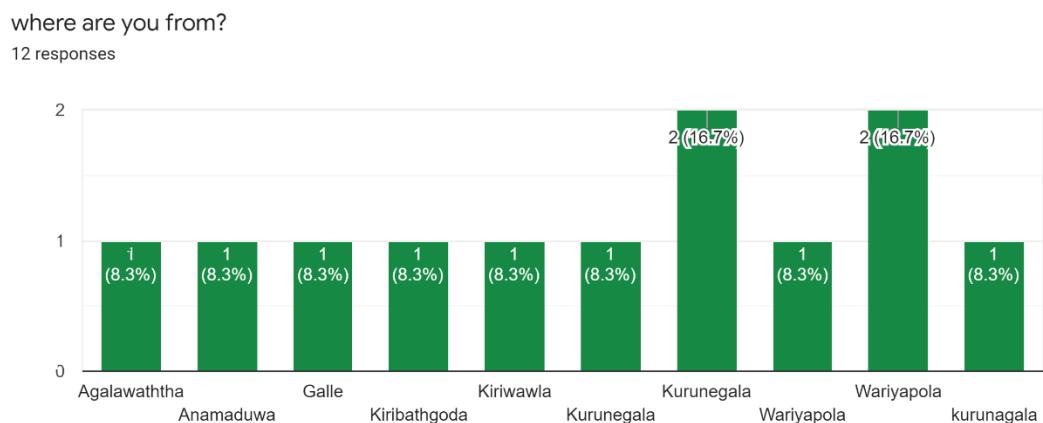
This project answers all the social issues mentioned above. Also, a brief overview of the steps taken by this project to address the issues mentioned above is given at the end of the above topic. In addition, this online grocery store will greatly benefit the entire community. It enables all people to move forward without fear in the face of severe disasters such as corona in society. Let us now take a look at the services rendered to the community by this online grocery store one by one.

- Setting up a way to people for ordering essential goods online stay from home, working place and any place of the country.
- Allows consumers to do the payments with online payment methods without touch money.
- Remove the difficulty of buy essential goods in a lockdown, quarantine period and any serious situation like this.
- Providing 24 hours service to to the clients to checkout essential products they are interested in.
- Removes the need of having staff around for proposes such as helping to the customers.
- The process of browsing an item would be much easier.
- Reduces time and labor spent on browsing for an item.
- Reduce the economic loses of grocery shop owners and other vendors in pandemic situations and lockdown.
- Remove the use of public transport services when going to the shopping.

### 3.6 Social Recommendations about the “Online Grocery Store”

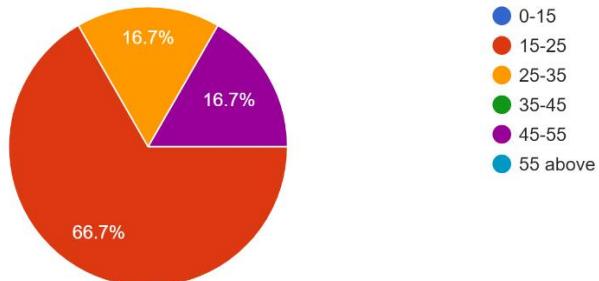
Before the start of this project a survey is done by me based on the title about “Questionnaire for Customers and People about Online Grocery Store” from 20th November 2021 to 12th January 2022 to identify the peoples’ opinions and recommendations about the “online grocery store”. A survey is a good method to identify the social opinions and recommendations to develop this kind of project. A survey must be needed to a successful project. With the help of this survey conducted by me, lot of peoples’ ideas and recommendations about the current system of buying and selling essential goods, outcomes of the current system, outcomes of the traditional grocery shops, difficulties that people faced in a traditional grocery shop and fair, importance of the online system to conduct the current system and many more things could be identified. The proposed system was developed based on the majority of these social opinions and recommendations. Following are some detailed description about this survey result.

In order to obtain more reliable information, the survey was distributed between various kind of people live in the different areas in the Si Lanka. Following charts representing the results of the people who participated to this survey and give their valuable opinions and recommendations to success this project. The majority of them (66.7%) are between under 15-25 age category.



What is your age category?

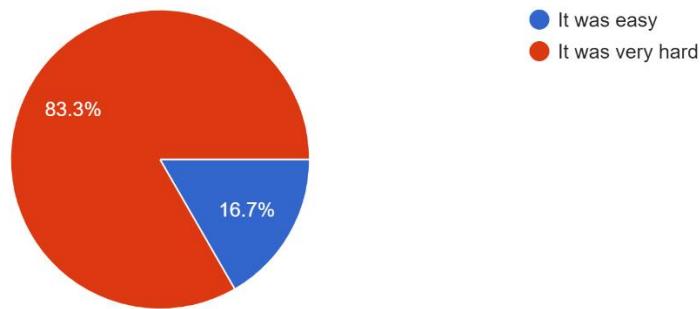
12 responses



The following chart is representing the survey result that based on the difficulties and challenges that are faced by the Corona infections in their quarantine period. The majority (83.3%) of them were faced lot of difficulties and had a hard time when purchasing the essential goods and their wanted in the quarantine season.

What do you think about the purchase of essential items during the quarantine season?

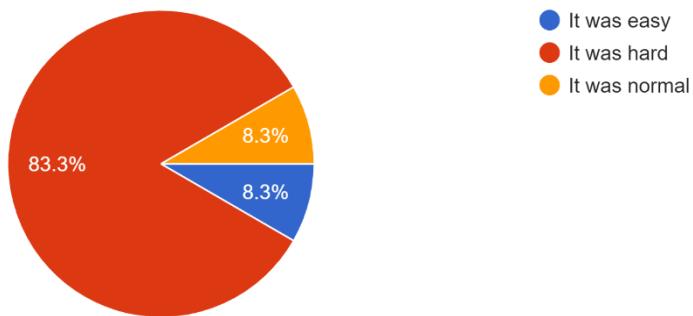
12 responses



Not only that but also, according to the survey the majority (83.3%) of people faced some serious troubles and inconveniences during the country lock down time period. The following chart provide evidence to make it sure.

What do you think about the purchase of essential items during the lock down season?

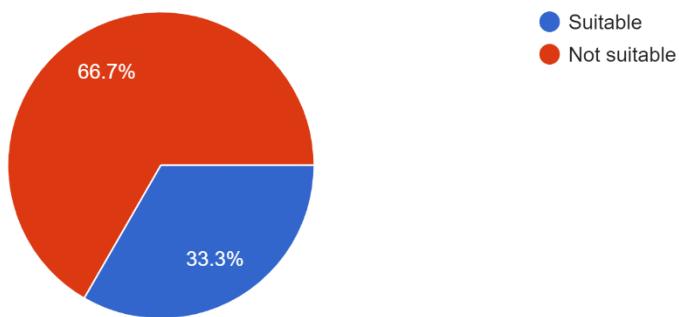
12 responses



According to this survey, the majority (66.7%) of people are of the opinion that this physical method of buying and selling essential goods is not suitable for to the society that the Covid-19 virus is present.

Is the current system suitable for purchasing essential goods during the period when the Corona virus is present in the society and any pandemic situation like this?

12 responses

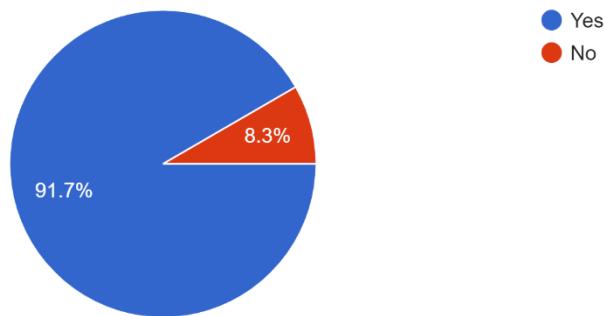


This is the one major section of this survey to identify the people opinions and recommendations about the current system of buying and selling essential goods, their experiences about this physical system. By this section, valuable information such as difficulties that are faced by the customers when they are travelling to the shopping, outcomes and limitations of the traditional grocery shop, how this physical method of buying and selling essential goods in traditional shop works in parallel with the Covid-19 virus and its outcomes during this time of period and many more things can be clearly identified. Following are the survey results.

According to the survey, the most of the people (91.7%) spend extra time to buy essential goods from a grocery shop or super market. It is not suitable for people who are spending a busy life in day today life.

Do you spend extra time to buy essential goods from a grocery shop or market?

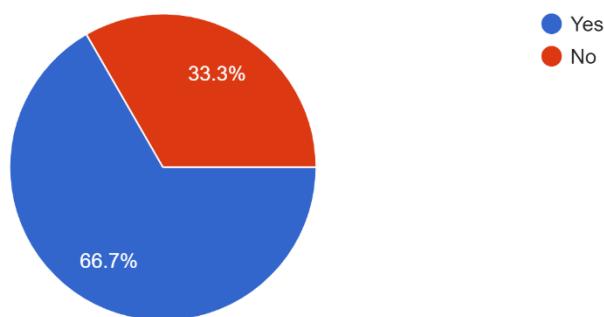
12 responses



As the result of the survey, the public transportation methods are used by the majority (66.7%) of people to travel to the grocery shop, super market or fair to buy essential goods. It is not a necessary thing for the society when a time the corona virus is spreading very quickly between people. By using the public transportsations such as buses, three wheels with crowded by people, the Covid-19 virus can be spreading with each other very quickly. Not only that but also, there are different people coming from various areas are used these public transportsations and money are sharing hand in hand between them. It is very risky situation when the corona virus is still present in the society.

Do you use public transportations to get to the grocery shop or market?

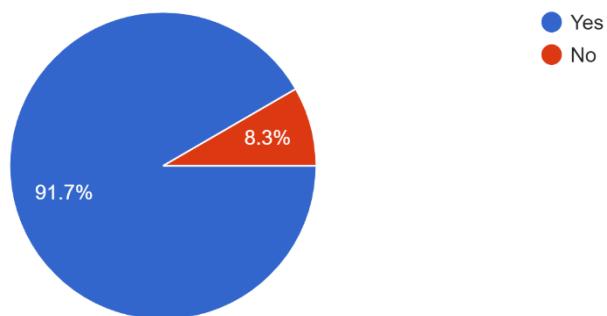
12 responses



This survey representing some important troubles that are faced by the customers at the grocery shop, market or any other place, when purchasing goods. The majority (91.7%) of the people had to rascal at the grocery shop or market when they are shopping at the traditional grocery shop. Following diagram display the result of it.

Do you have to be rascal at grocery shop or market, when you buy essential goods?

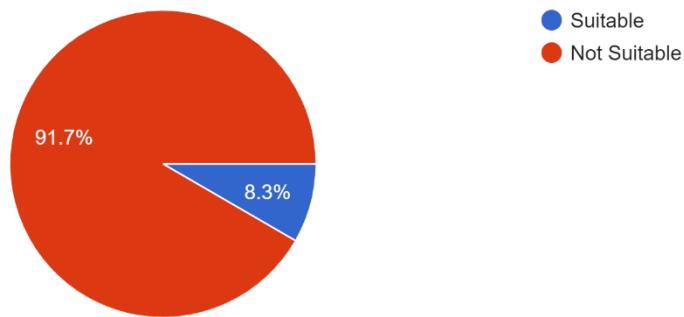
12 responses



The most of the people (91.7%) who participate to this survey are not happy about the sharing money hand in hand between different people in a grocery shop at a time when the Covid-19 virus present in the society.

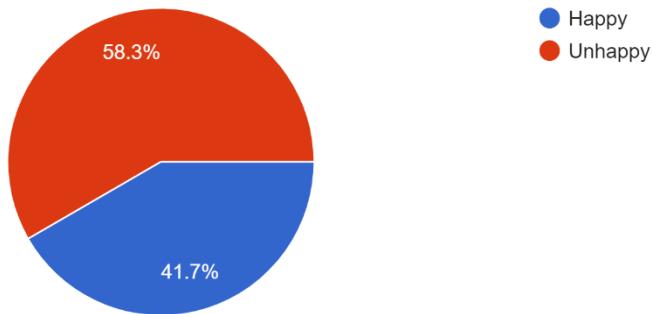
What is your opinion about sharing money hand in hand between people in a grocery shop at a time when the Corona virus present in the society?

12 responses



As a result of those conditions the majority (58.3%) of people are not happy with the service that the traditional grocery shop provides to the customers.

Taken as a whole, are you happy with the service provided to you by a traditional grocery shop?  
12 responses

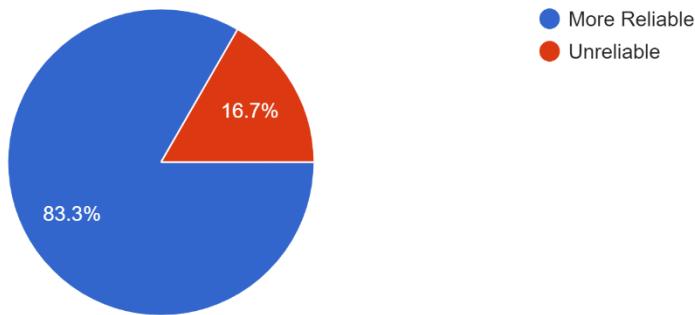


This is the last section of this survey to identify the people opinions and recommendations about the E-commerce websites, their experiences working with these E-commerce websites and online shopping. By this section, valuable information such as reliability of the customers about the online transactions. reliability and social recommendations about online grocery store can be identified. following are the survey results.

Following diagram display the people opinions about the reliability of online transactions. The majority (83.3%) of them are satisfied with the online payment methods and its reliability.

How reliable are you about online transaction through a E-commerce website or mobile application?

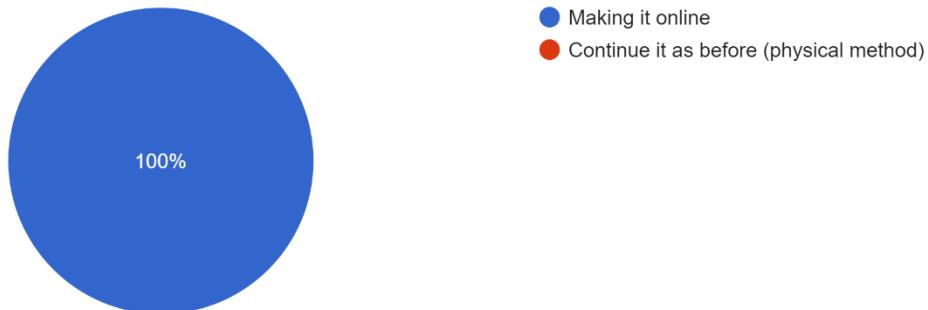
12 responses



This is the most valuable part of this survey, the majority of people who participate to this questionnaire recommended an “Online Grocery Store” to perform the current method of buying and selling essential goods during the Covid-19 virus present in the society. Following are the two diagrams that representing it.

What is the best way of buying and selling essential goods at a time when the Corona virus present in the society and any pandemic disaster like this?

12 responses



Considering the above, as the most suitable method for the season when the Corona virus is present in the society,

12 responses



Considering the above social opinions and recommendations, an “Online Grocery Store” is the best answer to continue the current physical method of buying and selling essential goods during the Covid-19 period and any other disaster like this. So, this project is very important and more valuable to the present society suffering from the Corona virus.

### 3.7 Current Solutions

Even before the start of this project there are various kind of “online grocery store” web applications and mobile applications exists in the whole world and Sri Lanka. Following are some top most famous online grocery store web sites among the people in the world.

- Walmart, Amazon Fresh, Instacart, Fresh Direct, Local Harvest

These applications are also parallel with this project produced by me but their objectives and purposes may not be consistent with this project. As an undergraduate student this project is totally developed by

me to protecting human lives from the Covid-19 virus, reduce the spread of the virus and solve the all situations between seller and customer in a traditional grocery shop by an online grocery store.

## 4. ARCHITECTURE AND DESIGN

### 4.1 USE CASES AND FUNCTIONAL REQUIREMENTS

#### 4.1.1 FUNCTIONAL REQUIREMENTS

Functional Requirements are usually defined as the requirement specifications necessary for a System to achieve its goal. (Jafari, 2020). Given below are the functional requirements divided into three segments namely Core, Desirable and Optional. The core functions are the most important and need to be present requirements. Without them the System would cease to function and the Project would not meet its requirement and completion. The Desirable Requirements would contain functionality that gives the user additional options, but if they were not present in the project, the system would still function. Optional requirements are elements of functionality that are more likely not to be present, in the presented final project, due to restrictions (time, cost, resources, power cut etc.). They are the requirements that title itself under future improvements of the project.

CORE:

1. Administration
  - 1.1. The administration of this online grocery Store should login to the System with Credentials already known (E-mail address and the password).
  - 1.2. The administration should be able to view product details already displayed in the site.
  - 1.3. The administration should be able to view a single product's details.
  - 1.4. The administration should be able to update product details.
  - 1.5. The administration should be able to search a product using search bar by its name or description to make changes.
  - 1.6. The administration should be able to add new product to the system.
  - 1.7. The administration should be able to manage the product's status. (Ex: Expired, Available, Upcoming)
  - 1.8. The administration should be able to manage companies who involved with the system by management tool.
    - 1.8.1. View single company's details,
    - 1.8.2. Update company details
    - 1.8.3. Delete a company from the system.
    - 1.8.4. Add a new company to the system.
  - 1.9. The administration should be able to manage Brands who involved with the system by management tool.
    - 1.9.1. View single brand's details,
    - 1.9.2. Update brand details
    - 1.9.3. Delete a brand from the system.
    - 1.9.4. Add a new brand to the system.

- 1.10. The administration should be able to manage suppliers who involved with the system by management tool.
    - 1.10.1. View single supplier's details,
    - 1.10.2. Update supplier details
    - 1.10.3. Delete a supplier from the system.
    - 1.10.4. Add a new supplier to the system.
  - 1.11. The administration should be able view customer orders.
  - 1.12. The administration should be able to Log Out.
- 
2. Customer
    - 2.1. A Customer should have the ability to login to the system with Credentials already known (E-mail address and the password).
    - 2.2. When a new consumer of this online grocery store wishes to access the System, a new account can be created by user registration section.
    - 2.3. The customer should be able to view product details already displayed in the site.
    - 2.4. The customer should be able to view a single product's details.
    - 2.5. The customer should be able to search their interesting products using search bar by its name or description very easily.
    - 2.6. The customer should be able to add product in to the cart.
    - 2.7. The customer should be able to update the shopping cart.
    - 2.8. The customer should be able to view orders made by them.
    - 2.9. The customer should be able to checkout products by PayPal payment getaway.
    - 2.10. The customer should be able to Log Out.
- 
3. Microsoft SQL Server Management studio – Database
    - 3.1. Have a database of every Model
      - **Brand**
      - **Company**
      - **OrderItem**
      - **Orders**
      - **Product**
      - **ShoppingCartItem**
      - **Supplier**
      - **Supplier\_product**
      - **AplicationUser** (Admin User, App user)
    - 3.2. All the app users and the admin passwords are encrypted using hash value.

#### DESIRABLE:

1. Administration
  - 1.1. Should be able to Update Customer Oder list
    - 1.1.1. Delete completed customer orders from the list.
    - 1.1.2. Cancel Customer orders because of the out of stock.

- 1.2. The administration should be able to view and edit profile details.
2. Customer
  - 2.1. Should be able to Update the order list
    - 2.1.1. Delete older orders from the list.
    - 2.1.2. Cancel orders made by them.
  - 2.2. The customer should be able to view and edit profile details.

**OPTIONAL:**

1. Administration
  - 1.1. The administration would be able to login to the system by face recognition option.
  - 1.2. Contact with consumers via chat bot.
  - 1.3. Contact with client via E-mails when an order is completed to maintain the quality of the system.
2. Customer
  - 2.1. The customer would be able to login to the system by face recognition option.
  - 2.2. The customer would be able to login to the system by Google account or Facebook account.
  - 2.3. Contact with administration via chat bot.
  - 2.4. The customer would be able to track their orders.

#### **4.1.2 NON- FUNCTIONAL – REQUIREMENTS**

Following features are quite important to give better experience for users.

1. Maintainability-Easiness for developers to add upgrades, make changes as facing future improvements of system solution.
2. Scalability- Ability to expand according to expansion of business model and business needs of solution.
3. User Friendliness- Ability to attract users by giving familiar and consistent feedback from intended solution design.
4. Performance – Should promptly respond to user actions
5. Security – Keep out unauthorized Users.
6. Validation – User inputs should be validated before moving on to the next action.
7. Privacy – Data should not be shared with another party.

## **4.2 DESIGN**

### **4.2.1 DATABASE DESIGN**

As given below the Class Diagram, Use Case Diagram, Activity Diagram, give a visual representation of the relationships and flow between data. In this online grocery store project, the SQL Server Management Studio 18 update is used as the database of the whole system to store data. It is a SQL database that allows the SQL commands. The MVC architecture is used to develop the web application. MVC is an architecture design pattern that stands for Model-View-Controller design pattern. This pattern uses to separate application under different tiers based on their applicability as a view, controller or a

model. Each model represents a table in the database. In this project, there are nine models which are representing a table in the database. Following are the models that are used in this project.

- Brand
  - Company
  - OrderItem
  - Orders
  - Product
  - ShoppingCartItem
  - Supplier
  - Supplier\_product
  - ApplicationUser

Each model has one or more relationship between the other models. Following database schema display the relationships between these models.

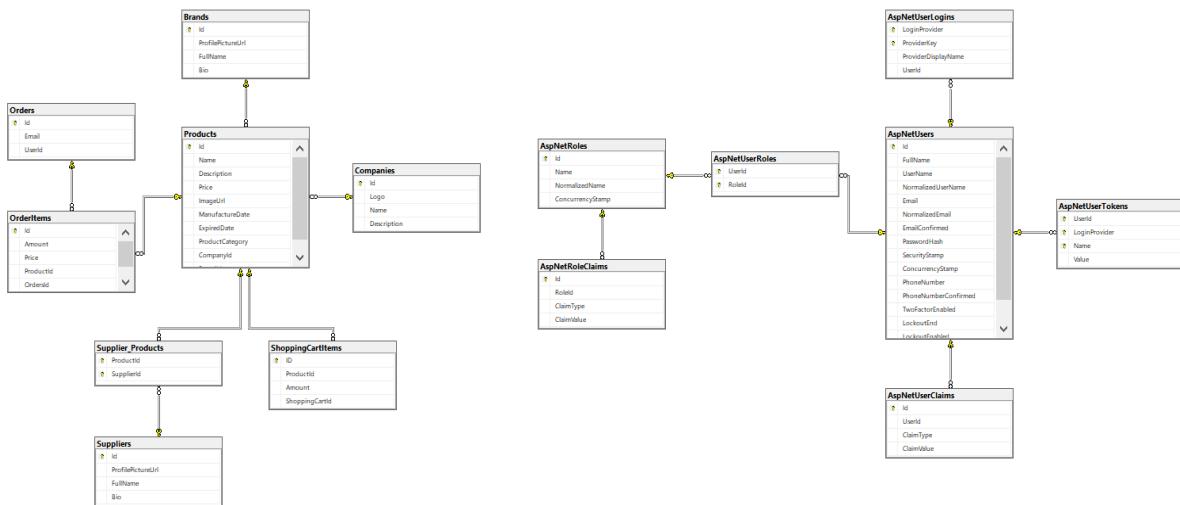


Figure 1: Database diagram

The web application was programmed using ASP.NET CORE. In entity framework core migrations are used to sync the model changes with the database schema. It is a very good feature to handle the database very easily.

Not only that but also, all the sensitive data such as client's passwords and the admin passwords are encrypted by using hash value in the databases for the security purpose.

## 4.2.2 USE CASES

### USE CASE DIAGRAM



Figure 2: Use case diagram

## USE CASE DESCRIPTIONS

### USE CASE \_ CUSTOMER SIGNUP

Use Case No.	Uc - 01	
Use Case Name	Customer Signup	
Actor	Customer	
Description	If this use case is successful a Customer would be able to register to the system.	
Pre-condition	None	
Post condition	Signup success	
The fundamental course of action	User Action	System Response
	1.The customer is on the home page for login.  3. Customer enters user credentials and clicks the register button.	2. System requests for Full name, Email address, password and Confirm password from Customer to create an account.  4.System runs verification on credentials.  5.Customer successfully sign up.  6. Use case exit.
An alternative course of action	4.1. If required fields is empty, the program will pop a message for validation and would allow refilling of credentials.  4.2. If the customer email address is already registered in the system, the system will pop a message for email address already exists and would allow refilling credentials.	

## USE CASE \_ LOGIN

Use Case No.	Uc - 02	
Use Case Name	Login	
Actor	System Administrator, Customer	
Description	If this use case is successful the System Administration and the Customer would be able to login to the system	
Pre-condition	Uc - 01	
Post condition	Login success	
The fundamental course of action	User Action	System Response
	<p>1.The customer/System administrator is on the home page for login.</p> <p>3. Customer/System Administration enters user credentials and clicks the login button.</p>	<p>2. System requests for login credentials from Customer/ System Administration.</p> <p>4.System runs verification on credentials.</p> <p>5.Store Administration/ Customer successfully logs in.</p> <p>6. Use case exit.</p>
An alternative course of action	<p>4.1. If user credentials are incorrect or not valid, the program will pop a message for validation and would allow re-filling of credentials.</p>	

### USE CASE\_ SEARCH PRODUCT

Use Case No.	Uc - 03	
Use Case Name	Search product	
Actor	Customer	
Description	This use case allows to the customer to search their interesting products using product name or product description.	
Pre-condition	None	
Post condition	Search successful and the customer would be able to found the item looking for.	
The fundamental course of action	User Action	System Response
	1.The customer need to find a product by searching.  2. Customer enters the product name in the search bar and clicks the search button.	3. System looking for the relevant product in the database and display it on the screen.  4. Use case exit.
An alternative course of action	3.1. If the searched product is not available in the database, system display a blank page.	

### USE CASE\_SHOW PRODUCT DETAILS

Use Case No.	Uc - 04	
Use Case Name	Show product details	
Actor	Customer	
Description	If this use case is successful the Customer would be able to view the details of a product.	
Pre-condition	Uc - 03	
Post condition	Login success	
The fundamental course of action	User Action	System Response
	1.The customer need to view details of a product.  2. Customer click show details button.	3. System display the whole description about this product.  4. Use case exit.
An alternative course of action	None	

### USE CASE\_ADD TO SHOPPING CART

Use Case No.	Uc - 05	
Use Case Name	Add to shopping cart	
Actor	Customer	
Description	If this use case is successful the Customer would be able to add a product to the shopping cart.	
Pre-condition	Uc – 03, Uc - 04	
Post condition	Product successfully add to the shopping cart	
The fundamental course of action	User Action	System Response
	1.The customer need to add a product to the shopping cart.  2.Customer click the Add to cart button.	3. System redirect to the shopping cart page and display the item in the cart.  4. Use case exit.
An alternative course of action	None	

## USE CASE \_ PLACE AN ORDER

Use Case No.	Uc - 06	
Use Case Name	Place an order	
Actor	Primary	Secondary
	Customer	PayPal
Description	If this use case is successful the Customer would be able to checkout the products in the cart.	
Pre-condition	Uc – 01, Uc- 02, Uc -03, Uc -Uc-04, Uc-05	
Post condition	Checkout success	
The fundamental course of action	User Action	System Response
	<p>1.The customer need to checkout product/products in the shopping cart.</p> <p>2. Customer Click the PayPal button.</p> <p>4.Customer enter the PayPal login credentials and hit the Login button.</p> <p>7.Customer select the payment option and hit the pay now button.</p>	<p>3. System redirect to the PayPal window and requests for PayPal account login credentials from Customer.</p> <p>5.PayPal run a verification on the login credentials.</p> <p>6.Customer login successfully and redirect to the PayPal payment option window.</p> <p>8.System display a response message order completed successfully.</p> <p>9. Use case exit.</p>
An alternative course of action	<p>5.1. If user PayPal login credentials are incorrect or not valid, the program will pop a message for validation and would allow re-filling of credentials.</p>	

#### USE CASE\_ADD NEW PRODUCT

Use Case No.	Uc - 07	
Use Case Name	Add new product	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to add new product to the system.	
Pre-condition	Uc - 02	
Post condition	The new product successfully adds to the system.	
The fundamental course of action	User Action	System Response
	1.The System administrator need to add a new product to the system. 2.System Administration click the Add new button. 4.System administrator fill the form and click create product button.	3. System redirect to the Add New Product page and request all details of the new product to be added. 5.System runs verification on credentials. 6.System display the new product in the product page. 7. Use case exit.
An alternative course of action	5.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

#### USE CASE\_UPDATE PRODUCT DETAILS

Use Case No.	Uc - 08	
Use Case Name	Update product details	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to change a current product details and update it with the new details to the system.	
Pre-condition	Uc - 02	
Post condition	The item updated successfully and display the updated product in the product section.	

The fundamental course of action	User Action	System Response
	<p>1.The System administrator need to update a current product with new details.</p> <p>2.System Administration click the pencil icon display top border of the product box.</p> <p>4.System administrator make the changes and hit the update button.</p>	<p>3. System redirect to the Update Product page and display the old product details of the item in a format of form.</p> <p>5.System runs verification on credentials.</p> <p>6.product details updated successfully.</p> <p>7. Use case exit.</p>
An alternative course of action	5.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

## USE CASE\_ADD NEW COMPANY

Use Case No.	Uc - 09	
Use Case Name	Add new company	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to add new company to the system.	
Pre-condition	Uc - 02	
Post condition	The new company successfully adds to the system.	
The fundamental course of action	User Action	System Response
	1.The System administrator need to add a new Company to the system.	3. System redirect to the page that are display the Companies details.
	2.System Administration click the Management tool and select Company.	5.System display the Add New Company page and request the new company details by a form.
	4.System administrator click the Add new button.	7.System runs verification on credentials.
	6.Actor enters the details of the new company and hit the create button.	8.System display the newly added company in the company section.
		9. Use case exit.
An alternative course of action	7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

## USE CASE\_EDITE COMPANY DETAILS

Use Case No.	Uc - 10	
Use Case Name	Edit company details	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to change a current company details and update it with the new details to the system.	
Pre-condition	Uc - 02	
Post condition	The Company details updated successfully and display the updated Company in the Company section.	
The fundamental course of action	User Action	System Response
	1.The System administrator need to edit a company details that are already exists in the system. 2.System Administration click the Management tool and select the company section. 4.System administrator click the Edit button. 6.Actor make changes and click update button.	3.System redirect to company page. 5. System redirect to the Update Company Page and display the old company details in a format of form. 7.System runs verification on credentials. 8.Company details updated successfully. 9. Use case exit.
An alternative course of action	7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

## USE CASE\_DELETE COMPANY

Use Case No.	Uc - 11	
Use Case Name	Delete company	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to delete a company from the system.	
Pre-condition	Uc - 02	
Post condition	The company deleted successfully from the system.	
The fundamental course of action	<p>User Action</p> <p>1.The System administrator need to delete a Company from the system.</p> <p>2.System Administration click the Management tool and select Company.</p> <p>4.System administrator click the delete button which is situated in front of the relevant company.</p>	<p>System Response</p> <p>3. System redirect to the company page.</p> <p>5.Company delete successfully.</p> <p>6. Use case exit.</p>
An alternative course of action	None	

## USE CASE\_ADD NEW BRAND

Use Case No.	Uc - 12	
Use Case Name	Add new brand	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to add new brand to the system.	
Pre-condition	Uc - 02	
Post condition	The new brand successfully adds to the system.	
The fundamental course of action	User Action 1.The System administrator need to add a new Brand to the system.  2.System Administration click the Management tool and select Brand.  4.System administrator click the Add new button.  6.Actor enters the details of the new Brand and hit the create button.	System Response 3. System redirect to the page that are display the Brands details.  5.System display the Add New Brand page and request the new Brand details by a form.  7.System runs verification on credentials.  8.System display the newly added Brand in the Brand section.  9. Use case exit.
An alternative course of action	7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

## USE CASE\_EDIT BRAND DETAILS

Use Case No.	Uc - 13	
Use Case Name	Edit Brand details	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to change a current Brand details and update it with the new details to the system.	
Pre-condition	Uc - 02	
Post condition	The Brand details updated successfully and display the updated Brand in the Brand section.	
The fundamental course of action	<p>User Action</p> <p>1.The System administrator need to edit a Brand details that are already exists in the system.</p> <p>2.System Administration click the Management tool and select the Brand section.</p> <p>4.System administrator click the Edit button.</p> <p>6.Actor make changes and click update button.</p>	<p>System Response</p> <p>3.System redirect to Brand page.</p> <p>5. System redirect to the Update Brand Page and display the old Brand details in a format of form.</p> <p>7.System runs verification on credentials.</p> <p>8.Brand details updated successfully.</p> <p>9. Use case exit.</p>
An alternative course of action	<p>7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.</p>	

## USE CASE\_DELETE BRAND

Use Case No.	Uc - 14	
Use Case Name	Delete Brand	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to delete a Brand from the system.	
Pre-condition	Uc - 02	
Post condition	The Brand deleted successfully from the system.	
The fundamental course of action	User Action	System Response
	1.The System administrator need to delete a Brand from the system. 2.System Administration click the Management tool and select Brand section. 4.System administrator click the delete button which is situated in front of the relevant Brand.	3. System redirect to the Brands page. 5.Brand delete successfully. 6. Use case exit.
An alternative course of action	None	

### USE CASE\_ADD NEW SUPPLIER

Use Case No.	Uc - 15	
Use Case Name	Add new Supplier	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to add new Supplier to the system.	
Pre-condition	Uc - 02	
Post condition	The new Supplier successfully adds to the system.	
The fundamental course of action	User Action	System Response
	1.The System administrator need to add a new Supplier to the system. 2.System Administration click the Management tool and select Supplier section. 4.System administrator click the Add new button. 6.Actor enters the details of the new Supplier and hit the create button.	3. System redirect to the page that are display the suppliers' details. 5.System display the Add New Supplier page and request the new Supplier details by a form. 7.System runs verification on credentials. 8.System display the newly added Supplier in the Brand section. 9. Use case exit.
An alternative course of action	7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.	

