Swinburne University of Technology
School of Science, Computing and Engineering Technologies

ASSIGNMENT AND PROJECT COVER SHEET

Subject Code: <u>SWE30003</u>   Unit Title: <u>Software Architectures and Design</u>

Assignment number and title: <u>1, Requirements</u>   Due date: <u>25th February</u> 2024

Tutorial Day and Time: <u>Tuesday 11:00AM</u>   Project Group:<u>   9   </u>

Tutor: <u>Ms. Mandeep Dhindsa</u>

To be completed as this is a group assignment:
We declare that this is a group assignment and that no part of this submission has been copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part been written for us by another person.

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Introduction

This document is for All Your Healthy Foods, a healthy food store nestled on Glenferrie Road. With the aim of extending their reach beyond their physical storefront and catering to a broader audience across Australia, the owners are eager to embrace the convenience and accessibility of e-commerce. This document aims to cover the requirement and quality attributes of the All Your Healthy Foods store through the identification of primary user tasks and utilization of the Tasks and Support method.

Project Background

Overview

The store owners of *All Your Healthy Foods* noticed that the brand chain only has one physical store, still needed to be more developed. On this condition, new online service is compulsory for the progress, which not only helps the customers purchase products from long distance, but can also receive directly from delivery systems. Whereby, Swinsoft Consulting is assigned to be responsible for analyzing the potentials, and developing the new online presence for this brand of Healthy Food, to reach the desired outcomes.

Domain Vocabulary

- **Customers, Users**: Online users that want to purchase products in any method
- **Products:** Healthy Foods in the store
- **Account:** Online individuals' corner that can access online platforms
- **Catalogue:** Types of Healthy Foods separated on the store
- **Payments:** Transaction made by customers
- **Order:** Request of customers to purchase the products
- **Statistics:** Data of sales performances, trends recorded

Assumptions:

- The Swinsoft UI/UX design guidelines document illustrates reasonable measurements for client testing and generic design level prerequisites
- The online presence reach customers Australia-wide
- Accounts are created using individuals' email address, with high secure.
- Food types are divided rationally, similar to actual food stalls
- Customers can receive online receipts after their purchase, which can be used for refund
- Record the profits, along with sold products in the past for statistical analysis. The service is expected to automatically display the trending items.

Scope

The *All Your Healthy Foods* wants to expand its operation through an online store, to promote its popularity beyond current brand, aiming to reach customers Australia-wide. Online users must be able to create their account, browsing store catalogues, managing and updating their purchase cart. In particular, the online store should also have high security in payments, support basic statistics about the sold items over various periods, thereby predicting trending products and customer preferences. The system also can allow store owners to change the types of products available for sale as new products become available.

Problem Domain

Pain Points

- Limited reach due to reliance on physical store location.

- Inability to serve customers outside of surrounding suburbs.

- Manual processes for managing orders, invoices, and receipts.

- Lack of insights into sales performance and trends.

- Limited flexibility in updating available products.

Domain Entities

- Customers: Individuals browsing and purchasing products.

- Staffs: Store owners & salespeople

- Products: Items available for purchase in the store.

- Orders: Requests made by customers for purchasing products.

- Invoices/Receipts: Documentation of purchases made by customers.

- Payment: Transactions made by customers to complete purchases.

- Shipping: Process of packaging and delivering orders to customers.

- Database: Data related to sales performance and trends.

Actors

- Store Owners: Initiate, oversee and manage the development of the online store.
- Developers: Build and maintain the online store system.
- Customers: Interact with the online store to browse and purchase products.

Tasks

1. Creating and managing customer accounts.

2. Browsing the store catalogue.

3. Managing the shopping cart.

4. Handling payments securely.

5. Creating invoices and receipts for customers.

6. Managing goods packaging and shipment.

7. Generating basic statistics on goods sold over various periods.

8. Updating the available products as new items become available.

CRUD Check

Task	Entity	Create	Read	Update	Delete
Creating and managing user accounts	Users	C	R	U	D
Browsing the product catalog	Products	-	R	-	-
Managing the shopping cart	Carts	-	R	U	-
Creating invoices and receipts for orders	Invoices	C	R	U	D
Handling payments securely	Transactions	C	R	U	-
Managing goods packaging and shipment	Shipments	C	R	U	-
Generating basic statistics on sales	Sales	-	R	-	-
Updating product availability	Products	C	R	U	-

