

# GetFreshFood

## User Requirement Specification



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SA4101 Software Analysis and Design

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## Background Information

### Current Business Operations

GetFreshFood Supermarket (GFFS) is a supermarket company. GFFS has grown from a start-up company to a mid-size supermarket company. It has one outlet that is currently located at the Junction 8 Shopping Center in Bishan. GFFS sells a large variety of products, ranging from fresh foods such as milk, cheese and bread to household items such as detergents, pots and pans. GFFS has been operating in a very traditional way, which means that, for the most part, its employees have to carry out their duties manually. These duties include inventory management, managing the supermarket's pricing system (manually labelling items with price tags) and manually checking out items for customers. It should be noted that some employees have incorporated some form of technology in their work processes. For example, while receiving goods from suppliers, store men use handheld barcode scanners to scan the barcode of the goods which in turn stores the product data in an existing inventory data repository system. However, this system is mainly used by the store men and not implemented to cover the rest of the employees and their respective work processes. To handle the labor-intensive duties, GFFS currently employs 6 cashiers, 20 promoters and 4 store men and they work in shifts. There are two shifts, 7am to 3pm and 3pm to 10pm. There are 3 cashiers, 10 promoters and 2 store men for each shift.

### Background Information about the Existing System

There are 2 documentation records that are of utmost importance to management which are termed as the end-of-day sales record and the inventory records of all goods in the supermarket.

The cashiers are responsible for creating their individual end-of-day sales record. The cashier goes through the shopping baskets of each customer and enters the price of the selected products into a cash register. The price entered is based on the price tag labelled on the product by the store promoter. The cash register prints out two copies of the receipt which consists of the list of items bought and the total amount payable. The cashier collects the money from the customers and keep the receipts. At the end of the cashier's shift, the cashier tallies up the collected money. In addition, the cashier collates all the items sold in her shift and lists them in a document known as the end-of-day sales record. The supermarket manager checks the cash collected by each cashier against their end-of-day sales record. Currently, there are frequent discrepancies between the two amounts.

Moving along, the inventory record of all goods in the supermarket are maintained by the store men. The inventory records need to be modified to reflect transactions of goods. In particular:

- 1) The number of goods received from suppliers by the store men need to be added to the inventory records.
- 2) The number of products sold to customers need to be subtracted from the inventory records. The numbers are provided in end-of-day sales records provided by the cashiers.
- 3) The store men are responsible for returning damaged or expired goods to suppliers. The numbers need to be subtracted from the inventory records.

During each monthly inventory check, there are frequent discrepancies between the numbers recorded in the inventory and the number of goods physically present in the supermarket.

GFFS's management has deemed the fixing of the occurrences of discrepancies in the end-of-day sales records and inventory records as top priority.

## Proposed System

The new system will automate the supermarket's work processes, covering sales, inventory and reporting. The new system will be able solve the aforementioned problems faced by GFFS. The new system will be built upon a cloud database along with a barcode system. Each product will be linked to a barcode and the system will store the information of every product carried by GFFS, such as the barcode, total stock and pricing.

When a customer purchases an item, the cashier would be able to scan the barcode and the system would retrieve the price of the product as opposed to requiring the cashier to manually input the price based on the price tags which are also manually labelled. This way, the cashiers would be able to charge customers the right prices set by the supermarket's management. At the end of the cashier's shift, the system will automatically collate all the items sold in her shift and generate an end-of-day report which will be sent to the supermarket manager for approval. As a whole, this would reduce the occurrences of discrepancies in the end-of-day sales record.



With the help of the new system, the inventory records will be automatically updated to reflect the transaction of goods. Repeating the above example, when a customer purchases an item, the cashier would scan the barcode which would retrieve the price of the product. At the same time, the system will automatically subtract the quantity of stock in the inventory records. Similar processes will also happen for other types of transactions such as receiving stock from suppliers and returning damaged and expired products to suppliers. Because all transaction of goods are recorded, this will reduce the risk of discrepancies between the records and number of goods physically present in the supermarket. Another additional benefit will be that because the inventory records will be updated automatically, authorized employees will be able to monitor stock levels in real time. Employees in charge of ordering from suppliers will be notified of products with low stock levels and can create purchase orders for the products in question. This will ensure that the supermarket will be stock optimally at all times.

All in all, with the help of the new system, GFFS would be able to ensure that the 2 documentation records that are of utmost importance to management (end-of-day sales record and the inventory records) will be accurate and free of discrepancies.

In addition, the new system will also incorporate other features such as end-to-end customer services as well as a digitized shop floor that is linked to the back-room store.

## Overview of Scope

### In Scope

The following actors are defined to be main users of the proposed system:

- Manager
- Store Man
- Promoter
- Cashier
- Online Customer
- Accountant
- Fridge Temperature Sensor

After analysis of their respective influencers and pain points, our proposed system takes into account crucial processes that would improve the daily business processes. The proposed system includes the following user-activity relationships:

Users	Activity
Manager	Managing electronic pricing system and electronic price tags
Store Man	Withdrawal of items from warehouse to supermarket
Store Man	Return and exchange damaged or expired goods to suppliers
Online Customer	Online ordering by customers
Manager	Compile sales records to check for discrepancies
Fridge Temperature Sensor	Monitor temperature for all chillers in-store and in warehouse
Store Man	Maintain warehouse inventory records
Manager	Update product details
Manager	Cancel purchase order
Promoter	Return damaged item to warehouse
Manager	Ordering goods
Accountant	Accounting processes

## Out of Scope

The following actors are considered out of scope for the proposed system:

Users	Activity
Supplier	Third party payment (supplier)
Delivery Partner	Delivery for online order

We consider suppliers and delivery partners to be out of scope as they are external parties and have little to no interaction with our system. For example, delivery partners will only send or receive timely notifications regarding pick-up and successful deliveries of online orders. Suppliers merely receive or view purchase orders made by the company.

## Identifying the Users

### Persona – Store Man

**Tom**

*"A well-managed store inventory is crucial for any business. We want to make our inventory faster than our people."*



Tom enjoys keeping up with new and upcoming technologies. He is good with numbers and has fantastic memory which allows him to keep track of goods in the storeroom. He is good at team-building and has a knack for building rapport with co-workers and suppliers, allowing for smooth daily operations in maintaining the inventory.

Tom has been working at GetFreshFood for the past 12 years. His main duties include managing a set of inventory of all goods, and he also oversees the online home delivery service. He needs to keep it up to date daily. He is also responsible for exchanging and returning goods that are damaged or expired. Finally, he also needs to order goods from suppliers when the goods are running low in the inventory.

Attributes	Score
Organisational Skills	4.5
Basic Arithmetic Skills	5.0
Communication Skills	4.0
Observation Skills	3.0

About	Influencers	Goals	Pain Points
<b>Occupation:</b> Storeman <b>Location:</b> Singapore <b>Education:</b> Bachelor's Degree in Warehouse Management <b>Language:</b> English / Mandarin	<ul style="list-style-type: none"><li>Interested in supply chain</li><li>Loves keeping up with upcoming technologies</li><li>Looking forward to digital upgrading of inventory system</li><li>Secure and stable working environment</li><li>Enjoys exchanging ideas with people while attending conferences and seminars</li></ul>	<ul style="list-style-type: none"><li>Aims to excel in work with a better inventory system</li><li>Looking forward to a more efficient process to maintain inventory records</li><li>Hopes to work amicably with colleagues through a new and improved system</li><li>Looking forward to having a perfect system during operation hours</li><li>Good relationship with co-workers and suppliers</li></ul>	<ul style="list-style-type: none"><li>Tedious to manually maintain inventory</li><li>Numbers in inventory record often does not tally with the actual goods during the monthly check</li><li>Hard to find supplier of damaged / expired goods</li><li>Difficult to tally inventory record manually daily</li><li>Promoter does not push goods that are close to expire, hence he has to return many expired goods to suppliers</li></ul>

## Customer Journey Map – Store Man

Stages Of Journey	Ordering Goods	Getting Goods from Suppliers	Maintain Ad-hoc Inventory Records	Moving Goods to Supermarket	Maintain chiller temperature	Process Online Orders	Exchanging of damaged / expired goods
<b>Activities</b>	The Storeman contacts the suppliers for pricing list.  Then he <b>selects</b> the particular supplier according to best value for money and places the order.  The storeman also places order based on a list of pre-approved suppliers.	The Storeman checks in all the items except the damaged / expired products. He returns the damaged / expired goods to the supplier after checking.	This will be access whenever there is ad-hoc updating or correction to the inventory. For example, adding of supplier details or identifying the supplier of damaged / expired goods. Daily and monthly inventory checks	The Promoter would fill up a form and request for the required goods from the store.	The Storeman needs to check the temperature manually adjust the temperature settings manually.	The company now uses the RedMart platform to fulfil online orders. Items ordered will be packaged by Get Fresh and collected by RedMart who will then deliver to customers.	The storeman will contact the supplier and place the returned item in the store room. For recording purpose, the storeman will have to prepare three copies of the same form for the store, finance and the sender. If the sender is a customer, then the customer will be given a copy instead.
<b>Happy</b>							
<b>Overall Satisfied</b>							
<b>Unhappy</b>							
<b>Experience</b>	It is tedious to check the details of the suppliers manually.	The scanning of the SKU of each item in the pellet and entering the related details manually are important tasks in the current system.	They are able to update the inventory information into a spreadsheet. They are also able to compile their inventory information into a spreadsheet.	Sometimes, the storeman is unavailable when the promoter visits the store and the promoter may take goods from store without informing the storeman which results in discrepancies during inventory checks.	The storeman has to check the temperature every day manually. If there is any temperature anomaly, the storeman may not be able to detect it immediately.	We have no control over user experience on the web since we are using 3rd party platform.  We also don't have control over delivery.	Sometimes, the promoter will just leave the returned item in the store without informing the storeman.
<b>Expectations</b>	Needs a system which can notify him when a product reaches its reorder level.  The new system can provide details of the suppliers efficiently.	Needs a system that can maintain the usefulness of the current system.	The inventory updating system should be easy to use. The new system should easily provide a summary of the inventory to be checked.	A system which can notify him (and keep track) if anyone takes any product from the shelf.	All temperature detection information can be viewed in the system. If there is any problem with the chillers, the system will notify us in real-time.	The new system can provide the best user experience according to the profile of our customers.	There should be a system that can provide a record every time there is a return or exchange task.
<b>Corresponding Use Cases</b>	Notify storeman of low stock levels  Order confirmation notification to supplier and storemen	Check-in delivered goods to inventory  Retrieve order details  Return expired / damaged goods  Maintain stock  Retrieve supplier details	Summary of inventory records(Monthly, Weekly)	Withdraw item	Notification from fridge temperature sensor  Maintain freezer temperature	Retrieve customer order details	Return expired / damaged goods  

## User Story – Store Man

Workflow	Pain Points	User Story
Order goods	Manually check shelves to know when to place order for goods that are running low on stock	As a storeman, I need to be notified when the product reaches reorder level so that I can contact supplier to order goods.
	Manually check the details of the pre-approved suppliers to order from	As a storeman, I need to retrieve details of all the suppliers so that i can contact them for price list. 
	Tedious to compare the prices between suppliers	As a storeman, I need to compare and select supplier with best value-for-money for each product so that I can order from them. 
	Difficult to keep track if goods that are running low on stock have already been reordered by another storeman	As a storeman, I would like to access a consolidated summary of pending orders before placing an order for goods so that I don't place a duplicate order.
	Difficult to keep track of order confirmation status	As a storeman, I would like to receive a notification (including delivery date) whenever an order for goods is confirmed.
	Difficult to remember the details of every order placed	As a storeman, I need to have a consolidated summary of pending orders so that I can see the details of orders (pricing, delivery time, etc).
	Cancelling order manually	As a storeman, i need to see all the order yet to be delivered so that I can cancel.
Getting Goods from Suppliers	Tallying pellet's SKUs with purchase order's SKUs manually is difficult	As a storeman, I need to compare SKUs of goods by scanning the pellet barcode to check that there should be no discrepancies between goods received and those stated on the purchase order.
	Manually search for each SKU's details	As a storeman, I need to retrieve the details of past purchased products so that I need not to enter it again.
	Manually update the quantity for order based on the DO	As a storeman, I need to update the quantity once we check in the products automatically so that we do not enter incorrect quantity.