## USE CASE\_EDIT SUPPLIER DETAILS

Use Case No.	Uc - 16	
Use Case Name	Edit Supplier details	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to change a current Supplier's details and update it with the new details to the system.	
Pre-condition	Uc - 02	
Post condition	The Supplier's details updated successfully and display the updated supplier in the Brand section.	
The fundamental course of action	<p>User Action</p> <p>1.The System administrator need to edit a Supplier details that are already exists in the system.</p> <p>2.System Administration click the Management tool and select the Supplier section.</p> <p>4.System administrator click the Edit button.</p> <p>6.Actor make changes and click update button.</p>	<p>System Response</p> <p>3.System redirect to Supplier page.</p> <p>5. System redirect to the Update Supplier Page and display the old Supplier's details in a format of form.</p> <p>7.System runs verification on credentials.</p> <p>8.supplier's details updated successfully.</p> <p>9. Use case exit.</p>
An alternative course of action	<p>7.1. If the required fields given in the form are empty, the program will pop a message for validation and would allow re-filling of credentials.</p>	

#### USE CASE\_DELETE SUPPLIER

Use Case No.	Uc - 17	
Use Case Name	Delete Supplier	
Actor	System Administrator	
Description	If this use case is successful the System administrator would be able to delete a Supplier from the system.	
Pre-condition	Uc - 02	
Post condition	The Supplier deleted successfully from the system.	
The fundamental course of action	User Action 1.The System administrator need to delete a Supplier from the system.  2.System Administration click the Management tool and select Supplier section.  4.System administrator click the delete button which is situated in front of the relevant Supplier.	System Response 3. System redirect to the Supplier page.  5.Supplier delete successfully.  6. Use case exit.
An alternative course of action	None	

#### USE CASE\_LOGOUT

Use Case No.	Uc - 18	
Use Case Name	Logout	
Actor	System Administrator, Customer	
Description	If this use case is successful the System Administration and the Customer would be able to logout from the system	
Pre-condition	Uc – 01, Uc -02	
Post condition	Logout success	
The fundamental course of action	User Action 1. Actors wish to logout.  2.Actors click logout button	System Response 3. System logs out and redirect to the home page.  4. Use case exit.
An alternative course of action	None	

### 4.2.3 SYSTEM ARCHITECTURE DESIGN

#### CLASS DIAGRAM

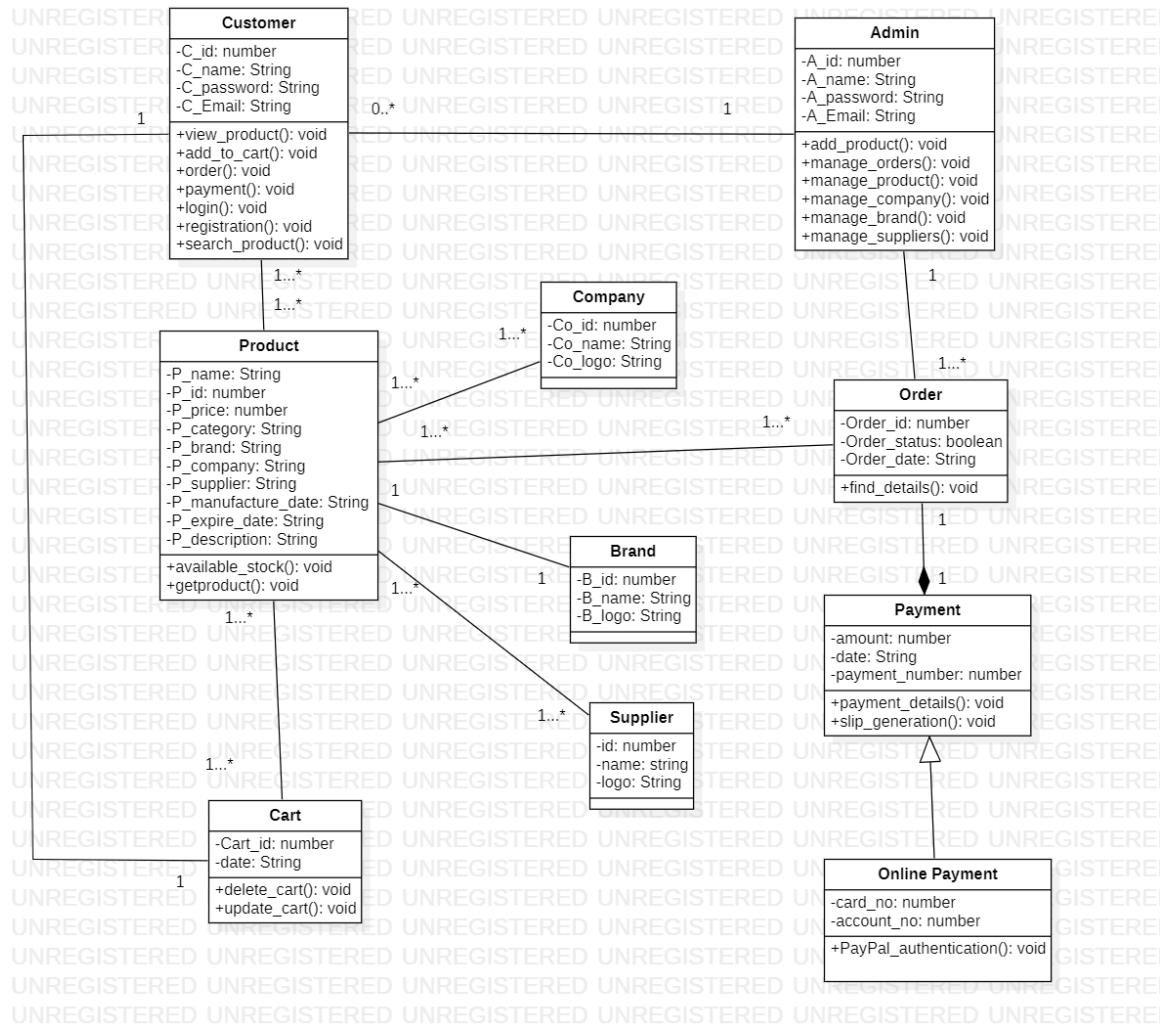


Figure 3: Class diagram

#### ACTIVITY DIAGRAM

## CLIENT SIDE

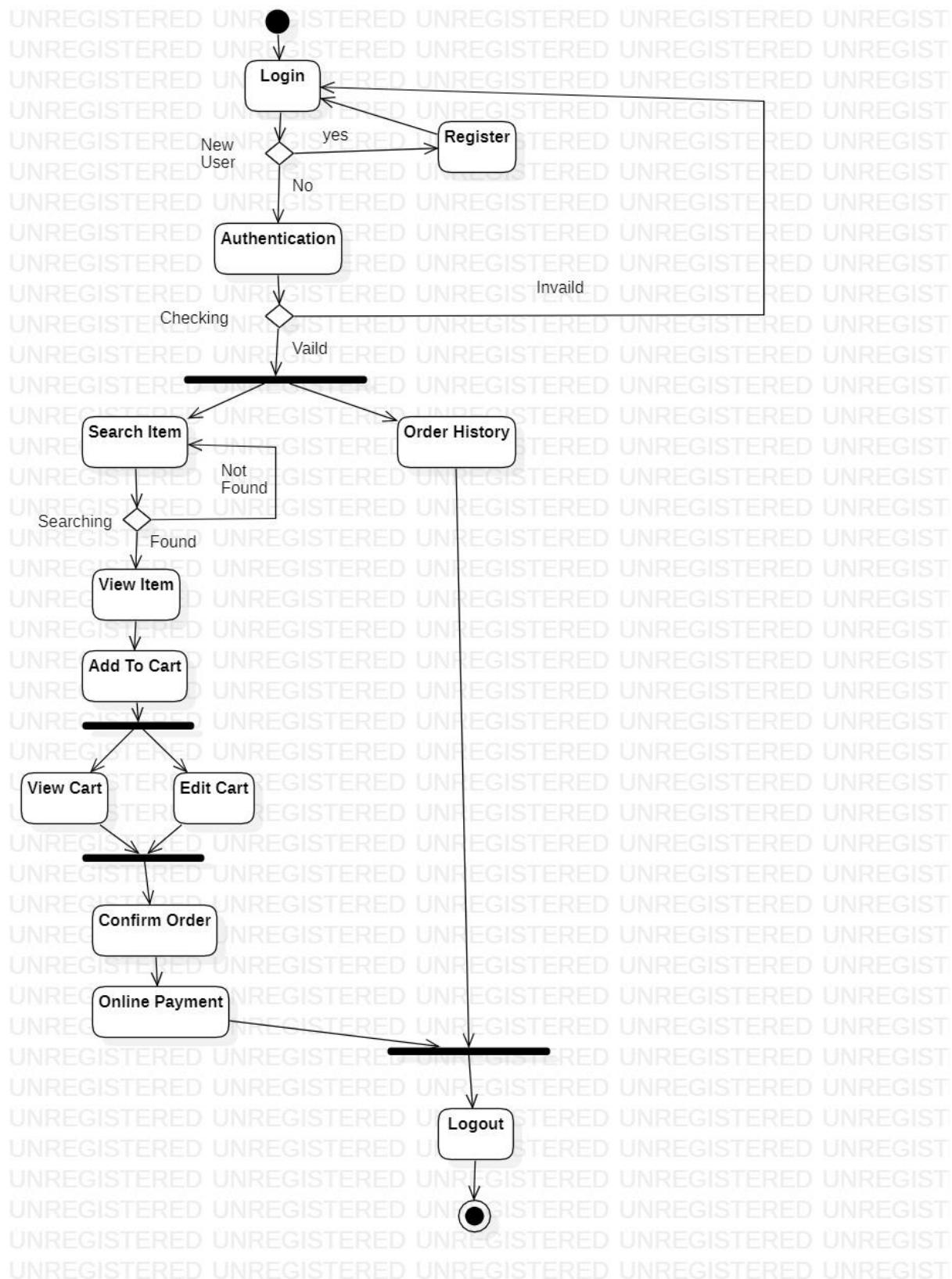


Figure 4: Activity diagram of the client side

#### ADMIN SIDE

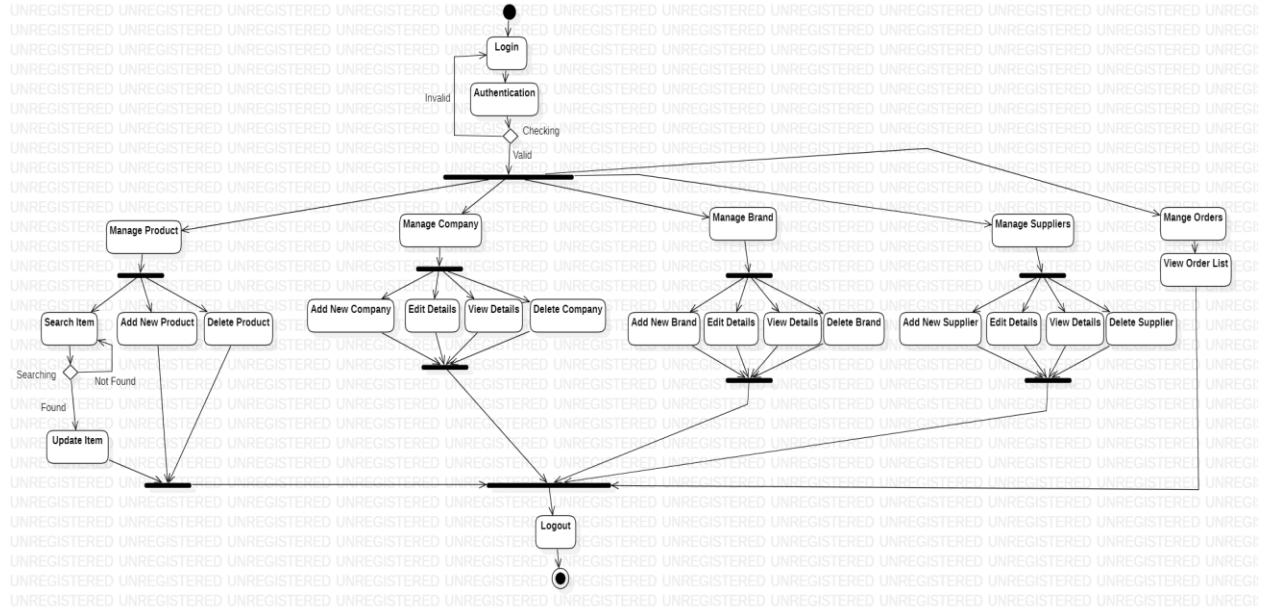


Figure 5: Activity diagram of the admin side

#### 4.2.4 USER INTERFACE DESIGN

An abstract design was created in regards to the interfaces, before the development of the project as I Mainly focused on the backend work of the core functionality. By the end, of the System requirements being complete I focused on the design and color schemes, layouts as such in concern to the front end, as it is also a crucial part in the eyes of the clients. Poorly defined interfaces can lead to frustration and regardless of how good the functionality is, if it is not user friendly on the outside, it would keep clients from accomplishing what they need to do. (HANNAH, 2019)

In this project main focus was on the web application development. After the development process of the web application, the web view was obtained using android studio for the mobile application. Both programs are worked fine. The Razor view was used to program the front end of the web application. It is a good feature come up with visual studio to develop the front-end design of a program. Razor view is a combination of C# and html and it allows users to code with object-oriented concepts and html codes. Not only that but also bootstrap classes and bootstrap CDN icons were used to design the user interfaces in away that attracts the client's minds. The whole website was designed in a responsive format.

## Responsiveness of the web application

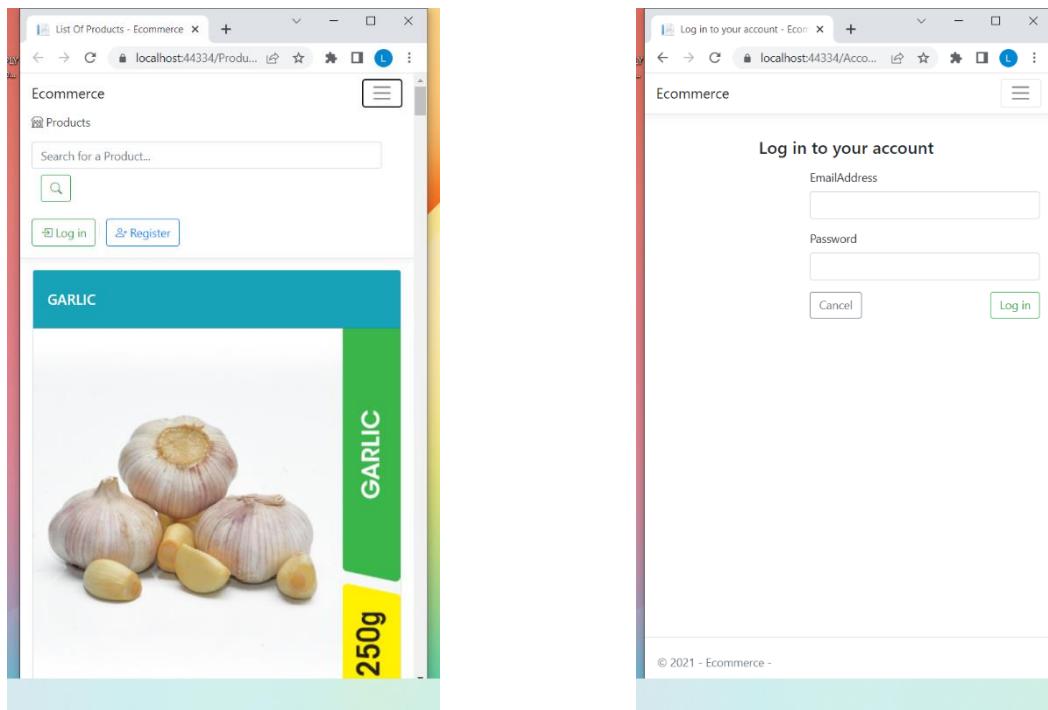


Figure 6: screenshots of the web application in mobile view

## 4.2.5 FUNCTIONS AND USER INTERFACES DESCRIPTION

### 4.2.5.1 USER LEVEL LOGIN

The screenshot shows a login form titled "Log in to your account". At the top, there is a navigation bar with links for "Ecommerce" and "Products", a search bar with placeholder text "Search for a Product...", and buttons for "Log in" and "Register". Below the title, there are two input fields: "EmailAddress" containing "admin@ecommerce.com" and "Password" containing a masked password. At the bottom of the form are two buttons: "Cancel" and "Log in".

Figure 7: Login interface

This is the login page of this online grocery store web application. It divides main admin and the normal user from same logging. Main admin as well as the normal users can log in to the online grocery store web application using this login form. Main admin can log in to the admin panel of this online grocery store web application by using email address and the password. Also, the normal users can log in to the web application by using registered user email address and password. Not only that but also main admin as well as normal users should be filled these two required fields to successfully complete this login task.

The screenshot shows a login form titled "Log in to your account". It has two input fields: "Email Address" and "Password". Below the "Email Address" field is a red error message: "Email is Required". Below the "Password" field is another red error message: "The Password field is required.". At the bottom are "Cancel" and "Log in" buttons.

Ecommerce Products Management ▾

Search for a Product...

Log in to your account

EmailAddress

Email is Required

Password

The Password field is required.

© 2021 - Ecommerce -

These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables.

#### 4.2.5.2 CUSTOMER VIEW

#### CUSTOMER SIGNUP

The screenshot shows a sign up form titled "Sign up for a new account". It has four input fields: "Full Name", "Email Address", "Password", and "Confirm Password". The "Full Name" field contains "lasindu". The "Email Address" field contains "lasindu@123". The "Password" and "Confirm Password" fields both contain "\*\*\*\*\*". At the bottom are "Cancel" and "Sign up" buttons.

Ecommerce Products

Search for a Product...

Sign up for a new account

Full Name

Email Address

Password

Confirm Password

© 2021 - Ecommerce -

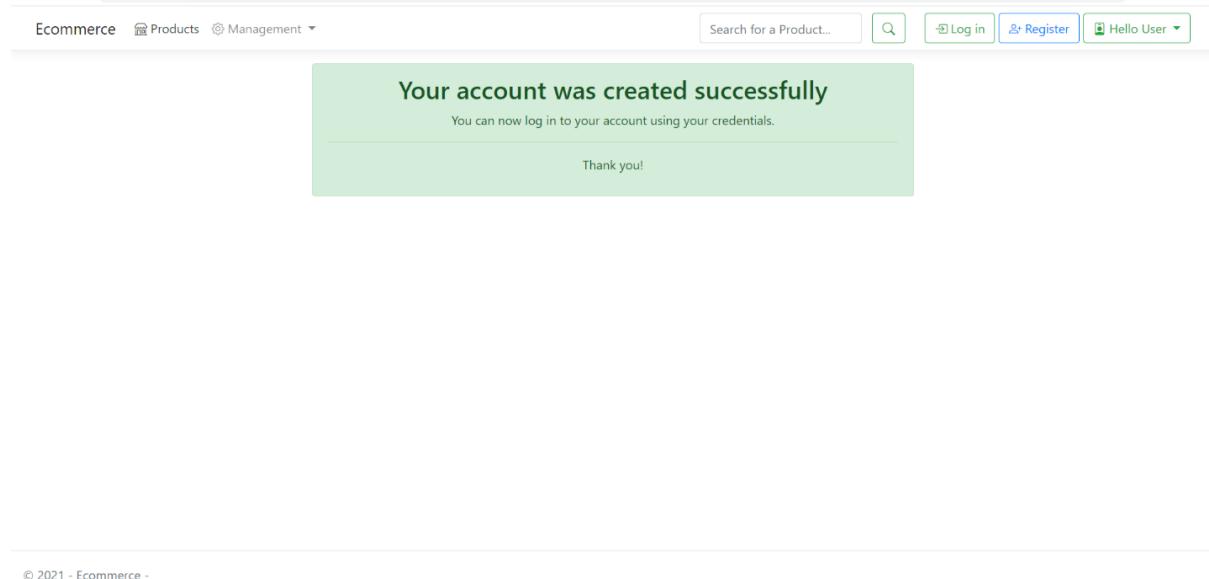
Figure 8: Sign up page

This is the user signup window of this online grocery store web application. Using this sign up form new customer can register to the web application by creating a new account. For that, user need to fill some

text fields. At the first text field user must enter his name and in the second text field he must enter his valid e-mail address. After the compilation of the password and confirm password fields new customer can register to the web application using green color sign up button. Password and the confirm password should be matched for to create the user account. If the registration process is done successfully, the web application gives an output message to the user as below.

**Special Note: the password must be including,**

- **Capital letters**
- **Simple letters**
- **Numbers**
- **Symbols**      (Ex: Coding@1234?)



Not only that but also, Users need to fill every required field without skipped, to register in this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiusses the intrusion null values to the database tables.

## Sign up for a new account

Full Name

Full Name is Required

Email Address

Email is Required

Password

The Password field is required.

Confirm Password

Confirm Password is Required

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After the registration is success, user can log to the web site using that Email address used in the registration process.

The system does not allow to the user to sign up with e mail address that already exists in the system.

## Sign up for a new account

Sorry! - This email address is already in use

Full Name

Email Address

Password

Confirm Password

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## SEARCH PRODUCTS USING SEARCH BOX

Ecommerce  Products   Log in Register

---

### GARLIC



This is Garlic.  
Company: Fontera  
Category: Vegetables  
Manufactured Date: 01 Jan 22  
Exp Date: 30 Oct 98  
Status: AVAILABLE

Add to Cart (Rs. 6000.00) Show Details

---

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Figure 9: Search result

Ecommerce  Products   Log in Register

---

### RAW GINGER



This is the description of RAW GINGER.  
Company: Lanka  
Category: Vegetables  
Manufactured Date: 10 Oct 21  
Exp Date: 01 Jan 22  
Status: EXPIRED

Add to Cart (Rs. 500.00) Show Details

---

© 2021 - Ecommerce -

Ecommerce web application definitely need a search box to search user needs and find that needs to the users very easily and very quickly. It is a major user Requirement of an any web application. This application also has a search function. Using it, client/customer can easily find the products by without time wasting throughout the web site. When a user types a product name or product description and hit the search button, application will give an output window to the user of the product that the user searched before. It helps to maintain the quality of this “Online grocery store” and users can get their

service without a rash. Using the “Products” button of the top left corner, users can move to the previous window. All the interfaces are designed as responsive user interfaces.

#### SHOW PRODUCT DETAILS

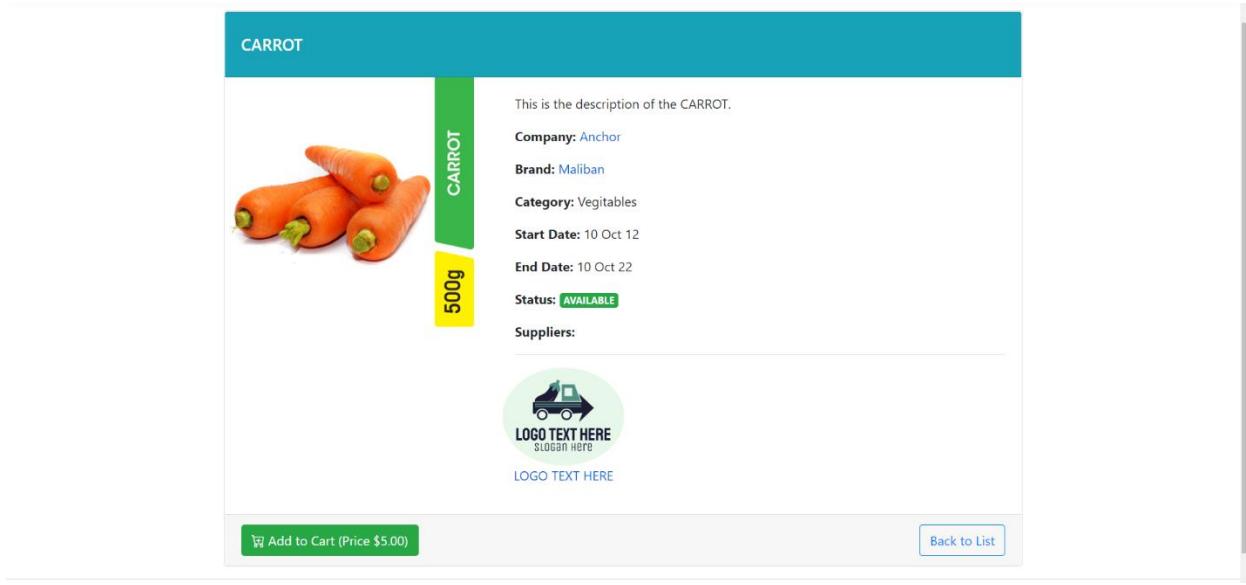


Figure 10: Product details page

This is the details page of one of the products in this online grocery store. Users can get an idea and information about any product using this show details page. It shows the product name, company, brand name, product category, product description, date of manufacture, expire date, availability status and the supplier's details. It is very helpful for the customers. Customers can add this product in to the shopping cart using Add to Cart button.

## ADD TO THE SHOPPING CART

The screenshot shows a shopping cart summary page for an online grocery store. At the top, there's a navigation bar with links for Ecommerce, Products, Management, a search bar, a shopping cart icon showing 2 items, and buttons for Log in, Register, and Hello User. The main title is "Your shopping cart summary". Below it is a table with columns: Selected amount, Product, Price, and Subtotal. The table contains two rows: one for a "carrott" (note the misspelling) priced at \$50.00 with a subtotal of \$100.00, and another for a "buscuit" (another misspelling) priced at \$23.00 with a subtotal of \$23.00. A total row shows a total of \$123.00. At the bottom right of the table area are two buttons: "PayPal Checkout" and "Add more items".

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Figure 11: Shopping cart

This is the shopping cart of this online grocery store web application. It shows a summary about product items stored in the cart. By this shopping cart, Customers can store their interesting items in it. Not only that but also customers can see the total price of the items, that are stored in the shopping cart. Also, they can delete and reduce items from the shopping cart by using red color minus cart button and they can increase the amount of the item using green color plus cart button. Finally, users can do the checkout process by using PayPal checkout button.

## CHECKOUT ITEMS

The screenshot shows a PayPal checkout window overlaid on a browser. The browser's address bar shows a non-secure connection to https://localhost:44334/Orders/ShoppingCart. The PayPal window has a "Pay with PayPal" header and a field for entering an email or mobile number. It also features a "Next" button and a "Pay with Debit or Credit Card" option. At the bottom of the PayPal window, there are links for "Cancel and return to Test Store" and language options: English, Français, Español, and 中文. The background of the browser shows the same shopping cart summary as Figure 11.

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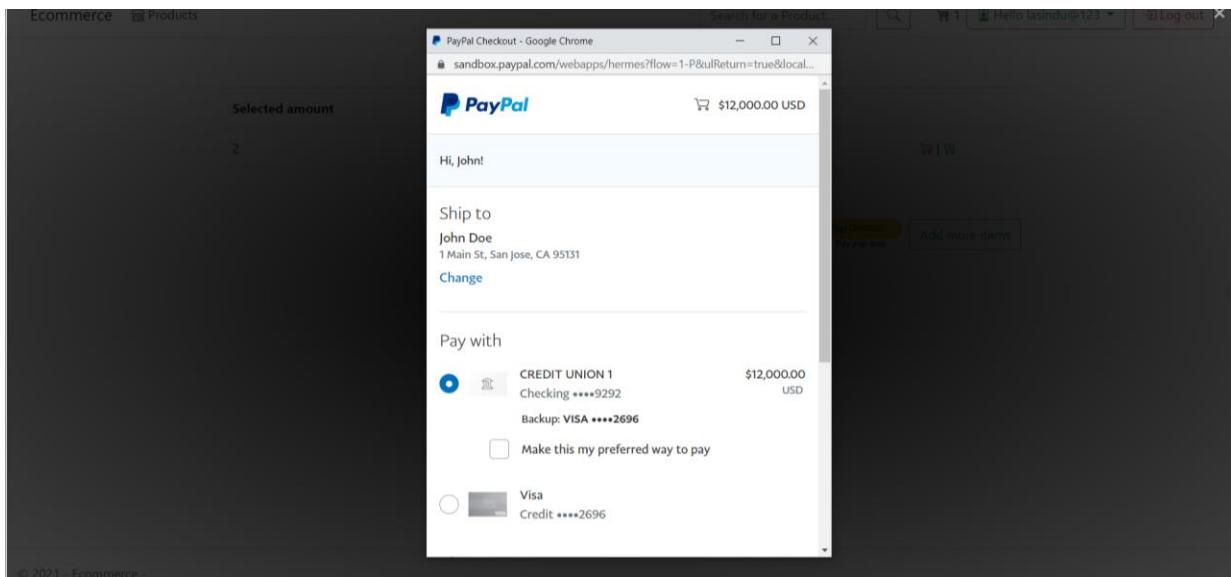
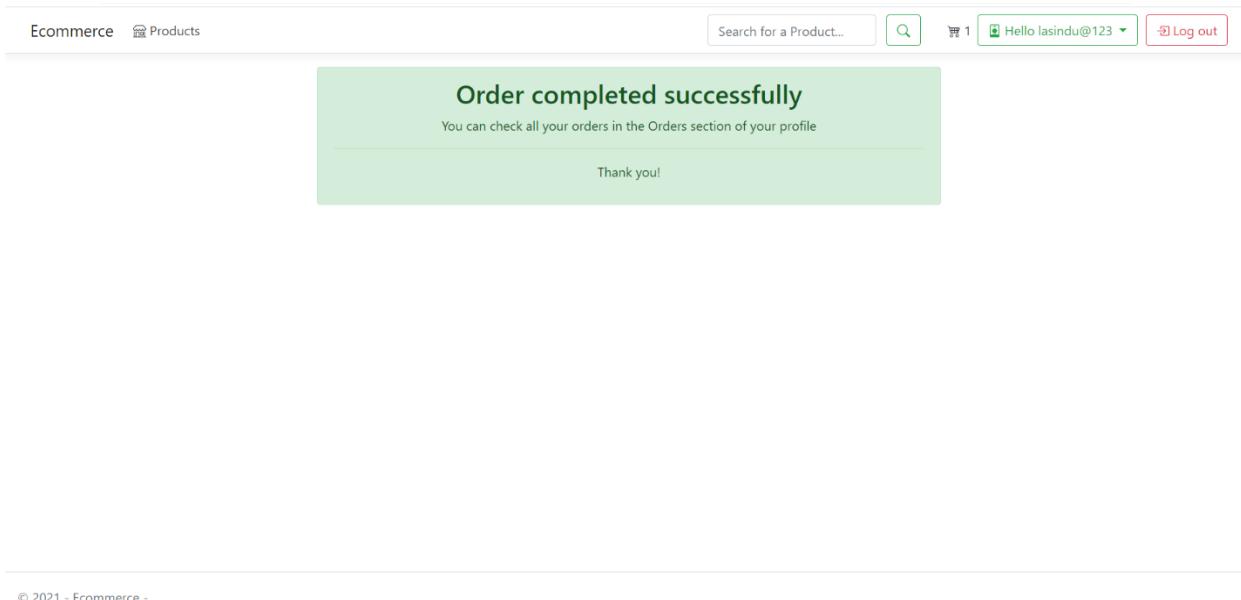


Figure 12: PayPal Window

The products can be checked out to the customers by PayPal payment gateway. Customers must need enters their valid PayPal login credentials to the PayPal login window. After that the customer would be able to purchase the products in the shopping cart. When it is completed successfully, the system displays the following response message to the customer.