Domain Model
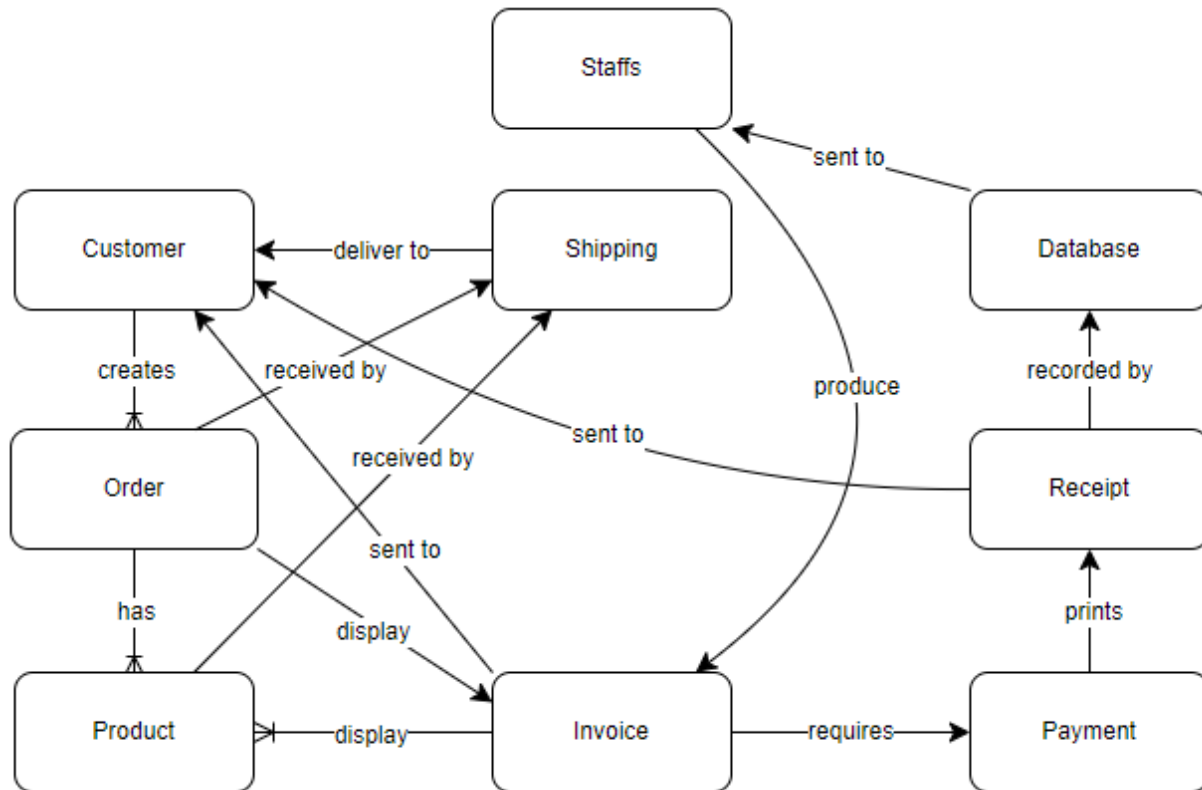
Basically, the model illustrates the entities that participate in the online presence of All Your Healthy Foods.

First and foremost, there are two main types of online account that access this webpage, customers, and staffs (the store owner & salespeople). Customer will access the webpage through Product page or the Menu (navigation pane, which is included in UML). On this condition, customer can opt for their purchase options, regarded as orders, which displays invoices produced by the Staffs for them.

Each invoice requires to be paid. After the Payment step, receipts are printed out for the customers. After the customers' payment, orders and products are sent to shipping services for delivery purposes. Finally, after customers received the products successfully and complete their purchase experience 100%, the database will record sales statistics and trending products based on the receipts.

Functional Requirements & Tasks Descriptions

Task 1: Create and manage customer accounts

Task: Create and manage customer accounts	
Purpose:	Establish and maintain records of customer information for future interactions and transactions
Trigger/Precondition:	A new customer expresses interest in purchasing or inquiring about products/services
Frequency:	Occurs with each new customer interaction
Work area:	Online platform (application or website)
Subtasks	
1. Collect customer information	Design an intuitive registration form on the application or website where customers can input their details securely. Use clear labeling and minimal required fields to streamline the process. Employ input validation to ensure accurate data entry and provide real-time feedback for any errors.
2. Enter information into the system	Upon submission of the registration form, automatically input customer data into the database backend. Utilize encryption protocols to protect sensitive information during transmission and storage. Implement error handling mechanisms to address any issues that may arise during data entry.
3. Verify and update information	Allow customers to review and edit their account information through their profile settings on the application or website. Provide clear instructions and options for updating personal details such as contact information or preferences. Send email notifications to confirm any changes made to the account.
4. Assign unique identifiers	Automatically generate unique account IDs or usernames for each customer upon registration. Ensure that these identifiers are easily distinguishable and not tied to personally identifiable information. Use alphanumeric characters or a combination of letters and numbers to create robust identifiers.