	Send the DO to the finance after receiving the goods	As a storeman, I need to send the DO to the account section so that we can process the payment.
Maintain inventory record	Manually updating the quantities of the goods received according to the DO	As a storeman, I need to update the quantities of goods received to ensure inventory records are kept up-to-date.
	We may alter the details of the spreadsheet accidentally during the printing process..	As a storeman, i need to be able to print records securely to prevent accidental edits made to the inventory records.
	Difficult to generate a consolidated summary of previous purchase orders	As a storeman, i want to be able to access a list of purchase orders being made so that i can contact The supplier to return goods
Move goods from storeroom to supermarket shelves	Difficult to trace the product and quantity if promoter or other staff take out the items without informing them	As a storeman, I would like to be notified of product details and quantity whenever goods are removed from the storeroom so that all goods are accounted for. (e.g. when promoter takes from store to stock shop shelves)
	Storemen update on their own hard copy spreadsheet when promoter informs them that they've taken goods from the storeroom.	As a storeman, I would like to access and edit inventory records real time so that all storemen working on the shift are informed of the latest inventory status.
Return or exchange damaged or expired goods	It is impossible to determine whether the returned goods have been paid for.	As a storeman, I need to confirm whether payment has been made, and the amount of money that has been paid needs to be refunded. If there is no refund, you need to cancel the credit sale 
	Maintaining records of Expired/Damaged goods manually	As a storeman, I need to record the details of damaged/expired goods so that I can keep the inventory records up-to-date.
	Updating inventory when damaged /expired goods found	As a storeman, I need to update inventory when damaged/expired goods are found so that my inventory records should show correct stock quantity.

## Persona – Promoter

**Jennifer**

"Ask and you shall receive"

As the sales promoter, Jennifer is the main sales driver for the supermarket. She ensures that her products are well-stocked, displayed in the right locations and priced accurately in order to provide the best shopping experience. She supplements her meticulously setup product display by being present to answer customers' questions and concerns. She also frequently carries out sampling booths to draw new customers to selected products.

She believes that the current system is intensively manual and hampers her efforts to excel at her job. She hopes that digital solutions can improve company's workflow and processes to allow her to perform better. With the new system in place she hopes to foster better relationship with her colleagues to further boost customer satisfaction and staff morale.

About	Key Attributes	Goals
Occupation: Promoter Location: Singapore Education: Diploma Language: English / Mandarin	    	<ul style="list-style-type: none"> <li>Ensure shelves are stocked to proper levels at all times</li> <li>Ensure that goods displayed at the proper shelf level according to their sales rate</li> <li>Ensure that shelves have zero expired product</li> <li>Provide accurate pricing to customers</li> <li>Be able to provide product information to customers without the need to memorize everything about the product (location, available stock, available brands for a particular product)</li> </ul>
Influencers	Frustration and Pain Points	
<ul style="list-style-type: none"> <li>Withdrawal of goods from store with little to no paperwork</li> <li>Check real time availability on inventory stocks.</li> <li>Ability to provide warnings when item count on shelves reach low levels</li> <li>Ability to monitor expiry dates of shelved items.</li> <li>Provide accurate pricing through electronic price tags</li> <li>Able to search for products digitally</li> </ul>	<ul style="list-style-type: none"> <li>Laborious inventory withdrawal with storemen because of number of forms to fill in</li> <li>Unable to stock shelves in the absence of storemen. Causing customers to wait.</li> <li>Lots of time spent manually checking expiry dates.</li> <li>Manually checking expiry dates inevitably leads to mistakes causing customer complaints</li> <li>Tedious to write/update price tags on shelves manually</li> <li>Tedious to stick price tag on every product</li> <li>Difficult to clarify pricing with manager because he may not be around</li> <li>Product form provided by manager is often unclear or consists of mistakes</li> <li>Price labels shown on shelves are often misplaced</li> <li>Hard to remember the price for all products</li> <li>Difficult to account for products used for sampling</li> </ul>	

## Customer Journey Map – Promoter

Stages	Checking Shelves						Price Labelling		Displaying Goods on Shelves		Sampling Booth
Activities	Checking for expired or dmg goods	Checking stock levels on shelves	Returning expired/damaged goods to storeroom	Restocking when shelf levels are low	Customer Enquiries	Labeling each product with a price tag.	Labeling shelf with appropriate product name and price.	Receiving product form from Supermarket Manager	Displaying product on shelves based on selling rate classification	Providing samples to customers.	
<b>Happy</b>											
<b>Overall Satisfied</b>											
<b>Unhappy</b>											
<b>Experience (interview notes)</b>	A big part of my work is to check the product in my shelves for expired/damaged goods. Doing this manually results in mistakes which leads to expired/damaged goods being left on shelves.	Very tedious to constantly inspect stock levels. Due to the fluctuations of day-to-day sales, I have to conduct multiple inspections several times a day.	Very tedious to return expired/damaged goods to the warehouse because the process requires her to fill in several forms. Unable to return goods when storemen are absent.	Very tedious to withdraw products from the warehouse because the process requires her to fill in several forms. Unable to withdraw products when storemen are absent.	Difficult to remember the details of all the products and may not be able to answer customer enquiries. (Location, available stock in store, available brands of particular item, weight)	After getting the product form from the supermarket manager, I have to put price tags on all my products manually. Having to manually stick a price tag on each product is a time-consuming process.	After getting the product form from the supermarket manager, I have to write price on a shelf label and stick the label on the side of the shelf. This is a time-consuming process.	In general, there are no problems receiving product form from Supermarket Manager. However, it can be difficult to seek clarifications because the Supermarket Manager is not present in the store throughout the day. During busy periods, the Supermarket Manager would also provide hand-written product forms which can be difficult to decipher.	Following the instructions provided on the product form, the shelves are arranged based on how fast the goods were sold in the previous week.	Unclear on how to account for product used for customer sampling. Concerned that this would lead to discrepancies during stock check.	
<b>Expectations (influencers)</b>	Have digital inventory record of products withdrawn from store. <b>Able to use digital record to monitor expiry dates of shelfed products.</b> Able to get automated warnings when products are about to expire.	Have digital inventory record of products withdrawn from warehouse. Stock levels get automatically updated when customers purchase products. Able to get automated warnings when there's a need to restock.	Be able to scan the goods that she wants to deposit and have the results be digitally recorded. This process would replace the need for forms.	Be able to scan the products that she wants to withdraw and have the results be digitally recorded.	Have a handheld device which can scan product barcode and display the relevant product details.	Remove the need to label every product with price tag. Each product barcode should have an associated price that can be updated by the Supermarket Manager.	Have electronic price tags that can be updated digitally.	Be able to get a digital product form. Be able to receive urgent updates in product forms and also be able to raise clarifications to the Supermarket Manager.	Would like to have easy access to accurate instructions.	Have digital inventory record of products used for customer sampling.	



## User Story – Promoter

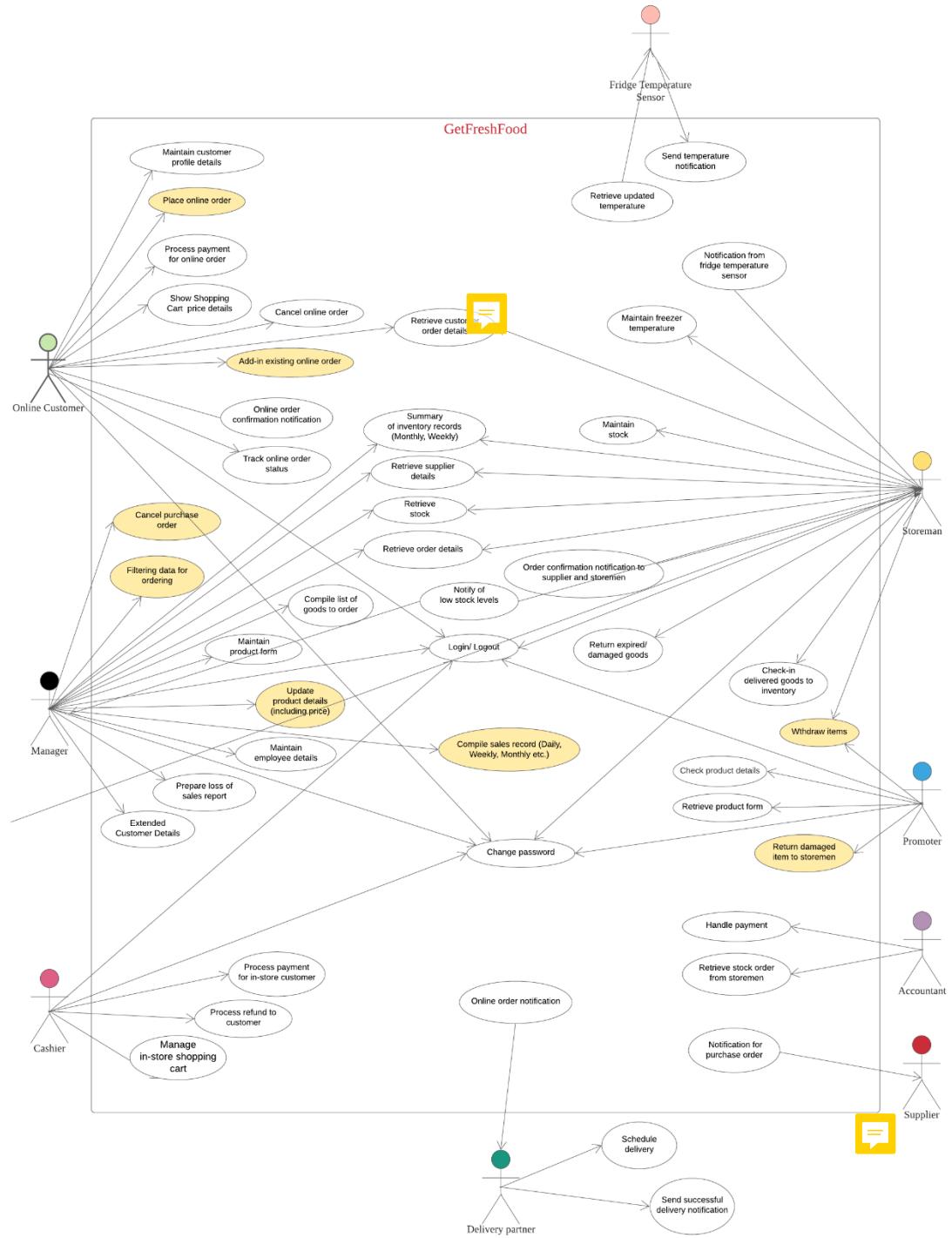
Workflow	Pain Points	Influencers	Goals	User Story
Checking Products on Shelves	Hard to remember the price for all products	Able to search for products digitally	Provide accurate pricing to customers  Be able to provide product information to customers without the need to memorize everything about the product (location, available stock, available brands for a particular product)	As a promoter, I would like to have a handheld barcode scanner which I can use to scan product barcodes to view product information so that i can entertain customer enquiries.
	Lots of time spent manually checking expiry dates.	Ability to monitor expiry dates of shelved items.	Ensure that shelves have zero expired product	As a promoter, I would like to have a digital inventory record of the products that I'm responsible for which I can use to monitor expiry dates so that I can remove products that are close to expiring/expired from the shelves.
	Very tedious to constantly inspect stock levels several times a day.	Check real time availability on inventory stocks.	Ensure shelves are stocked to proper levels at all times	As a promoter, I would like to receive notifications when the goods on my shelf are about to expire so that I can remove them from the shelves.