## SHOW ORDER DETAILS

The Customer has the ability to see their orders list and order details in the List of all orders page.

The screenshot shows two pages from an Ecommerce application:

**Order completed successfully**

You can check all your orders in the Orders section of your profile

Thank you!

**List of all your orders**

Order ID	Items	Total
1	[ \$299.00 ] - TOMATO	\$299.00
2	[ \$6,000.00 ] - GARLIC	\$6,000.00
3	[ \$299.00 ] - TOMATO	\$897.00
4	[ \$2.00 ] - POTATOES	\$2.00
5	[ \$2.00 ] - POTATOES	\$2.00
6	[ \$5.00 ] - CARROT	\$10.00

Figure 13: List of all order page

#### 4.2.5.3 SYSTEM ADMINISTRATOR VIEW

The screenshot displays the System Administrator View of an online grocery store. It shows six product cards arranged in two rows of three. Each card contains the following information:

- GARLIC:** 250g. Description: This is Garlic. Company: Fontera. Category: Vegetables. Manufactured Date: 01 Jan 22. Exp Date: 30 Oct 98. Status: AVAILABLE.
- RAW GINGER:** 200g. Description: This is the description of RAW GINGER. Company: Lanka. Category: Vegetables. Manufactured Date: 10 Oct 21. Exp Date: 01 Jan 22. Status: EXPIRED.
- TOMATO:** 500g. Description: This is the description of TOMATO. Company: Lanka. Category: Vegetables. Manufactured Date: 10 Oct 22. Exp Date: 10 Oct 22. Status: UPCOMING.
- GREEN CHILLIES:** Description: This is the description of GREEN CHILLIES. Company: Anchor.
- GREEN BEANS:** Description: This is the description of GREEN BEANS. Company: Lanka.
- CARROT:** Description: This is the description of the CARROT. Company: ...

Figure 14: Admin panel

This is the view of the admin panel. This view is only visible for the System administrator. Normal users cannot see this interface. By using green color Add New button displayed on the bottom right corner of this application, admin can add new product to this online grocery store.

The screenshot shows the same product cards as Figure 14, but with a blue oval highlighting the 'Add New' button for the CARROT product card. This button is located at the bottom right of the CARROT card.

By using management button main admin can see the details about Companies, Brands and suppliers involve with this online grocery store.

The screenshot shows the product cards for GARLIC and RAW GINGER. A management dropdown menu is open over the GARLIC card, displaying three options: Companies, Brands, and Suppliers.

These functions are explained detailed in the following topics.

## ADD NEW PRODUCT

Ecommerce   Products   Management ▾

Search for a Product... Log in Hello User ▾

Create a new Product

Product Name <input type="text"/>	Select Company <input type="text" value="Anchor"/>
Manufacture Date <input type="text" value="mm/dd/yyyy"/>	Select Product Category <input type="text" value="Grocery"/>
Expired Date <input type="text" value="mm/dd/yyyy"/>	Select Brand <input type="text" value="Brand 1wdwsdswgff-updated"/>
Product Price <input type="text"/>	Select Supplier(s) <input type="text" value="ado&lt;br/&gt;Greanb Hostal&lt;br/&gt;Janith Creations t&lt;br/&gt;name"/>
Product Image <input type="text"/>	
Product Description <input type="text"/>	

Show all Create

Figure 15: Create new product page

Main admin can create a new product using this interface. For do that admin have to completed all these required fields in this form. Admin can enter the manufacture date and the expire date easily with the calendar option. Also, the admin can add product image easily with using google and copy the image address to the product image text field. Then product image is visible under the product description. It is a very good feature of this online grocery store.

Anchor updated

Select Product Category  
Grocery

Select Brand  
Brand updated

Select Supplier(s)  
ado

Product Description



Show all Create

By clicking green color create button, new product can be displayed in the online store.

### UPDATE PRODUCT

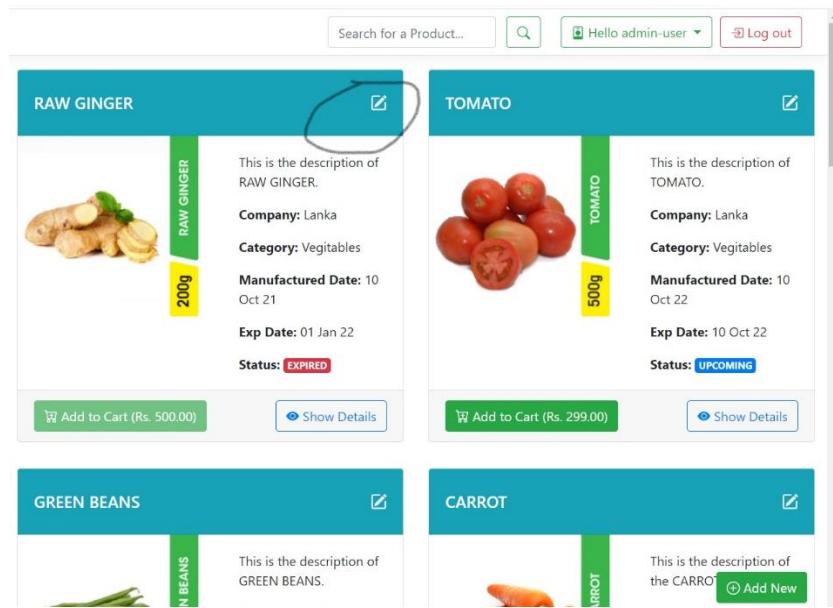


Figure 16: Update Icon

By Using this pencil mark admin can update the product details. This pencil mark is only visible for the admin panel of this online grocery store. After clicking this pencil mark, it gives an output window interface as bellow.

## Update Product

Product Name <input type="text" value="item 2"/>	Select Company <input type="text" value="fdfedf"/>
Manufacture Date <input type="text" value="10/10/2021"/>	Select Product Category <input type="text" value="Provisions"/>
Expired Date <input type="text" value="01/01/2022"/>	Select Brand <input type="text" value="new"/>
Product Price <input type="text" value="500"/>	Select Supplier(s) <div style="border: 1px solid #ccc; padding: 5px; width: fit-content;">           ado            Greanb Hostal            Janith Creations            Shehan Chamikaz         </div>
Product Description <div style="border: 1px solid #ccc; padding: 5px; height: 40px; margin-bottom: 10px;">           hghgsg         </div> <div style="border: 1px solid #ccc; padding: 5px; height: 40px; background-color: #f0f0f0;"> </div>	

Figure 17: Update product page

## MANAGE COMPANIES

Manage Companies			
Company Logo	Company Name	Company Description	Actions
	Anchor updated	This is the description of the first Anchor	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	Fontera updated	This is the description of the first Fontera	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
<a href="#">Add New</a>			

Figure 18: Company page

This is an interface that shows about the companies that involve with this online grocery store. This interface is only visible to the admin panel of this web site. Only the System administrator has the permission of adding new companies to the online grocery store. Admin can add a new company to the online grocery store by using green color add new button on the lower right corner of this interface.

Ecommerce Products Management

Search for a Product...

Log in Register Hello User

## Add a New Company

Company Logo

Logo is Required

Company Name

Name is Required

Company Description

Description is Required

Show All

Create

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Figure 19: Add new company page

As mentioned in the previous functions, the admin can add Company Logo easily with using google and copy the image address to the Company Logo text field. Then the logo is visible under the Company description. It is a very good feature of this online grocery store. Admin need to fill every required field without skipped, to add new company into this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables. By using green color create button, new company can be displayed in the previous chart.

**Also, admin can update, delete and view details of the companies in this online grocery store.**

## Update the Company



Company Logo

data:image/jpeg;base64,/9j/4AAQSkZJRgABAQAAAQABAAAD/2wCEAAkGBw0QEhANDQ0F

Company Name

Anchor updated

Company Description

This is the description of the first Anchor

[Show All](#)[Update](#)

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**Figure 20: Update the company page**

## Details for Anchor updated



Company Logo

data:image/jpeg;base64,/9j/4AAQSkZJRgABAQAAAQABAAAD/2wCEAAkGBw0QEhANDQ0F

Company Name

Anchor updated

Company Description

This is the description of the first Anchor

[Show All](#)[Edit](#)

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**Figure 21: Company details page**

## MANAGE BRANDS

The screenshot shows a table with four rows, each representing a brand. The columns are: Logo, Brand Name, Description, and Actions.

Logo	Brand Name	Description	Actions
	ReeBonn	This is the ReeBonn brand.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	Fits Retails	This is Fits Retails brand.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	Lucky	This is Lucky Brand.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	NOAS	This is NOAS Brand.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>

A green button labeled '+ Add New' is located at the bottom right of the table.

Figure 22: Brands page

This is an interface that shows about the brands that involve with this online grocery store. This interface is only visible to the admin panel of this web site. Only the main admin has the permission of adding new brands to the online grocery store. Admin can add a new brand to the online grocery store by using green color add new button on the lower right corner of this interface.

The screenshot shows a form titled 'Add a New Brand' with the following fields:

- Logo: A file input field with a red error message: "Profile Picture is Required".
- Brand Name: A text input field with a red error message: "Full Name is Required".
- Description: A text input field with a red error message: "Biography is Required".
- Buttons: "Show All" and "Create".

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Figure 23: Add new brand page

As mentioned in the previous functions, the admin can add Brand Logo easily with using google and copy the image address to the Logo text field. Then the logo is visible under the Company description. It is a very good feature of this online grocery store. Admin need to fill every required field without skipped, to add new brand into this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables. By using green color create button, new brand can be displayed in the previous chart.

**Also, admin can update, delete and view details of the brands in this online grocery store.**

The screenshot shows a web application interface for updating a brand. At the top, there is a navigation bar with links for Ecommerce, Products, Management, a search bar, and user authentication buttons for 'Hello admin-user' and 'Log out'. The main title is 'Update the Brand'. Below the title, there is a logo preview for 'Reebonn' with a small leaf icon above it. The logo URL is listed as [https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSoT1u5dMKZ2pm\\_Y6HgQoxK](https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSoT1u5dMKZ2pm_Y6HgQoxK). There are three input fields: 'Brand Name' containing 'Reebonn', 'Description' containing 'This is the Reebonn brand.', and a 'Show All' button. To the right of the 'Description' field is an 'Update' button.

Figure 24:Update the brand page

## Details for ReeBonn



Logo

[https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSoT1u5dMKZ2pm\\_Y6HgQoxK](https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSoT1u5dMKZ2pm_Y6HgQoxK)

Brand Name

ReeBonn

Description

This is the ReeBonn brand.

[Show All](#)

[Edit](#)

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Figure25: Details of the brand

## MANAGE SUPPLIERS

Logo	Full Name	Biography	Actions
	Suppliers	This is the Bio of the Suppliers.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	Vectors	This is the supplier bio of vectors.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	Clipofice	This is the Bio of Clipofice.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	LOGO TEXT HERE	This is the Supplier details of the LOGO TEXT HERE.	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>   <a href="#">Add New</a>

Figure 26: Supplier page

This is an interface that shows about the suppliers that involve with this online grocery store. This interface is only visible to the admin panel of this web site. Only the main admin has the permission of

adding new suppliers to the online grocery store. Admin can add a new supplier to the online grocery store by using green color add new button on the lower right corner of this interface.

Ecommerce Products Management ▾

Search for a Product...

Hello admin-user

## Add a New Supplier

Logo

Full Name

Biography

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Figure 27: Add new supplier page

The admin can add supplier Logo easily with using google and copy the image address to the Logo text field. Then the logo is visible under the biography text field. It is a very good feature of this online grocery store. Admin need to fill every required field without skipped, to add new supplier into this online grocery store.

**Also, admin can update, delete and view details of the suppliers in this online grocery store.**

## Details for Suppliers



Logo

data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAUAAAAACeCAMAAAB0DSNzAA

Full Name

Suppliers

Biography

This is the Bio of the Suppliers.

[Show All](#)[Edit](#)

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**Figure 28: Details of the supplier**

## Update the Supplier



Logo

data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAUAAAAACeCAMAAAB0DSNzAA

Full Name

Suppliers

Biography

This is the Bio of the Suppliers.

[Show All](#)[Update](#)

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**Figure 29: Update supplier page**

## PRODUCT STATUS MANAGEMENT

This is one of the important features of this online grocery store system. The product status can be able to manage by the system administrator in different occasions. There are three type of status shows under the product details.

### 1. AVAILABLE



Figure 30: Available status

When the system administrator needs to display any kind of a product to make available for the customers, the status can be managed as "**AVAILABLE**" by the admin. The status is automatically display in the product description using the admin entered manufacture date and expired date. So, in that time frame, the product status is shows as "**AVAILABLE**". When the product status is "**AVAILABLE**" customers can add relevant product to the shopping cart using Add to Cart button.

## 2. EXPIRED

“EXPIRED” status is displayed in two occasions.

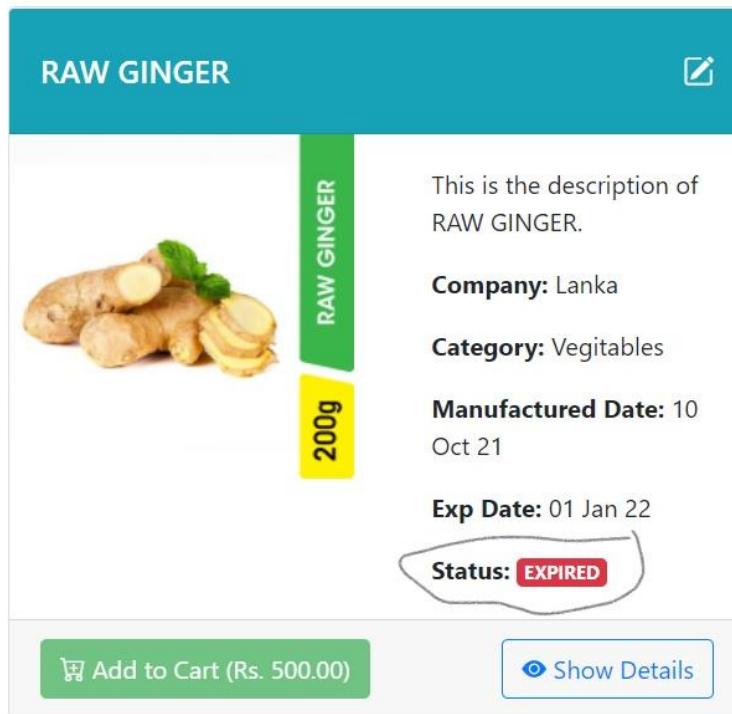


Figure 31: Expired status

- When a expire date of a certain product was expired that entered by the system administrator previously, the system automatically changes the product status from “AVAILABLE” to “EXPIRED”.
- When any of product run out of stock, the system administrator has the ability to change the product status as “EXPIRED” by changing the expired date of that relevant item in to the present date.

When the product status shows as “EXPIRED”, the Add to Cart button is automatically disabled. So, in that occasion customers not be able to add the relevant product in to the shopping cart.

### 3. UPCOMMING

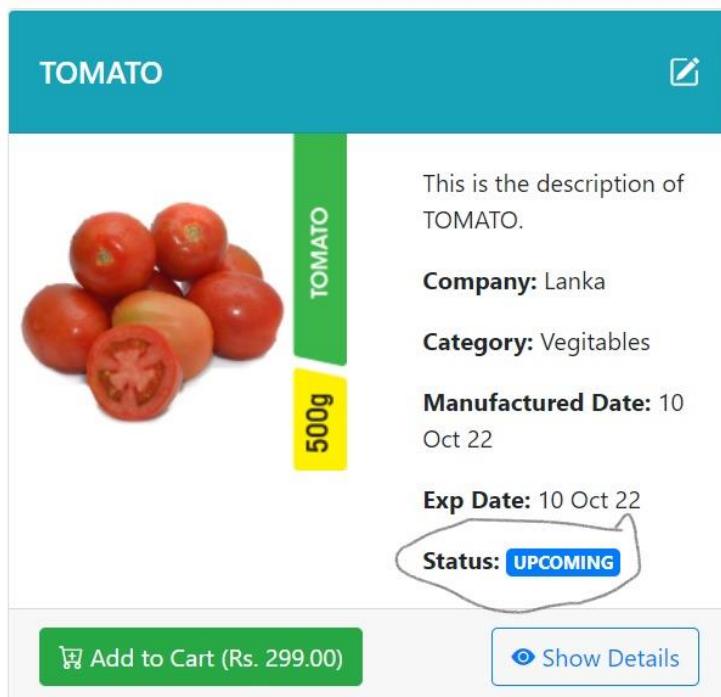


Figure 32: Upcoming status

The companies gain the ability to show their newly introduced products/Upcoming products in the online grocery store through the system administrator. The customers would be able to add these upcoming products in to the shopping cart as a free order.

## SHOW CUSTOMER ORDERS

The system administrator has the ability to see customer orders list and order details from the List of all orders page.

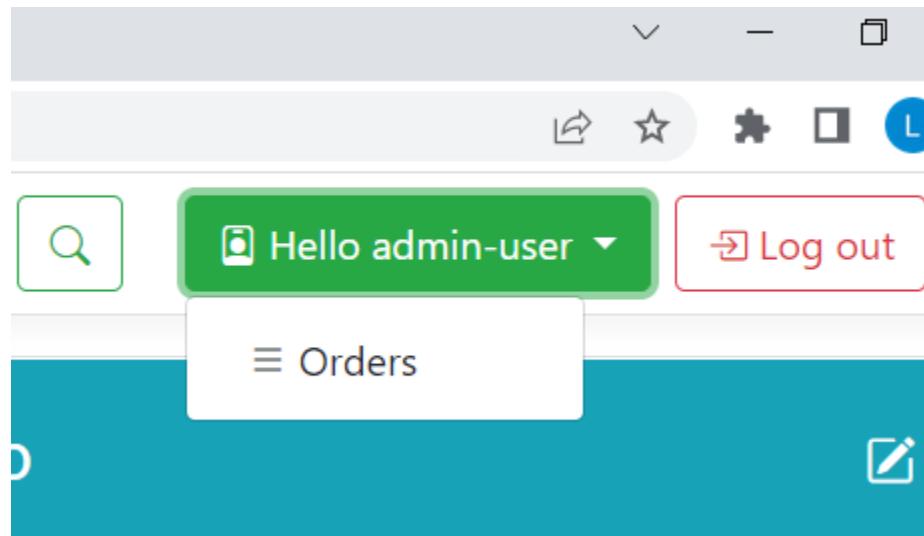


Figure 33: Orders button

List of all your orders		
Order ID	Items	Total
1	[ \$299.00 ] - TOMATO	\$299.00
2	[ \$6,000.00 ] - GARLIC	\$6,000.00
3	[ \$299.00 ] - TOMATO	\$897.00
4	[ \$2.00 ] - POTATOES	\$2.00
5	[ \$2.00 ] - POTATOES	\$2.00
6	[ \$5.00 ] - CARROT	\$10.00

Figure 34: Customer order list

These functions were explained details in the demonstration video.

## 5. DEVELOPMENT TECHNOLOGIES

Before the project development phase began, an investigation was carried out to choose the most suitable technologies as best suited. In the end, the technologies chosen were the best but were unfamiliar and time was allocated to learning specific aspects of these technologies, building on the knowledge already available. The technologies chosen were,

### 5.1 WEB APPLICATION

Visual studio 2019 was the chosen platform for develop the web application. The web application was developed using ASP.NET CORE programming language. The ASP.NET Core version 1.0 was released to the world on 27th June 2016. ASP.NET Core is a free and open-source web system and replacement to ASP.NET, it was developed by Microsoft organization. After that there are different kind of ASP.NET.CORE versions released to the market. In this project ASP.NET Core 5.0 version was selected to develop this “online grocery store” web application. It was released to the market on 10th November 2020 and this version is supported to the Visual studio 2019 16.8 version. There are some fantastic advantages come up with ASP.NET.Core language. Those are,

- Cross platform – it can run windows, Linux and Mac OS.
- Better Performance - Asp.net center everything is bundles which we want for our application. Bundles lessen the solicitation pipeline and further develop application execution.
- Dependency Injection
- Hosting - Net Core application can be Hosted on different Web servers, for example, IIS, Apache, Docker and so forth It isn't subject to IIS.
- Very Easy to do the unit testing in ASP.NET Core application. (Reference: Swain)

Not only that but also, this web application was developed by according to the MVC architecture. Model-view-controller (MVC) is a product plan pattern generally utilized for creating UIs that partition the connected program rationale into three interconnected components. This is done to isolate inward portrayals of data from the manners in which data is introduced to and acknowledged from the user stand for Model View Controller. Model View Controller are related to each other. This Model, View and Controller pattern is something new for me. according to my knowledge.

- A model is just a C# class that represent a table in the database. It straightforwardly deals with the information, rationale and rules of the application. As an Example, in an ecommerce website products' details, suppliers' details, companies' details have to be stored in a database. So, system needs tables to store each data. In this situation, product model, supplier model and company model have to be created by the programmer.
- View is the file representing user interface. From the View user can Triggers the request and event get handle by the controller.
- Controller Receives events and return data to view. C# class inherits from controller base class. According to the previous example product controller, supplier controller, company controller are the controllers of that website.

## 5.2 MOBILE APPLICATION

Android was the chosen platform for the mobile application. After the successful completion of the web application, the web view was obtained using android studio for the mobile application. Both programs are worked fine. There were few steps followed by me to deployed the web application and get the mobile view.

- Firstly, the web application and the database hosted on the SmarterASP.NET.com

The screenshot shows the SmarterASP.NET website management interface. The top navigation bar includes links for Knowledge Base, Helpdesk, and LASINDU-001. The main menu has tabs for WEBSITES, DATABASES, EMAILS, FILES, APPS, FTP, CDN, DNS, SSL, ADVANCE, and a WordPress icon. A banner at the top right offers a free SSL certificate. The left sidebar displays 'Server Overview' with details like FTP Address (win8023.site4now.net), FTP Login ID (lasindu-001), DNS Servers (NS1.SITE4NOW.NET, NS2.SITE4NOW.NET, NS3.SITE4NOW.NET), and IP Address (199.102.48.23). It also shows resource usage: 128 MB Ram Quota, 1 MB Bandwidth Usage, 24 MB Disk Usage, and 124 GB File Usage. The right sidebar shows 'My Websites' with a site named 'ecommercewebsite' (lasindu-001-site1.dtempurl.com) and options to add a new site or sub-domain. At the bottom are 'Quick Start Guide' and 'Got Questions?' buttons.

Figure 35: Web site hosted location

The screenshot shows the SmarterASP.NET database management interface. The top navigation bar includes links for Knowledge Base, Helpdesk, and LASINDU-001. The main menu has tabs for WEBSITES, DATABASES, EMAILS, FILES, APPS, FTP, CDN, DNS, SSL, ADVANCE, and a WordPress icon. A banner at the top right warns about daily backup being off. The left sidebar displays 'Quotas' with a progress bar for DB # Quota (1/1) and another for DB Disk Quota (500/1000 Mb). The right sidebar shows the 'MSSQL Manager' for a database named 'db\_a8717e\_ecommercebd'. Details include Login ID: db\_a8717e\_ecommercebd\_admin, MSSQL 2019, and a connection status of 3.2% / 500MB Active. It also shows download, upload, and other database management icons. At the bottom are 'Quick Start Guide' and 'Got Questions? Ask Us!' buttons.

Figure 36: Database hosted location

SmarterASP.NET provides a 60 days free trial facility to the developers to host their web sites free of charge. So, the online grocery store web application was deployed by using 60-day free trial because it costs lot of money to deploy the website in internet.

- Using android studio IDE, the web view of online grocery store web application was taking to the mobile application and create the apk file.

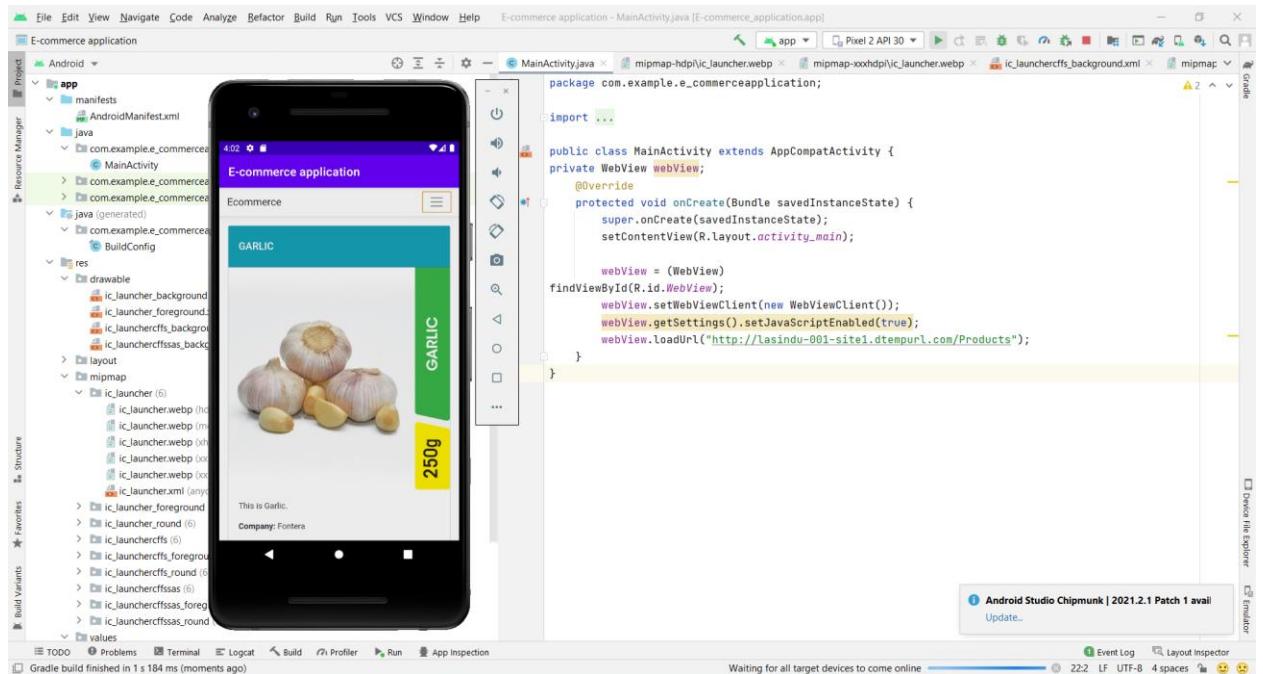


Figure 37: Mobile view

### 5.3 DATABASE

Microsoft SQL Server Management 2018 version (18) was handled the database of this online grocery store system. Microsoft SQL Server Management Studio is a product application initially sent off with Microsoft SQL Server 2005 that is utilized for arranging, making due, and directing all parts inside Microsoft SQL Server. In actuality, Microsoft SQL Server Management Studio is a coordinated climate that gives instruments to designing, observing, and managing SQL Server examples and information bases. Microsoft SQL Server Management studio is working fine with Visual Studio and ASP.NET.Core.

## 6. METHOD OF APPROACH

### 6.1 AGILE

An agile approach was taken and implemented into the planning, designing and development of the project. This methodology has the ability to approach a scenario in a flexible mechanism, in a way that is open to change (Ranicic, 2021). Rather than having the long drawn out release cycles of the previously popular Waterfall Model, the agile technique gives a regular short sprint release cycle.



Figure 38: Agile Approach

The reason as to why Agile was more suited for this project, was because it also supports development in short iterative steps. Unlike the Waterfall Model, an entire stage is not treated as a single event, making it easy to adjust scope, add features and dare to improve. In agile there is continuous development as given in the figure (38). It was important to have an approach as such, as I had to deal with new technologies, and had to run several prototypes and integrations.

### 6.2 TEST DRIVEN DEVELOPMENT

Test Driven Development (TDD) is a software development approach, in which test cases for each functionality is created and tested first so if the test returns negative, a new code is written to pass the test, making the code simple and bug free. This allows for creating high quality and maintainable code and in a long run the TDD approach has advantages overpowering the negative. (Beck)

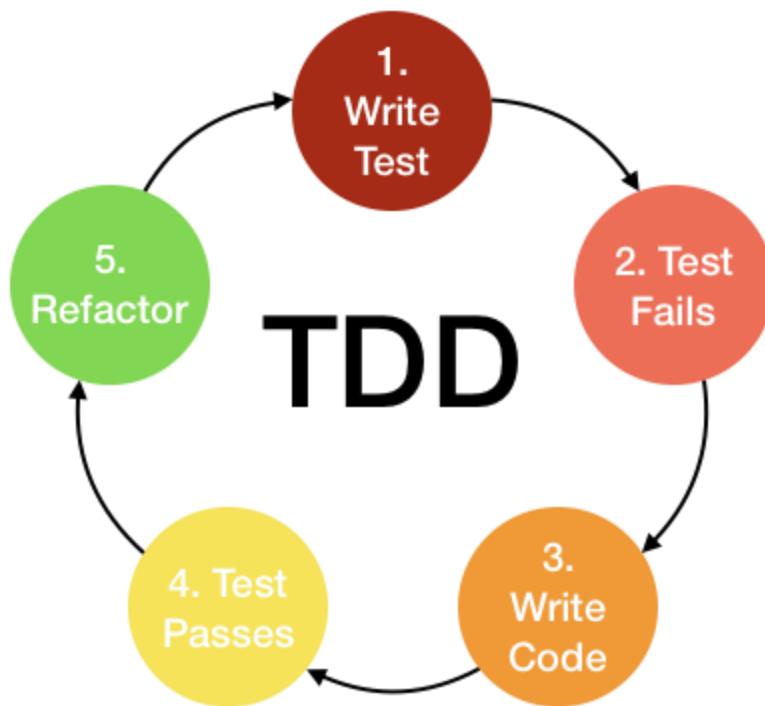


Figure 39: Test Driven Approach

The main benefit I procured from implementing this approach is that it helped me with establish an understanding of what the code needs to do, while testing each functionality before moving onto the next.

## 7. TESTING

Testing is a crucial part in the development of any project because it brings about the bugs and errors that need to be cleaned up before distribution. Thoroughly testing the system would ensure reliability, security, usability and stability.