Variants	
3A. Verify customer information via Email Verification	Send a verification email to the customer's provided email address after registration. Include a unique verification link that the customer must click to confirm their email and activate their account. This process ensures that the email provided is valid and allows customers to review their account details before activation.
4A. Assign unique identifiers via Customizable Usernames:	Allow customers to choose their usernames during the registration process. Implement validation rules to ensure uniqueness and suitability of usernames. Provide suggestions or availability checks to assist users in selecting appropriate usernames. This approach adds a personal touch to the account creation process.

Task 2: Browse the store catalogue

Task: Browse the store catalogue	
Purpose:	Enable customers to explore and discover products offered by the store.
Trigger/Precondition:	Customer enters the store or accesses the store's website/application.
Frequency:	Varies based on customer interest and engagement.
Critical:	Providing an intuitive and engaging browsing experience to facilitate product discovery and encourage purchases.
Work area:	In-store displays or online platform (website/application).
Subtasks	
1. Display product categories	Organize products into distinct categories (e.g., electronics, clothing, home goods) visible at the entrance of the store or on the

	homepage of the website/application. Utilize clear signage or navigation menus to guide customers to their desired product categories efficiently.
2. Showcase featured products	Highlight select products or promotions prominently within the store or on the homepage of the website/application. Use eye-catching displays, banners, or carousel sliders to showcase featured items that may be of particular interest to customers.
3. Provide search functionality	Implement a search bar within the store or on the website/application, allowing customers to quickly search for specific products by name, category, or keyword. Utilize autocomplete suggestions and filtering options to enhance search accuracy and efficiency.
4. Enable product exploration	Arrange products in an organized and visually appealing manner within the store or on the website/application. Utilize attractive displays, product images, and descriptions to engage customers and encourage them to explore different product offerings.
Variants	
2A. Personalized Featured Products	Implement a personalized recommendation system that dynamically showcases featured products based on each customer's preferences, browsing history, and purchase behavior. On the website/application homepage or designated sections within the store, display a curated selection of products tailored to individual customers, increasing the relevance and appeal of featured items.
3A. Visual Search Capability	Integrate visual search functionality into the website/application, allowing customers to search for products by uploading images or taking photos of items they're interested in. Utilize image recognition technology to analyze visual input and retrieve matching products from the catalogue, offering a novel and intuitive search experience for customers.

Task 3: Manage the Shopping Cart

Tasks: Manage the Shopping Cart	
Purpose:	Gathering desired products & checking users' purchased options, along with the total price
Trigger/ Precondition:	After users have completely selected what to buy
Frequency:	Appears when customers access Cart button
Critical:	Accurate selection, along with price calculation
Sub tasks:	
1. Customer creates order	An new order will be automatically created after customers opt for their first purchase selection
2. Adjusting Cart	The customer navigates the product catalog and select their desired items, adding them to the Shopping Cart
3. Updating Items Quantity	If customers want to change the quantity of an item, they can easily adjust the number
4. Removing Items from Cart	Customers should have options to remove the products that they decide not to purchase anymore
5. Displaying Cart	The app displays a summary of your Cart (products, quantity, and price)
6. Calculating Subtotal	The application automatically calculates the subtotal of all the items in the Cart
7. Checkout	The customer proceeds to checkout, observe the invoices for payment
Variants:	
2A. Out of stocks	Unavailable products are still added to cart but cannot be purchased at that time. Nevertheless, customers can receive notifications when those products are available again.
5A. Incorrect Cart	Purchase is still able to be cancelled after "Purchase" button has been pressed, in case customers change their mind about their options.

Task 4: Create invoices and receipts for customers

Tasks: Create Invoices and Receipts for customers	
Purpose:	Illustrated as proof of payment
Trigger/ Precondition:	After customers complete their payment
Frequency:	Repeat on every transaction that success
Critical:	Accurate price, products, transactions
Sub tasks:	

1. Retrieving Order details	Fetching the details of the order for which the invoice is to be created. This includes information such as order ID, date of order and customer account.
2. Listing Ordered products	The invoice list all the products that were included in the order, along with their quantities and price
3. Applying Discounts or Coupons	If users have any discounts or coupons, the app will notice users to provide them options for this.
4. Calculating Total Amount	The total price is calculating by adding the total discounted and the tax amount
5. Including Shipping Details	The invoice should include details about the shipping method, address and shipping fees
6. Saving the Invoice	After details are included and calculation is done, the invoice is saved and are sent to the customers
Variants	
6A. Misunderstanding Invoice	Sending feedback for confirmation