		Ability to provide warnings when item count on shelves reach low levels		As a promoter, I would like to be notified when item count on shelves reach low levels so that I can withdraw more goods from the warehouse.
	Laborious inventory withdrawal with storeman because of number of forms to fill in	Withdrawal of goods from store with little to no paperwork	Ensure that promoter can take out items from the store quickly and accurately.	As a promoter, I would like the process of withdrawing goods from the warehouse to be similar to withdrawing cash from an ATM such that the transaction is electronically recorded so that I can avoid filling in physical forms. 
Price Labelling	Tedious to write/update price tags on shelves manually	Provide accurate pricing through electronic price tags	Ensure that price tags can be done without writing.	As a promoter, I would like the barcode to be linked to the real-time pricing such that the barcode would become the new price-tag so that I can avoid manually sticking price tags on every item. 
	Tedious to constantly check with supermarket manager on changes in instructions on product forms.			As a promoter, I would like to be alerted when the manager updates the product forms so that I can make the changes in a timely manner.
Displaying Goods on Shelves	The supermarket manager provides hand-written product forms which can be difficult to decipher.	Having a digital form to replace the branch manager's hand-writing	Ensure that staff working in the supermarket can distinguish the branch manager's form without confusion.	As a promoter, I would like to have a digital inventory of the products that lists the critical information for every product that I'm responsible for (stock level, price), with which I would be able to view the Product Forms, so that I always have the most up-to-date instructions on how to carry out my duties.
	The supermarket manager is not present at the store throughout the day.			As a promoter, I would like be able to send a message to the manager so that I can efficiently deal with problems.

Sampling Booth	Unclear on how to account for product used for customer sampling. Concerned that this would lead to discrepancies during stock check.			As a promoter, I would like the process of withdrawing goods from the warehouse to be similar to withdrawing cash from an ATM such that the transaction is electronically recorded so that I can avoid filling in physical forms.
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# Functional Requirement

## System Use Case Diagram



## Activity Diagrams, Class Diagrams and Screens

We chose the following 8 use cases to go in detail as they are more significant to the system. These use cases cover important actors in the system such as managers, online customers, store men and promoter.

Screen – Promoter Homepage



Shelf  
Inventory

Withdraw  
from  
Warehouse

Return  
Damaged &  
Expired  
Products

Logout

Screen – Store Man Homepage



Inventory Records

Sales Records

This is the screen  
store man will see  
when he first logs  
in

miro



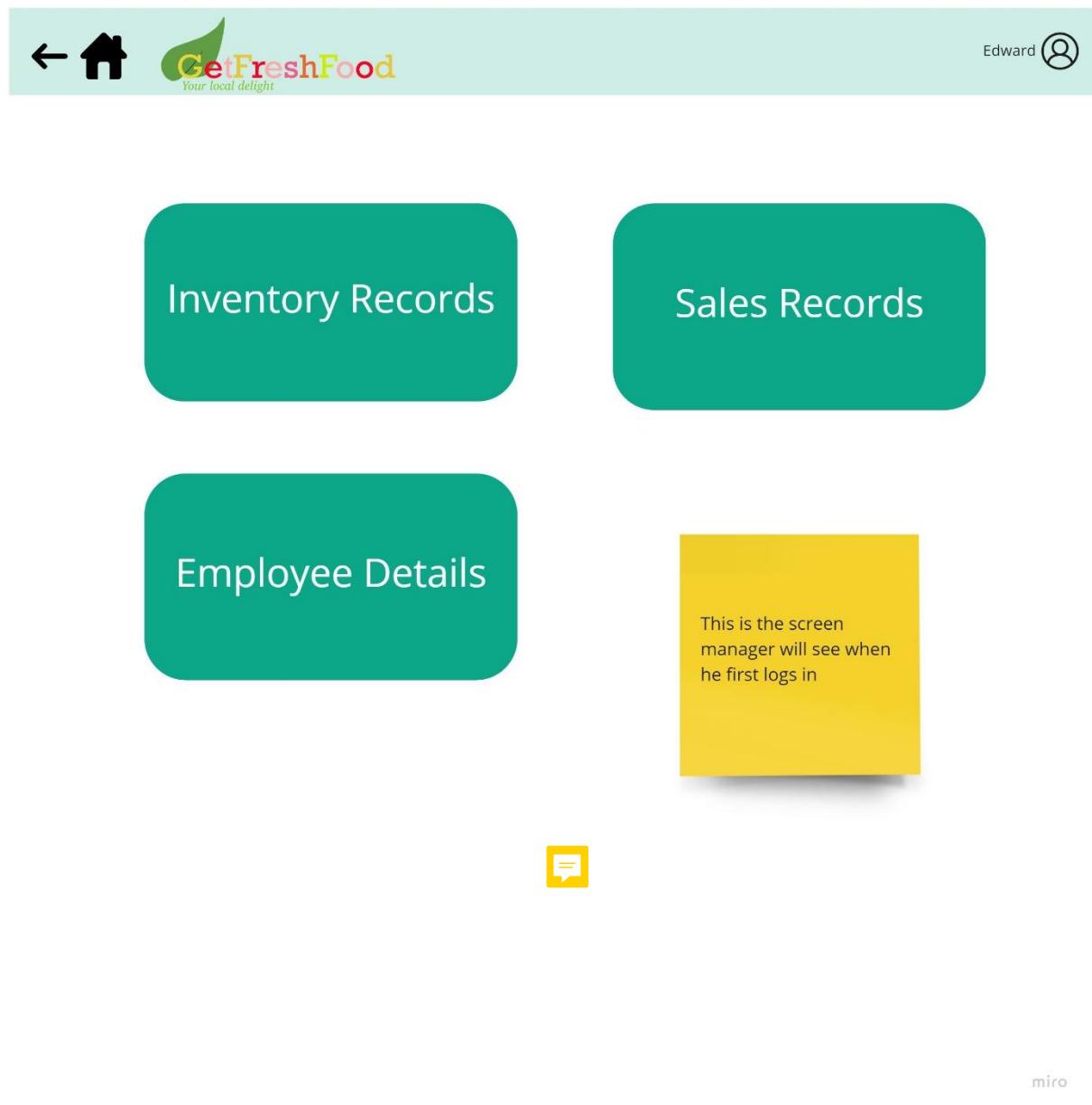
Tom

Inventory Records

Sales Records

miro

Screen – Manager Homepage



The wireframe shows a mobile application interface for a manager. At the top is a header bar with a back arrow, a home icon, the logo 'GetFreshFood' (with a green leaf icon and the tagline 'Your local delight'), and a user profile for 'Edward' with a circular icon. Below the header are four rounded rectangular buttons: 'Inventory Records' (top-left), 'Sales Records' (top-right), 'Employee Details' (bottom-left), and a yellow note card (bottom-right) containing the text: 'This is the screen manager will see when he first logs in'. A small message icon is located at the bottom center.