### 7.1 SYSTEM FUNCTIONALITY TESTING

Test case ID	Test case name	Test case step	Test case details	Actions	Expected result	Test result	Note
01	Login	01	Login in to the system with valid credentials. Checking whether it	1.Open the application. 2.Click the login button.	User login successfully and navigate to the home page.	User login successfully and navigate to the home page.	Passed

			navigates to the next page.	3.Enter the valid Email address.  4.Enter the valid password.  5.Click the login button.			
02	Login	02	Login in to the system with invalid email address.	1.Open the application.  2.Click the login button.  3.Enter the invalid Email address.  4.Enter the valid password.  5.Click the login button.	Pop up the red color validation massage.	Pop up the red color validation massage.	Passed
03	Login	03	Login with invalid password.	1.Open the application.  2.Click the login button.  3.Enter the valid Email address.  4.Enter the invalid password.  5.Click the login button.	Pop up the red color validation massage.	Pop up the red color validation massage.	Passed
04	User sign-up	01	Sign up to the system with new email address and password.	1.Open the application.  2.Click the register button.  3.Enter the Full name.	User registered successfully.	User registered successfully.	Passed

				4.Enter the new email address.  5.Enter the password.  6.enter the confirm password.  7.Click the sign-up button.			
05	User sign-up	02	Sign up to the system with email address that were already exist in the database.	1.Open the application.  2.Click the register button.  3.Enter the Full name.  4.Enter the email address that are already exist in the database.  5.Enter the password.  6.enter the confirm password.  7.Click the sign-up button.	Pop up the validation massage, "This email address is already in use".	Pop up the validation massage, "This email address is already in use".	Passed
06	User sign-up	03	Enter a different password in the confirm password section.	1.Open the application.  2.Click the register button.  3.Enter the Full name.	Pop up the validation massage, "Password do not match".	Pop up the validation massage, "Password do not match".	Passed

				4.Enter the new email address.  5.Enter the password.  6.enter another password as the confirm password.  7.Click the sign-up button.			
07	Search item	01	Search an item using its name or description.	1.open the application.  2.Go to the products page.  3.Type the name or description of the product in the search bar.  4.Click the search icon.	System shows the relevant product.	System shows the relevant product.	Passed
08	Show details	01	Checking whether the product show details button works fine.	1.open the application.  2.Go to the products page.  3.Select a product.  4.Click the show details button.	System redirect to the product details page.	System redirect to the product details page.	Passed
09	Add to cart	01	Checking whether the Add to cart button works fine.	1.open the application.  2.Go to the products page.	System redirect to the Shopping cart page and shows the relevant	System redirect to the Shopping cart page and shows the relevant	Passed

				3.Select a product. 4.Click the Add to cart button.	item in the cart.	item in the cart.	
10	Delete product from the shopping cart	01	Check whether the reduce cart button situated in the shopping cart page works fine.	1.open the application.  2.Go to the shopping cart page by clicking the cart icon in the navigation bar.  3.Click the red color minus cart button situated in-front of the relevant product.	Product amount reduced or remove relevant product from the shopping cart.	Product amount reduced or remove relevant product from the shopping cart.	Passed
11	Increase the amount of a product in the shopping cart.	01	Check whether the plus cart button situated in the shopping cart page works fine.	1.open the application.  2.Go to the shopping cart page by clicking the cart icon in the navigation bar.  3.Click the green color plus cart button situated in-front of the relevant product.	Product amount increased.	Product amount increased.	Passed
12	Checkout items	01	Check whether the item can be purchased	1.open the application.  2. Login as a customer using valid credentials	Order completed successfully	Order completed successfully	Passed

				<p>3.Add a product to the shopping cart</p> <p>4.Go to the shopping cart page by clicking the cart icon in the navigation bar.</p> <p>5. click the PayPal button situated under the shopping cart.</p> <p>6.Login to the PayPal account</p> <p>6.select the payment method and click the pay now button</p>			
13.	Add new product	01	Check whether the new product can be added to the system	<p>1.open the application</p> <p>2.Login as system administrator</p> <p>3.click the Add new button at the right lower corner of the screen.</p> <p>4.Fill the all required fields in the Create a New Product page.</p> <p>5.Click the Create button</p>	New product successfully added.	New product successfully added.	Passed

14.	Update product detail	01	Check whether the product details can be changed	1.Open the application 2.Login as system administrator 3.Click the pencil icon that situated in the upper right corner of the product details box 4.Change the relevant information 5.Click the update button	Product details updated successfully.	Product details updated successfully.	<b>Passed</b>
15	Add new company	01	Check whether the new company can be added to the system	1.Open the application 2.Login as system administrator 3.click the management tool and select the company section 4.Click the add new button situated lower right corner of the screen. 5.Fill all the required field of the Create a New Company page 6.Click create button	New Company added to the system successfully.	New Company added to the system successfully.	<b>Passed</b>

16	Edit company details	01	Check whether company details can be edit	1.Open the application 2.Login as system administrator 3.click the management tool and select the company section 4.Click the Edit button situated in front of the relevant company. 5.Change the details 6.Click update button	Company details updated successfully	Company details updated successfully	<b>Passed</b>
17	Delete company	01	Check whether a company can be deleted from the system	1.Open the application 2.Login as system administrator 3.Click the management tool and select the company section 4.Click the red color delete button situated in front of the relevant company	Company deleted successfully	Company deleted successfully	<b>Passed</b>
18	Add new Brand	01	Check whether a new brand can be added to the system	1.Open the application	Brand added successfully	Brand added successfully	<b>Passed</b>

				<p>2.Login as system administrator</p> <p>3.click the management tool and select the brand section</p> <p>4.Click the add new button situated lower right corner of the screen.</p> <p>5.Fill all the required field of the Create a New Brand page</p> <p>6.Click create button</p>			
19	Edit brand details	01	Check whether the brand details can be updated	<p>1.Open the application</p> <p>2.Login as system administrator</p> <p>3.click the management tool and select the brand section</p> <p>4.Click the Edit button situated in front of the relevant brand.</p> <p>5.Change the details</p> <p>6.Click update button</p>	Brand updated successfully	Brand updated successfully	Passed

20	Delete brand	01	Check whether a brand can be deleted from the system	1.Open the application 2.Login as system administrator 3.Click the management tool and select the brand section 4.Click the red color delete button situated in front of the relevant brand	Brand deleted successfully	Brand deleted successfully	<b>Passed</b>
21	Add new supplier	01	Check whether a new supplier can be added to the system	1.Open the application 2.Login as system administrator 3.click the management tool and select the supplier section 4.Click the add new button situated lower right corner of the screen. 5.Fill all the required field of the Create a New Supplier page 6.Click create button	New supplier added successfully	New supplier added successfully	<b>Passed</b>
22	Edit supplier details	01	Check whether a supplier	1.Open the application	Supplier details	Supplier details	<b>Passed</b>

			details can be updated	2.Login as system administrator  3.click the management tool and select the supplier section  4.Click the Edit button situated in front of the relevant supplier.  5.Change the details  6.Click update button	updated successfully	updated successfully	
23	Delete supplier	01	Check whether a supplier can be deleted from the system	1.Open the application  2.Login as system administrator  3.Click the management tool and select the supplier section  4.Click the red color delete button situated in front of the relevant supplier	Supplier deleted successfully	Supplier deleted successfully	Passed
24	Check customers order list	01	Check whether customers order list display correctly	1.Open the application  2.Login as system administrator	Customer order list display successfully	Customer order list display successfully	Passed

				3.Click the orders button situated under the “Hello admin-user” button in the navigation bar.			
25	Log out	01	Check whether log out button is worked fine	1.open the application 2.Login to the system with valid credentials 3.Click the red color Log out button in the navigation bar	Log out successfully	Log out successfully	Passed

Figure 40: Test results

## 8. END PROJECT REPORT

### 8.1 END PROJECT SUMMARY

On an overall basis, the project was a success, as all main requirements were able to be met on time. The main object of this project is to set a way to the society for buy essential goods preventing from the Covid-19 virus and any pandemic situation like this. The system allows consumers to buy their interesting products using online payment method like PayPal. Also, the system covers the main process between consumers and the grocery shop staff in a traditional retail shop. The applications covered the core functionality and most of the desired functions.

### 8.2 PROJECT OBJECTIVES REVIEW

#### 8.2.1 To analyze current online grocery store solutions

This objective has been met by identifying current solutions that are somewhat in hand with my project structure. As a result of the research based on the “online solutions for buy essential goods”, different kind of projects and research found by me over the whole world. These current solutions are lot of helped to me to identify the common grounds between my project and other research projects. The goal was to identify similarities in requirements that would help with the building of functional and non-functional requirements in my application.

#### **8.2.2 To analyse user requirements for the application**

As a result of the previous research based on the current solutions, valuable and user-friendly requirements were identified. Not only that but also, the survey done by me to identify the peoples' opinions and recommendations about the "online grocery store", major requirements of the people and their recommendations were identified. It is more important to me for implement this project.

#### **8.2.3 To analyze potential development technologies to use**

This objective was met by conducting extensive research in the primary stages, in regards to the best development technologies. Certain factors considered here are cost, scalability, security, documentation etc. This stage is as important as development process, even more so.

#### **8.2.4 Design the interface of the Application**

As mentioned in the previous topics, all the front-end development and GUI were designed in a way of user friendly. The researches that previously mentioned were very important to develop the front end and implement the system with user friendly GUIs. But the project mostly focused on the back end designed and the core functionalities.

#### **8.2.5 Designing the architecture of the application**

System architecture was planned and analyzed before the development of the project. First Microsoft SQL Server was chosen and decided upon for data storage. MVC pattern was chosen to develop the system. A class diagram, use case diagram and an activity diagram would follow on with how the system would be divided according to a work break down structure. Also, those diagrams were helped to identified the data flow of the project.

#### **8.2.6 The Development Process**

Firstly, the focus was to develop core functionality before deciding on the desired. According to the time management plan, firstly the back-end coding of the web application was done. After that the front-end design was focused. After that other functionalities were implemented in the time that was left.

### **8.3 PROJECT CHANGES REVIEW**

There were some changes made by me in the project in addition to the facts that were previously mentioned in the PID report because of the many reasons. The chosen technologies and programming languages were not familiar to me. So, I had to self-learn about the ASP.NET CORE concepts to familiar with it. Also, I did some practice scenarios to familiar myself with MVC architecture in ASP.NET CORE.

Not only that but also, a lot of time was missed to me because of my leg injury. I was mentioned detailed description about this situation in the previous reports. Because of my leg injury I had to spent lot of time in the hospital for two leg surgeries. It was a serious problem for do my project in this limited time period. Also, the current situation of the country was very harmful for my works. Among them, power cut was the main reason for get down project. Some days there were 5-10-hour power cut had been occurred in the country. However, the project was covered the main core functionalities that I was excepted in the earlier stage.

## **9. PROJECT POST-MORTEM**

### **9.1 OBJECTIVES EVALUATION**

Because of the author's interest in develop web applications and mobile applications, this project was chosen as the final year project. The main purpose of this project was to solve all situations between seller and consumer in a traditional retail shop through an "Online Grocery Store" preventing from the Covid-19 virus. Looking back at the project, the main objectives and purposes were covered by the end product with the help of following functions.

- The system administrator handles all the products and its details, customer orders, companies, brands and suppliers that are involved with system by login to the admin view.
- Consumers buy their interesting products online with help of PayPal option.

So, this system reduces the spread of the Covid-19 virus. Also, people can buy their essential goods in any time without rascal and visiting to the crowded supermarket or grocery shop.

### **9.2 DEVELOPMENT PROCESS EVALUATION**

An agile approach was taken to make sure the project was contained between constraints. But still since I had very little knowledge over most technologies used, it was extremely difficult to develop a detailed plan in the development schedule. Considering this, I spared time for learning the technologies to a certain level and then continued with my plan to develop.

Agile as mentioned before was the right approach to software development because of the flexibility it offers. Also, I got the feedbacks and recommendations of people to develop this project and its features with help of a survey. It is very helpful for me lot to continue this project without any difficulties. Not only that but also, a time table was followed by me to complete different tasks of this project before the dead line. According to the time table, a certain task/tasks was done by me in a relevant week. Firstly, most focus was gone on to the implementation of the web application and its back-end coding. After that, the focus was on to the GUIs designed and mobile application designed according to the time left. Following a weekly time table for implement a relevant core functionality was very valuable for me to manage the time very well.

### **9.3 TECHNOLOGIES EVALUATION**

The development technologies that have been used are the right ones and because of that, no significant issues were posed during the development process. All the development technologies are licensed and all were recommended from the universities for their students to work with. There was no cracked software used in this project.

Deciding to use Microsoft SQL Server as the database and data storage was a seamless process. It is a good database management software and its works fine with visual studio platform. Also, working with MSS is very easy for the developers to success their tasks.

ASP.NET CORE was chosen to develop the web application and it is a new programming language in the world. Using ASP.NET CORE, the web application could be coded very easy way by using object-oriented concepts. ASP.NET.CORE focuses security of the application more than other programming languages. The program was implemented using ASP.NET CORE MVC architecture. Visual studio Was used as the IDE. Also, the CSS, HTML and bootstrap were used to designed the front-end of the web application. The web application was hosted on the SmarterASP.NET.com. It provides a 60-day free trail for the developers to host their application in the internet.

The web view of the web application was got to the mobile application by android studio because the time was not enough for me to hard code the mobile application. It is worked fine because the web application was designed responsive.

## **9.4 DEVELOPER PERFORMANCE EVALUATION**

This project was bringing me lot of benefits for success my career. As a result, my knowledge base was broadened and I managed to accomplish what I set out to do. Among them following are very important.

- Learned how to manage the time before the deadlines and how to work according to a time table.
- Improved knowledge about project management and mythologies.
- Learned about risk management.
- Improved knowledge about ASP.NET CORE programming language and MVC architecture.
- Got an experience to work with new or unfamiliar technologies.
- Learn about web hosting and rules.

## **9.5 FUTURE WORKS**

At this limited time period the project was covered its core functionality. But with more features being updated consistently, there is always room for improvement. Here are some areas, where there can be potential growth, listed below.

- Add a face recognition login and sign up system.
- Add a chat bot to the online grocery store.
- Set a way to system administrator to cancel customer orders and customers to cancel their orders made by them early.
- Convert the whole system in to a distributed system.
- Hard code the mobile application with android studio and Java.
- Implement the online grocery store with, consumer would be able to track their products.

By adding those features this system will be able to give an efficient service to the consumers.

## 10. CONCLUSION

This project was produced to the end clients a web application and an android application based on the “Online grocery store”. The main objective of this project is, set a way to the society for buy essential goods online by preventing from the Covid-19 pandemic. The system was totally built to making the current process of buying and selling essential goods in to an online process and provide efficient service for the consumers. There were various new technologies used to implement the system with user friendly requirements. I, personally am proud of my accomplishment and believe in my decisions to work with unfamiliar technologies and concepts. It was a good decision to keep the core functionality at a higher standard, for the feel of full completion. I have also worked on a couple of the future enhancements as given in the above segment, but they could be implemented on a later date with the goal of improving customer interaction.

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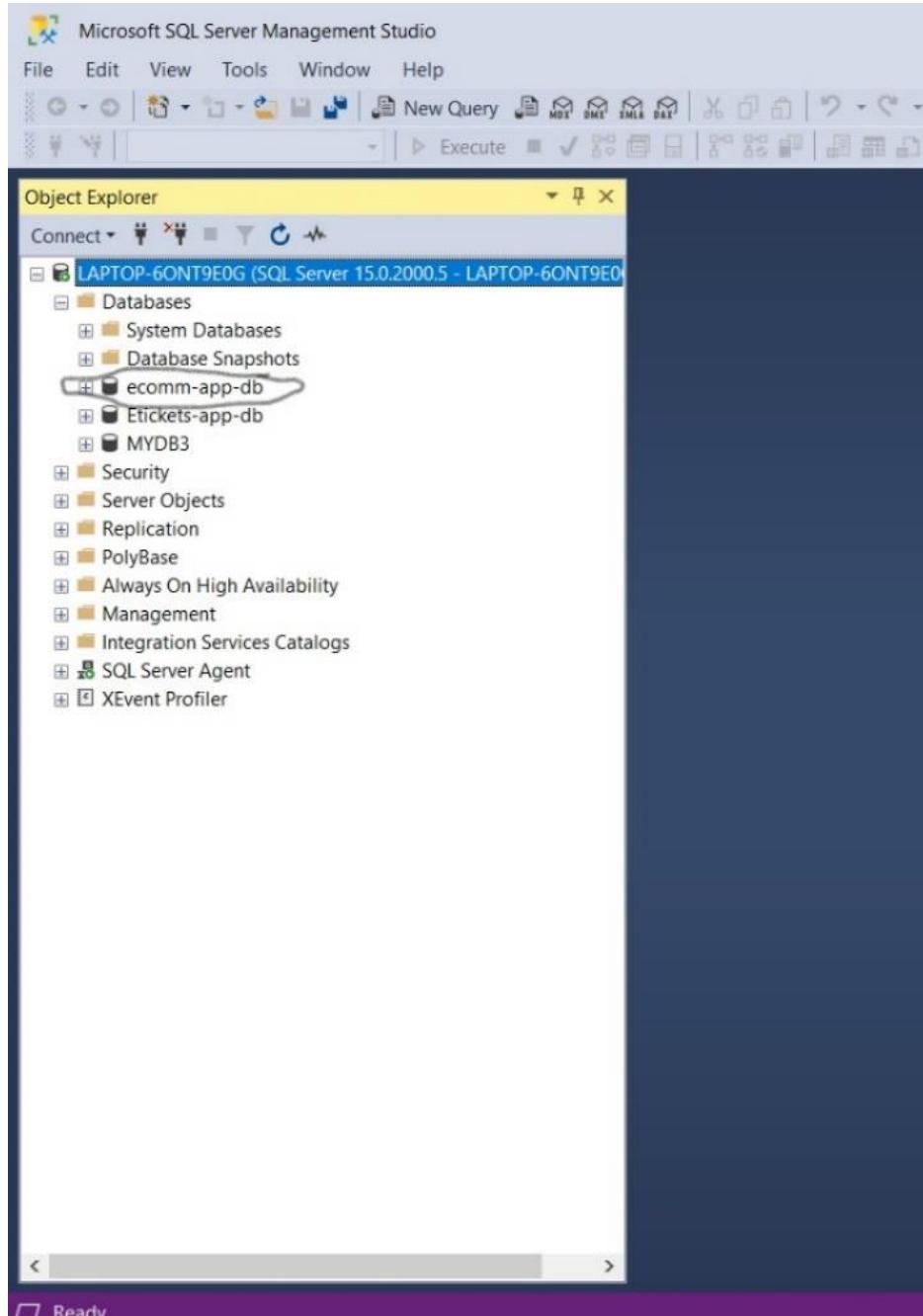
## 12. APPENDICES

### 12.1 USER GUIDE

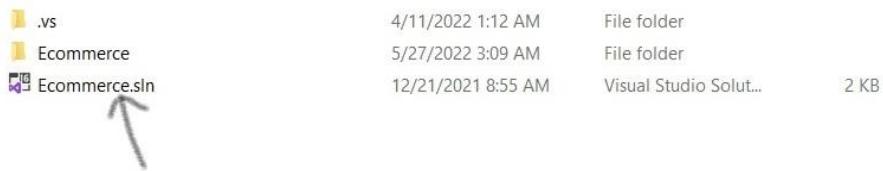
### 12.1.1 USER GUID FOR THE WEB APPLICATION

#### RUN ON THE LOCALHOST

- 01) You must need to install the following software for run the web application in your local host.
  - Visual Studio 2019
  - Microsoft SQL Server Management Studio 18
- 02) After that you should install the **ASP.NET CORE 5.0** version using Visual Studio platform.
- 03) Restore the database backup file in to the Microsoft SQL Server.

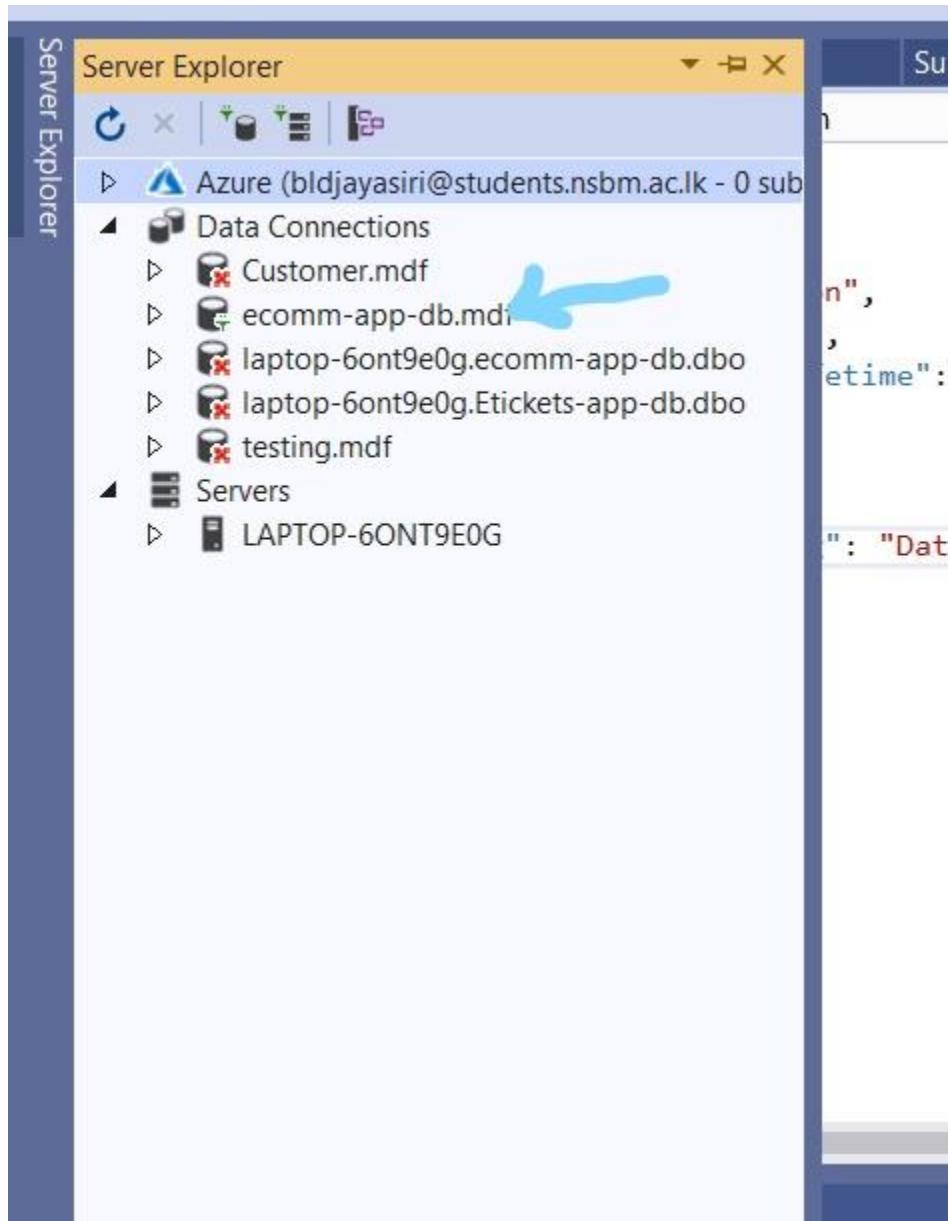


04) Run the following file (project file)

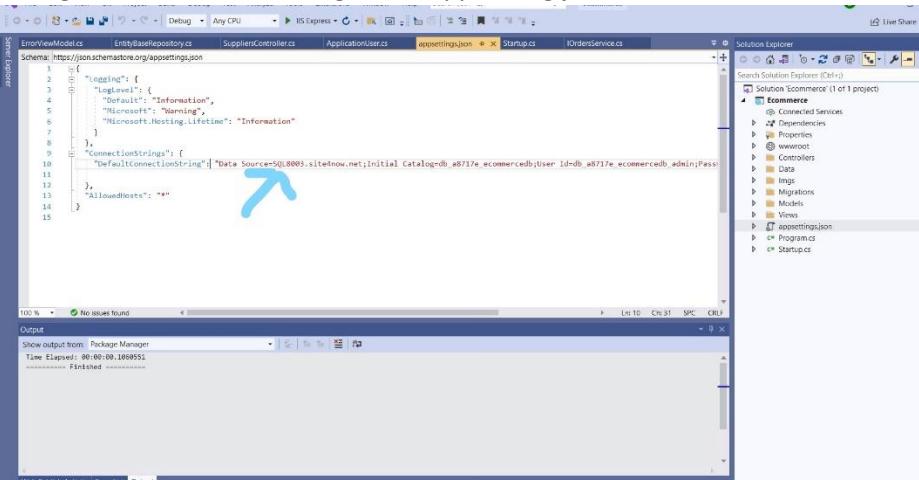


.vs	4/11/2022 1:12 AM	File folder
Ecommerce	5/27/2022 3:09 AM	File folder
Ecommerce.sln	12/21/2021 8:55 AM	Visual Studio Solut... 2 KB

05) Using Server explore connect to the database that previously restored.



06) Change the connection string in the appsetting.json file

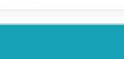
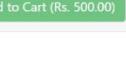
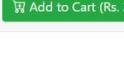


```
Schema: https://json.schemastore.org/appsettings.json
ErrorViewModels.cs EntityBaseRepository.cs SupplierController.cs ApplicationUser.cs appsettings.json startup.cs IOrdersService.cs
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
{
  "Logging": {
    "LogLevel": {
      "Default": "Information",
      "Microsoft": "Warning",
      "Microsoft.Hosting.Lifetime": "Information"
    }
  },
  "ConnectionStrings": {
    "DefaultConnectionString": {
      "ConnectionString": "Data Source=SQL80009.siteknow.net;Initial Catalog=db_a8717e_ecommerce;User Id=db_a8717e_ecommerce;Admin;Pass"
    }
  },
  "AllowedHosts": "*"
}
Solution Explorer
Search Solution Explorer (Ctrl+I)
Solution 'Commerce' (1 of 1 project)
Commerce
  Connected Services
  Properties
  wwwroot
  Data
  Images
  Models
  Views
  appsettings.json
  Program.cs
  Startup.cs
Output
No issues found
Output
Show output from: Package Manager
Time Elapsed: 00:00:00.1069551
Finished
Web Publish Activity | Error List | Output
```

## RUN ON THE GOOGLE

The application was hosted on SmarterASP.NET.com for 60 days as a free trial. You can simply copy and paste the following link on the google and find the online grocery store web site within this free trial period.

Website link: <http://lasindu-001-site1.dtempurl.com/Products>

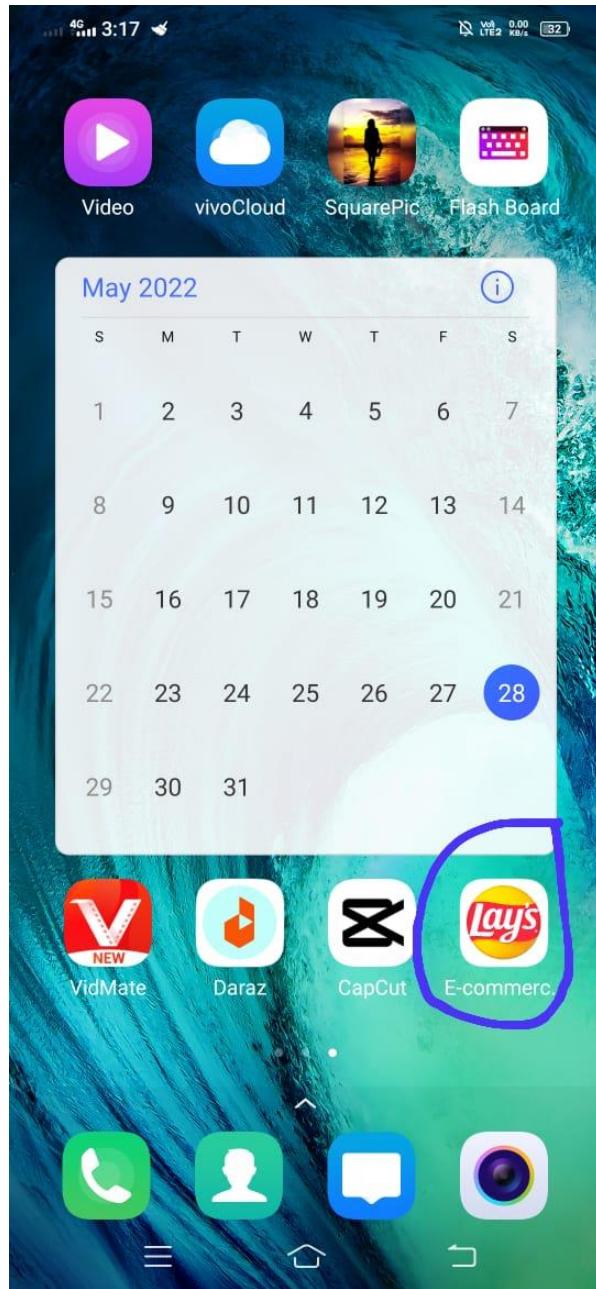
Ecommerce Products		Search for a Product... <span>Log in</span> <span>Register</span>	
 <b>GARLIC</b>	<p>This is Garlic.</p> <p><b>Company:</b> Fontera</p> <p><b>Category:</b> Vegetables</p> <p><b>Manufactured Date:</b> 01 Jan 22</p> <p><b>Exp Date:</b> 30 Oct 98</p> <p><b>Status:</b> <span>AVAILABLE</span></p>	 <b>RAW GINGER</b>	<p>This is the description of RAW GINGER.</p> <p><b>Company:</b> Lanka</p> <p><b>Category:</b> Vegetables</p> <p><b>Manufactured Date:</b> 10 Oct 21</p> <p><b>Exp Date:</b> 01 Jan 22</p> <p><b>Status:</b> <span>EXPIRED</span></p>
 <b>TOMATO</b>	<p>This is the description of TOMATO.</p> <p><b>Company:</b> Lanka</p> <p><b>Category:</b> Vegetables</p> <p><b>Manufactured Date:</b> 10 Oct 22</p> <p><b>Exp Date:</b> 10 Oct 22</p> <p><b>Status:</b> <span>UPCOMING</span></p>	 <b>250g</b>	 <b>500g</b>
 <b>GREEN CHILIES</b>	<p>This is the description of GREEN CHILLIES.</p> <p><b>Company:</b> Anchor</p>	 <b>GREEN BEANS</b>	<p>This is the description of GREEN BEANS.</p> <p><b>Company:</b> Lanka</p>
 <b>CARROT</b>	<p>This is the description of the CARROT.</p> <p><b>Company:</b> Anchor</p>	 <b>250g</b>	 <b>500g</b>

### **12.1.2 USER GUID FOR THE MOBILE APPLICATION**

**01) Install the following apk file in to your mobile phone.**

Name	Date modified	Type	Size
app-release.apk	5/27/2022 3:59 AM	APK File	3,396 KB
output-metadata	5/27/2022 3:59 AM	JSON File	1 KB

**02) When it installed successfully, the application was displayed in your mobile phone screen like following.**



03) Open the application and enjoy!

**Special Note: Because the web view of the web application was taken to the Mobile app, Its only work within the 60 days free trial period.**

#### SPECIAL INFORMATIONS

- 01) This online grocery store only has one main admin. The main admin's user name and the password only can be changed using the back end at current stage. So, access to the admin view of the system use following credentials.
  - **User Name: admin@etickets.com**
  - **Password: Coding@1234?**

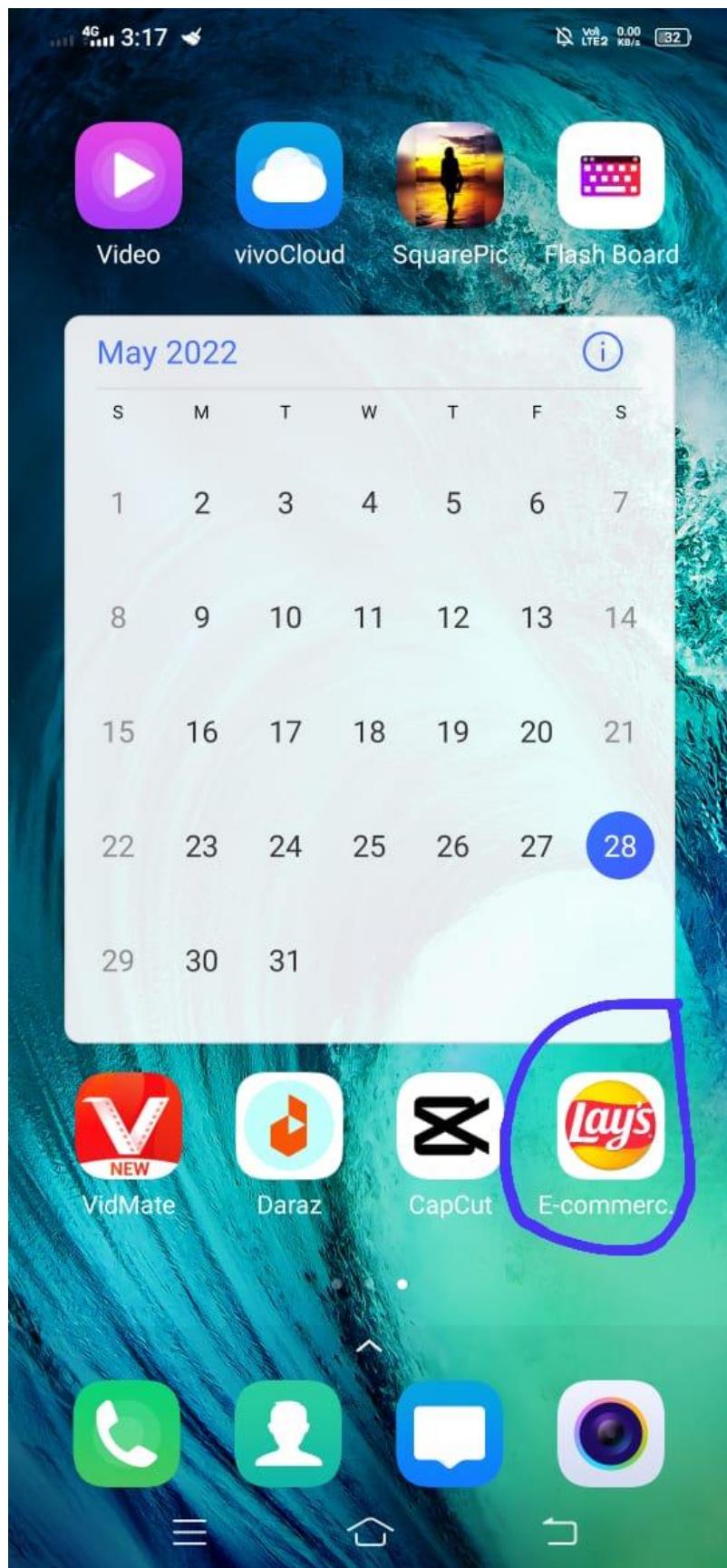
02) Please use the following format of password when you sign up to the system as a new client.