Task 5: Handle payments securely

Task: Handle Payments	
Purpose:	Verify payment, ensure that all payments are processed accurately and on time
Trigger/Precondition:	The customer proceeds to checkout and choose their payment method to complete a purchase
Frequency:	Repeat on every transaction
Critical:	COD (cash-on delivery)
Subtasks	
1. Payment detail	Customers fill in their payment details then the system will collect that with the customer's name, email/phone number from their account. All customer information will be kept confidential.
2. Verify payments	Customers will receive a confirmation note from the bank or e-wallet to confirm their transaction. To ensure the reputation of the store, COD shipping is only accepted when the customer's address is in the same city as store's address
3. Print out bills for customers	Customers will receive digital receipts display their shipping detail, transaction method and the amount they paid. The system will automatically update the database to keep in track of the transaction. If incorrect charge is happening, customer can contact the store's customer service department to ask for a refund

Task 6: Manage goods packaging and shipment

Task: Manage goods packaging and shipment	
Purpose:	Ensure customers will receive the product in the best quality and within the best time frame
Trigger/Precondition:	After customer finish their payment
Frequency:	Repeat on every transaction that success
Critical:	Australia-wide order
Subtask	
1. Contact the customer	Contact customers again by phone to confirm their orders. Confirm with them their shipping detail, contain their order, delivery address and phone number. For remote customers, discuss with the customer the time they will likely receive the goods.
2. Identify the items need to package	To avoid incorrect packaging or missing items, employees must recheck customer orders before packaging. Then, order information (recipient name, home address, ordered items) will be printed and pasted on the package. Long distance orders will be packed extra carefully. If the product inside has errors or is missing items, customers can contact the store for a refund or exchange.
3. Contact the delivery party	Connect with a reputable nationwide delivery party. Because the store's products are mostly food, the delivery party must ensure food hygiene and safety, especially for long-distance orders. For orders close by within a 5km radius of Glenferrie Road, the store will support free shipping and express delivery.
4. Deliver the goods to the shipping party/delivery guy pick up the order	For long-distance orders, the shop will send the goods to the shipping units as soon as possible so they can transport them to customers as quickly as possible. For nearby orders, the shipper will pick up the goods directly from the shop.
5. The goods are being delivered	All activities, from packing the goods to the shipper transporting them, until the goods are delivered to the customer, are carefully updated in the shop's database system. Customers can also view the status of their order in their account.
Variant	

1a. Customer denied the order	Stop all the packaging and refund to the customer
5a. Shipper cannot find/contact to customer	The shop will inform that the goods have already arrived at the customer's address by different method (call, email, etc.) The customer will not get a refund or exchange if they do not response back to the shop

Task 7: Record statistics of goods sold based on receipts over various periods

Task: Generate basic statistics on goods sold over various periods	
Purpose:	Give insight into the amounts of sales in a period
Trigger/Precondition:	Requested by the Staffs
Frequency:	As much as requested
Critical:	
Work area:	Owner's website or application
Subtasks	
Process request from owner	System takes request from the owner when interacted with through the website/app to send statistics
Check number of sales in history	Data of the amounts of sales will be sent over from the website's information system to the system
Visualize the data of sales	Said data above collected will then be used as a dataset for creating chart showing number of sales in requested time
Display the statistics	System shows chart created by displaying through the website/app

Task 8: Update the available products as new items become available

Task: Update the available products as new items become available	
Purpose:	Updating the product list from the store with the newest ones available
Trigger/Precondition:	Before the store opens
Frequency:	Everyday
Critical:	
Work area:	In the website or application
Subtasks	
Check for available products	System gets a list of available products from company's warehouse, storage with their associated images, descriptions, etc.
Add/remove items	System will update its current version of product list with the new one including all the new/removed items
Display the product in the store	System adds the product to the store front menu
Variants	
1A. Items have missing information	Systems will fill it with generic information such as "Picture of (item's name)" and send a notice to owner

Quality Attributes

Usability

Food ordering website/application needs to be intuitive with their interaction with users for a seamless and satisfying experience. Sometimes, users will not understand something in the interface of the system, there needs to be explanation and some help from the system to highlight what those thing does in a simple and easy way to understand. Customers can also interact with some features that they don't quite understand or by accident, like buying an item without realizing, the system must help to alleviate those issues.

To do this, the system will do the following:

- Most UI interactable features will have brief explanation when hovered.
- When making a major decision, the system will request for process to continue or cancel with pop-up description showing what are being done.

Security

For an online food store system, security is necessary and needs to be highly evaluated. The system needs to securely process the customer request when purchasing items via handling their money or credit cards to prevent actors stealing money. Also, it's important for proof of purchase when delivering products bought by customers online who can fake their identity.