←  GetFreshFood  
Your local delight

Edward 

Inventory Records

Sales Records

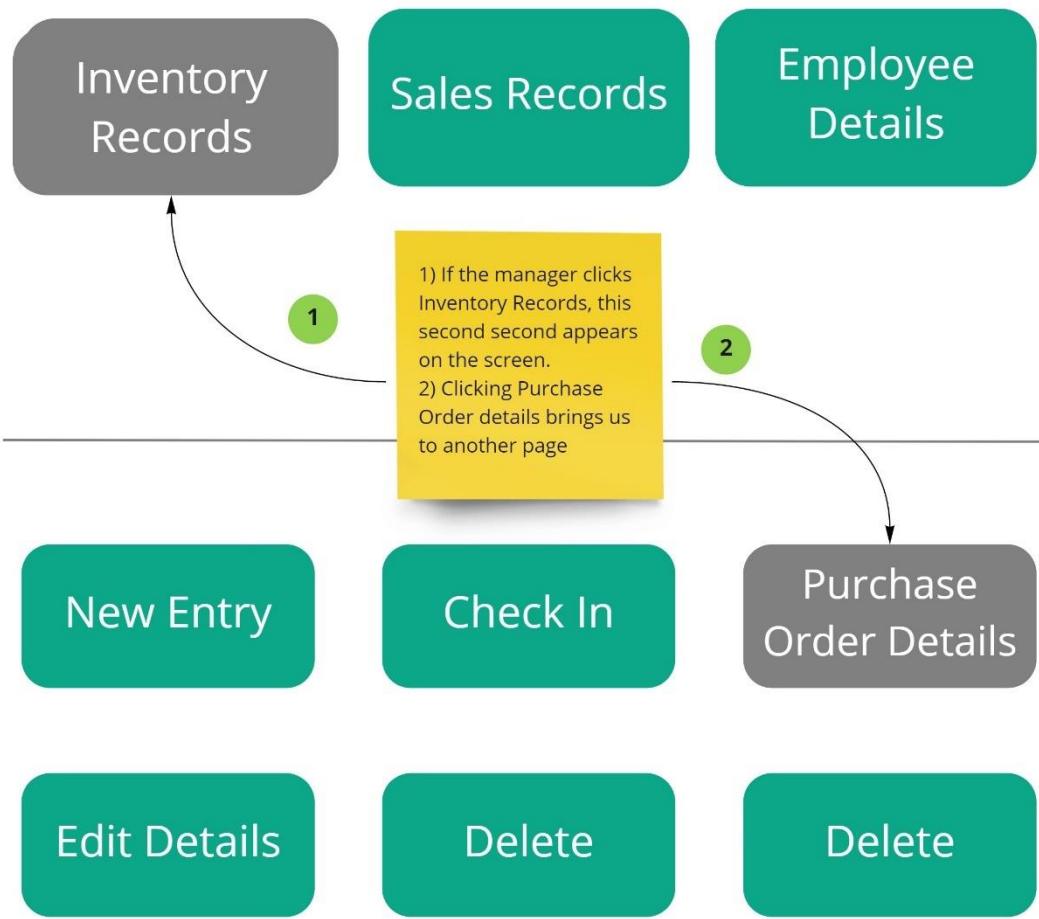
Employee Details

This is the screen manager will see when he first logs in

miro



Tom

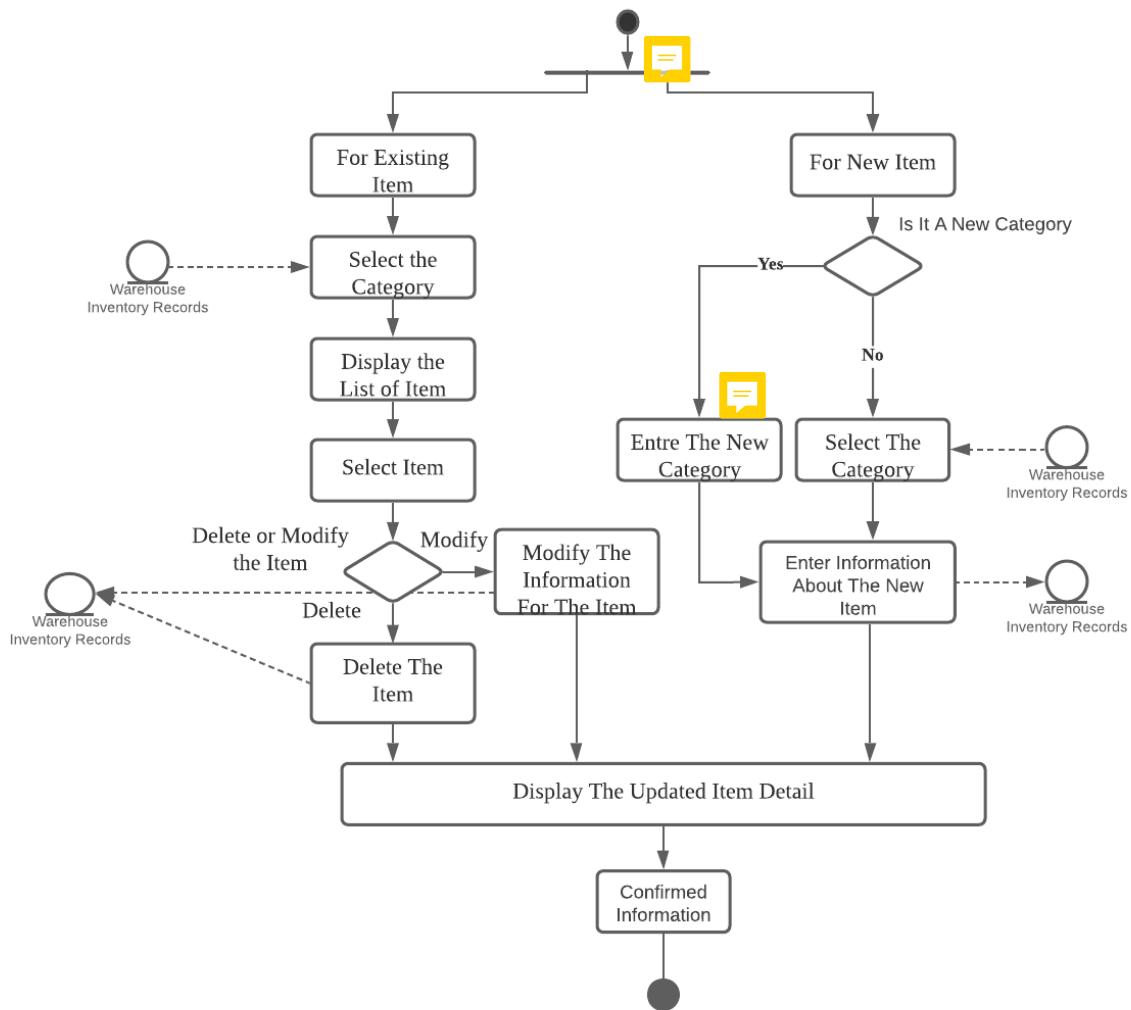


miro

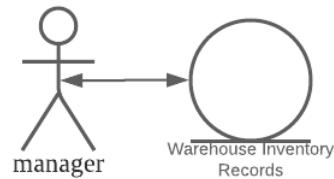
## Update Product Information – Use Case Diagram



## Update Product Information – Activity Diagram

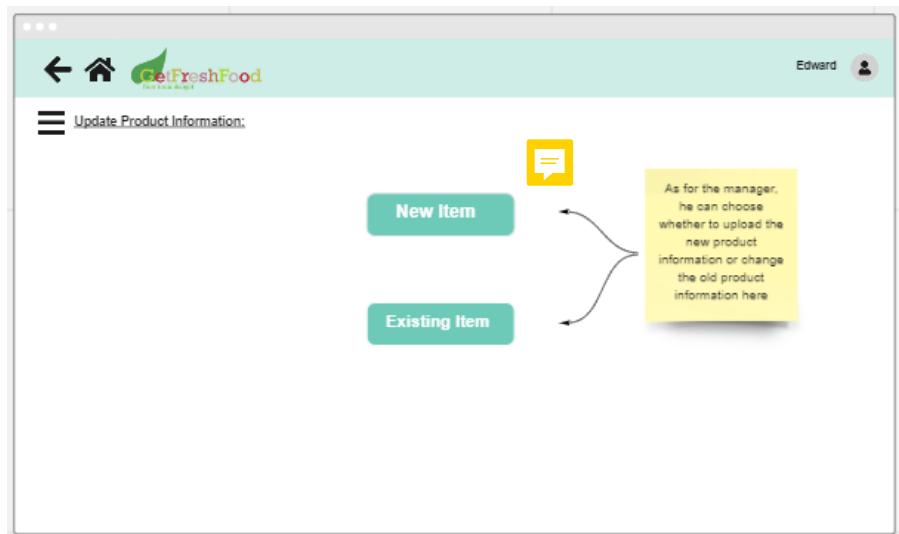


## Update Product Information – Class Diagram

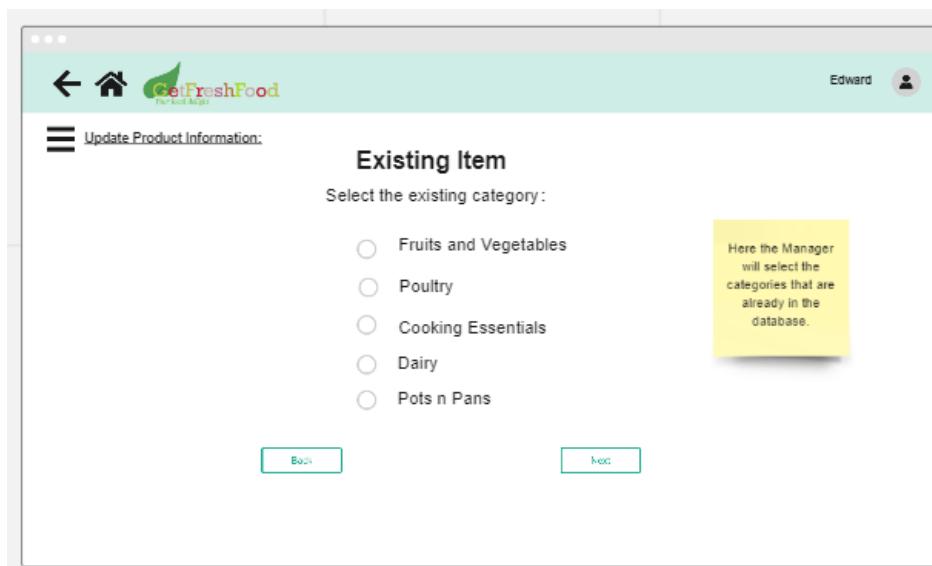


## Update Product Information – Screens

For starred page



For existing item



**Update Product Information:**

Select	Product ID	Item Description	Unit Price	Location	Supplier by	Discount (option)	Note (option)
<input checked="" type="checkbox"/>	SKU123456X	China fuji Apple	\$8	Aisle 1 Shelf 20	Baishui County Runkangyuan Agricultural Co., Ltd.		
<input type="checkbox"/>	SKU123477X	Red Delicious Apple	\$10	Aisle 1 Shelf 21	Baishui County Runkangyuan Agricultural Co., Ltd		
<input type="checkbox"/>	SKU122477X	Mildly Sweet Apple	\$12	Aisle 1 Shelf 22	TAKAMATSUDAICH ISEIKA CO.,LTD.		
<input type="checkbox"/>	SKU123477X	Red Sweet Peach	\$9	Aisle 1 Shelf 24	LA COCCINELLA.COM SRL		

**Delete**      **Modify**

If Delete is clicked

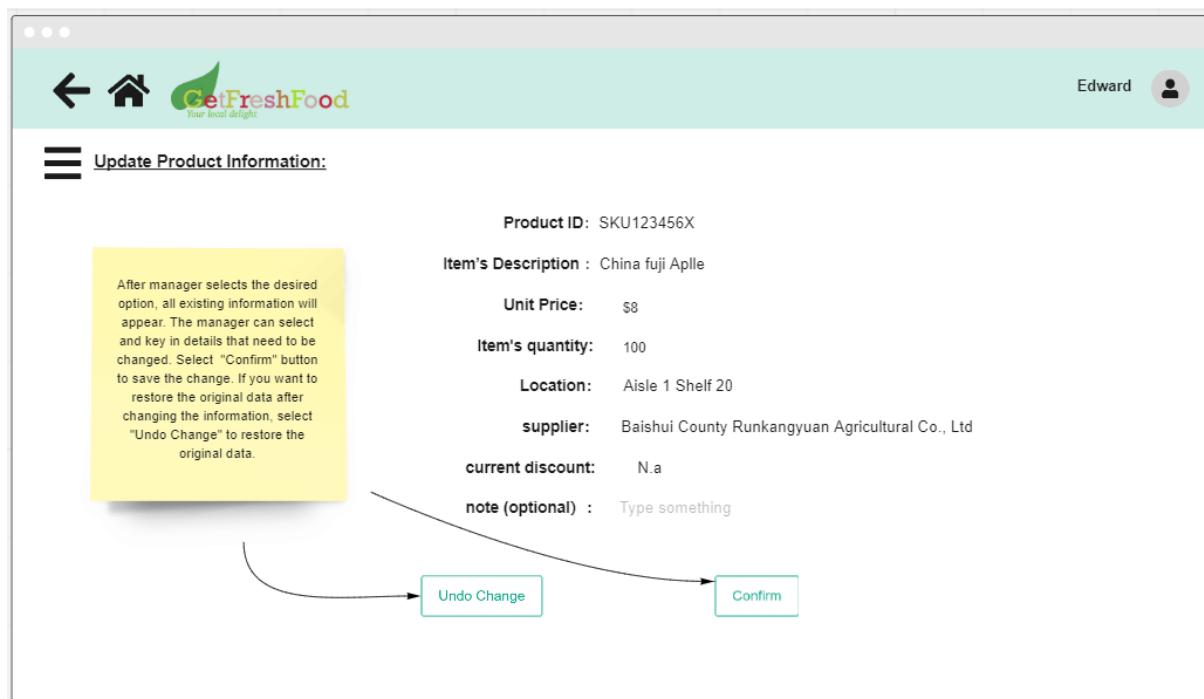
**Update Product Information:**

Are you sure you want to delete this item?