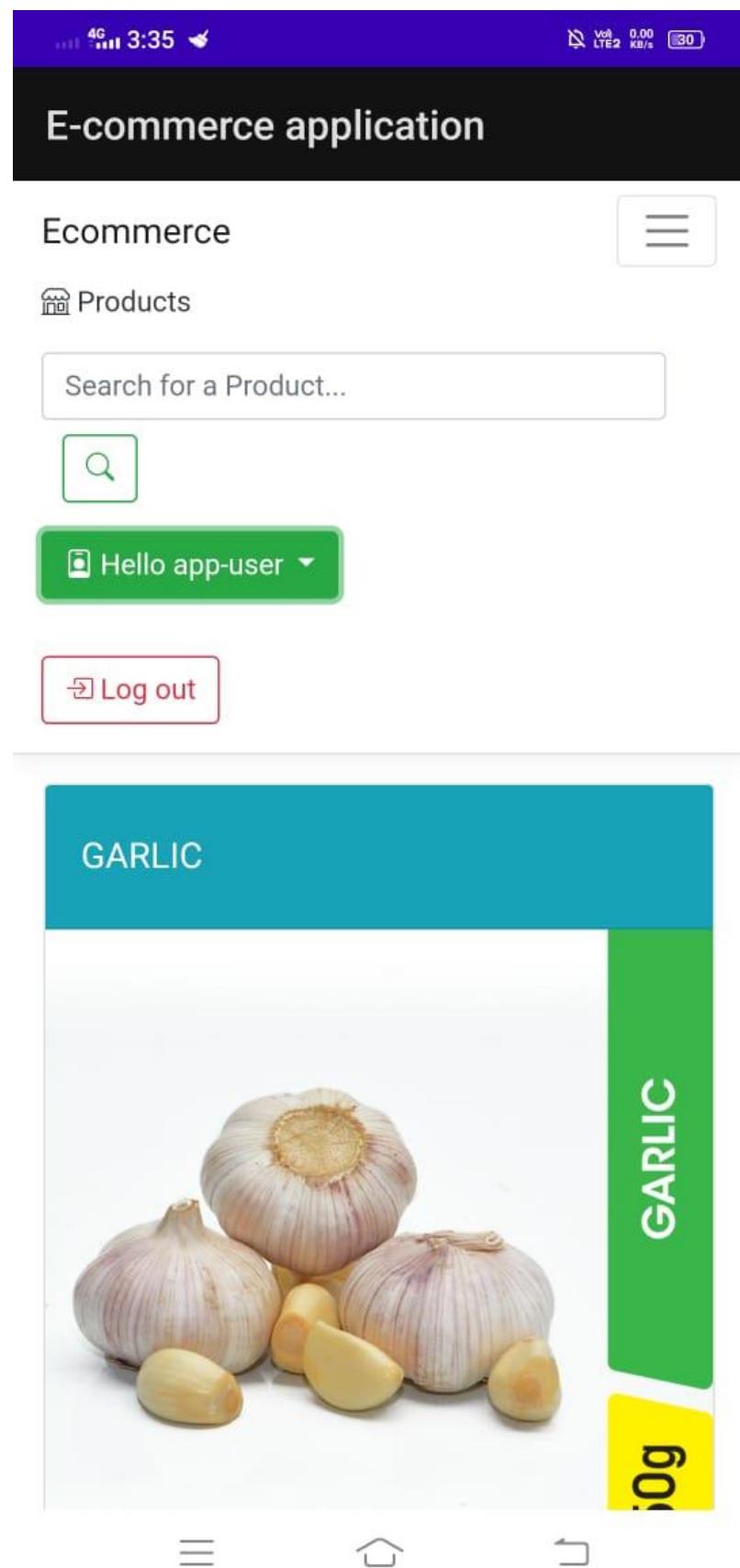
**the password must be including,**

- **Capital letters**
- **Simple letters**
- **Numbers**
- **Symbols      (Ex: Coding@1234?)**

## 12.2 GUIs OF THE MOBILE APP

This is a section about Online Grocery store mobile application GUIs designed and its screen shots.





4G 3:35

Volte 0.10 KB/s 30%

# E-commerce application

Ecommerce

GARLIC

This is Garlic.

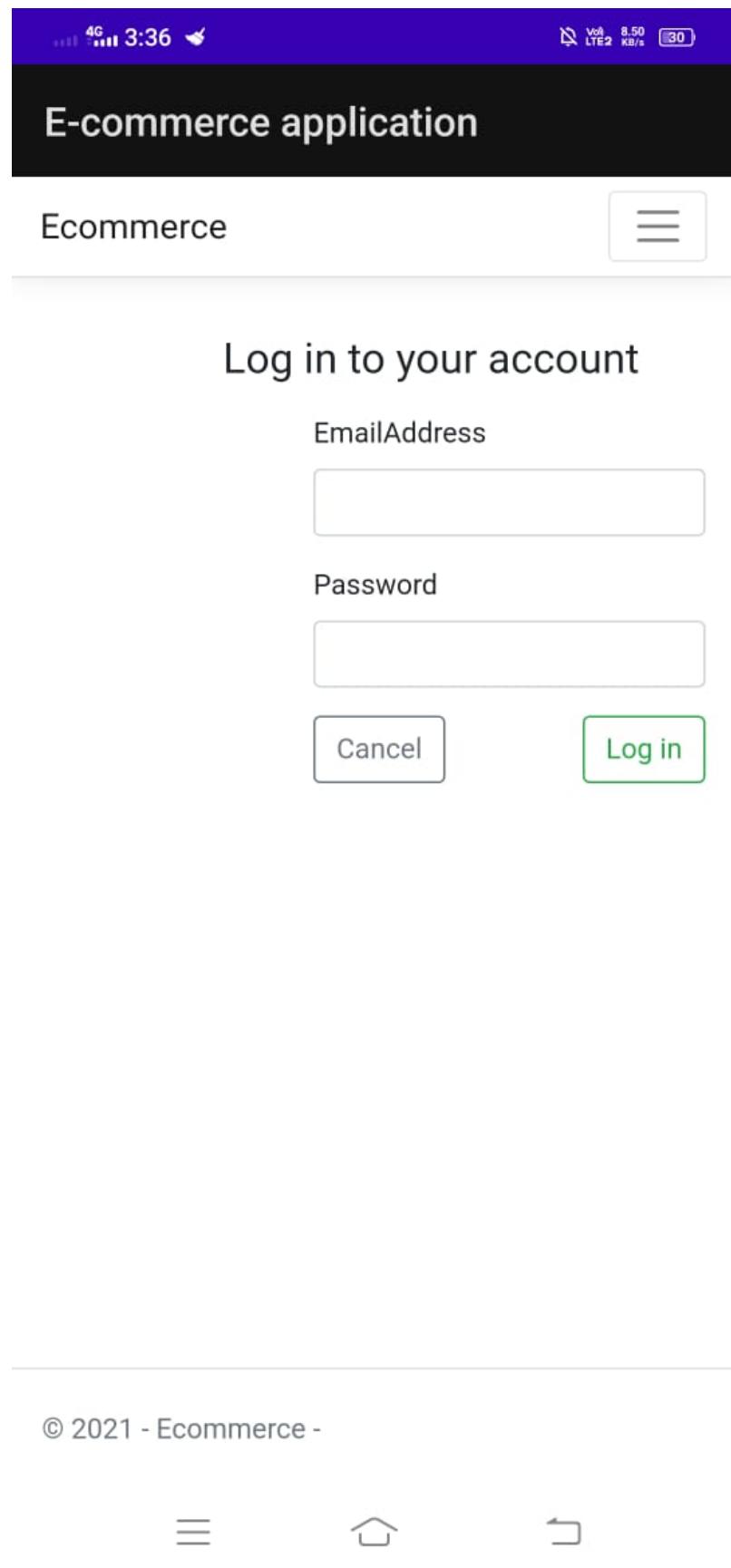
**Company:** Fontera

**Category:** Vegetables

**Manufactured Date:** 01 Jan 22

**Exp Date:** 30 Oct 98





3:37 4G LTE 0.40

## E-commerce application

Ecommerce

RAW GINGER

RAW GINGER  
200g

This is the description of RAW GINGER.

**Company:** Lanka

**Brand:** ECO LABEL SRI LANKA

**Category:** Vegetables

**Start Date:** 10 Oct 21

**End Date:** 01 Jan 22

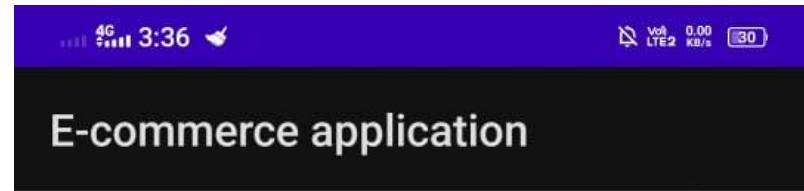
**Status:** EXPIRED

**Suppliers:**

HOTEL\_SUPPLIER

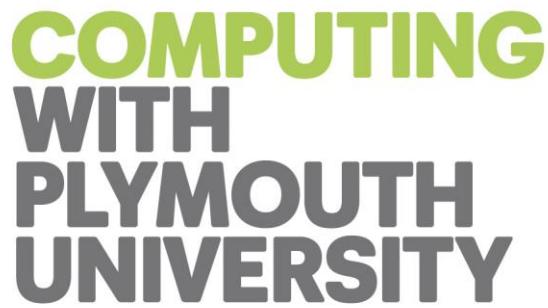
Back to List

Add to Cart (Price \$500.00)



- Ecommerce -





School of Computing and Mathematics

PRCO303  
Final Stage Computing Project

BSc (Hons) <*Software Engineering*>

<*B.L.D.Jayasiri*>

<Online Grocery Store - Web Application/Mobile Application>

2021/2022

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## 2. Introduction

### 2.1 About Us

Now a days, the Covid-19 virus has been a serious problem to the whole world. It has affected to the Sri Lanka a lot. Because the severity of the virus and the lockdown, people cannot do their day to day works as before. Sometimes, people are helpless with no way to meet the grant requirements. Not only that but also lot of people lose their jobs and become miserable. So, as a solution the society is moving forward with an Online system for continue their normal life style. In this project, I hope to give a best solution as an undergraduate student to move forward the current method of buying and selling essential goods through an “**online grocery store**” (both web application and mobile application) with new processes and procedures.

### 2.2 Introduction

The Corona virus pandemic is an ongoing global pandemic. The first infected of corona virus was identified in the Chinese city of Wuhan in December 2019. Since then, the spread of the Covid-19 virus is began to the other part of the China and all around the world quickly. The lockdown failed to contain the outbreak. In this situation the first Sri Lankan person, who infected with Covid-19 was identified on March of 2020. Since then, the virus is still spreading all around the country. Sometimes the country was closed time to time by the government for control the spread of the virus. Although, the first wave of the pandemic was controlled successfully by the Sri Lankan government. But, the increase of Covid-19 deaths since November 2020, second and third wave of the pandemic was failed to Controlled by them. After the effect of the Delta variant, Sri Lanka became the country with fourth-largest number of daily deaths in the world by population. As of 16<sup>th</sup> November 2021, 552,274 cases and 14,016 deaths have been confirmed in the Sri Lanka. Also, there are more than 253 million confirmed Covid cases and 5.1 million of deaths have been identified all over the world. Because of that, Corona virus pandemic became the most dangerous pandemic in the history.

#### 2.2.1 Problem Identification

But Today's society is moving forward with Covid-19 virus. It has been major factor to socialize the virus and spread it quickly. In a situation like this, it is dangerous to go to a crowded shop and buy essential goods. Not only that but also exchanging money with each other is very risky. During the lockdown, people are helpless with no way to go out to buy essential goods and grocery shop owners are not able to run their business properly. Because of those problems, People are in a lot of trouble. To overcome those problems, as a developing society we have to move to an online system to continue the method of buying and selling essential goods. For that, need of an online grocery store has been arisen. Being protected from the virus essential goods can be bought by the people through an online grocery store website and a mobile application. Also, the business can be continued without any economic losses by the grocery shop owners in any pandemic situation like this.

### 2.3 Background & Motivation

At the moment, there are some projects like this in the country. In my background research, I found an online grocery store where a lot of people dealing. It is a website and its name is Super Box. (References: <https://www.superbox.lk/>). There are some shortcomings found by me in the Super Box grocery store. Among them,

- ✓ Now a days, most applications coming with a face detection login system. It is the new trend. But, the Super Box hasn't a face detection login system.
- ✓ There is no chat bot facility to the customers to get some real-time details.
- ✓ No language translation facility in the website.

- ✓ In the contact us page, there is no map view of the head office address. They are only displaying a text view of the address.

So, in my project I come up with some user-friendly features to get some more customer interaction and solve above shortcomings. In order to that,

- ❖ Come up with face detection logging system.
- ❖ Come up with chat bot and language translation facilities.
- ❖ Add Google API Map to the both web and mobile application. For the convenience of the customer.

### 3. Business Case

#### 3.1 Business Need

Food is a major need of every people in the world. During the pandemic of Covid-19, grocery shops are crowded by the people for buy essential goods. Because of that it is a very dangerous case to both sellers and customers. According to the world health organization website there are certain places where the Covid-19 virus spread more easily. Among them,

- Crowded places-with many people nearby
- Close-contact settings, especially where people have conversations very near each other;
- Confined and enclosed spaces with poor ventilation are the key places

(World Helth Organization, 2020 )

So, it is very risky to go to crowded grocery shop to buy essential goods in a situation like this. Not only that but also, there is money in the grocery shop coming from everywhere. Because of the use of money touched by different people virus can be spread with each other's very easily.

World health organization said" **People may also become infected by touching surfaces that have been contaminated by the virus when touching their eyes, nose or mouth without cleaning their hands.**" (World Helth Organization, 2020 )

Sometimes there are no way to go out to some people for buy essential goods in a period of curfew. So, they have to bought goods and piled up in advanced. There is no lot of money to some people to pile up essential goods. It is serious problem faced by the society now a days. Not only that but also, sometimes customers have to be waited in a long queue near the cashier for do the payments. Also, it takes some time to select items to the customers in a grocery shop. Sometimes, Customers have to get help from the staff for select their items and grocery shop owners also have to deployed many staff around the shop. So, it is waste lot of time to buy essential goods in a grocery shop. Because of staying lot of time in the shop virus can be infected easily.

The covid-19 pandemic and resulting of lockdown there are huge amount of lost working hours. According to the details of [www.weforum.org](http://www.weforum.org) website,

- **The COVID-19 pandemic and the resulting lockdown caused 114 million people to lose their jobs over 2020.**
- **The ILO estimates working hours lost in 2020 were equivalent to 255 million full-time jobs, leading to \$3.7 trillion in lost labor income.**

(Richter, F., 2021. COVID-19 has caused a huge amount of lost working hours. [Online] Available at: <https://www.weforum.org/agenda/2021/02/covid-employment-global-job-loss/> [Accessed 14 11 2021].)

In this Covid situation, the business cannot be continued by the grocery shop owners in a proper way. Economic losses have to be incurred by the shop owners because shop have to be closed from time to time. So, During the Covid-19 Pandemic, the current method of buying and selling essential goods is not necessary.

### 3.1.1 Underlaying Problem

If the people cannot buy essential goods because of the Covid-19 pandemic and resulting of lockdown, protests can be arisen against the government through the society. Also, because of the lost working hours and due to job losses, the country's economy is declining. All of those problems are really affected for the future of the country.

## 3.2 Business Objectives

As a solution for all those problems,

- Setting up a way to people for buy essential goods online stay from home.
- Allows customer to do the payments with online payment methods.
- Remove the difficulty of buy essential goods in a lockdown.
- Providing the opportunity to buy essential goods and select the items for the people in any time of the day.
- Removes the need of having staff around for proposes such as helping to the customers.
- The process of browsing an item would be much easier.
- Reduces time and labour spent on browsing for an item.
- Reduce the economic loses of grocery shop owners in pandemic situations and lockdown.
- Remove the use of public transport services when going to the shopping.

## 4. Project Objectives

1. To analyze existing method of buying and selling essential goods and provide recommendations to do it in an online platform. [Eg: Online Grocery Store]
2. To analyze user requirement for the online grocery store website and mobile application in line with new processes and procedures and come up with user friendly system.
3. To analyze potential development technologies and deployment solutions.
4. To analyze how to make a face detection login system when the users sign in to the system and analyze what are the best technologies to use.
5. To get a good knowledge about image processing, python and android studio.
6. To provide interoperability between the grocery shop owner and customer through a chatbot.
7. To protecting human lives from the Covid-19 virus and to prevent the spread of the virus.
8. To provide a safeties way to organization and sellers to continued their business.

## 5. Chapter 4: Initial Scope

1. As a start point of this project, Current method of buying and selling goods in a grocery shop and their shortcomings during the covid-19 period will be identified by questionnaires and observations. Also, the way of customer and seller dealing with each other's, customer employee interactions, what are the difficulties customers face in a grocery shop and general rules of a grocery shop will be identified by this questionnaires and observations.
2. The proposed system will allow
  - a) customers to easily signup and signing to the system using face recognition feature.
  - b) Things the customer needs can be searched using product categories and find those easily and store in the cart.
  - c) Confidence that the customer has about client and the interaction are improved because of using the chat bot and customers can get valuable information about projects.
  - d) Customers to do the payment easily with the online payment methods or cash on delivery.
  - e) View the orders delivery status and get the information about delivery.
  - f) For more understanding purpose of the customer, web application language can be translated Sinhala and Tamil languages.
  - g) Grocery shop owners to manage product details, customer details, product categories and orders with the help of admin panel.

## 6. Method of Approach

As the first SDLC model introduced in the history, waterfall approach is used to develop this project. Following the waterfall approach, first analyse all the possible requirements of the system to be developed and documented it. After that, the system design is prepared according to the requirements specifications identified in the first step. Next, the expected system is first developed in smaller units and each unit tested for its functionality. After the unit testing each unit combined them together and entire system is checked for any bugs. After the success of above steps product is released into the market. (TutorialsPoint, 2021)

Possible technologies are,

- PHP/MYSQL- Development process of the web application
- Bootstrap framework- Front end development and for the responsive website development
- Python and open cv- Face detection
- Python and Java script- Chat bot
- Android studio/Java- for the development process of the mobile application
- Firebase -Database process

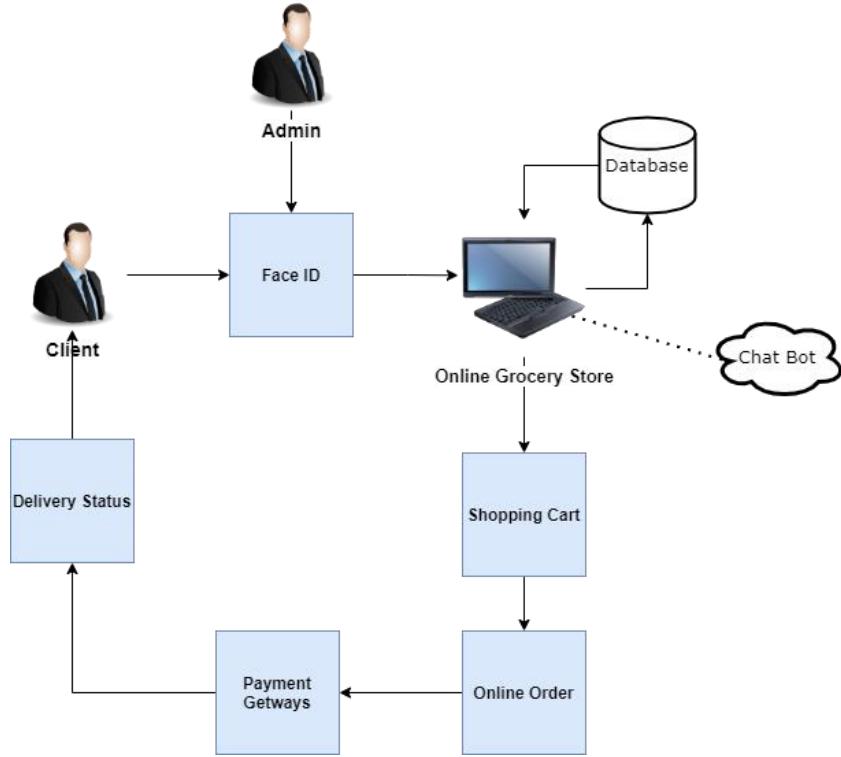


Figure 1. A diagram that can explain your project

## 7. Project Plan

### 7.1 Control Plan

The following PRINCE2 control techniques will be employed: end-Stage reports; end-Stage review (with supervisor); fortnightly Highlight report12; risk management (see Section 8); communication plan (see Section 7.2), and quality plan (see Section 9).

### 7.2 Communication plan

In addition to ad-hoc supervisor meetings as necessary, planned review/feedback meetings will be held at the end of each stage in order to discuss the end-Stage report, the next Stage plan, and to review any technical deliverables produced during the stage. Feedback meetings will also be held following the submission of the two Interim reports.

TASK NAME	OCT 2021				NOV 2021				DEC 2021				JAN 2022				FEB 2022				MAR 2022			
	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
PID SUBMISSION					Week 1																			
Analyze similar project, current method of buying and selling goods and their shortcomings	Week 1																							
Design the front end of the web application	Week 1																							
Design the front end of the mobile application	Week 1																							
Complete the backend design of the web application	Week 1																							
Complete the backend design of the mobile application and working for the interim report 1	Week 1																							
Coding for the chatbot feature and working for the interim report 2	Week 1																							
Coding for the Face resignation system	Week 1																							
Text and Bug fixing of the systems	Week 1																							
Final project report	Week 1																							

Table 1. Stage 1 Plan

<b>Task</b>	<b>Deadline</b>	<b>deliverable</b>
Analysis of Similar Projects & their shortcomings and analyze the current method of buying and selling goods.	<b>Estimated Time to complete all 07/11/2021</b>	Documented Processes.
Requirement Specification		Requirement Specification Document
Evaluation of Possible Technologies.		Report emphasizing on available technologies, issues, outcomes, best to use and reasons

Table 2. Stage 2 Plan

## 8. Initial Risk List

What can go wrong and what management strategies are you adopting now to deal with these.

<b>Risk</b>	<b>Management Strategy</b>
Schedule Overrun	Contingency has been introduced to the project plan. Highlights and supervisor meetings will monitor progress and keep track of all. More days added to the estimation of completion of each stage.
Issues with the technologies required for developing the project	Each phase will have a simple prototype built to investigate and test validity. Keeping a documentation of each stage.
Other commitments	There will be other projects running parallel with this and full attention would be derived. A time management plan would help me to be on track
Project complexity	To follow a regulation where the core functionality would be implemented and would provide a working product
Loss of data/ technical failure	Keeping backups using one drive and Git hub account

Table 3. Initial Risk List

## 9. Initial Quality Plan

What quality checks are you going to apply to your products, and when?

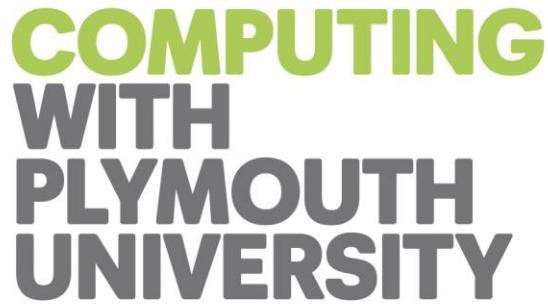
Quality check	Strategy
Requirements	Continual unit testing will go on to check validity and relevance to the proposed business function after every phase. Prototyping and user intervention will be deployed.
Design Validation	Will follow the principals under H.C.I Guidance and will be checked against backend functionality. User intervention will be deployed so that feedback would be retrieved. Database Normalization, Data Flow Diagrams (DFD0/1/2) & UML Diagrams would guide me through each phase.
Validation	To be conducted after each phase (sub system)

Table 4. Quality Plan

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School of Computing and Mathematics

PRCO303  
Final Stage Computing Project

BSc (Hons) <*Software Engineering*>

<***B.L.D. JAYASIRI***>

< Online Grocery Store - Web Application/Mobile Application>

2021/2022

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# 1. Introduction

## 1.1 Abstract

Covid-19 virus is a big threat to the each and every country in the world. After the first infected of Covid-19 virus was identified in china, “Covid-19” became the major topic of the world. The virus started to spread all around the world very quickly. The millions of people fell victim to the Covid-19 virus for nearly three years. Not only that but also, millions of people died all around the world because of this Corona pandemic. It is not still over. Different kind of vaccines was invented by few countries and the vaccines are distributed all around the world by them. World Health Organization has advised to the people for get the vaccine quickly, but the vaccines are not the correct answer for the Covid-19 Virus. At the moment, there are not clear lack of Covid-19 virus all around the world. Time to time the covid-19 virus is come up with different kind of variants and it is still spreading all around the world. “Omicron” is the newest variant of the Covi-19 virus. It is a very dangerous variant and without any lack many people became infected of it.

Because of the severity of Covid-19 virus, every country has started to follow the safety measures to prevent from the virus. So, every people had to wear a mask to go to the outside of the home, they had to used hand sanitizer to clear theirs' hands in every moment when they touch external surface. Not only that but also most of the countries in the world had to lock down the country for long time period to control the virus. Sri Lankan government also had to lock down the country time to time when the Covid-19 virus raising the head. Sometimes Sri Lankan people had to followed provincial travel restrictions. Also, weddings and other functions were cancelled. Even a funeral or any other type of essential function was held with limited public participation. As a safety measure, Government stopped public transport services like bus, train etc and decrease the passenger level. Not only that but also fair was stopped while the Covid-19 virus decrease. Also, every grocery shop, super markets, general markets and every crowded place had to be closed.

Because of those reasons people had to stay home long time of period. So, every people faced some difficulties in buy essential goods and other things. Some time they fear to go out and crowded grocery shops, super markets and any other place to buy essential goods. Also, the small grocery shop owners had to closed theirs' shops long time of period and because of that they had to suffered with some serious economic loses. So, we need a way to continue the current method of buying and selling essential goods preventing from the Covid-19 virus. It is very useful for move forward with this Corona pandemic.

## 1.2 The Process So Far.

Now a days, the modern society is going forward with ICT and Software engineering. After the Covid-19 virus there is a huge amount of demand in the software engineering field. Most of companies and the organizations in all around the world started to continue theirs works in online platform after this corona pandemic. So, software engineers had to developed different kind of systems to complete these kinds of task. At the peak level of the Covid-19 virus, there were different kinds of Online banking apps invented to Sri Lankan market as a result of it. Not only that but also there were many kinds of marketing and business websites invested in this time of period.

Keeping the above in my mind, a “Online grocery store” is proposed by me as solution to continue the current system of buying and selling essential goods preventing from the Covid-19 virus. With the help of this system every people can buy goods stay from the home and grocery shop owners can run their business through the website. It is very valuable for these days and any kind of pandemic like this. There are some different kind of purposes to come up with this kind of system. Following are some of them.

- The main objective of this project is to build an “online grocery store” to solve the all situations between the seller and the customer in a traditional grocery shop.
- The project is totally built to protecting human lives from the Covid-19 virus and to prevent the spread of the virus.
- Users can get rid of rascals and save their time by using this online store.
- In period of a curfew or pandemic like this, business can be continued to the grocery shop owners, suppliers and business organizations in a safety's way with help of this project.

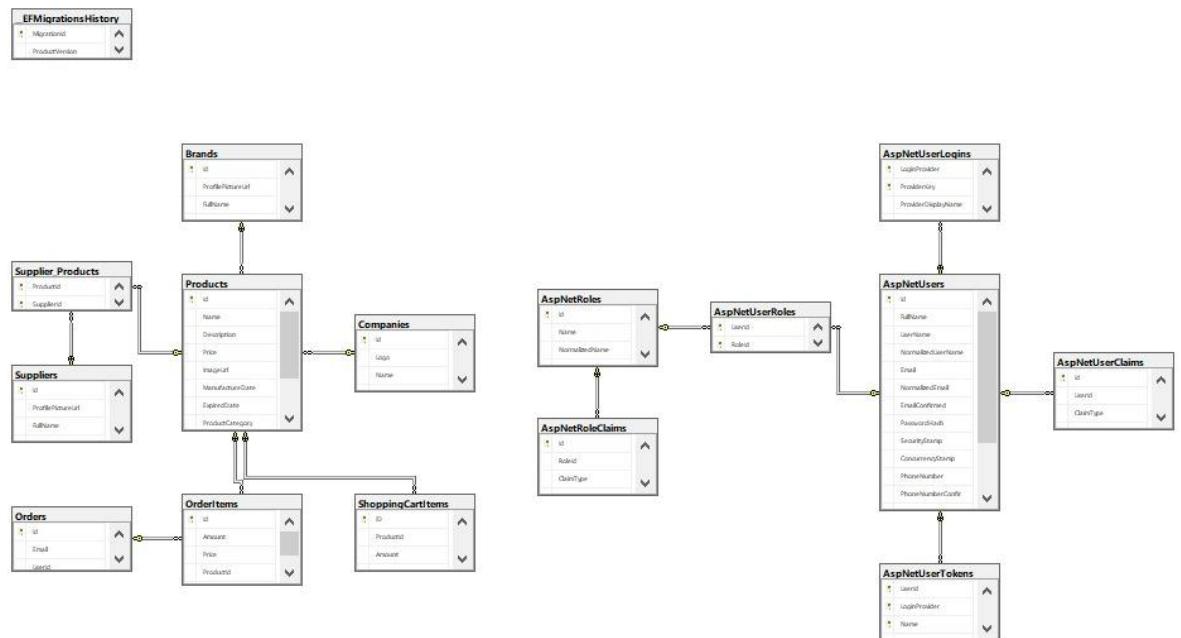
At the moment there are some similar projects in the world. I hope to come up with new user-friendly features in my system. Talking about my project, I hope to develop both web and mobile applications of the “online grocery store” if the time permits for my development process. For the development of the web application, ASP.NET Core 5.0 version is used by me. It is a new technology released on 2020. ASP.NET Core is advanced than ASP.NET and it is the newest updated version of ASP.NET. Visual Studio 2019 framework is used by me to do the coding. Not only that but also MVC architecture is used to develop my Online Grocery store web application. It is one kind of a web API developing format coming up with the ASP.NET.CORE. MVC is stand for Model-View-Controller. These concepts are discussed more detailed in following topics.

As a dynamic web application, the validations and the crud operations are included right places. In Every Form (Form means, the page is to input some credentials to the users with some text fields etc.) was created so far in this we application, a validation was included near every required field. It is very important in produce a product like this into the market and it is a very good programming skill. The main purpose of this project is to solve the all situations between the seller and the customer in a traditional grocery shop. For that there are some special functions must be included to this web application. For do that task, search function, add to cart function, delete from the cart function, way to purchase the product for the customer are included by me to this system. Not only that but also there are some many more features in my project. These concepts are also discussed more detailed in following topics.

## 2. System Architecture

### 2.1 Database structure

This is the Database Structure of my “Online Grocery Store” web application.



## 3. Task Undertaken and Outcomes

### 3.1 Working with ASP.NET Core and its outcomes

There are different kind of programming languages in the world. Among them java script, J2EE, ASP.Net, PHP are some kind of different languages used in web application development. AS an undergraduate student, I already have an idea about these kind of technologies in my two years of

experience in my university education life as a software engineering student. At the beginning stage of this project, I had a hard time to select a correct and most suitable language for this “Online grocery store” web application. At the start level of this project, PHP programming language was selected by me to do the backend coding parts of this web application and some coding parts were finished by me. PHP is a good language but, the knowledge about some concepts in PHP language had been learned from the university. Not only that but also, I developed a small kind of web application in my first year of the university learning period using PHP programming language. So, I decided to change my mind to come up with new and more advanced technology to do the development of my online grocery store web application. As a result of that I decided to move forward with ASP.NET Core language.

The first ASP.NET Core version 1.0 was released to the world on 27<sup>th</sup> June 2016. ASP.NET Core is a free and open-source web system and replacement to ASP.NET, it was developed by Microsoft organization. After that there are different kind of ASP.NET.Core versions released to the market. In my project ASP.NET Core 5.0 version was selected by me to develop this “online grocery store” web application. It was released to the market on 10<sup>th</sup> November 2020 and this version is supported to the Visual studio 2019 16.8 version. There are some fantastic advantages come up with ASP.NET.Core language. Those are,

- Cross platform – it can run windows, Linux and Mac OS.
- Better Performance - Asp.net center everything is bundles which we want for our application. Bundles lessen the solicitation pipeline and further develop application execution.
- Dependency Injection
- Hosting - Net Core application can be Hosted on different Web servers, for example, IIS, Apache, Docker and so forth It isn't subject to IIS.
- Very Easy to do the unit testing in ASP.NET Core application.

Reference: Swain

So, as mention ASP.NET Core is a modern and new technology. I can get more outcomes by working with ASP.NET Core programming language. I can learn new concepts in web application developments, polished my C# object-oriented knowledge etc.