To achieve this, the system will need to do the following:

- Hiding customer's credit card details
- Invoices sent to customer the moment purchase is made that will be requested when products are delivered.

Correctness

The system in question should only work as intended as an online food delivering system, no more no less, meaning customers are legally bound to the fact that their personal information won't be used by third parties before, during and after their transaction, if used, the change needed to be shown to the customers. Additionally, aside from buying goods, customers need to also allow to refund their items in situation of low-quality item not meeting standard as promised.

To achieve this, the system will:

- Not saved important personal data from customers (such as address, name, etc.), only account login details are stored for easier access.
- Customer should be able to refund within specified days after purchase given in their receipts if they can prove the product fails to achieve normal standard (rotten, bug-infested, etc.)

Reliability (Availability)

The system providing access to food for customers need to be available at least before midnight for customers to leniently purchase and get delivered as soon as possible, especially during holiday season when more people are home, potentially more will be shopping for holiday food items. For critical situation such as possible local electrical outages, the system still needs to be able to function normally.

To get this, system will do the following:

- Have scalable servers to handle website/application high usages during predicted or unusual spikes.
- Have backup electrical generators in-office where the system is to manually restart and run normally.

Performance

Considering the scope of the system being used across Australia, problems arose such as delay in loading items list and purchase processing and so on need to be as minimal as possible. Aside from this, the number of purchases the system can handle should be specifically quantified to stop system from overworking or vice versa.
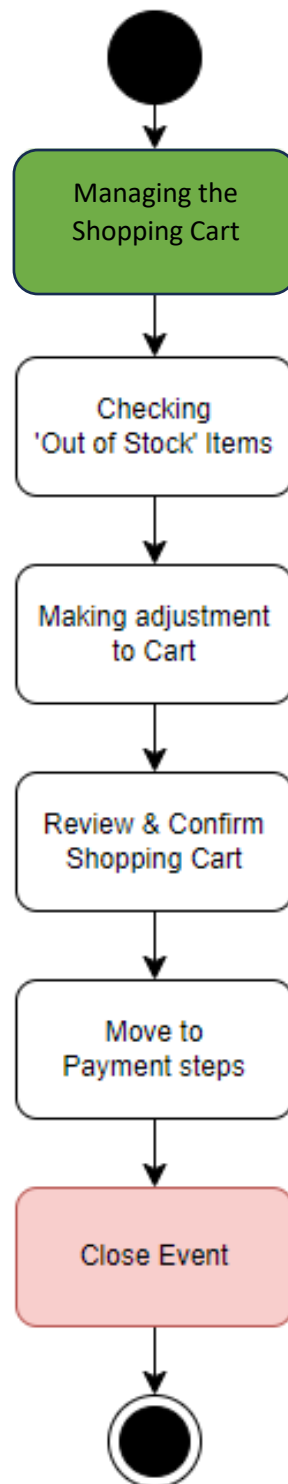
To do this, the system will do as follows:

- The system response to purchase or when a customer interacts with anything in it needs to be within 4 seconds.
- Number of purchases handled need not to be lower than 200 and higher than 1000 purchases per day.
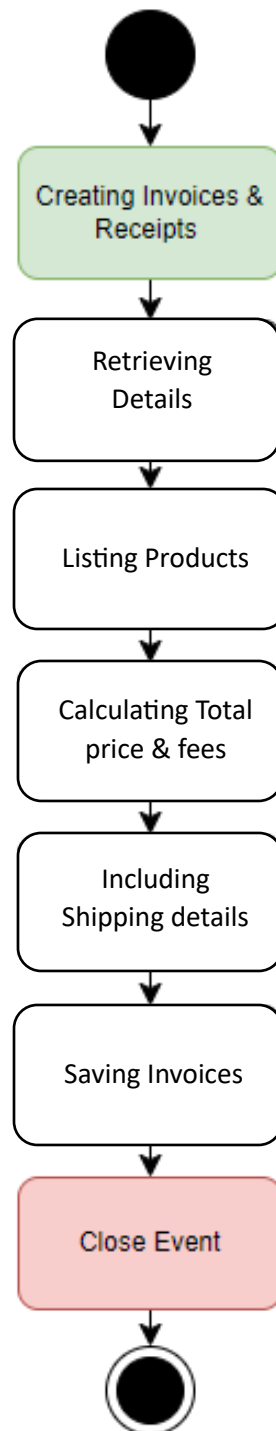
Workflow