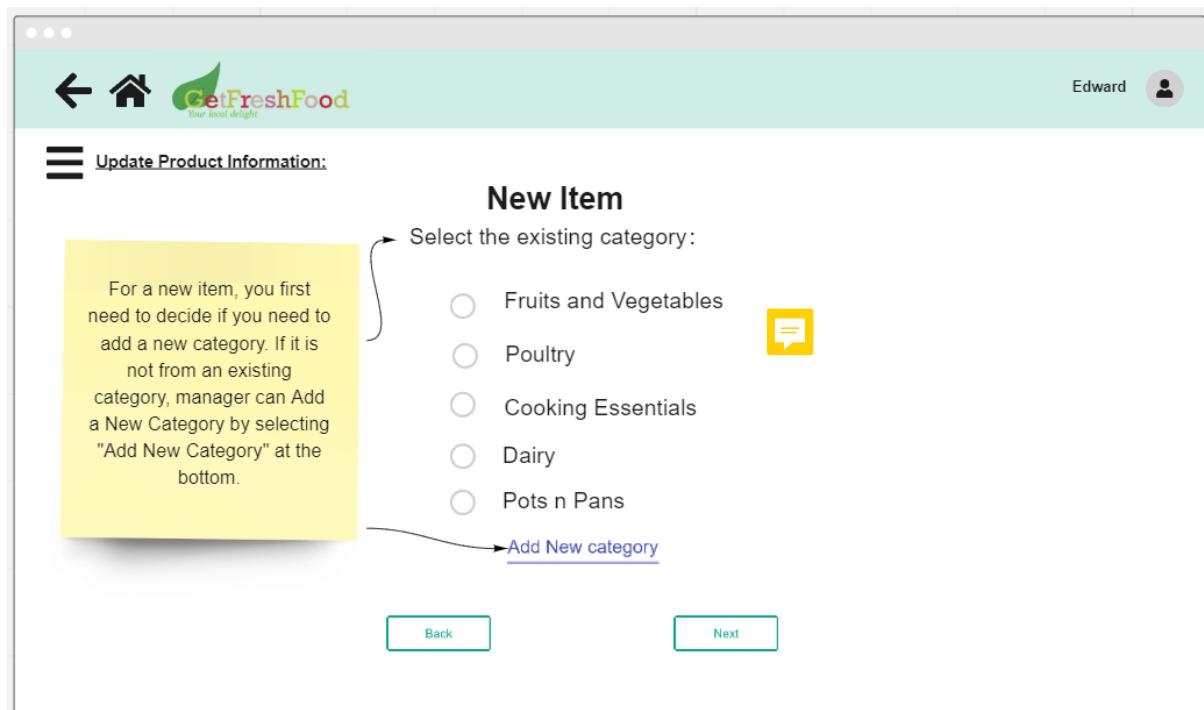
**yes**      **No**

The manager will be required to confirm the action. If confirmed, click the Yes button. If there are any changes or returns, you need to click the No button.