### **3.2 Using MVC model for the development and its outcomes**

Model-view-controller (MVC) is a product plan pattern generally utilized for creating UIs that partition the connected program rationale into three interconnected components. This is done to isolate inward portrayals of data from the manners in which data is introduced to and acknowledged from the user stand for Model View Controller. Model View Controller are related to each other. This Model, View and Controller pattern is something new for me. I updated my knowledge about this model, view and controller pattern using some you tube videos, reading some attractive research articles, following some LinkedIn learning courses and Udemy course. After that, I gotten some idea about this Model, View, Controller model and I keep them in my mind. This concept is very new for me and I already have some difficulties in some areas in my coding. But I always research and try to get answers in these difficulty areas and always be happily move forwarding my “online grocery store” web application with these advance concepts because it will help me lot to improve my programming skills in different kind of new areas.

In ASP.NET Core, it provides every programmer to implement their web application using this Model, View and Controller architecture. following are some basic description about this MVC pattern according to my knowledge.

A model is just a C# class that represent a table in the database. It straightforwardly deals with the information, rationale and rules of the application. As an Example, in an ecommerce website we have to stored product details, suppliers' details, Companies details in the database. So, we need tables to store each data. In this situation we have to create product model, supplier model and company model.

View is the file representing user interface. From the View user can Triggers the request and event get handle by the controller.

Controller Receives events and return data to view. C# class inherits from controller base class. According to the previous example product controller, supplier controller, company controller are the controllers of the website.

### **3.3 Working with Microsoft SQL Server and its outcomes**

Microsoft SQL Server Management Studio is a product application initially sent off with Microsoft SQL Server 2005 that is utilized for arranging, making due, and directing all parts inside Microsoft SQL Server. In actuality, Microsoft SQL Server Management Studio is a coordinated climate that gives instruments to designing, observing, and managing SQL Server examples and information bases. Microsoft SQL Server Management studio is working fine with Visual Studio and ASP.NET.Core. Microsoft SQL Server 2018 version is used by me to manage the database of this “online grocery store” web application. All the product images, brand images, companies and supplier images are displayed in the front end by using the help of the tables in the database application. All the images displayed in the front-end side are stored in each table of the data base using admin panel. Not only that but also it handles all the crud operations very fine.

So, I can improve my SQL knowledge and clear about some doubts in SQL quires with the help of this Microsoft SQL Server Management Studio. Not only that but also, I can improve my knowledge about advanced database concepts like store procedures etc.

## **4. Products Produced and Product Quality**

### **4.1 User Interfaces and Functions developed so far...**

#### **4.1.1 Search product using search box**

Ecommerce web application definitely need a search box to search user needs and find that needs to the users very easily and very quickly. It is a major user Requirement of an any web application. So, as I planned before, I decided to add a search function to my “online grocery store” web application. Using it, client/customer can easily find the products by without time wasting throughout the web site. When a user types a product name and hit the search button, application will give an output window to the user of the product that the user searched before. At the current stage of this web application, users can search product using product name only. I hope to improve the current code for that the users allow to search products using product description. It helps to maintain the quality of this “Online grocery store” web application and users can get their service without a rash.

#### **4.1.2 User registration and logging**

At the current stage, any user can register to the “online grocery store” website using Register button of the navigation menu. User needs to fill four text fields with some information to create an account. These text fields are Full Name, E mail Address, Password and Confirm Password. Password and the confirm password should be matched for to create the user account. Users need to fill every required field without skipped, to register in this web site.

Any kind of client/customer cannot use a previously used e mail address for register to the web application. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables.

After the registration is success, user can log to the web site using that Email address used in the registration process. I hope to improve this registration and logging process with some other user-friendly features, if the time is enough to me.

#### **4.1.3 Admin panel and its functions**

In my “online grocery store” there are four user levels. These four user levels are main admin, companies, brands and suppliers. Main admin has the full control of the “online grocery store” web application. Companies, brands and suppliers are under control of the main admin of this web site. That's mean, only the main admin can add companies, brands and suppliers to the web site. Not only that but also main admin can edit, update and view currently added companies, brands and suppliers' details and main admin can also delete and add new companies, brands and suppliers to the “online grocery store” web site.

Because of that reason other user levels cannot works as they want. It is very helpful to maintain the quality of this “online grocery store” web application. So, garbage data are not inserted to the web site and the database. Not only that but also client/users can get a good service from this “online grocery store” web application.

Also, only the main admin can add new products and update previously added product in the web site. When creating a new product, admin can manage the product name, bio, select the companies, brands and suppliers, product price, product image, select the manufactured date, select the expire date etc. Using this manufactured date and expire date, customer can get an idea about the product quality. It helps to give a quality service for the customer through this “online grocery store” web application. When the product is expired, it will show a red colour status as “Expired”. It was done automatically.

At the current stage, these are the features in the admin area. I hope to develop some more features in admin area in next few months. Some coding parts are still processing.

## 4.2 Future works

At the current situation, my final year project works are still ongoing. I have already done some parts. About these parts, I discussed detailed in the below topic. In the next two months of time period, I hope to develop other parts and user requirements of my final year project according to the PID report as I mentioned before. (Ex: adding payment getaways, develop the add to cart function, allow admin to see the customer order list, allow customers to reduce the orders and purchase them etc).

## 4.3 Benefits and other advantages

There are some other benefits and advantages can be got to the client/customer by using this “online grocery store” web application. Using a “online grocery store” people can buy essential goods stay from home. They don’t need to go the crowded grocery store. Not only that but also, without touching money customers can buy essential goods easily. People don’t need to use public transport services to travel to the super market. It is help to get rid of rascal. Not only the covid-19 period but also in any other pandemics people can use this “online grocery store” web application.

# 5. Risks that have materialized and your response changes to the risk list

## 5.1 Risks to be Materialized

In the Project Initiation Document (PID), potential dangers were recognized. Some appeared and were alleviated with the arrangement referenced in the danger the executives plan. Going ahead, there must be more. From all requirements, hazards are autonomous of any remaining imperatives and are unavoidable. Thus, given the following are a rundown of dangers that might possibly happen in due time.

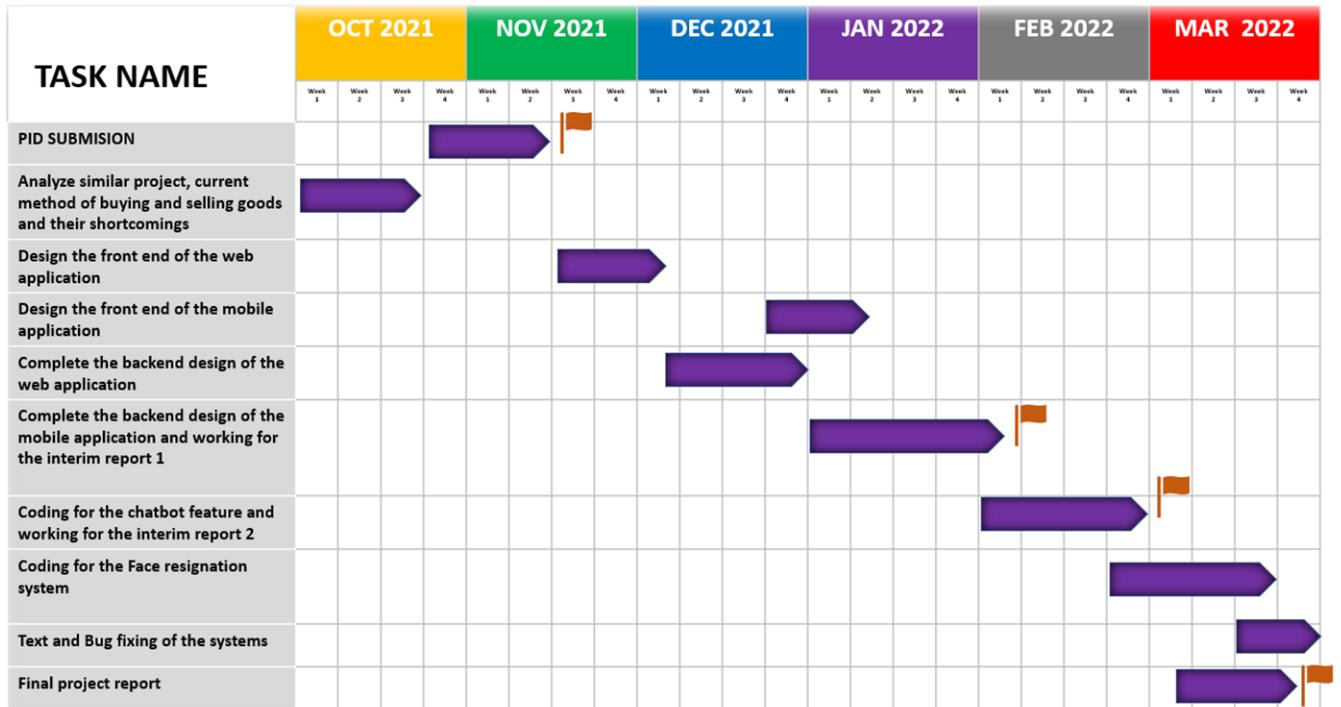
Risk	Management Strategy
Schedule Overrun	Some of the task of the critical path is delayed for any reason
Project complexity	Some part of the projects is very complex and I have to research and find details using internet, follow Udemy courses.
Loss of data/ technical failure	Keeping backups using one drive and Git hub account
Time requirement being fixed creating additional deviations and awkwardness in scope. This would bring about a project requirement getting out of control and element creep. In the iron triangle, yielded programming and undertaking the executives we perceive how time could cause changes in extension and	Research and do unit testing by building models of the parts essential. A time usage plan from here on would empower helpful arranging and hazard moderation on the time factor.

assets. This, in the event that not oversaw as expected can be lethal at the last phases of finishing. The item would be a disappointment or not of fulfillment, during the customer acknowledgment stage.	
Covering Projects - With the last semester of the last year drawing nearer, we have different undertakings that need consideration and advancement. Some of the time, are needs can veer off from this and could be either sure or negative except if there is a period supervisor.	Sprints would permit me to screen progress on both of the tasks. Steady manager gatherings would likewise look at in the event that I'm on the correct course.
Highlight creep-This is something that typically happens during the last phases of undertaking advancement, where we attempt to focus on 'good to have' over 'need to have'. This is perilous as it would bring about disappointment of the utilitarian prerequisite fundamental.	Early planning and exploration of utilitarian necessities would give me the certainty to push ahead rather than to conceal, with undesirable suggestions.

Likewise, these are chances that can take structure however on the off chance that the right appraisal strategies are thought about, we can alleviate and control the dangers as of now appeared and can diminish the likelihood of dangers to be.

## 6. Schedule

This is the schedule I follow to success my final year project.



## 7. Resources used

Following are the resources are used in this “online grocery store” project at the current moment.

- Visual Studio 2019
  - C# ASP.NET CORE
  - Microsoft SQL Server Management Studio 2018
  - Bootstrap
  - Udemy courses, research papers and YouTube tutorials about ASP.NET Core
  - Follow some YouTube tutorials about MVC architecture

## 8. Learning undertaken and required

## **8.1 Student Learning Undertaken**

As I mentioned before, at the start level of this project I had some difficulties in choosing the correct and most suitable language for developing this “online grocery store” web application. After that I started my coding with ASP.NET Core 5.0 programming language. It is a modern and new programming language in the world. This language is also a new experience for my programming life. So, I had to follow some programmers research articles about ASP.NET CORE programming language. After that I got some clear understand about ASP.NET Core language, its benefits, advantages, how can it use to develop a web application, what are the new technologies come up with ASP.NET Core, how it's different from ASP.NET, What are the resources I have to install to my computer to work with this language correctly likewise I learned more basic about this ASP.NET CORE by researching myself. Not only that but also, I started to follow some you tube tutorials about ASP.NET Core and find some more details about this programming language and do some practices by myself and started to self-learning. After the PID submission, I started to follow some Udemy and

LinkedIn courses about ASP.NET Core programming language to get more idea and understand about this new language.

Not only that but also, because of this project I could get more understand about the Model, View and Controller pattern and learned more advanced concepts. In earlier I haven't understood about what is the MVC pattern, what are the advantages and benefits of this MVC pattern, why this Model, view and controller pattern use in web application development and what are the important of using this MVC pattern. But now, I had a clear understand about this Model, view and controller pattern and how it's working with ASP.NET Core.

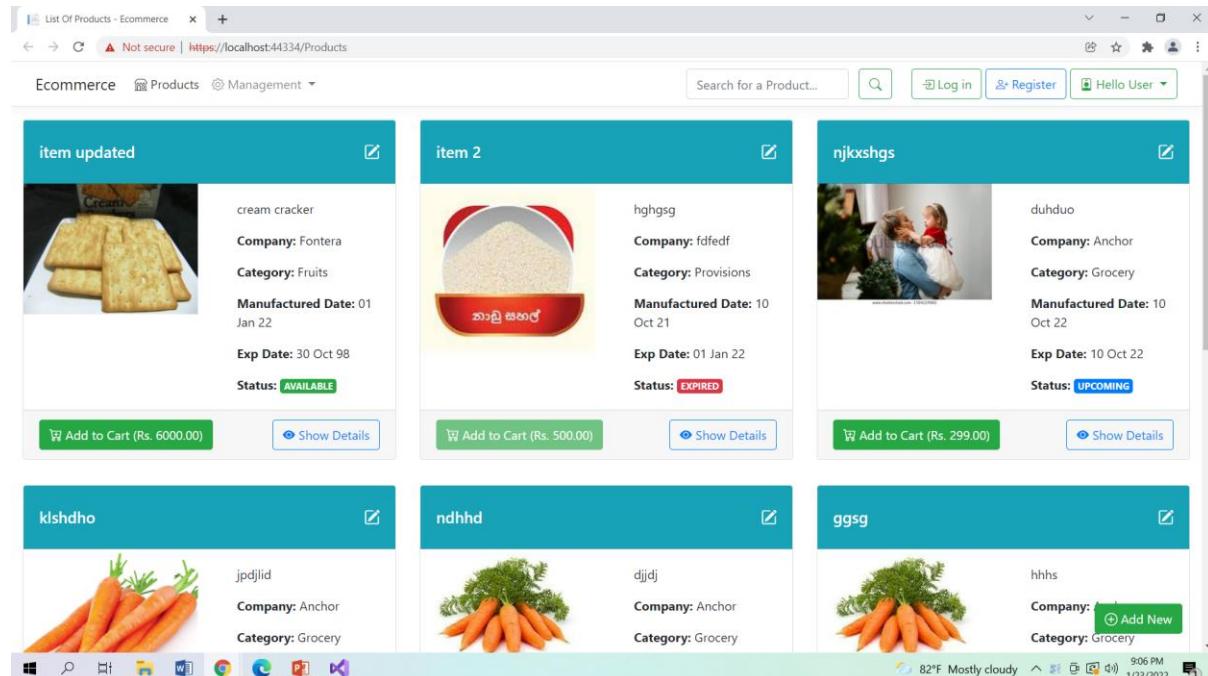
As a result of the self-learning and researches, I could polish my programming skills in different paths and got some other benefits as well as. Flowing are some of them,

- I could improve my C# programming knowledge and learned to handle Crud operations very well.
- Learned about advanced database concepts and improve knowledge about SQL quires.
- Got and good idea about project management and how to handle risks in any kind of project.
- Improved my knowledge about report writing.

## 8.2 Studies required

- Need some more knowledge about ASP.NET Core and MVC model to improve the web site with some advanced features.
- Need a good SQL knowledge, data security knowledge and good understanding of advanced database concepts to improve the current database of this application with some new features.  
(Egg: Hide the user's password in the database table)
- Need to improve knowledge and research about web hosting.
- Need of some practice and good knowledge about mobile app development software's like android studio or flutter to move forward the project.

## 9. Screenshots



List Of Products - Ecommerce

Not secure | https://localhost:44334/Products

Ecommerce Products Management

Search for a Product... Log in Register Hello User

Companies Brands Suppliers

item updated

cream cracker

**Company:** Fontera **Category:** Fruits **Manufactured Date:** 01 Jan 22 **Exp Date:** 30 Oct 98 **Status:** AVAILABLE

Add to Cart (Rs. 6000.00) Show Details

item 2

hghsg

**Company:** fddef **Category:** Provisions **Manufactured Date:** 10 Oct 21 **Exp Date:** 01 Jan 22 **Status:** EXPIRED

Add to Cart (Rs. 500.00) Show Details

njkxshgs

duhduo

**Company:** Anchor **Category:** Grocery **Manufactured Date:** 10 Oct 22 **Exp Date:** 10 Oct 22 **Status:** UPCOMING

Add to Cart (Rs. 299.00) Show Details

klshdho

jpdjld

**Company:** Anchor **Category:** Grocery

ndhhd

djjdj

**Company:** Anchor **Category:** Grocery

ggsg

hhhs

**Company:** Add New **Category:** Grocery

82°F Mostly cloudy 9:06 PM 1/23/2022

Log in to your account - Ecommerce

Not secure | https://localhost:44334/Account/Login

Ecommerce Products Management

Search for a Product... Log in Register Hello User

Log in to your account

EmailAddress

Password

Cancel Log in

82°F Mostly cloudy 9:07 PM 1/23/2022

Log in to your account - Ecommerce

Not secure | https://localhost:44334/Account/Login

Ecommerce Products Management

Search for a Product...  Log in Register Hello User

### Log in to your account

EmailAddress   
Email is Required

Password   
The Password field is required.

© 2021 - Ecommerce -

82°F Mostly cloudy 9:07 PM 1/23/2022

Sign up for a new account - Ecommerce

Not secure | https://localhost:44334/Account/Register

Ecommerce Products Management

Search for a Product...  Log in Register Hello User

### Sign up for a new account

Full Name

Email Address

Password

Confirm Password



Sign up for a new account - Ecommerce

Ecommerce Products Management

Search for a Product...  Log in Register Hello User

### Sign up for a new account

Full Name   
Full Name is Required

Email Address   
Email is Required

Password   
The Password field is required.

Confirm Password   
Confirm Password is Required

© 2021 - Ecommerce -

82°F Mostly cloudy 9:07 PM 1/23/2022

List Of Companies - Ecommerce

Ecommerce Products Management

Search for a Product...  Log in Register Hello User

Company Logo	Company Name	Company Description	Actions
	jdioswhdohw-updated	jopjpd	<input type="button" value="Edit"/> <input type="button" value="Details"/> <input type="button" value="Delete"/>
	Munchee	This is the description of the first Munchee	<input type="button" value="Edit"/> <input type="button" value="Details"/> <input type="button" value="Delete"/>
	Anchor	This is the description of the first Anchor	<input type="button" value="Edit"/> <input type="button" value="Details"/> <input type="button" value="Delete"/>
	Fontera	This is the description of the first Fontera	<input type="button" value="Edit"/> <input type="button" value="Details"/> <input type="button" value="Delete"/> <input type="button" value="Add New"/>

Details of the Company - Ecommerce

Not secure | https://localhost:44334/Companies/Details/1

Ecommerce Products Management

Search for a Product... Log In Register Hello User

## Details for jdioswhdohw-updated



Company Logo  
data:image/jpeg;base64,/9j/4AAQSkZJRGABAQAAAQABAAD/2wCEAAkGBxQUEYUExQW

Company Name  
jdioswhdohw-updated

Company Description  
jopjpj

Show All Edit

© 2021 - Ecommerce -

Add a new Company - Ecommerce

Not secure | https://localhost:44334/Companies/Create

Ecommerce Products Management

Search for a Product... Log In Register Hello User

## Add a New Company

Company Logo

Logo is Required

Company Name

Name is Required

Company Description

Description is Required

Show All Create



List Of Suppliers - Ecommerce

Not secure | https://localhost:44334/Suppliers

Ecommerce Products Management

Search for a Product... Log in Register Hello User

Logo	Full Name	Biography	Actions
	Janith Creations t	This is the Bio of the Supplier	<a href="#">Edit</a> <a href="#">Details</a> <a href="#">Delete</a>
	Shehan Products	This is the Bio of the Supplier	<a href="#">Edit</a> <a href="#">Details</a> <a href="#">Delete</a>
	name	MJ Supplierz	<a href="#">Edit</a> <a href="#">Details</a> <a href="#">Delete</a>
	ado	ado	<a href="#">Edit</a> <a href="#">Details</a> <a href="#">Delete</a> <a href="#">Add New</a>

Add a new Supplier - Ecommerce

Not secure | https://localhost:44334/Suppliers/Create

Ecommerce Products Management

Search for a Product... Log in Register Hello User

## Add a New Supplier

Logo

Full Name

Biography

Show All

Create

Details of the actor - E-commerce x +

Not secure | https://localhost:44334/Suppliers/Details/4

Ecommerce Products Management Search for a Product... Log In Register Hello User

## Details for Janith Creations t



Logo  
http://dotnethow.net/images/actors/actor-2.jpeg

Full Name  
Janith Creations t

Biography  
This is the Bio of the Supplier

Show All Edit

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82°F Mostly cloudy 9:09 PM 1/23/2022

Update Supplier - E-commerce x +

Not secure | https://localhost:44334/Suppliers/Edit/4

Ecommerce Products Management Search for a Product... Log In Register Hello User

## Update the Supplier



Logo  
http://dotnethow.net/images/actors/actor-2.jpeg

Full Name  
Janith Creations t

Biography  
This is the Bio of the Supplier

Show All Update

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82°F Mostly cloudy 9:09 PM 1/23/2022

**Create a new Product**

Product Name	Select Company
<input type="text"/>	Anchor
Manufacture Date	Select Product Category
<input type="text"/> mm/dd/yyyy	Grocery
Expired Date	Select Brand
<input type="text"/> mm/dd/yyyy	Brand 1wdwsdswgff-updated
Product Price	Select Supplier(s)
<input type="text"/>	ado Greanb Hostal Janith Creations t name
Product Image	
Product Description	
<input type="text"/>	
<input type="button" value="Show all"/> <input type="button" value="Create"/>	

**Update Product**

Product Name	Select Company
<input type="text"/> item updated	Fontera
Manufacture Date	Select Product Category
<input type="text"/> 01/01/2022	Fruits
Expired Date	Select Brand
<input type="text"/> 10/30/2098	new
Product Price	Select Supplier(s)
<input type="text"/> 6000	ado Greanb Hostal Janith Creations t name
Product Image	
<input type="text"/> 	
Product Description	
<input type="text"/> cream cracker	

Most Functionality is Shown in the Video Submission!

## 10. Appendices

### 10.1 Meeting Minutes Form

Double click on the document to see it clearly.



### Final Year Project – Supervisory meeting minutes

Meeting No:01

Date : 27<sup>th</sup> October 2021 at 9.00 AM  
Project Title : "Online grocery store" web application and mobile application.  
Name of the Student : B.L.D. Jayasiri  
Students ID : 10707228  
Name of the Supervisor : Ms. Nethmi Weerasinghe  
Meeting Link : <https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fplymouth.zoom.us%2Fj%2F94376619657%3Fpwd%3DNIBtRzhJZ0V5NTZQZ3hacnU5QnV0dz09&data=04%7C01%7C107228%40students.plymouth.ac.uk%7C893e33d050c342c2ea0508d9984ce600%7C5437e7eb83fb4d1abfd3bb247e061bf1%7C1%7C0%7C637708278324664920%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCIjQjoiV2luMzliLCJBtil6lk1haWwiLCJXVCi6Mn0%3D%7C1000&sdat=a=gcpNh0mvzbkLbCizqiPvlnZobxTzHWSNsRn5OzPkE2w%3D&reserved=0>

#### Items discussed:

Discuss with my project approach. As the first supervisory meeting, my supervisor and me discussed about the problem identification and my solution to handle that problem. I come up with basic web application to solve my problem definition and supervise advised me to, develop some kind of an advanced ecommerce web application with user friendly features. she advised me to do some research about other ecommerce web applications in the world and come with good product because it is very important for me to find some good job in the future and get some good grade for the degree.

#### Items to be completed before the next supervisory meeting:

Do some research about other ecommerce web applications in the world.  
To get some idea about what are the functions should be included in an ecommerce web application.  
Advised me to add some features like, admin panel, payment get ways, chat bot.  
Do some research about programming languages to use develop this project.

## 10.2 PID Document

Double click on the document to see it clearly.



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<B.L.D.Jayasiri>

-Online Grocery Store Web Application/Mobile Application-

2021/2022

## 10.3 Project Proposal

Double click on the document to see it clearly.

## **Online grocery store- (Web and Mobile application)**

### **Proposer**

Name: B.L.D. Jayasiri

Index No:10707228

### **Proposed supervisor**

Ms. Nethmi Weerasinghe

### **Problem statement**

These days Covid-19 virus is a serious problem to the whole world. So, it is dangerous to go to crowded places. Not only that but also money cannot be touched by people because Covid-19 virus spread quickly with the money. Because of that reason, grocery shop or supermarket cannot be gone by people for buy essential goods. In order to minimize this struggle, Online grocery store is helping a lot to buy essential goods protecting yourself from the Covid-19 virus.

### **Project description**

My proposal for the final year project is an online grocery store website and mobile application with following requirement:

- The user is allowed to create an account or use face recognition feature to sign-up and login to the system as a customer.
- Things the customer needs can be searched using product categories and find those easily and store in the cart.
- There is a chat bot in these applications and information about products can be received by seller.
- Payment gateways are included to the both systems.
- GPS Tracking system has been included to the both applications for see the order location.
- Language of the online grocery store website can be translated to the Sinhala and Tamil languages for the ease of understanding of the users.
- There is an Admin panel in both applications to manage the products details, customers details, product categories and orders.

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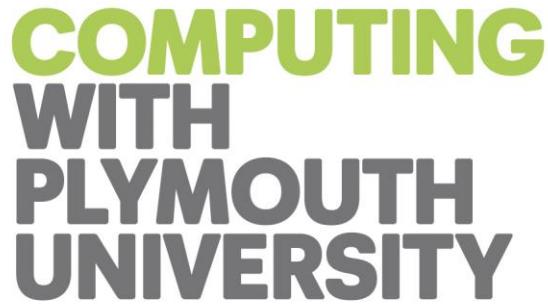
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Final Stage Computing Project

BSc (Hons) <***Software Engineering***>

<B.L.D. JAYASIRI>

<Online Grocery Store – Web Application/Mobile Application>

2021/2022

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# 1. Introduction

## **Online grocery store - Web application and mobile application**

### **1.1 Problem Definition**

As mentioned in previous reports, a virus called Covid 19 has spread around the world quickly. Millions of people around the world have fallen victim to this scourge. Not only that, but also considerable number of people around the world have died because of this Corona strain. Many people with coronavirus infection develop various malformations. As a result, many countries-imposed quarantine curfews, and travel restrictions. People around the world realized that to protect themselves from this disease, they would have to stay indoors instead of going to crowded places. In a situation like this, it is dangerous to go to a crowded shop and buy essential goods. It has been a major factor to socialize with the virus and spreading it quickly. Not only that but also exchanging money with each other is very risky. During the lockdown, people are helpless with no way to go out to buy essential goods and grocery shop owners are not able to run their businesses properly. Because of those problems, People are in a lot of trouble. To overcome those problems, as a developing society we must move to an online system to continue the method of buying and selling essential goods. For that, the need for an online grocery store has arisen. Being protected from the virus, essential goods can be bought by people through an online grocery store website and a mobile application. Also, the business can be continued without any economic losses by the grocery shop owners in any pandemic situation like this. So, I decided to develop an “online Grocery Store” as my final year project to overcome these problems.

### **1.2 The Process So Far....**

As mentioned in the previous interim report, I have just begun to build my final year project, so let us look at the current process of this online grocery store web and mobile application. I hope to achieve some of the key objectives of this online grocery store. They are listed below.

- The main objective of this project is to build an “online grocery store” to solve all situations between the seller and the customer in a traditional grocery shop.
- The project is totally built to protecting human lives from the Covid-19 virus and to prevent the spread of the virus.
- Users can get rid of rascals and save their time by using this online store.
- In a period of a curfew or pandemic like this, the business can be continued to the grocery shop owners, suppliers, and business organizations in a safety's way with help of this project.

I hope to develop my whole project according to the above objectives. It is extremely useful for the customers, grocery shop owners, and the whole society to move forward with this corona situation and any other pandemic like this.

As I mentioned in the previous report, I started to work with ASP.NET Core 5.0 version. It is come up with visual studio 2019 framework. ASP.NET Core 5.0 version is released to the world in year of 2020. It is a new technology and as an undergraduate student I decided to develop my online grocery store web application with the help of this ASP.NET Core 5.0 version. It is a new experience to my programming life. Not only that but also, I started to develop my online grocery store web application with MVC architecture. It is a one kind of a Web API developing format coming up with the ASP.NET core. MVC architecture is a one kind of popular pattern used in web application development. This is my first experience in working with MVC format. So, at the current moment, I have to face some difficulties in some coding parts of my online grocery store web site. To overcome those kinds of problems I follow some YouTube tutorials about ASP.NET core and MVC architecture conducted by foreign software engineers.

At the current situation of my online grocery store web application, users can sign up to the website with their email address and password. After the registration is done, they can login to the web site with the help of previously registered email address and password. At the current moment there are some errors in the login process. But I hope to solve those problems in next two month of time period as well as I can. Every user can easily search product using search box. It is very helpful to every customer. Not only that but also every user

can add product to the cart. Users can update their shopping cart using reduce and plus cart icon. Also, they can get idea about the total price of products in the cart.

In the current situation, I tried to add some payment getaways to my online grocery store web application. But I faced more difficulties in this task. There are different kinds of payment getaways in the world but their prices are very expensive. So, I started to do some research about "how to add payment getaways to a web application". As a result of that, I found a PayPal getaway that helps the developers do their tasks easily. It is a free payment getaway that helps developers to improve their programming skills. So, I added this PayPal payment getaway to my online grocery store web application to do the checkout process for the customers. In the current situation, I completed some tasks of the admin panel. There is only one main admin in this web application. Admin can login to the web site using email address and the password. Admin can manage the suppliers, companies and brands. Not only that but also admin can add new product to the online grocery store. He can manage the product details and product status. About all of these features are discussed detailed in the following topics.

### **1.3 The Process to be....**

By now, the work on my final year project has been completed to some extent and I have put my best effort into that work. At the current situation I added some valuable functions to my online grocery store web application. I hope to make a few more changes in my online grocery store over the next two months. I hope to add some features to the admin panel of my online grocery store. With the help of this feature admin can manage the customer orders. With the help of this feature admin can see all the customer orders. It is very helpful to improve the quality of this online grocery store.

If time permits, I hope to add face recognition login system to this online grocery store web application and the mobile application. This face recognition logging and sign up process is very difficult one for me.

I tried to do some examples but sadly some open CV libraries are not worked properly in my lap top. At the current situation I search some knowledge about these computer vision and AI subjects. Not only that but also, I hope to add supplier tracking system to the online grocery store. It is very useful for the customers to get some tracking idea about their orders. Also, I will do my best to complete all the work properly as I expected.

## **2. Project Objectives**

### **2.1 The Inconvenience that society become**

Corona virus is very dangerous threat to the whole world. However, Today's general public is pushing ahead with the Covid-19 infection. It has been a main consideration to mingle the infection and spreading it rapidly. In a circumstance like this, it is perilous to go to a crowded grocery shop and purchase fundamental merchandise. That as well as trading cash with each other is exceptionally hazardous. During the lockdown, individuals are vulnerable with no real way to go out to purchase fundamental merchandise and staple retailers can't maintain their organizations appropriately. Due to those issues, People are in a tough situation.

Food is a major need of every people in the world. During the pandemic of Covid-19, grocery shops are crowded by the people for buy essential goods. Because of that it is a very dangerous case to both sellers and customers. Thus, it is exceptionally hazardous to go to a packed basic food item shop to purchase fundamental products in a circumstance like this. That as well as, there is cash in the staple shop coming from all over the place. Due to the utilization of cash contacted by various individuals, the infection can be spread with each other's without any problem. At a time when the Corona epidemic was spreading rapidly, many countries around the world-imposed travel restrictions for the safety of the people. As a result of that Sri Lankan government also imposed curfews and travel restrictions on the entire island to control the epidemic. In this time period normal people faced some serious kind of difficulties to move their life forward with this Covid 19 pandemic. During this quarantine period, many poor people as well as all other people had some difficulty in fulfilling their basic needs. Wealthy people were tempted to stockpile as much food and other essentials as they could in their homes. As a result, ordinary people could not afford to stockpile such essentials, much to their chagrin. So many problems arose in the society.