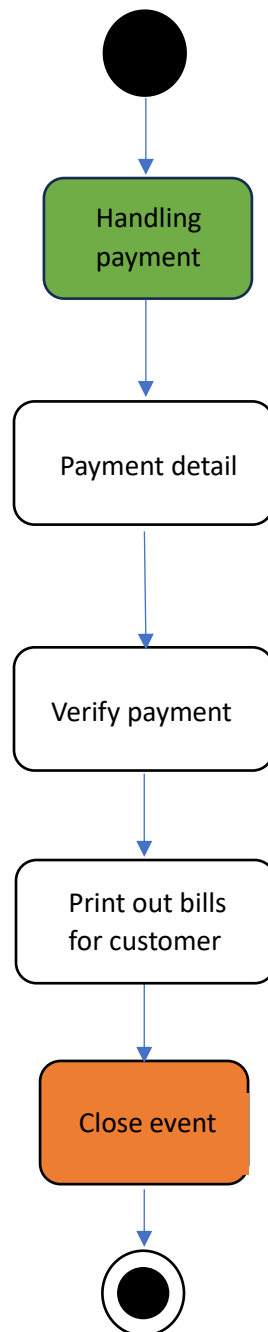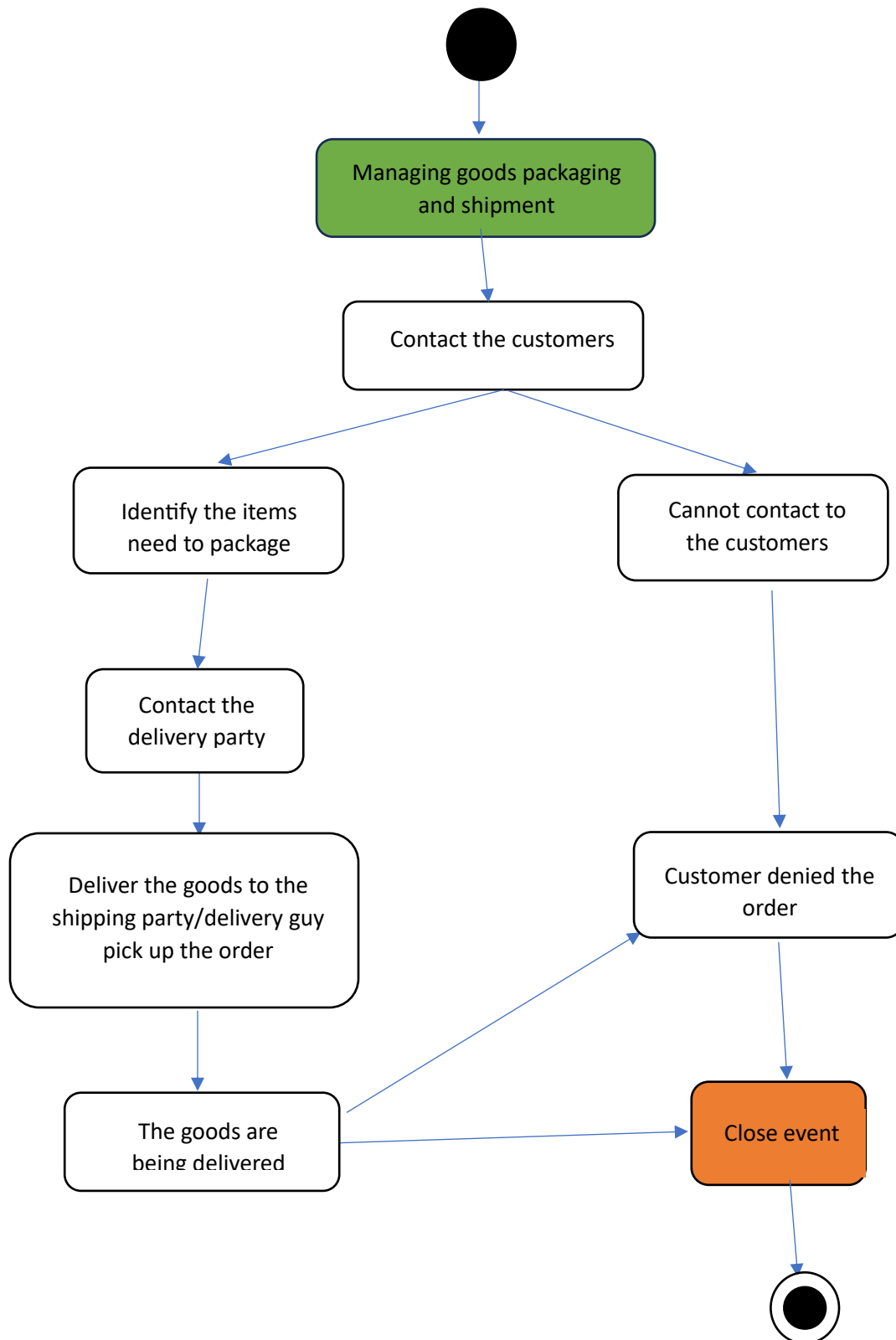## Task 1: Create and manage customer accounts