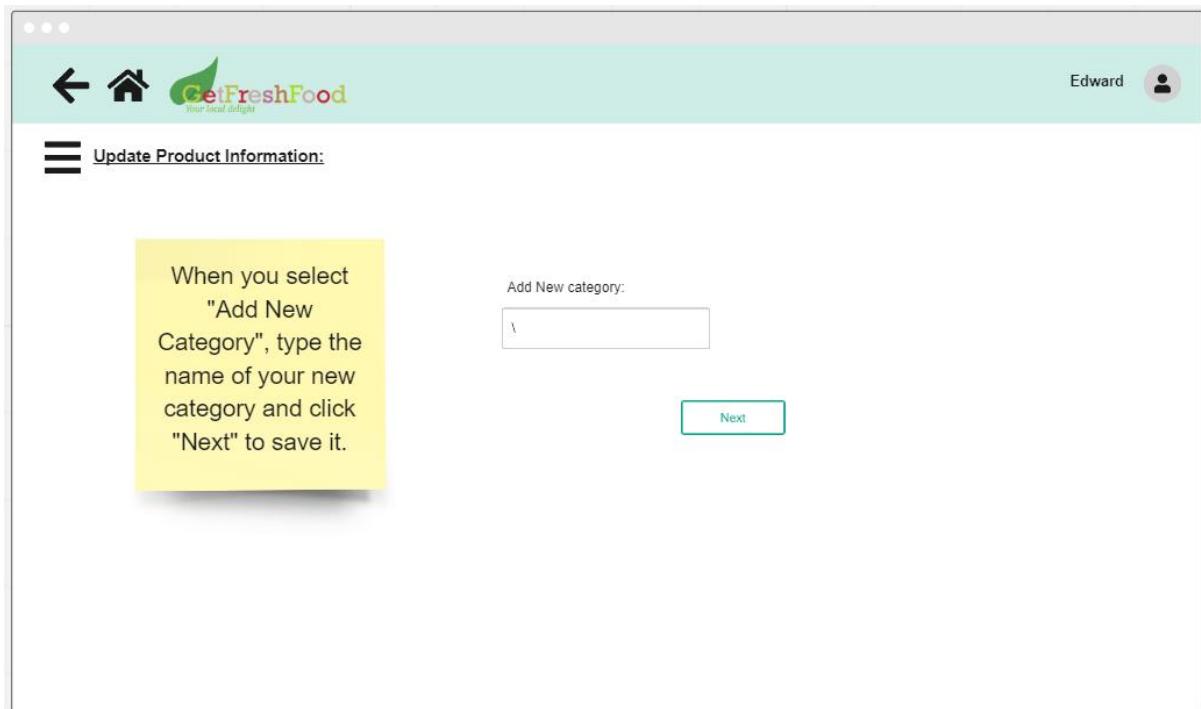
If Modify is clicked



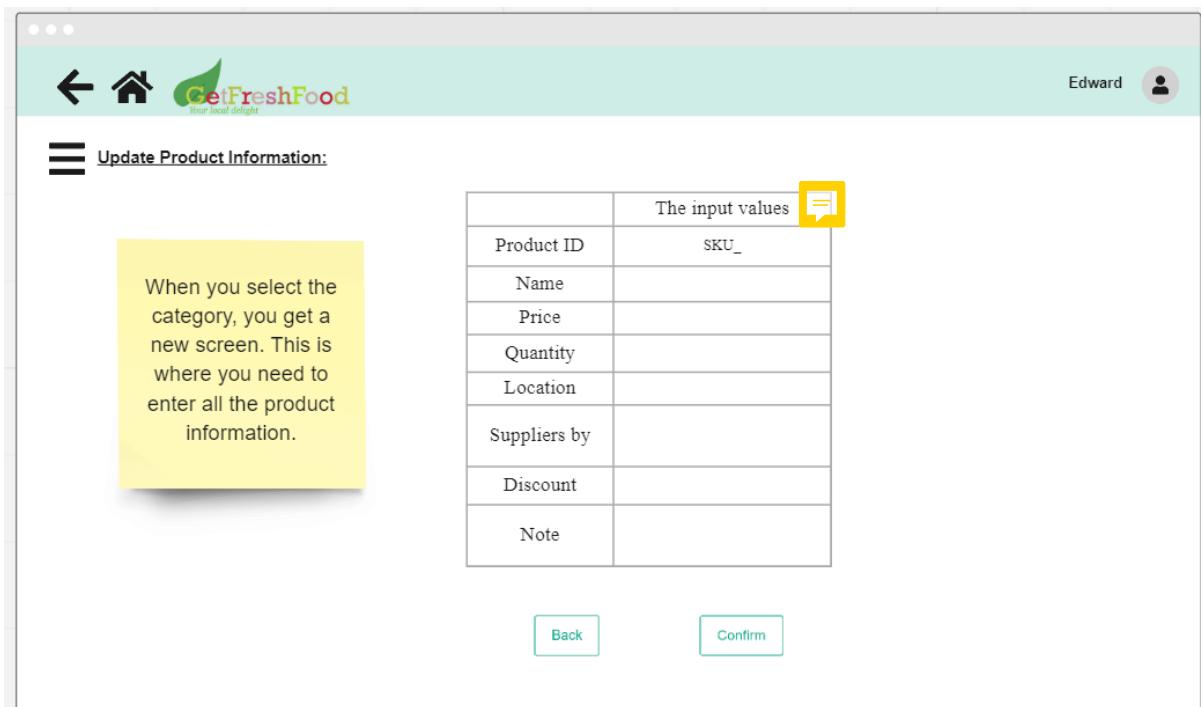
To add a New Item to inventory records



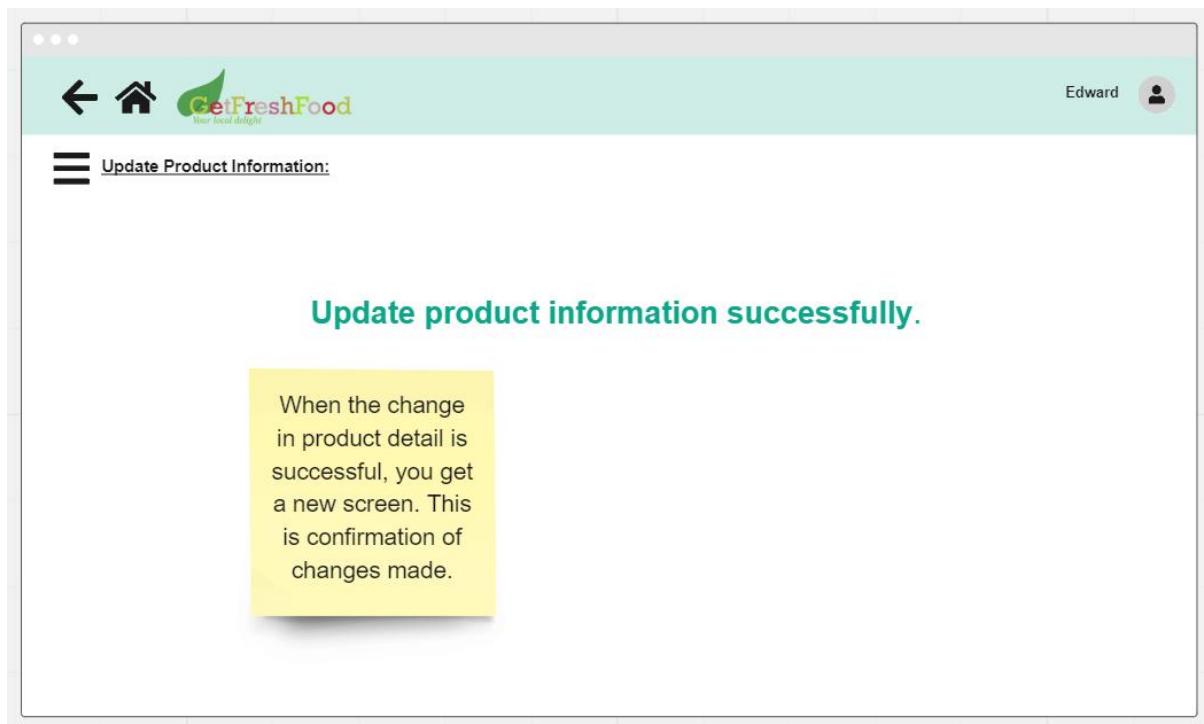
When you choose “Add New category”



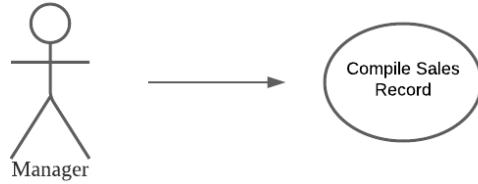
After clicking Next



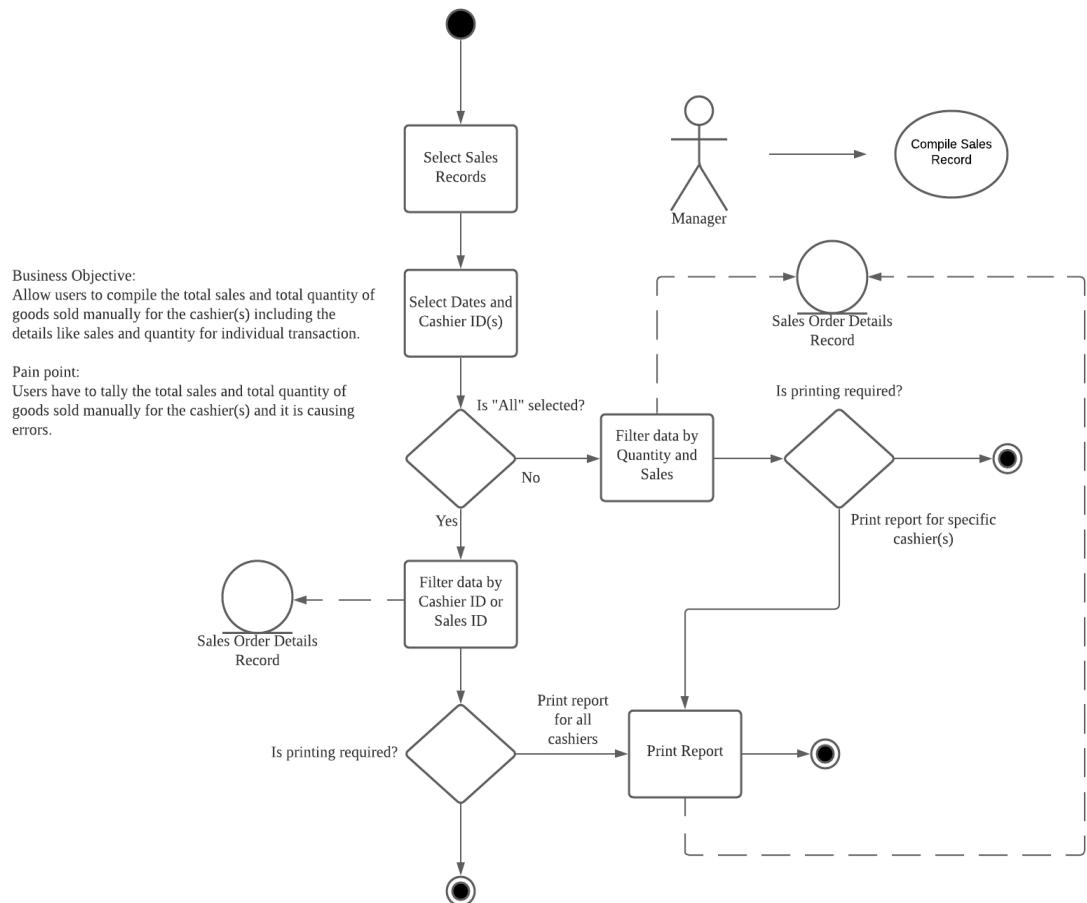
## Successful update confirmation



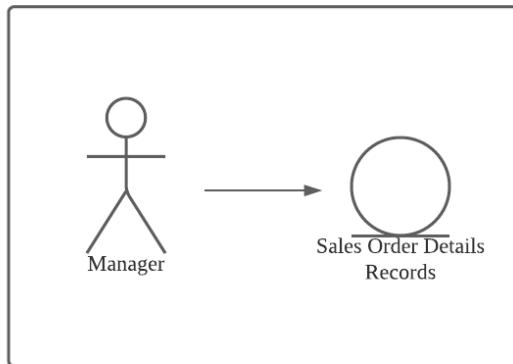
## Compile Sales Records – Use Case Diagram



## Compile Sales Records – Activity Diagram



## Compile Sales Records – Class Diagram



## Compile Sales Records – Screens

### Selecting Specific Cashier(s)



Select Dates And Cashier ID(s)

The form consists of several input fields and buttons. There are two sets of input fields for dates: "Start Date" and "End Date". Each set includes a text input field containing the number "1" and a button labeled with the date type ("Start Date" or "End Date"). To the right of these, there is a dropdown menu currently showing "C" and an "Add" button. Below the date inputs is a large, empty rectangular input field. At the bottom right of the form is a blue "Next" button.

The user will select the dates and the cashier ID(s). For the dates, the users can key in manually. For the cashier ID(s), the user has to add in from the drop-down box one at a time.



Select Dates And Cashier ID(s)

15/03/2021	Start Date	C	Add
21/03/2021	End Date	C	

**Next**



The dates  
are keyed  
in manually  
here.



Edwards

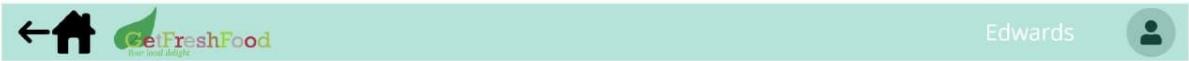


Select Dates And Cashier ID(s)

15/03/2021	Start Date	C0006	Add
21/03/2021	End Date	C0004 C0005 C0006	

**Next**

The cashier ID(s) are added one at a time. The user will select from the drop-down box first and then use the Add button to add into the text box



Select Dates And Cashier ID(s)



15/03/2021	Start Date	C0006	Add
21/03/2021	End Date	C0004 C0005 C0006	<b>Next</b>

After clicking on the Next button, the Sales Report will be displayed on the next page



Cashier Sales | All Sales

Filter by: [Quantity](#) | [Sales](#) | [Print](#)

Cashier ID	Cashier Name	Sales	Quantity of Goods Sold
C0001	Ann	4200	1850
C0002	Mary	4100	1900
C0003	Celia	4000	1950
C0004	Talia	3700	2100
C0005	Nancy	3800	2050
C0006	Anna	3900	2000
Total		23,700	11,850



Cashier Sales | All Sales

Filter by: [Quantity](#) [Print](#)

Cashier ID	Cashier Name	Sales	Quantity of Goods Sold
C0004	Talia	3700	2100
C0005	Nancy	3800	2050
C0006	Anna	3900	2000
C0003	Celia	4000	1950
C0002	Mary	4100	1900
C0001	Ann	4200	1850
Total			

After clicking on the Quantity link,  
the Sales Report is arranged by  
Quantity in descending order  
and appears on the right



Cashier Sales | All Sales



Filter by: Qua



Cashier ID	Confirm Print?		
C0004			Quantity of Goods Sold
C0005			100
C0006			050
C0003	Celia	4000	000
C0002	Mary	4100	1950
C0001	Ann	4200	1900
Total			1850

Ok

After clicking on the Print link,  
the pop-up box appears  
asking for print confirmation



Edwards



## Cashier Sales



Filter by: Qua

X

Cashier ID	Printer Not Ready!		Quantity of Goods Sold
C0004			.100
C0005			.050
C0006			.000
C0003	Celia	4000	1950
C0002	Mary	4100	1900
C0001	Ann	4200	1850
Total			

If the printer is not detected, a pop-up box appears informing user to check printer

## Selecting All Cashier(s)



Select Dates And Cashier ID(s)



After clicking on the Select Dates and Cashier ID(s) button, the Select Dates and Cashier ID(s) page appears on the right



Select Dates And Cashier ID(s)

15/03/2021	Start Date	All	Add
15/03/2021	End Date	All	
			Next

The dates are assumed to have been selected.

To display all records, select "All" from the drop-down box and click the Add button. Click on the Next button to display the details.



Select Dates And Cashier ID(s)

Filter by: [Cashier ID](#) | [Sales ID](#) | [Print](#)

Cashier ID	Sales ID	Sales	Quantity of Goods Sold
C0001	S1110001	2.40	1
C0003	S1110002	1.80	2
C0002	S1110003	2.00	1
C0001	S1110004	1.60	3
C0005	S1110005	5.00	1
C0003	S1110006	3.50	1
Total		23,700	11,850



Select Dates And Cashier ID(s)

Filter by: [Sales ID](#) | [Cashier ID](#) | [Print](#)

Cashier ID	Sales ID	Sales	Quantity of Goods Sold
C0001	S1110001	2.40	1
C0001	S1110004	1.60	3
C0001	S1110007	5.00	1
C0001	S1110008	8.50	1
C0001	S1110010	1.20	5
C0001	S1110012	3.00	1
Total		23,700	11,850

In default, the sales report is sorted according to the Sales ID in ascending order

After clicking on the Cashier ID button, the Sales Report is sorted according to Cashier ID on the right



Edwards



Select Dates And Cashier ID(s)



Filter by: Sale



Cashier ID	Quantity of Goods Sold		
C0001			
C0001			
C0001			
C0001	S1110008	8.50	1
C0001	S1110010	1.20	5
C0001	S1110012	3.00	1
Total		23,700	11,850

Confirm Print?