Not only that, many ordinary people use public transport services to come to the grocery shops to buy essential goods. It is not advisable to use public transport during such periods. Public

transport services carry unidentified people from various parts of the country, which greatly aids the spread of the corona virus. Also, the use of such public transport services wastes a lot of people's time and effort. Not only that but also, there are several other major issues that consumers face in a typical store. Let us now turn our attention to that. In a traditional grocery shop or a super market, the customer has to walk all over the store with their luggage to buy the product they want. Sometimes they have to touch and buy goods touched by different kind of peoples. It is not a good thing and its help to spread the virus each other's. Not only that but also, in a large supermarket, Customers have to get help from the staff for select their items and grocery shop owners also have to deployed many staff around the shop. So, it is waste lot of time to buy essential goods in a grocery shop. sometimes customers have to be waited in a long queue near the cashier for do the payments. Because of staying lot of time in the shop virus can be infected easily.

In this Covid situation, the business cannot be continued by the grocery shop owners in a proper way. Economic losses have to be incurred by the shop owners because shop have to be closed from time to time. So, During the Covid-19 Pandemic, the current method of buying and selling essential goods is not necessary. If the people cannot buy essential goods because of the Covid-19 pandemic and resulting of lockdown, protests can be arisen against the government through the society. Also, because of the lost working hours and due to job losses, the country's economy is declining. All of those problems are really affected for the future of the country.

These are some serious problems facing society now a days because of this Corona pandemic. So, I definitely hope to solve all these kind of problem by my online grocery store. The following are some of the steps I have taken to address the above issues in my project.

- Setting up a way to people for buy essential goods online stay from home.
- Allows customer to do the payments with online payment methods.
- Remove the difficulty of buy essential goods in a lockdown.
- Providing the opportunity to buy essential goods and select the items for the people in any time of the day.
- Removes the need of having staff around for proposes such as helping to the customers.
- The process of browsing an item would be much easier.
- Reduces time and labour spent on browsing for an item.
- Reduce the economic loses of grocery shop owners in pandemic situations and lockdown.
- Remove the use of public transport services when going to the shopping.

## 2.2 Social mission

This project answers all the social issues mentioned above. Also, a brief overview of the steps taken by this project to address the issues mentioned above is given at the end of the above topic. In addition, this online grocery store will greatly benefit the entire community. It enables all people to move forward without fear in the face of severe disasters such as corona in society. Let us now take a look at the services rendered to the community by this online grocery store one by one.

- This online grocery store protects people from the corona straw and allows them to shop at home. It is a great benefit to the whole society through this project.
- Also, anyone in any area at any time of the day can purchase the items they want through this online grocery store.
- Also, this online grocery store helps a lot to get rid of the problems that people face when leaving home during the quarantine period.
- Not only that but also, with the help of this online grocery store people can buy essential goods by online payment method s. So, they do not have to touch money.
- People do not have to use public transportation to go shopping. So, it is very useful to prevent from the corona virus.
- It saves people time and labour and reduces unnecessary expenses.
- There is no need to unnecessarily stockpile essential items during the quarantine period.
- The security of money is ensured as online money transfer takes place. People do not have to deal with the inconveniences of a typical grocery shop.
- To analyse user requirement for the online grocery store website and mobile application in line with new processes and procedures and come up with user friendly system.

- To provide a safe way to organization and sellers to continue their business.
- People can use this online grocery store in any pandemic situation like this. It is very helpful for the whole world.
- The venture is completely worked to shielding human lives from the Covid-19 infection and to forestall the spread of the infection.
- In a time of a check in time or pandemic like this, the business can be proceeded to the basic food item retailers, providers, and business associations in a well-being's way with assistance of this undertaking.

As such, this online grocery store offers a great deal of social support. Therefore, there is less chance of unnecessary problems in the society.

### **2.3 Objectives that are important to me**

As an undergraduate student, this is my first experience with work this kind of a big project. This project can bring a lot of benefits to the society as well as to me. From the day I started creating this online grocery store, I was able to learn a lot of new things. It was very helpful to improve my learning and improve my programming skill very much. Not only that but also, I can get lot of life experiences about how to work with this kind of a large projects. It is very helpful for my future and industrial life. Let us now examine one by one some of the benefits I can gain in my life by doing this project.

- As a result of a report writing and reading some kind of a research papers, I can improve my English knowledge very well. Not only that but also, I can get a complete and good idea about how to write a PID report, Interim report, project proposal in a correct format. It is very helpful for my future industrial life.
- This project will give me a better understanding of the issues that may arise in moving a project forward. Not only that but also it gives a good risk management knowledge to manage some risks in a correct way.
- This project is very helpful for me to improve my self-confidence.
- While working with this online grocery store project, I can learn a lot about project management and project management life cycle.
- To analyse potential development technologies and deployment solutions.
- Because of this online grocery store web application, I can improve my programming skill about new programming language like ASP.NET Core and C# languages.
- To learn about Model, View, Controller architecture.

## **3. Initial Scope**

### **3.1 A Summary about the research**

The main topic of my research is the Covid 19 virus and how it affects the lives of ordinary people. Most of the focus is on how ordinary people can meet their basic needs during these difficult times and how grocery shop owners run their business without any economic losses in the quarantine period. These days, despite the presence of corona virus in the society, people carry out their daily activities as usual. It is a sign that the number of corona infections in the country is on the rise and the re-launch of travel restrictions in the country is a foregone conclusion. During this time, I began to explore, one by one, what I needed to do to successfully complete my final project. Let us now turn our attention to that.

For a start, I went to the grocery store nearest to my house and observed how transactions between customers and service providers took place. There I saw a lot of mistakes and omissions on the part of the customer as well as the service providers. At certain times of the day many people gather inside the shop to buy essential goods and during that time there was some congestion in the grocery shop. I saw some customers as well as some service providers walking around the grocery store half-masked and doing their job. Some of them were not wearing masks. Similarly, the consumer has to wait in long queues to buy goods near the cashier. There are times when the grocery shop is overcrowded and it is not possible to maintain the one-meter gap. Not only that but also some people do not use water and soap or hand sanitizers to clean their hands. Also, the staff of the grocery shop do not use hand sanitizers to disinfect the money given by consumers. Also, this money is exchanged

between the people who come to the shop. Therefore, it is clear from these observations that transactions in a traditional grocery shop do not comply with the quarantine rules. At a time when there is a corona virus in the society, doing so poses a great threat to the whole country. There is a risk of an increase in the number of corona infections in the country. So, this current method of buying and selling essential goods in a grocery shop is not necessary for this quarantine period.

Not only that but also as a start point of this project, Current method of buying and selling goods in a grocery shop and their shortcomings during the covid-19 period will be identified by questionnaires and interviews. As a next part of my research , I selected some ordinary level people of my village and asked them about, the way of customer and seller dealing with each other's in a traditional grocery shop, customer employee interactions, what are the difficulties customers face in a grocery shop , general rules of a grocery shop and , Current method of buying and selling goods in a grocery shop and their shortcomings during the covid-19 period to collect some information to my final year research. Many of them said that they had a hard time buying the goods they needed during the curfew. They also stated that they had to face a lot of difficulties while leaving their homes to buy essential goods. They also said that people who have been quarantined at home due to corona disease facing very difficulties to find the food they need. Many of them claim that they are wasting a lot of time, effort and money when they are shopping in a normal grocery store.

Above I have mentioned some of the important points that I have discovered.

## 3.2 Proposed System

As result of my research I proposed a system to overcome that kind of serious problems mentioned below. I analysed existing method of buying and selling essential goods and provide recommendations to do it in an online platform. [E.g.: Online Grocery Store] 2. Also, I analysed user requirement for the online grocery store website and mobile application in line with new processes and procedures and come up with user friendly system. As I mentioned in the previous PID document the proposed system will allow,

- a) customers to easily signup and signing to the system using face recognition feature.
- b) Things the customer needs can be searched using product categories and find those easily and store in the cart.
- c) Confidence that the customer has about client and the interaction are improved because of using the chat bot and customers can get valuable information about projects.
- d) Customers to do the payment easily with the online payment methods or cash on delivery.
- e) View the orders delivery status and get the information about delivery.
- f) For more understanding purpose of the customer, web application language can be translated Sinhala and Tamil languages.
- g) Grocery shop owners to manage product details, customer details, product categories and orders with the help of admin panel.

## 3.3 Changes in the plan and Process so far...

Current progress and features list of my online grocery store,

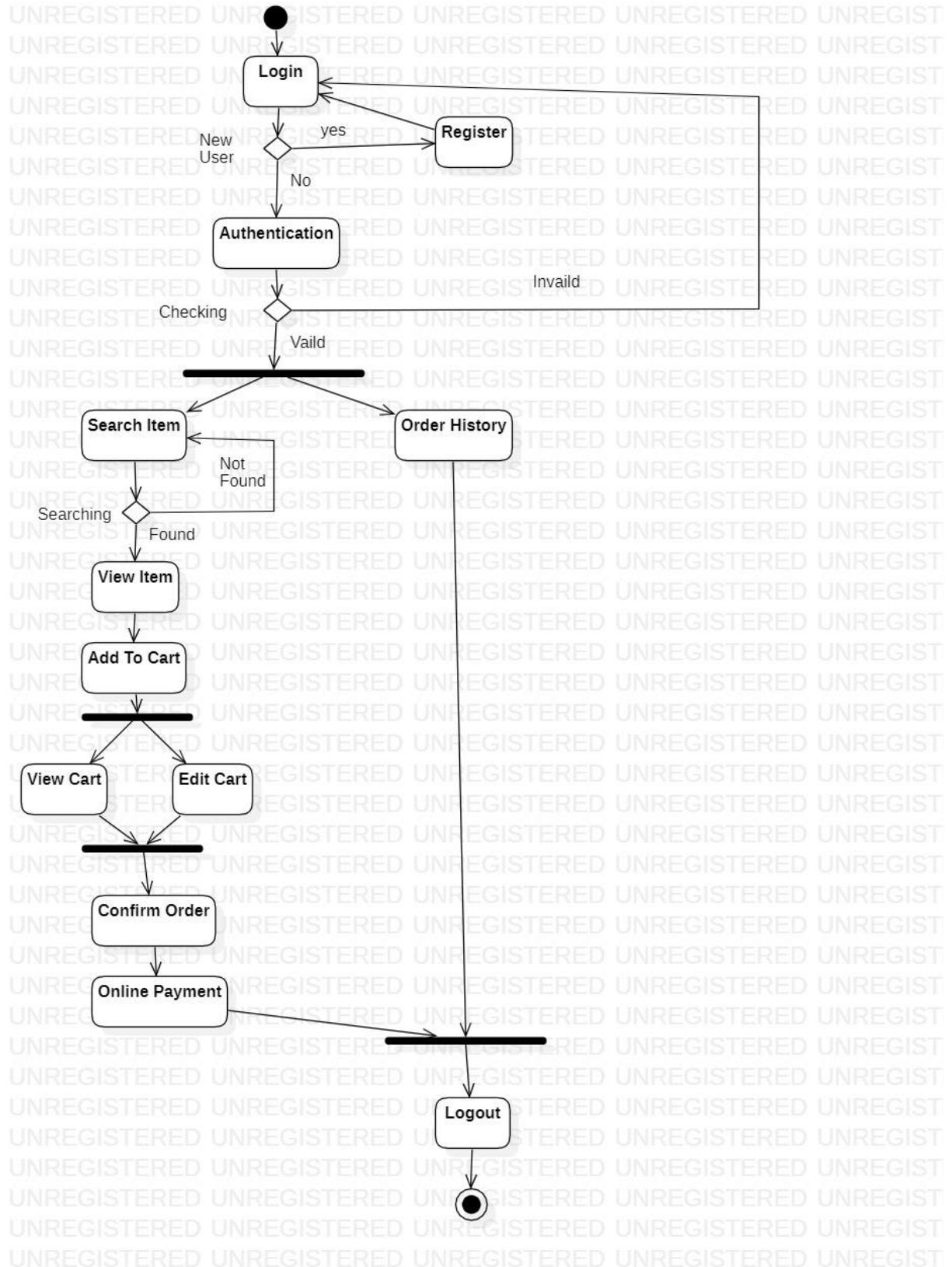
- a) User wise logging system – Divide main admin and the normal user from same logging
- b) Normal users can sign up and login to the system with their email address and the password.
- c) This online grocery store has responsive user interfaces.
- d) Normal users can search product easily with the help of the search bar.
- e) Customers can add their favourite product to the shopping cart.
- f) Customers can do the checkout using PayPal getaway.
- g) Main admin allows to add new product items, update items and delete items from the online store.
- h) Main admin allows to add new Brand names, update and delete Brand names from the online store.
- i) Main admin allows to add new suppliers, update and delete suppliers from the online store.
- j) Main admin can manage the order list of the customers.
- k) Suppliers tracking feature – process to be complete

This is the current progress of my online grocery store. At the current moment some of these features are still processing, but I think I can fix those bugs and errors in next several weeks and I hope to come up with complete production. Also, I hope to add some more user-friendly features to this online grocery store if the time is permitted to me. Additionally, I will give my all to finish basically everything appropriately as I anticipated.

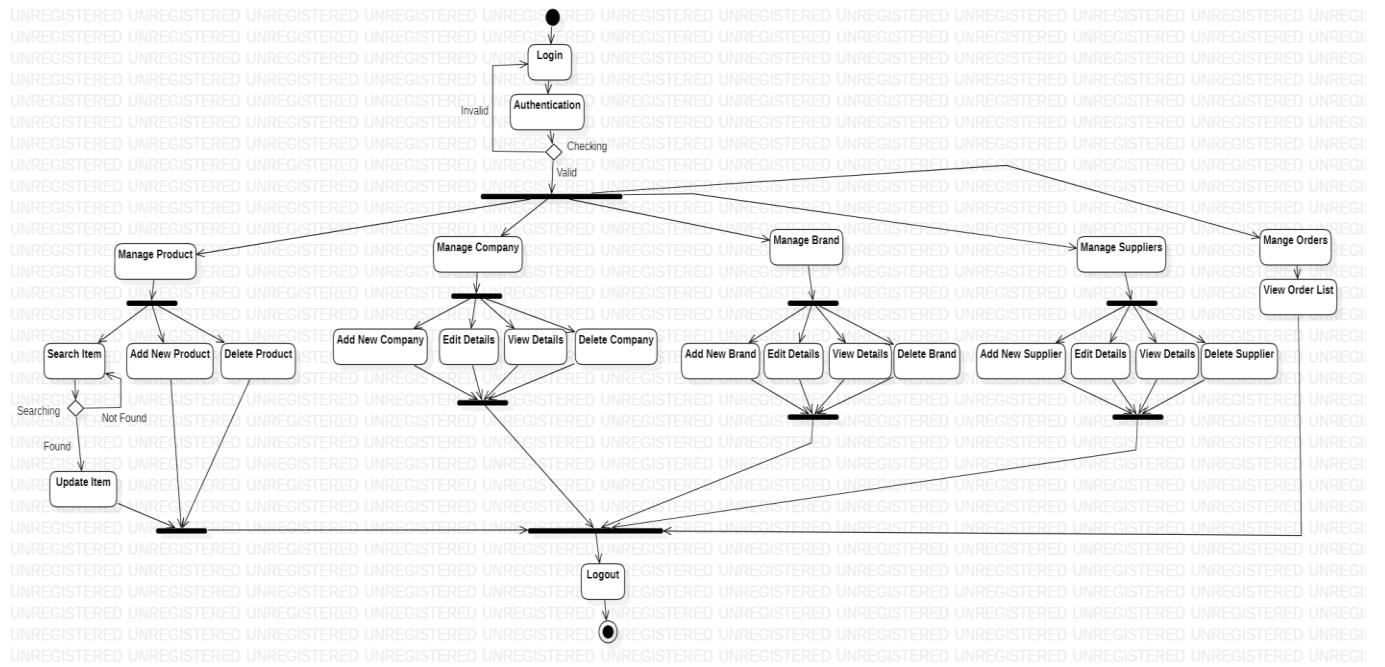
## 4. System Architecture

### 4.1 UML Activity Diagram

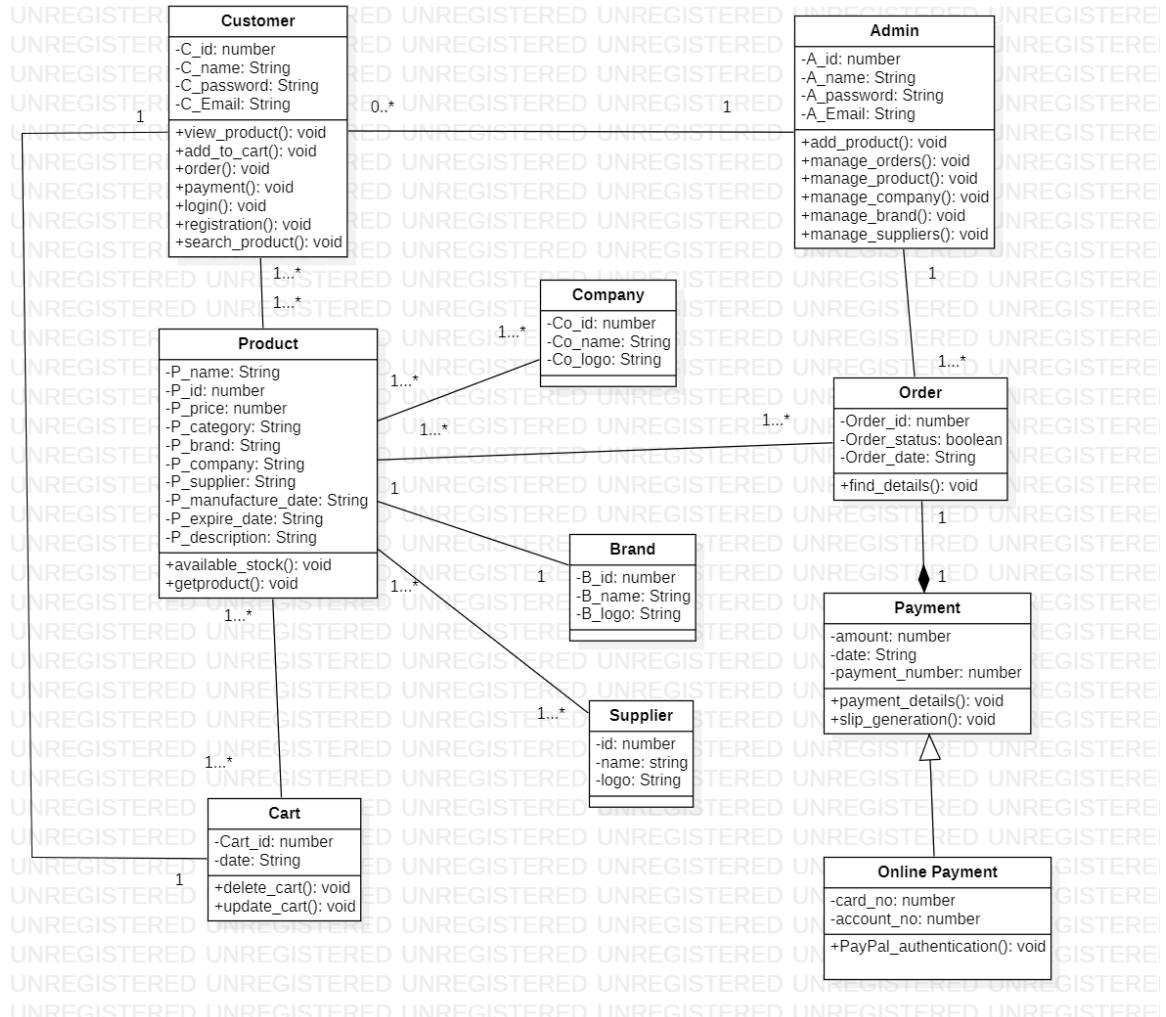
#### 4.1.1 Client Side



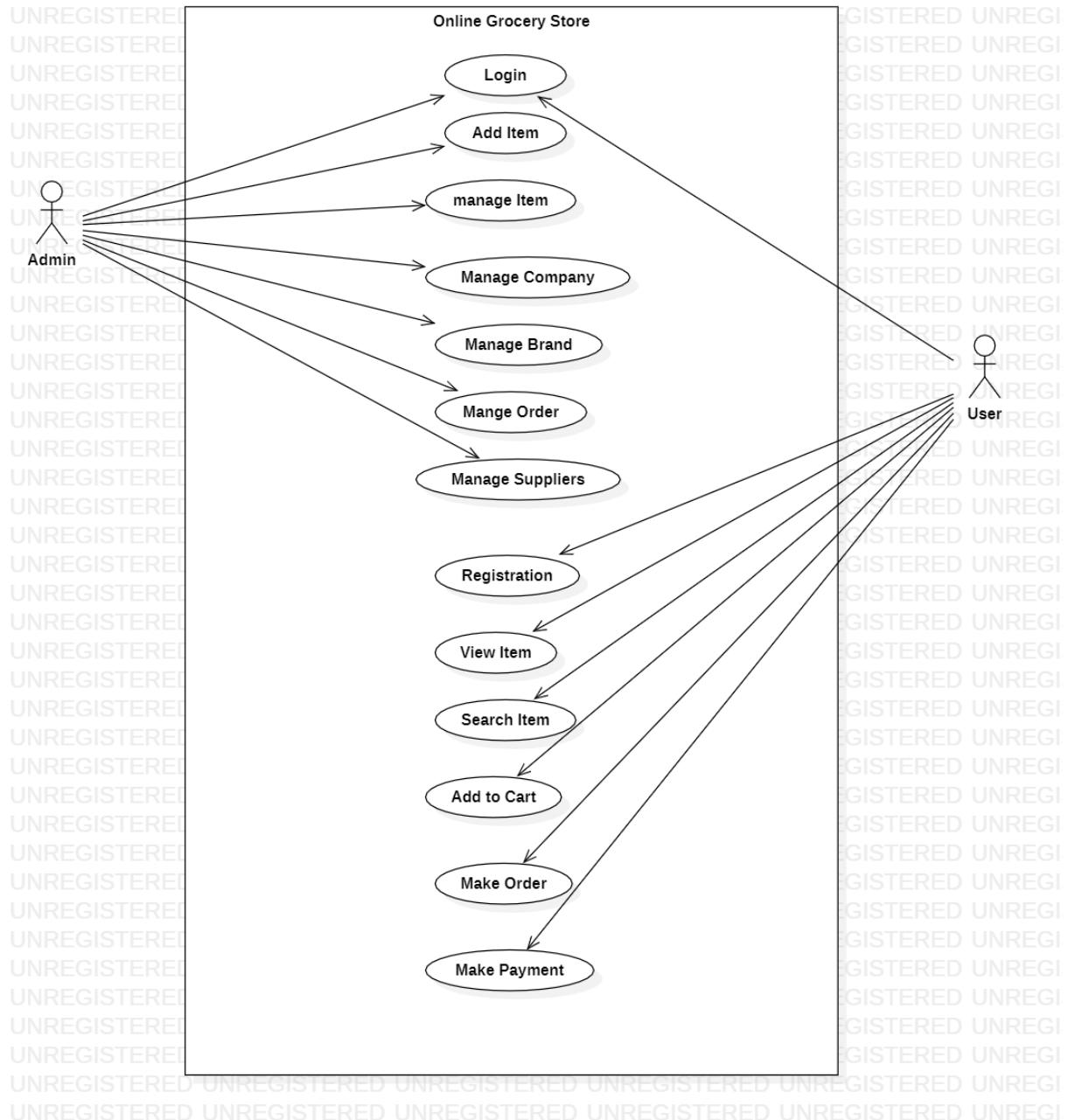
#### 4.1.2 Admin Side



## 4.2 UML Class Diagram

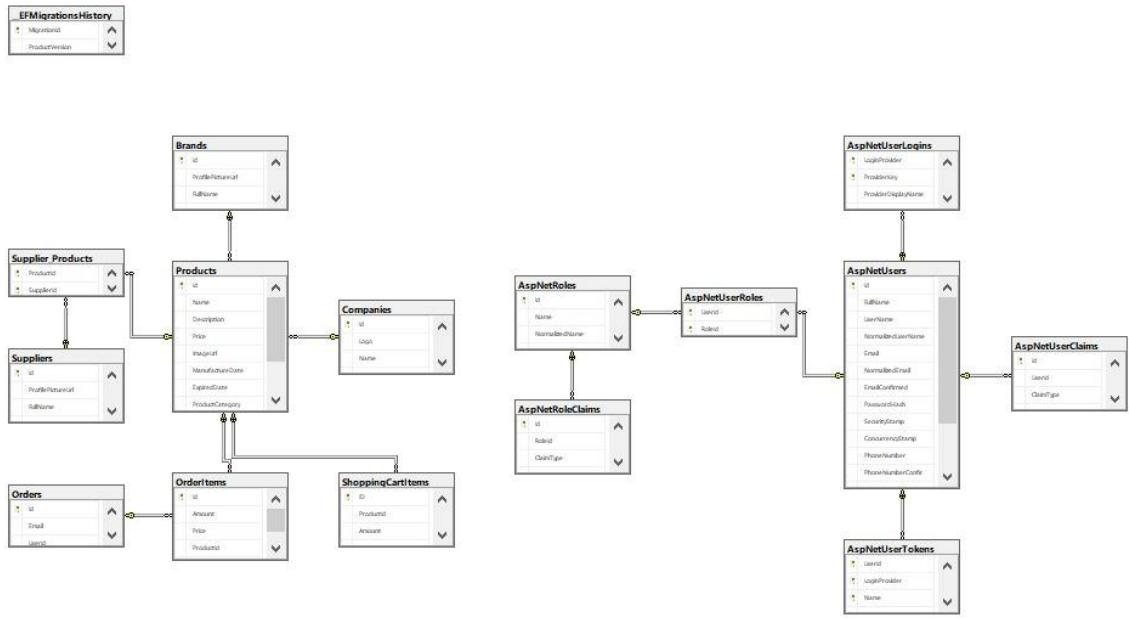


### 4.3 UML USE-CASE Diagram



### 4.4 Database Structure

This is the Database Structure of my “Online Grocery Store” web application.



## 5. Task Undertaken and Outcomes

### 5.1 Task Undertaken

As my final year project, I accepted to develop an online grocery store web application and a mobile application to do the current method of buying and selling essential goods in a traditional grocery shop in an online format. Presently days, the cutting-edge society is going ahead with ICT and Software designing. After the Covid 19 infection, there is a tremendous measure of interest in the programming field. The greater part of organizations and the associations from one side of the planet to the other began to proceed with their works in a web-based stage after this crown pandemic. In this way, programmers needed to created different sorts of frameworks to finish these sorts of errand. At the pinnacle level of the Covid-19 infection, there were various types of Online banking applications designed for the Sri Lankan market because of it. That, as well as there, was a large number sort of promoting and business sites put resources into this season of the period. Keeping the above to me, an "Online Grocery store" is proposed by me as an answer for proceeding with the current means of trading fundamental merchandise keeping from the Covid-19 infection. With the help of this framework, each individual can purchase merchandise stay from the home and basic food item retailers can run their business through the site. It is entirely important for nowadays and any sort of pandemic like this. I totally develop this online grocery store to continue the current method of buying and selling essential goods preventing from the Covid 19 virus. Not only that but also people can get the help of this online grocery store to prevent them lives from the new dangerous variant of corona virus like omicron as well as any pandemic situation like this. There are some different kind of purposes to come up with this kind of system.

Following are some of them.

- The principal objective of this undertaking is to construct an "online grocery store" to tackle them all circumstances between the dealer and the client in a customary basic food item shop.
- In period of a curfew or pandemic like this, business can be continued to the grocery shop owners, suppliers and business organizations in a safety's way with help of this project.

At the moment there are some similar projects in the world. I hope to come up with new user-friendly features in my system. Talking about my project, I hope to develop both web and mobile applications of the "online grocery store" if the time is permits for my development process. For the development of the web application, ASP.NET Core 5.0 version is used by me. It is a new technology released on 2020. ASP.NET Core is advanced than ASP.NET and it is the newest updated version of ASP.NET. Visual Studio 2019 framework is used by me to do the coding. Not only that but also MVC architecture is used to develop my Online Grocery store web application. It is one kind of a web API developing format coming up with the ASP.NET.CORE. MVC is stand for Model-View-Controller.

These concepts are discussed more detailed in following topics. As a dynamic web application, the validations and the crud operations are included right places. In Every Form (Form means, the page is to input some credentials to the users with some text fields etc.) was created so far in this we application, a validation was included near every required field. It is very important in produce a product like this into the market and it is a very good programming skill. The main purpose of this project is to solve the all situations between the seller and the customer in a traditional grocery shop. For that there are some special functions must be included to this web application. For do that task, search function, add to cart function, delete from the cart function, way to purchase the product for the customer are included by me to this system. Not only that but also there are some many more features in my project. These concepts are also discussed more detailed in following topics.

## 5.2 User interfaces and Functions developed so far...

### 5.2.1 Home page

Rice	item 2	njkxshgs
 shehan chamika <b>Company:</b> Fontera <b>Category:</b> Fruits <b>Manufactured Date:</b> 01 Jan 22 <b>Exp Date:</b> 30 Oct 98 <b>Status:</b> AVAILABLE	 hghgsg <b>Company:</b> fdfedf <b>Category:</b> Provisions <b>Manufactured Date:</b> 10 Oct 21 <b>Exp Date:</b> 01 Jan 22 <b>Status:</b> EXPIRED	 duhduo <b>Company:</b> Anchor <b>Category:</b> Grocery <b>Manufactured Date:</b> 10 Oct 22 <b>Exp Date:</b> 10 Oct 22 <b>Status:</b> UPCOMING
<a href="#">Add to Cart (Rs. 6000.00)</a> <a href="#">Show Details</a>	<a href="#">Add to Cart (Rs. 500.00)</a> <a href="#">Show Details</a>	<a href="#">Add to Cart (Rs. 299.00)</a> <a href="#">Show Details</a>
kishdho	jidhhdh	ndhhhd

This is the home page of my Online grocery store web application. First of all, this interface is the first thing that every normal user can see. This window is designed as a responsive user interface with the help of bootstrap. by this window normal users can see every product in this online grocery store web application have. Every normal user can register to the web site with a new account using the blue colour Register button and they can log in to the system using the green colour log in button. Not only that but also, they can search product easily from the search bar. Also, users can show some details and get and more information about any product in the web application using the show details button and they can store their favourite product in the shopping cart using the green colour add to cart button. After an any user logged in to the system below window is changed as following.

Rice	item 2	njkxshgs
 shehan chamika <b>Company:</b> Fontera <b>Category:</b> Fruits <b>Manufactured Date:</b> 01 Jan 22 <b>Exp Date:</b> 30 Oct 98 <b>Status:</b> AVAILABLE	 hghgsg <b>Company:</b> fdfedf <b>Category:</b> Provisions <b>Manufactured Date:</b> 10 Oct 21 <b>Exp Date:</b> 01 Jan 22 <b>Status:</b> EXPIRED	 duhduo <b>Company:</b> Anchor <b>Category:</b> Grocery <b>Manufactured Date:</b> 10 Oct 22 <b>Exp Date:</b> 10 Oct 22 <b>Status:</b> UPCOMING
<a href="#">Add to Cart (Rs. 6000.00)</a> <a href="#">Show Details</a>	<a href="#">Add to Cart (Rs. 500.00)</a> <a href="#">Show Details</a>	<a href="#">Add to Cart (Rs. 299.00)</a> <a href="#">Show Details</a>

Using this red colour log out button any user can log out from the system.

## 5.2.2 Search items using search box

The screenshot shows a product detail page for 'Rice'. At the top, there's a navigation bar with 'Ecommerce', 'Products', 'Management', a search bar containing 'Rice', a magnifying glass icon, a user dropdown 'Hello admin-user', and a 'Log out' button. The main content area has a teal header 'Rice' with a close button. Below it is a product image of a rice container labeled 'කොළඹ පෙරේල්'. To the right of the image, product details are listed: 'shehan chamika', 'Company: Fontera', 'Category: Fruits', 'Manufactured Date: 01 Jan 22', 'Exp Date: 30 Oct 98', and 'Status: AVAILABLE'. At the bottom of the card are two buttons: 'Add to Cart (Rs. 6000.00)' and 'Show Details'.

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Ecommerce web application definitely need a search box to search user needs and find that needs to the users very easily and very quickly. It is a major user Requirement of an any web application. So, as I planned before, I decided to add a search function to my “online grocery store” web application. Using it, client/customer can easily find the products by without time wasting throughout the web site. When a user types a product name and hit the search button, application will give an output window to the user of the product that the user searched before. At the current stage of this web application, users can search product using product name only. I hope to improve the current code for that the users allow to search products using product description. It helps to maintain the quality of this “Online grocery store” web application and users can get their service without a rash. Using the “Products” button of the top left corner, users can move to the previous window. All the interfaces are designed as responsive user interfaces.