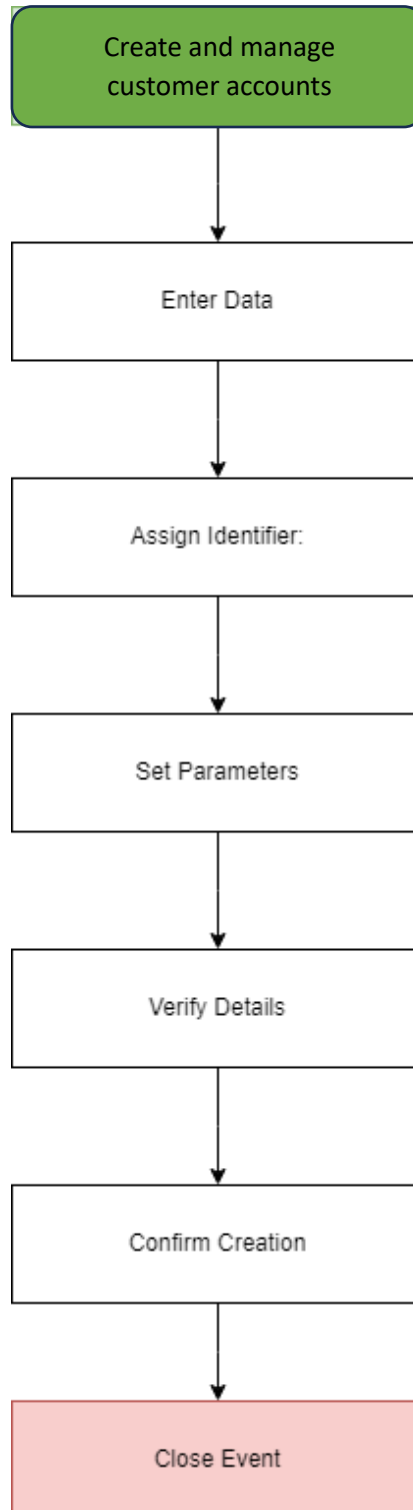
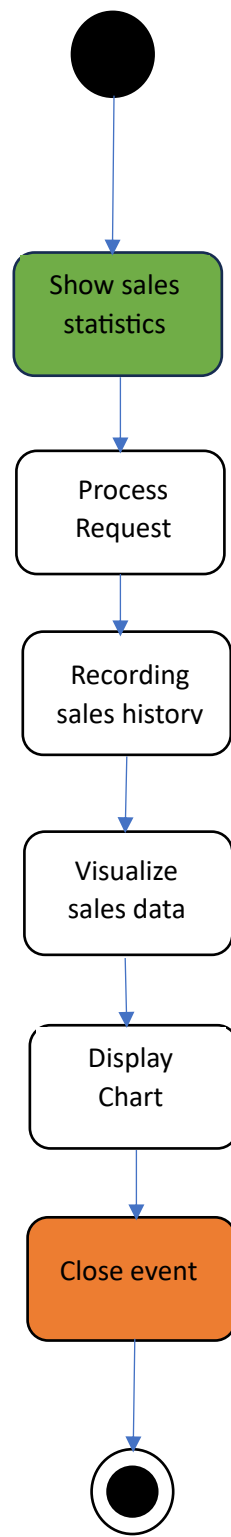**Task 2: Browse the store catalogue**