Ok

After clicking on the Print link,  
the pop-up box appears  
asking for print confirmation



Select Dates And Cashier ID(s)



Filter by: Sale



Cashier ID	Quantity of Goods Sold		
C0001			
C0001			
C0001			
C0001	S1110008	8.50	1
C0001	S1110010	1.20	5
C0001	S1110012	3.00	1
Total		23,700	11,850

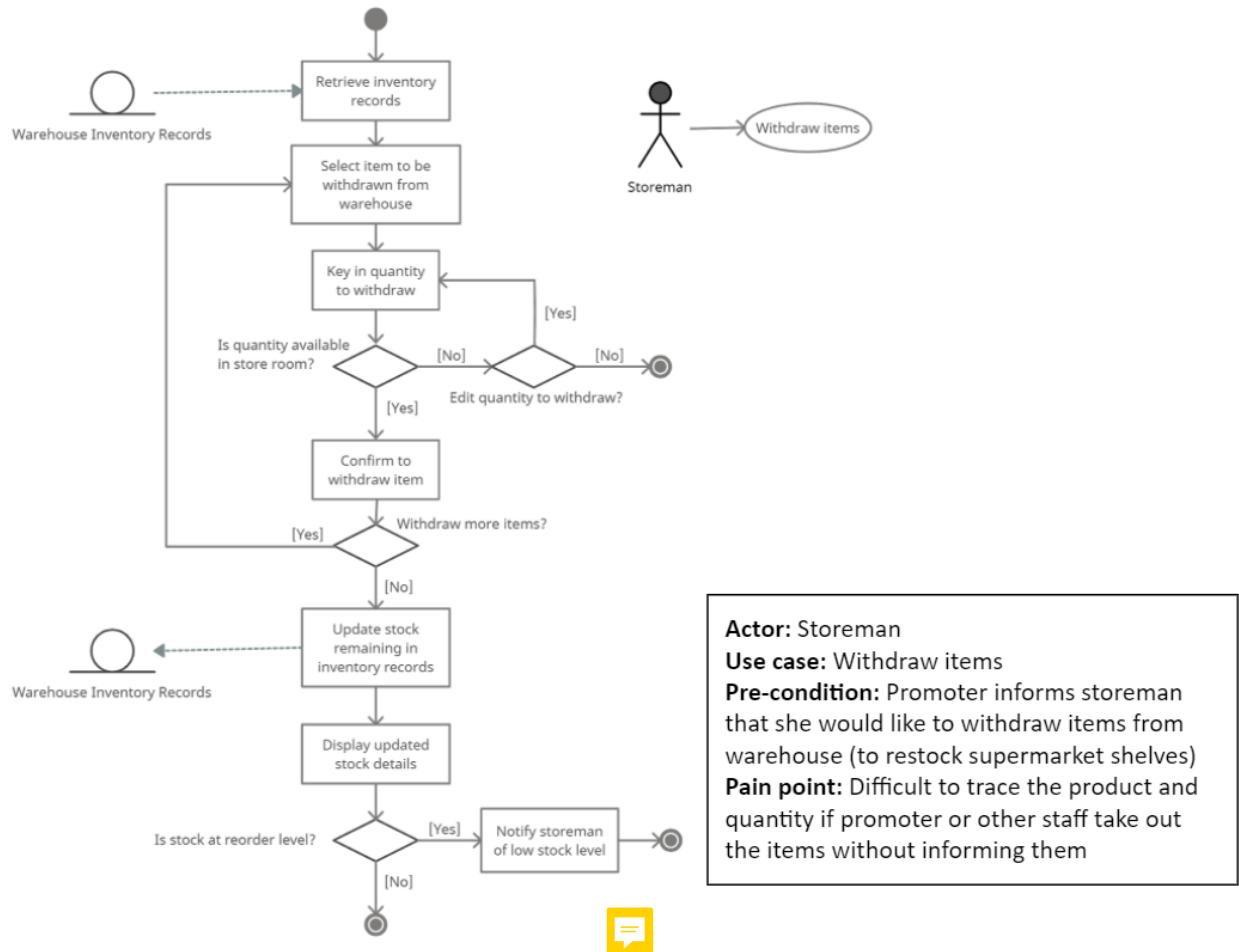
Printer Not Ready!

Ok

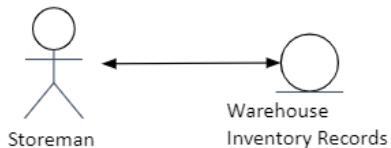
Cancel

If the printer is not detected, a pop-up box appears informing user to check printer

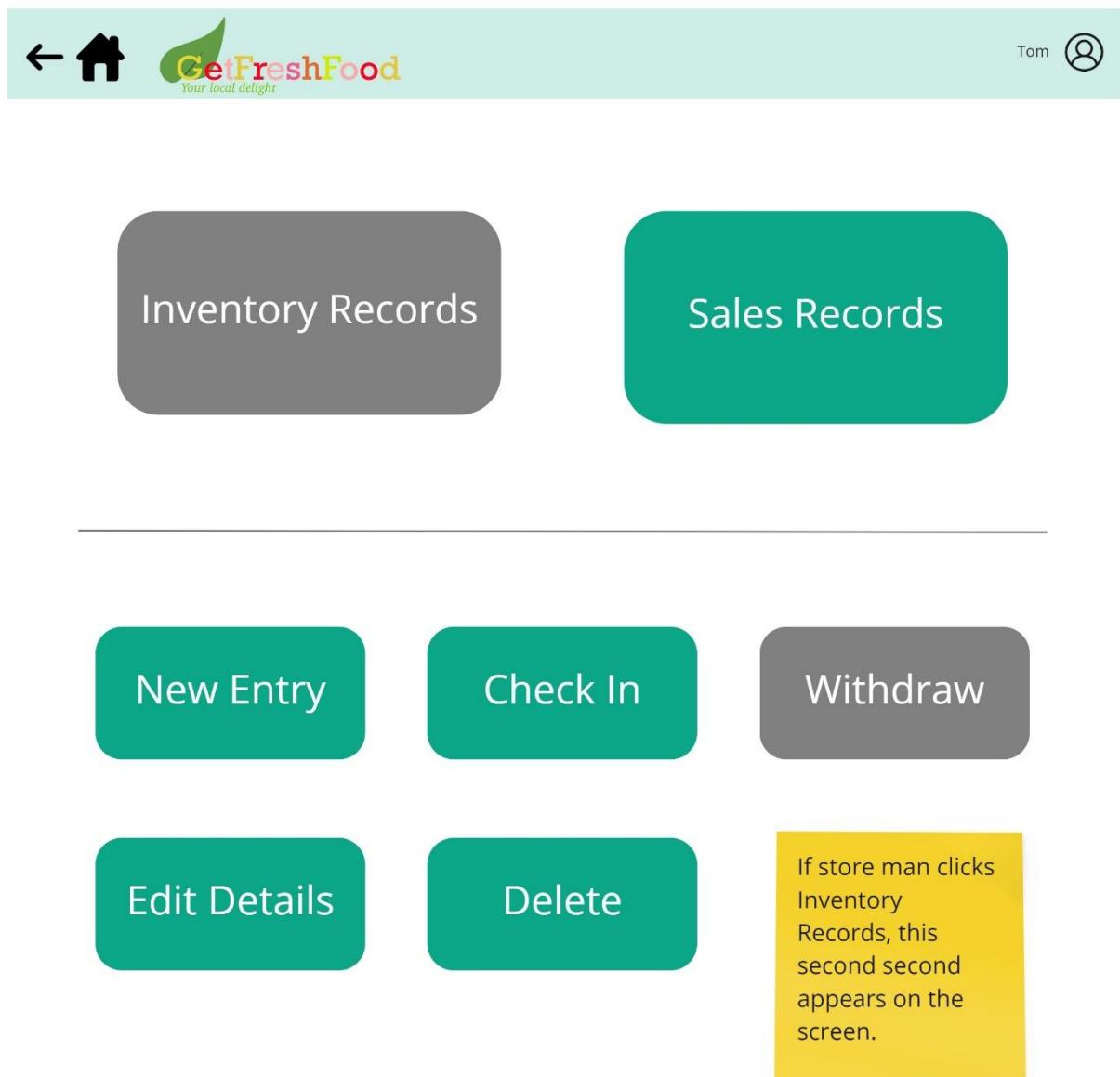
## Withdraw Items – Activity Diagram



## Withdraw Items – Class Diagram



## Withdraw Items – Screens





Tom

## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By :

If storeman clicks Withdraw, this screen appears. He can choose to view items in this list by filtering.

miro



Tom

## Inventory Records

[New Entry](#) | [Check In](#) | [Withdraw](#) | [Edit Details](#) | [Delete](#)Filter By : [Category ▾](#) [Fruit ▾](#)

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

Store man can filter the inventory records according to category and select the item that he wishes to withdraw.

[Withdraw](#)

miro



## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By : Category ▾ Fruit ▾

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

SKU123456X | China Fuji Apple

Quantity to withdraw:  Withdraw

Submit

Upon clicking the "Withdraw" button, a second section appears on the screen where store man can key in quantity that he wishes to withdraw



## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By: Category ▾ Fruit ▾

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

### Confirm withdrawal

SKU123456X | C  
Quantity to withdraw

Confirm withdrawal of 20 Qty :  
SKU123456X China Fuji Apple?

Confirm

Cancel

Withdraw

Withdraw

Upon clicking the "Submit" button, a pop-up appears to confirm the withdrawal from warehouse

miro



## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By : **Category ▾** **Fruit ▾**

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input type="checkbox"/>	SKU123456X	China Fuji Apple	80	30
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

Withdraw

Upon confirmation, the Warehouse Qty and In-Store Qty are updated respectively. An updated inventory record is shown.

The screens below illustrate the path of Store Man Tom when he wants to withdraw multiple types of items from the warehouse in one go.



Tom 

## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By : **Category** ▾ **Fruit** ▾

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input checked="" type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

Withdraw

Store man can process multiple withdrawals at a time by selecting all items that he wishes to withdraw from the warehouse.





Tom

## Inventory Records

[New Entry](#) | [Check In](#) | [Withdraw](#) | [Edit Details](#) | [Delete](#) Filter By : [Category ▾](#) [Fruit ▾](#)

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input checked="" type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

**SKU123456X | China Fuji Apple**Quantity to withdraw: 

Upon clicking the "Withdraw" button, a second screen appears on screen with all items that were selected

**SKU123459X | Korean Strawberry**Quantity to withdraw: 

miro



Tom

## Inventory Records

[New Entry](#) | [Check In](#) | [Withdraw](#) | [Edit Details](#) | [Delete](#) Filter By : [Category](#) [Fruit](#)

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	100	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input checked="" type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

### Confirm withdrawal

Confirm withdrawal of 20 Qty :  
SKU123456X China Fuji Apple?