## 5.2.3 User registration/Sign up

The screenshot shows a sign-up form titled 'Sign up for a new account'. At the top, there's a navigation bar with 'Ecommerce', 'Products', 'Management', a search bar containing 'Search for a Product...', a magnifying glass icon, a user dropdown 'Hello User', and a 'Log in' button. The form itself has fields for 'Full Name' (containing 'lasindu'), 'Email Address' (containing 'lasindu@123'), 'Password' (containing '...'), and 'Confirm Password' (containing '123'). At the bottom are 'Cancel' and 'Sign up' buttons.

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This is the user registration window of this online grocery store web application. This window is also design as responsive user interface with the help of bootstrap. Using this sign up form new normal user can register to the web application by creating a new account. For that, user need to fill some text fields. At the first text field user has to enter his name and in the second text field he has to enter his valid e-mail address. After the compilation of the password and confirm password fields new user can register to the web application using green color sign up button. Password and the confirm password should be matched for to create the user account. If the registration process is done successfully, the web application gives a output massage to the user as bellow.

## Your account was created successfully

You can now log in to your account using your credentials.

Thank you!

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Not only that but also, Users need to fill every required field without skipped, to register in this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables.

### Sign up for a new account

Full Name

Full Name is Required

Email Address

Email is Required

Password

The Password field is required.

Confirm Password

Confirm Password is Required

[Cancel](#)

[Sign up](#)

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After the registration is success, user can log to the web site using that Email address used in the registration process. I hope to improve this registration and logging process with some other user-friendly features, if the time is enough to me.

#### 5.2.4 User Wise Login

The screenshot shows a login form titled "Log in to your account". It includes fields for "EmailAddress" (containing "admin@ecommerce.com") and "Password" (containing a masked password). Below the fields are "Cancel" and "Log in" buttons. At the top, there's a navigation bar with "Ecommerce Products", a search bar, and links for "Log in" and "Register".

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This is the login page of this online grocery store web application. Its Divide main admin and the normal user from same logging. Main admin as well as the normal users can login to the online grocery store web application using this login form.

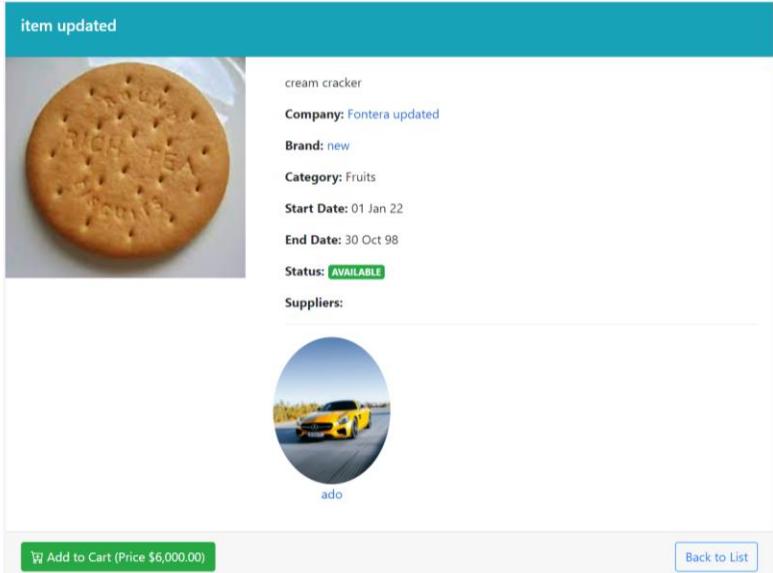
Main admin can login to the admin panel of this online grocery store web application by using email address and the password. Also, the normal users can login to the web application by using registered user email address and password. Not only that but also main admin as well as normal users should be filled this two required fields to successfully complete this login task.

The screenshot shows the same login form as above, but with validation errors. The "EmailAddress" field has a red error message "Email is Required". The "Password" field also has a red error message "The Password field is required". The "Cancel" and "Log in" buttons are at the bottom.

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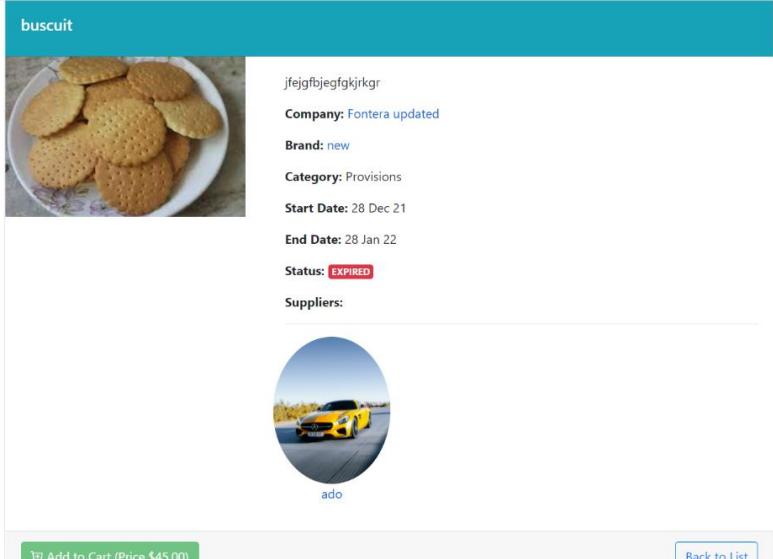
These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables. This user interfaces are also designed as responsive user interface with the help of bootstrap.

### 5.2.5 Show details page



The screenshot shows a product detail page for a "cream cracker". The top bar is teal with the text "item updated". Below it is a large image of a round, textured cookie. To the right of the image, the product name "cream cracker" is displayed. Underneath the name are several product details: Company: Fontera updated, Brand: new, Category: Fruits, Start Date: 01 Jan 22, End Date: 30 Oct 98, Status: AVAILABLE, and Suppliers: ado. At the bottom of the page are two buttons: a green "Add to Cart (Price \$6,000.00)" button and a blue "Back to List" button.

This is the show detail page of one of the products in this online grocery store. Users can get an idea and information about any product using this show details page. It shows the product name, company, brand name, product category, date of manufacture, expire date, availability status and the supplier's details of any product. It is very helpful for the normal users and it improve the quality of this web site. Normal users can add this product in to the shopping cart using green colour add to cart button. When the product expiration date expires, the status is updated automatically as Expired as display below.



The screenshot shows a product detail page for a "biscuit". The top bar is teal with the text "buscuit". Below it is a large image of a white plate filled with round biscuits. To the right of the image, the product name "jfejgbjegfgkjkgr" is displayed. Underneath the name are several product details: Company: Fontera updated, Brand: new, Category: Provisions, Start Date: 28 Dec 21, End Date: 28 Jan 22, Status: EXPIRED, and Suppliers: ado. At the bottom of the page are two buttons: a green "Add to Cart (Price \$45.00)" button which is disabled (grayed out), and a blue "Back to List" button.

When the product is expired, users can not add this item to the shopping cart because the add to cart button locks automatically. Using the blue colour back to list button user can move to the home page of this online grocery store web application.

## 5.2.6 Shopping Cart

The screenshot shows a shopping cart summary page. At the top, there are navigation links for Ecommerce, Products, Management, a search bar, and user account options (Log in, Register, Hello User). The main title is "Your shopping cart summary". Below it is a table with columns: Selected amount, Product, Price, and Subtotal. Two items are listed: 2 carrots at \$50.00 each (Subtotal: \$100.00) and 1 biscuit at \$23.00 (Subtotal: \$23.00). A total row shows a total of \$123.00. At the bottom right are buttons for "PayPal Checkout" and "Add more items".

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This is the shopping cart of this online grocery store web application. It shows a summary about product items stored in the cart. By this shopping cart, normal users can store their wanted items in it. Not only that but also users can see the total price of the items, that are stored in the shopping cart. Also, they can delete and reduce items from the shopping cart by using red colour minus cart button and they can increase the amount of the item using green colour plus cart button. Finally, users can do the checkout process by using PayPal payment getaway.

## 5.2.7 Admin Panel

The screenshot shows the admin panel interface. At the top, there are navigation links for Ecommerce, Products, Management, a search bar, and user account options. The main area displays a grid of product cards. Each card includes a thumbnail image, a unique identifier, and product details: cream cracker (Company: Fontera, updated), njkxshgs (Company: Anchor, updated), klshdho (Company: Anchor, updated), ndhhd (Company: Anchor), carrot (Company: Anchor), and gfddsf (Company: Anchor). Each card has an "Add to Cart" button and a "Show Details" link. In the bottom right corner of the grid, there is a green "Add New" button.

This is the view of the admin panel. This view is only visible for the main admin. Normal users cannot see this interface. By using green colour Add New button displayed on the bottom right corner of this web application, admin can add new product to this online grocery store web application.

The screenshot shows the admin panel interface with a focus on the "Add New" button. The grid of products is identical to the previous screenshot. A blue arrow points to the "Add New" button in the bottom right corner of the grid. The button is green with white text.

By using management button main admin can see the details about Companies, Brands and suppliers involve with this online grocery store.

The screenshot shows a dashboard with three cards. The first card is for 'Companies' with the title 'Rice' and a placeholder 'shahan chamika'. The second card is for 'Brands' with the title 'item 2' and a placeholder 'hhhsns'. The third card is for 'Suppliers' with the title 'njkxshgs' and a placeholder 'dubhdun'. At the top, there are navigation links for 'Ecommerce', 'Products', and 'Management'. A search bar, user info 'Hello admin-user', and a 'Log out' button are also present.

These functions are explained detailed in the following topics.

### 5.2.8 Add New Product Function

The screenshot shows the 'Create a new Product' form. It includes fields for 'Product Name' (empty), 'Select Company' (set to 'Anchor'), 'Manufacture Date' (empty), 'Select Product Category' (set to 'Grocery'), 'Expired Date' (empty), 'Select Brand' (empty), 'Product Price' (empty), 'Select Supplier(s)' (list showing 'ado', 'Greanb Hostal', 'Janith Creations t name'), 'Product Image' (empty), and 'Product Description' (empty). Below the form are 'Show all' and 'Create' buttons.

Main admin can create a new product using this interface. For do that admin have to completed all these required fields in this form. Admin can enter the manufacture date and the expire date easily with the calendar option. Also, the admin can add product image easily with using google and copy the image address to the product image text field. Then product image is visible under the product description. It is a very good feature of this online grocery store.

The screenshot shows the 'Create a new Product' form with a product image added. The 'Product Image' field contains the URL 'https://static.toiimg.com/photo/msid-7C...'. Below the form, a thumbnail image of a milk bottle and glass is displayed. The rest of the form fields are identical to the previous screenshot.

By using green colour create button, new product can be displayed in the online store.

### 5.2.9 Update Product Function



The screenshot shows a product detail page for "item 2". On the left is a thumbnail image of a rice container with the text "කාබු සහල" below it. To the right are the following details:

- Company:** fdfedf
- Category:** Provisions
- Manufactured Date:** 10 Oct 21
- Exp Date:** 01 Jan 22
- Status:** EXPIRED

At the bottom are two buttons: "Add to Cart (Rs. 500.00)" and "Show Details". A red circle highlights the edit icon (pencil) in the top right corner of the product header.

By Using this pencil mark admin can update the product details. This pencil mark is only visible for the admin panel of this online grocery store web application. After clicking this pencil mark, it gives an output window interface as bellow.

#### Update Product

Product Name	Select Company
<input type="text" value="item 2"/>	<input type="text" value="fdfedf"/>
Manufacture Date	Select Product Category
<input type="text" value="10/10/2021"/> 	<input type="text" value="Provisions"/>
Expired Date	Select Brand
<input type="text" value="01/01/2022"/> 	<input type="text" value="new"/>
Product Price	Select Supplier(s)
<input type="text" value="500"/>	<input type="text" value="ado"/> <input type="text" value="Greanb Hostal"/> <input type="text" value="Janith Creations"/> <input type="text" value="Shehan Chamikaz"/>
Product Image	
<input type="text" value="data:image/jpeg;base64,/9j/4AAQ"/>	
Product Description	
<input type="text" value="hghgsg"/>	

## 5.2.10 Company Interface

Company Logo		Company Name	Company Description	Actions		
	Anchor updated		This is the description of the first Anchor	<a href="#"> Edit</a>	<a href="#"> Details</a>	<a href="#"> Delete</a>
	Fonterra updated		This is the description of the first Fonterra	<a href="#"> Edit</a>	<a href="#"> Details</a>	<a href="#"> Delete</a>

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[!\[\]\(97b985f10292d65284476b0e77871f13\_img.jpg\) Add New](#)

This is an interface that shows about the companies that involve with this online grocery store web application. This interface is only visible to the admin panel of this web site. Only the main admin has the permission of adding new companies to the online grocery store. Admin can add a new company to the online grocery store by using green colour add new button on the lower right corner of this interface.

Ecommerce		Products	Management	Search for a Product...		<a href="#"> Log in</a>	<a href="#"> Register</a>	<a href="#"> Hello User</a>
<h3>Add a New Company</h3>								
<p>Company Logo</p> <input type="text"/> <p><small>Logo is Required</small></p> <p>Company Name</p> <input type="text"/> <p><small>Name is Required</small></p> <p>Company Description</p> <input type="text"/> <p><small>Description is Required</small></p> <p><a href="#">Show All</a> <a href="#" style="border: 1px solid green; padding: 2px;">Create</a></p>								

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As I mentioned in the previous functions, the admin can add Company Logo easily with using google and copy the image address to the Company Logo text field. Then the logo is visible under the Company description. It is a very good feature of this online grocery store. Admin need to fill every required field without skipped, to add new company into this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiusses the intrusion null values to the database tables. By using green colour create button, new company can be displayed in the previous chart.

Also, admin can update, delete and view details of the companies in this online grocery store.

## Update the Company



Company Logo

data:image/jpeg;base64,/9j/4AAQSkZJRgABAQAAAQABAAAD/2wCEAAkGBw0QEhANDQ0F

Company Name

Anchor updated

Company Description

This is the description of the first Anchor

[Show All](#)[Update](#)

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## Details for Anchor updated



Company Logo

data:image/jpeg;base64,/9j/4AAQSkZJRgABAQAAAQABAAAD/2wCEAAkGBw0QEhANDQ0F

Company Name

Anchor updated

Company Description

This is the description of the first Anchor

[Show All](#)[Edit](#)

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### 5.2.11 Brand Interface

Ecommerce Products Management ▾

Search for a Product...  Log in Register Hello User ▾

Logo	Brand Name	Description	Actions
	Brand updated	dsds	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>
	new	new	<a href="#">Edit</a>   <a href="#">Details</a>   <a href="#">Delete</a>

© 2021 - Ecommerce - [Add New](#)

This is an interface that shows about the brands that involve with this online grocery store web application. This interface is only visible to the admin panel of this web site. Only the main admin has the permission of adding new brands to the online grocery store. Admin can add a new brand to the online grocery store by using green colour add new button on the lower right corner of this interface. Also, admin can update, delete and view details of the brands in this online grocery store.

Ecommerce Products Management ▾

Search for a Product...  Log in Register Hello User ▾

### Update the Brand



Logo  
[https://upload.wikimedia.org/wikipedia/commons/d/d6/Cream\\_Crackers\\_Khong.GPJ](https://upload.wikimedia.org/wikipedia/commons/d/d6/Cream_Crackers_Khong_Guan.JPG)

Brand Name  
Brand updated

Description  
dsds

Show All 

## Details for Brand updated



Logo

[https://upload.wikimedia.org/wikipedia/commons/d/d6/Cream\\_Crackers\\_Khong\\_Guan.JPG](https://upload.wikimedia.org/wikipedia/commons/d/d6/Cream_Crackers_Khong_Guan.JPG)

Brand Name

Brand updated

Description

dsds

[Show All](#)[Edit](#)

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### 5.2.12 Supplier Interface

Logo	Full Name	Biography	Actions
	ado	ado	<a href="#"> Edit</a>   <a href="#"> Details</a>   <a href="#"> Delete</a>

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 [Add New](#)

This is an interface that shows about the suppliers that involve with this online grocery store web application. This interface is only visible to the admin panel of this web site. Only the main admin has the permission of adding new suppliers to the online grocery store. Admin can add a new supplier to the online grocery store by using green colour add new button on the lower right corner of this interface.

## Add a New Supplier

Logo

Full Name

Biography

[Show All](#)[Create](#)

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As I mentioned in the previous functions, the admin can add supplier Logo easily with using google and copy the image address to the Logo text field. Then the logo is visible under the biography text field. It is a very good feature of this online grocery store. Admin need to fill every required field without skipped, to add new supplier into this online grocery store web site. These kinds of validations are used to improve the quality of this web site. Not only that but also its radiuses the intrusion null values to the database tables. By using green colour create button, new supplier can be displayed in the previous chart.

Also, admin can update, delete and view details of the suppliers in this online grocery store.

## Update the Supplier



Logo

Full Name

Biography

[Show All](#)[Update](#)

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## Details for ado



Logo

<https://images.unsplash.com/photo-1605559424843-9e4c228bf1c2?ixlib=rb-1.2.1&ixid=1>

Full Name

ado

Biography

ado

[Show All](#)[Edit](#)

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## 5.2.13 PayPal Payment Getaway

In the current circumstance, I attempted to add some payment getaways to my online grocery store web application. However, I confronted more troubles in this errand. There are various types of payment getaways on the planet yet their costs are pricey. Along these lines, I began to do some exploration about "how to add a payment getaway to a web application". Because of that, I found a PayPal escape that assists the designers with taking care of their undertakings without any problem. It is a free instalment escape that assists designers with further developing their programming abilities. Along these lines, I added this PayPal instalment escape to online grocery store web application to do the checkout cycle for the clients.

## 6. Product Produced and Product Quality

### 6.1 Technologies that are used

#### 6.1.1 Working with ASP.NET Core

There are different kind of programming languages in the world. Among them java script, J2EE, ASP.Net, PHP are some kind of different languages used in web application development. AS an undergraduate student, I already have an idea about these kind of technologies in my two years of experience in my university education life as a software engineering student. At the begging stage of this project, I had a hard time to select a correct and most suitable language for this “Online grocery store” web application. At the start level of this project, PHP programming language was selected by me to do the backend coding parts of this web application and some coding parts was finished by me. PHP is a good language but, the knowledge about some concepts in PHP language had been learned from the university. Not only that but also, I developed a small kind of web application in my first year of the university learning period using PHP programming language. So, I decided to change my mind to come up with new and more advanced technology to do the development of my online grocery store web application. As a result of that I decided to move forward with ASP.NET Core language. The first ASP.NET Core version 1.0 was released to the world on 27th June 2016. ASP.NET Core is a free and open-source web system and replacement to ASP.NET, it was developed by Microsoft organization. After that there are different kind of ASP.NET.Core versions released to the market. In my project ASP.NET Core 5.0 version was selected by me to develop this “online grocery store” web application. It was released to the market on 10th November 2020 and this version is supported to the Visual studio 2019 16.8 version. There are some fantastic advantages come up with ASP.NET.Core language. Those are,

- Cross platform – it can run windows, Linux and Mac OS.
- Better Performance - Asp.net centre everything is bundles which we want for our application. Bundles lessen the solicitation pipeline and further develop application execution.
- Dependency Injection
- Hosting - Net Core application can be Hosted on different Web servers, for example, IIS, Apache, Docker and so forth It isn't subject to IIS.
- Very Easy to do the unit testing in ASP.NET Core application.

Reference: Swain

So, as mention ASP.NET Core is a modern and new technology. I can get more outcomes by working with ASP.NET Core programming language. I can learn new concepts in web application developments, polished my C# object-oriented knowledge etc.

#### 6.1.2 Using MVC Model for development

Model-view-controller (MVC) is a product plan pattern generally utilized for creating UIs that partition the connected program rationale into three interconnected components. This is done to isolate inward portrayals of data from the manners in which data is introduced to and acknowledged from the user stand for Model View Controller. Model View Controller are related to each other. This Model, View and Controller pattern is something new for me. I updated my knowledge about this model, view and controller pattern using some you tube videos, reading some attractive research articles, following some LinkedIn learning courses and Udemy course. After that, I gotten some idea about this Model, View, Controller model and I keep them in my mind. This concept is very new for me and I already have some difficulties in some areas in my coding. But I always research and try to get answers in these difficulty areas and always be happily move forwarding my “online grocery store” web application with these advance concepts because it will help me lot to improve my programming skills in different kind of new areas. In ASP.NET Core, it provides every programmer to implement their web application using this Model, View and Controller architecture. following are some basic description about this MVC pattern according to my knowledge. A model is just a C# class that represent a table in the database. It straightforwardly deals with the information, rationale and rules of the application. As an Example, in an ecommerce website we have to stored product details, suppliers' details, Companies details in the database. So, we need tables to store each data. In this situation we have to create product model, supplier model and company model. View is the file representing user

interface. From the View user can Triggers the request and event get handle by the controller. Controller Receives events and return data to view. C# class inherits from controller base class. According to the previous example product controller, supplier controller, company controller are the controllers of the website.

### **6.1.3 Working with Microsoft SQL Server**

Microsoft SQL Server Management Studio is a product application initially sent off with Microsoft SQL Server 2005 that is utilized for arranging, making due, and directing all parts inside Microsoft SQL Server. In actuality, Microsoft SQL Server Management Studio is a coordinated climate that gives instruments to designing, observing, and managing SQL Server examples and information bases. Microsoft SQL Server Management studio is working fine with Visual Studio and ASP.NET.Core. Microsoft SQL Server 2018 version is used by me to manage the database of this "online grocery store" web application. All the product images, brand images, companies and supplier images are displayed in the front end by using the help of the tables in the database application. All the images displayed in the front-end side are stored in each table of the data base using admin panel. Not only that but also it handles all the crud operations very fine. So, I can improve my SQL knowledge and clear about some doubts in SQL quires with the help of this Microsoft SQL Server Management Studio. Not only that but also, I can improve my knowledge about advanced database concepts like store procedures etc.

## **6.2 Benefits and other Advantages of this Online Grocery Store**

There are a few different advantages and benefits that can be got to the client/client by utilizing this "online grocery store". Utilizing an "online grocery store" individuals can purchase fundamental merchandise stay from home. They don't have to go to the jam-packed supermarket. That as well as, without contacting cash clients can purchase fundamental merchandise without any problem. Individuals don't have to utilize public vehicle administrations to head out to the store. It assists with disposing of the miscreant. In the Coronavirus time frame as well as in any different pandemics' individuals can utilize this "online supermarket" web application.

## **7. Risks that have materialized and your response changes to the risk list**

### **7.1 New Risk**

Unfortunately, I will not be able to go to the university due to a serious leg injury sustained in a sudden accident. My left leg was broken in two places by a motorcycle accident. It is scheduled for a surgery and will have to wait until the other wounds in the leg heal. So, I cannot walk. I cannot participate to the physical lectures during that time. At the time of writing this report, I am still receiving treatment in the hospital. This time period is very difficult time period for me and my family members. It will take me about two more months to recover but I hope to do my final year project and my other studies as well as I can. I informed about my situation to the NSBM Green University FOC program office and other lectures by E-mail.

[Screenshot of the E-mail](#)

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**From:** Mr.BLD Jayasiri <bldjayasiri@students.nsbm.ac.lk>  
**Sent:** Tuesday, February 8, 2022 10:53 PM  
**To:** Poorna Hettiarachchi <poorna.k@nsbm.ac.lk>  
**Cc:** Dr.Rasika Ranaweera <ranaweera.r@nsbm.ac.lk>  
**Subject:** To inform that I can not participate to the physical lectures at the university.

Name : B.L.D.Jayasiri  
Dgree :BSc(Hons)Software Engineering  
Batch: 19.2  
Plymouth ID : 10707228  
NSBM ID : 18063

Dear Sir,

I am a final year software engineering student of Plymouth University.I kindly inform u that, I will not be able to come to the university due to a serious leg injury sustained in a sudden accident.

My left leg was broken in two places by a motorcycle accident. It is scheduled for a surgery and will have to wait until the other wounds in the leg heal. So I can not walk. I can not come to the physical lectures during that time. Although I tried to contact the FOC program office several time to inform about this. But ,there was no answer.

This is my last semester of my dgree program.So, I kindly ask you to look at my problem and give me some reasonable solution to it. Thank you very much.

Get [Outlook for Android](#)

## 7.2 Other Risks

In the Project Initiation Document (PID), potential dangers were recognized. Some appeared and were alleviated with the arrangement referenced in the danger the executives plan. Going ahead, there must be more. From all requirements, hazards are autonomous of any remaining imperatives and are unavoidable. Thus, given the following are a rundown of dangers that might possibly happen in due time.

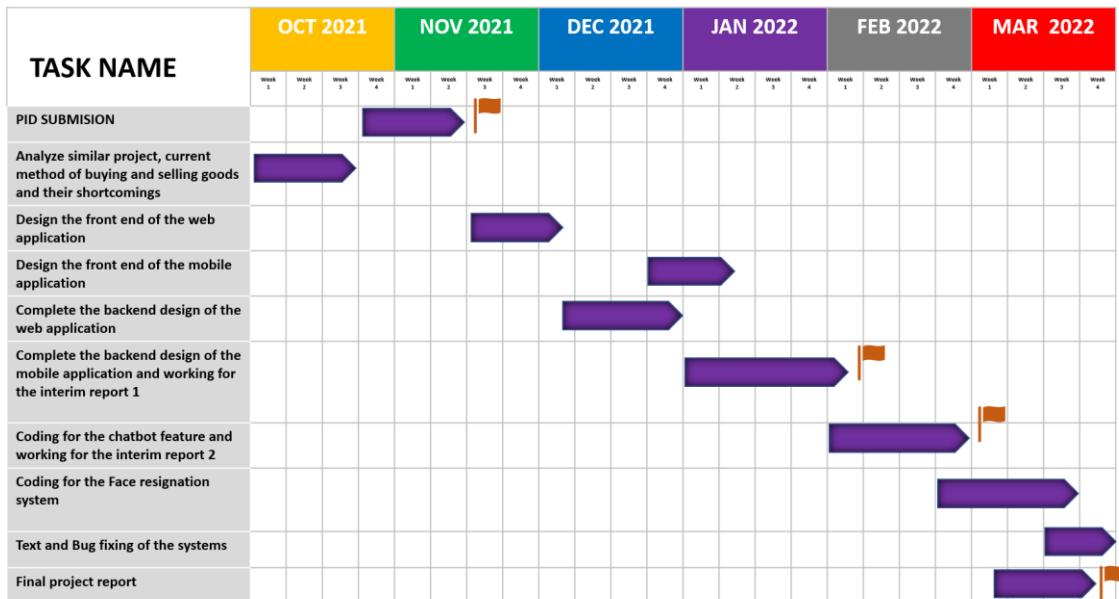
Risk	Management Strategy
Schedule Overrun	Some of the task of the critical path is delayed for any reason.
Time requirement being fixed creating additional deviations and awkwardness in scope. This would bring about a project requirement getting out of control and element creep. In the iron triangle, yielded programming and undertaking the executives we perceive how time could cause changes in extension and assets. This, in the event that not oversaw as expected can be lethal at the last phases of finishing. The item would be a disappointment or not of fulfillment, during the customer acknowledgment stage.	Research and do unit testing by building models of the parts essential. A time usage plan from here on would empower helpful arranging and hazard moderation on the time factor.
Loss of data/ technical failure	Keeping backups using one drive and Git hub account.
Highlight creep-This is something that	Early planning and exploration of utilitarian

typically happens during the last phases of undertaking advancement, where we attempt to focus on 'good to have' over 'need to have'. This is perilous as it would bring about disappointment of the utilitarian prerequisite fundamental necessities would give me the certainty to push ahead rather than to conceal, with undesirable suggestions.

## 8. Schedule

## 8.1 Previous Schedule

This is the previous schedule I follow to success my final year project.



## 8.2 Changes in the Schedule table

Task	Deadline	Estimation Time of Delivery
Write the Interim report 2 and making the progress video.	01/03/2022	22/02/2022 – 28/02/2022
Complete the back-end development part of the online grocery store web application.		28/02/2022 – 15/03/2022
Unit testing and bug fixing of the online grocery store web application		15/03/2022 – 18/03/2022
Analyze some information about free web hosting		15/03/2022 – 18/03/2022
Working for the mobile application development of this online grocery store		18/03/2022 – 28/03/2022
Bug fixing and the unit testing of the online grocery		28/03/2022 – 31/03/2022

store mobile application		
Final project report and poster	12/04/2022	01/04/2022 – 11/04/2022

## 9. Resources Used

Following are the resources are used in this “online grocery store” project at the current moment

- Visual Studio 2019
- C# ASP.NET CORE
- Microsoft SQL Server Management Studio 2018
- Bootstrap
- PayPal API
- Udemy courses, research papers and you tube tutorials about ASP.NET Core
- Follow some you tube tutorials about MVC architecture
- Follow some you tube tutorials about payment getaways and web APIS

## 10. Learning Undertaken and Studies required

### 10.1 Student Learning Undertaken

As I mentioned before, at the start level of this project I had some difficulties in choosing the correct and most suitable language for developing this “online grocery store” web application. After that I started my coding with ASP.NET Core 5.0 programming language. It is a modern and new programming language in the world. This language is also a new experience for my programming life. So, I had to follow some programmers research articles about ASP.NET CORE programming language. After that I got some clear understand about ASP.NET Core language, its benefits, advantages, how can it use to develop a web application, what are the new technologies come up with ASP.NET Core, how it's different from ASP.NET, What are the resources I have to install to my computer to work with this language correctly likewise I learned more basic about this ASP.NET CORE by researching myself. Not only that but also, I started to follow some you tube tutorials about ASP.NET Core and find some more details about this programming language and do some practices by myself and started to self-learning. After the PID submission, I started to follow some Udemy and LinkedIn courses about ASP.NET Core programming language to get more idea and understand about this new language. Not only that but also, because of this project I could get more understand about the Model, View and Controller pattern and learned more advanced concepts. In earlier I haven't understood about what is the MVC pattern, what are the advantages and benefits of this MVC pattern, why this Model, view and controller pattern use in web application development and what are the important of using this MVC pattern. But now, I had a clear understand about this Model, view and controller pattern and how it's working with ASP.NET Core. As a result of the self-learning and researches, I could polish my programming skills in different paths and got some other benefits as well as. Flowing are some of them,

- I could improve my C# programming knowledge and learned to handle Crud operations very well.
- Learned about advanced database concepts and improve knowledge about SQL quires.
- Got and good idea about project management and how to handle risks in any kind of project.
- Improved my knowledge about report writing.
- Improved my knowledge about UML Diagrams.

### 10.2 Studies required

- Need a few more information about ASP.NET Core and MVC model to work on the web site for certain high-level elements.

- Need a decent SQL information, information security information and great comprehension of progressed data set ideas to work on the current data set of this application with a few new elements. (Egg: Hide the client's secret word in the data set table)
- Need to further develop information and exploration about web facilitating.
- Need of a few practice and great information about portable application advancement programming's like android studio or flutter to push ahead the task.

## 11. Appendices

### 11.1 Meeting Minutes Form

Double click on the document to see it clearly.



Meeting Minutes.pdf

### 11.2 Project Proposal

Double click on the document to see it clearly.



10707228-Proposal.pdf

### 11.3 Project PID Document

Double click on the document to see it clearly.



10707228-PID.pdf

### 11.4 Interim Report 1

Double click on the document to see it clearly.



10707228\_Interim  
Report.pdf

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## Final Year Project – Supervisory meeting minutes

Meeting No:01

Date : 27<sup>th</sup> October 2021 at 9.00 AM

Project Title : “Online grocery store” web application and mobile application.

Name of the Student : B.L.D. Jayasiri

Students ID : 10707228

Name of the Supervisor : Ms. Nethmi Weerasinghe

Meeting Link :

<https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fplymouth.zoom.us%2Fj%2F94376619657%3Fpwd%3DNlBtRzhJZ0V5NTZQZ3hacnU5QnV0dz09&data=04%7C01%7C10707228%40students.plymouth.ac.uk%7C893e33d050c342c2ea0508d9984ce600%7C5437e7eb83fb4d1abfd3bb247e061bf1%7C1%7C0%7C637708278324664920%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBtil6Ik1haWwiLCJVCI6Mn0%3D%7C1000&sdata=gcpNh0mvzbkLbCizqiPvlnZobxTzHWSNsRn5OzPkE2w%3D&reserved=0>

### Items discussed:

Discuss with my project approach. As the first supervisory meeting, my supervisor and me discussed about the problem identification and my solution to handle that problem. I come up with basic web application to solve my problem definition and supervise advised me to, develop some kind of an advanced ecommerce web application with user friendly features. she advised me to do some research about other ecommerce web applications in the world and come with good product because it is very important for me to find some good job in the future and get some good grade for the degree.

### Items to be completed before the next supervisory meeting:

Do some research about other ecommerce web applications in the world.

To get some idea about what are the functions should be included in an ecommerce web application.

Advised me to add some features like, admin panel, payment get ways, chat bot.

Do some research about programming languages to use develop this project.

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Supervisor (Signature & Date)