Task 3: Manage the Shopping Cart

**Task 4: Create invoices and receipts for customers**

Task 5: Handle payment securely

Task 6: Manage goods packaging and shipment

Task 7: Record statistics of goods sold based on receipts over various periods

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                  ┌──────────────┐
                  │  Show sales  │
                  │  statistics  │
                  └──────────────┘

                  ┌──────────────┐
                  │   Process    │
                  │   Request    │
                  └──────────────┘

                  ┌──────────────┐
                  │  Recording   │
                  │ sales history│
                  └──────────────┘

                  ┌──────────────┐
                  │  Visualize   │
                  │  sales data  │
                  └──────────────┘

                  ┌──────────────┐
                  │   Display    │
                  │    Chart     │
                  └──────────────┘

                  ┌──────────────┐
                  │  Close event │
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Task 8: Update the available products as new items become available
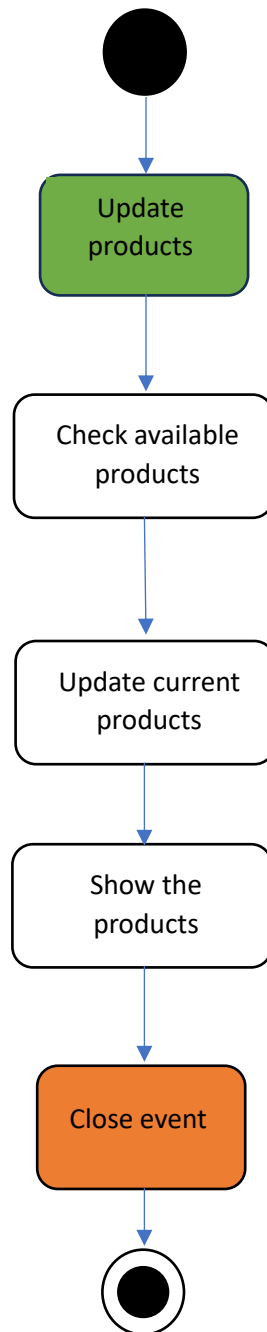
Possible Solutions

Possible Solution 1 – Website Based system

The website serves as a platform for online customers to create and manage their accounts, access the store inventory and purchase products. This approach involves developing a website tailored to the needs of the company. By offering a user-friendly design and intuitive interfaces, the website promotes the brand chain of the store with more opportunities than physical stores by means of conveniences and productivity.

First and foremost, by accessing the website link, the *Home Page* will appear first, along with some popular items of the store. Then, the website will guide online users to create a new account, or sign in with existing account using username & password to become an online customers of the store. Online users must sign in their account to make transactions on the website, as well as purchase items.

Once unique username and password has been entered, detailed list of items will be available at ***All Your Healthy Foods***, arranged for easy access in the *Home Page*. Users can also navigate the Product Page to review product descriptions, and add their desired products to Cart by clicking *"Add to Cart"* button, which appears below each product. The website allow online users to add, remove and verify the purchase items in their shopping cart, which can be observed in the Cart page. After ensuring the purchase cart, the website will display various payment methods for customers to pay with secure payment process.

Receipt Page will be illustrated after successful payment have been made, which displays information about the previous transaction, the total price, payment, along with purchased products. These types of information will be recorded in the database of the website, which can only be observed by the developers, the owners of the storechain, not the online customers.

To know when the products will be delivered, or when it will arrive the address, customers can tract the status of their orders in real time, receive notifications with order updates and delivery schedule in the Delivery logo, which will display the progress of all your purchased items. For any helps or concerns, like other online sale platforms, online users definitely can contact customer service representatives from the website for assistances, using the contact information at below of the website (footer).

Based on the database recorded from all the orders, the website will provide basic data on products sold in the past, allow store owners to gain insights into sale trends and customer preferences.

By implementing this website-based system, ***All Your Healthy Foods*** can enhance not only its online presence and customer loyalty, but also valuable insights into customer behavior and market trends. This will be regarded as significant step towards expanding the business, and reaching the expected outcomes.

Posible Solution 2 – Application Based system

To launch All Your Healthy Foods into the digital sphere and broaden its reach, deploying an application-based system provides a comprehensive answer. This strategy entails creating a dedicated mobile application suited to the needs of the company and its clients. The application will function as a consolidated platform for customers to explore the store inventory, place orders, manage their accounts, and monitor delivery. By providing a user-friendly design and straightforward navigation, the application improves the whole purchasing experience, making it convenient and accessible to customers across the country.

The application's key features are as follows:

1. Customer Accounts: Users may set up individualized accounts to maintain their profiles, track order history, and receive tailored suggestions based on their interests.

2. Store Catalogue: The program will provide a comprehensive list of items available at All Your Healthy Foods, organized for simple access. Customers can easily navigate through categories, examine product descriptions, and add goods to their cart with a few taps.

3. Shopping Cart Management: The program allows customers to simply add, delete, and alter goods in their shopping cart, making necessary adjustments for a smooth checkout process.

4. Order Management: Customers may see the progress of their orders in real time, from processing to delivery. Customers can receive push alerts with order changes and delivery timetables.

5. Payment Processing: The program will offer secure payment processing, allowing consumers to pay for orders with a variety of payment methods such as credit/debit cards, digital wallets, and online   banking.

6. Customer Support: With integrated customer support capabilities, customers may contact customer care personnel from within the application for help with orders, product queries, or other issues.

7. Analytics and Reporting: The program will give basic information on commodities sold over various time periods, allowing company managers to develop an understanding of sales patterns and consumer preferences.

All Your Healthy Foods can strengthen its internet visibility, attract new consumers, and increase customer loyalty by creating a bespoke mobile application. The application will be a valuable tool for expanding the business outside its physical presence and capitalizing on the rising trend of online-buying.