SKU123456X | C

Quantity to withdraw:

SKU123459X | K

Quantity to withdraw:

10

Store man has to  
confirm the qty to  
withdraw for each item  
selected separately to  
ensure no mistakes  
have been made while  
keying in qty.

miro



## Inventory Records

New Entry | Check In | Withdraw | Edit Details | Delete

Filter By : Category ▾ Fruit ▾

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input checked="" type="checkbox"/>	SKU123456X	China Fuji Apple	80	30
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input checked="" type="checkbox"/>	SKU123459X	Korean Strawberry	57	7
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

Warehouse Qty and In-Store Qty for China Fuji Apple has been updated respectively as Store man has confirmed its withdrawal

### Confirm withdrawal

Withdraw

Confirm withdrawal of 10 Qty :  
SKU123459X | Korean Strawberry?

Submit

Confirm

Cancel

SKU123459X | K

Quantity to withdraw:

10

Submit



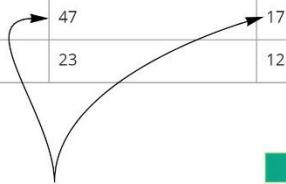
Tom 8

## Inventory Records

[New Entry](#) | [Check In](#) | [Withdraw](#) | [Edit Details](#) | [Delete](#)

Filter By : [Category ▾](#) [Fruit ▾](#)

Select	Item ID	Item Description	Warehouse Qty	In-Store Qty
<input type="checkbox"/>	SKU123456X	China Fuji Apple	80	30
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15
<input type="checkbox"/>	SKU123459X	Korean Strawberry	47	17
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12

[Withdraw](#)

Upon confirmation, the Warehouse Qty and In-Store Qty for Korean Strawberry are updated respectively. An updated inventory record is shown.

miro

## Return Damaged Item to Store Man – Activity Diagram

Providing the definition of:



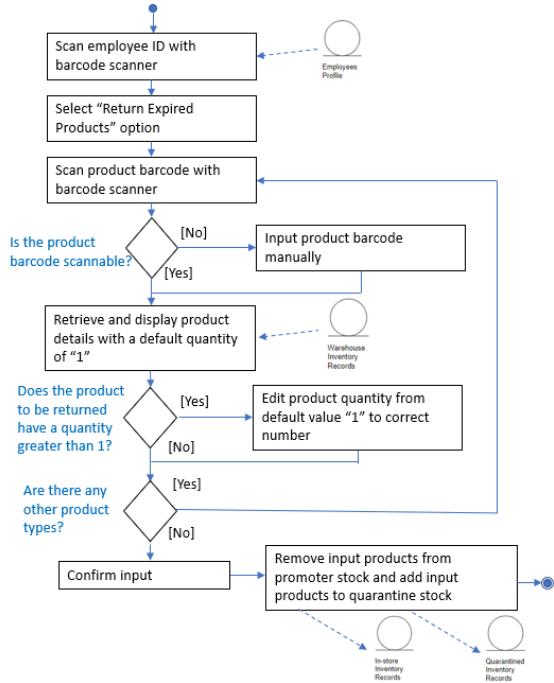
Return expired products to storeman

**Actor: Promoter**

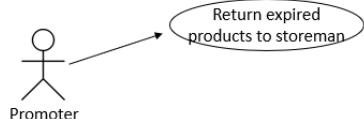
**Use Case: Return expired products to storeman**

**Description:** to return expired products to storeman. Specifically, the expired products will be placed in the quarantine area separate from the warehouse.

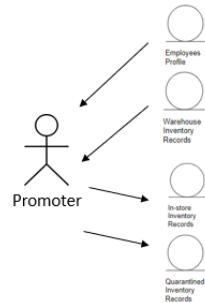
**Frustration:** In the current process of returning expired products to storeman, the promoter has to complete a lot of paperwork to document the transfer.



## Return Damaged Item to Store Man – Class Diagram



Return expired products to storeman



## Return Damaged Item to Store Man – Screens



### Deposit Expired Products into Quarantine Inventory

Input product by scanning barcode or manually  
inputting it using the Manual Input button

No.	Barcode	Product Description	Quantity
-----	---------	---------------------	----------



This is the screen that the user sees after selecting "Deposit Expired Products into Quarantine Inventory" option in their home screen.





Jennifer

## Deposit into Quarantined Inventory

**Input product by scanning barcode or manually  
inputting it using the Manual Input button**

No.	Barcode	Product Description	Quantity	
1	1234-5678	Anisha Brand Tuna	<input type="text" value="10"/>	
2	1234-5679	Aung Brand Chicken	<input type="text" value="1"/>	

Edit Quantity

Confirm

Cancel

**Manual Input**  
**Submit**

## Deposit into Quarantined Inventory

Input product by scanning barcode or manually  
inputting it using the Manual Input button

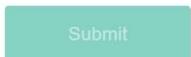
No.	Barcode	Product Description	Quantity	
1	1234-5678	Anisha Brand Tuna	10	
2	1234-5679	Aung Brand Chicken	1	

Input Product Barcode

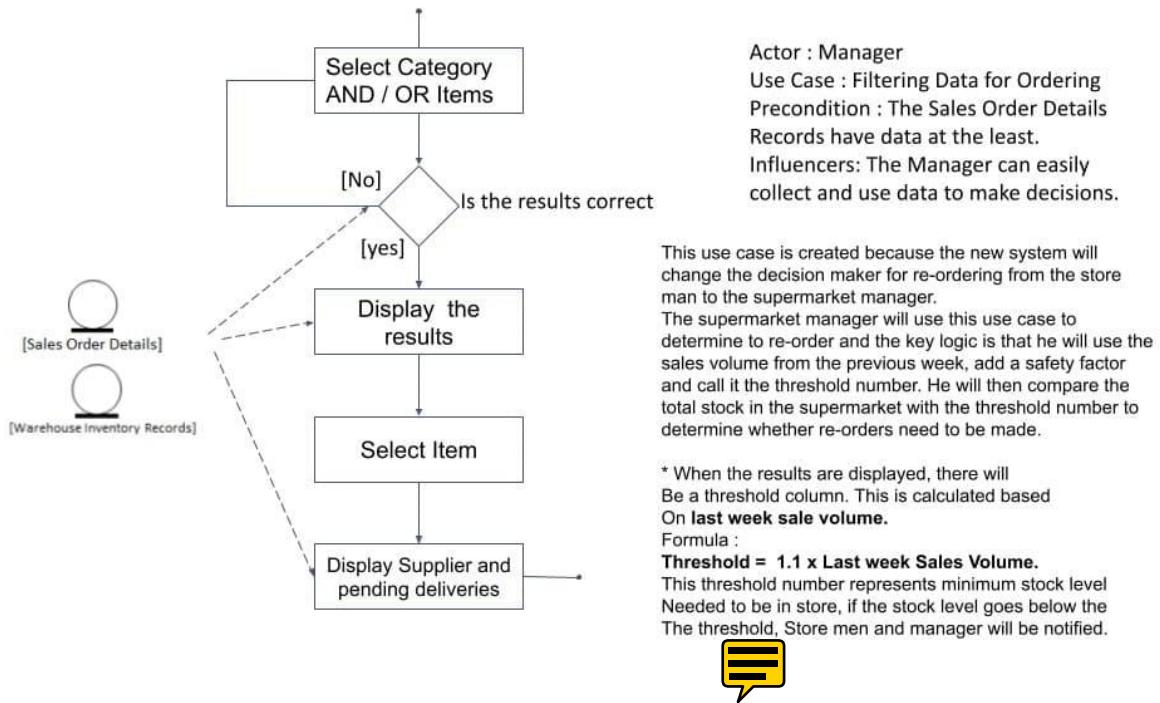
1234-5680

Confirm

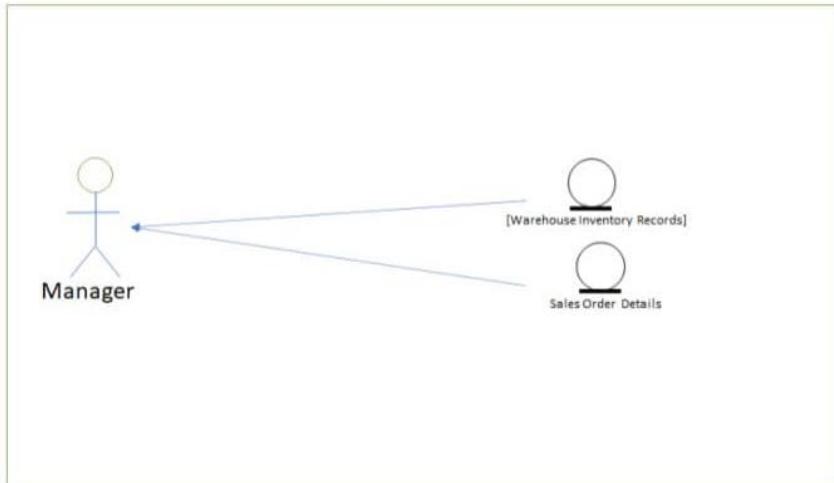
Cancel

Manual InputSubmit

## Filtering Data for Ordering – Activity Diagram



## Filtering Data for Ordering – Class Diagram



## Filtering Data for Ordering – Screens



Item ID:

Category :

Item Description :

miro

**GetFreshFood**  
your local delight

Edward

## Inventory Record (Manager- View)

Select	Item ID	Item description	Warehouse stock	In-Store Stock	Category	Threshold	Last Week Sales Volume (21/03/11 - 28/03/11)
<input type="checkbox"/>	SKU123456X	China Fuji Apple	100	10	Fruit	11	10
<input type="checkbox"/>	SKU123457X	Dole Banana	98	20	Fruit	20	18
<input type="checkbox"/>	SKU123458X	Japanese Watermelon	34	15	Fruit	15	13
<input type="checkbox"/>	SKU123459X	Korean Strawberry	57	7	Fruit	7	5
<input type="checkbox"/>	SKU123460X	USA Driscoll Raspberry	23	12	Fruit	12	10
<input type="checkbox"/>	SKU123461X	Asia Evergreen Frozen Edamame (Kernels)	40	20	Vegetables	20	18
<input type="checkbox"/>	SKU123462X	Go Fresh Baby Qing Bai	39	21	Vegetables	21	19
<input type="checkbox"/>	SKU123463X	Chef Chinese Spinach (Phuay Leng)	50	80	Vegetables	80	72
<input type="checkbox"/>	SKU123464X	Hokto Mushroom - Buna Shimeiji	60	50	Vegetables	240	200

If threshold falls below last week sales volume, the row will be highlighted

Search :

Item ID

Item description

Category

Search

MOI  
After selecting category, a new search will be conducted.

**GetFreshFood**  
Detail information of Item

All the suppliers of item

Supplier ID	Supplier Name
A12345	Fishman's Haven
Q45678	Meat's Nightmare
W99877	All Things Seafood

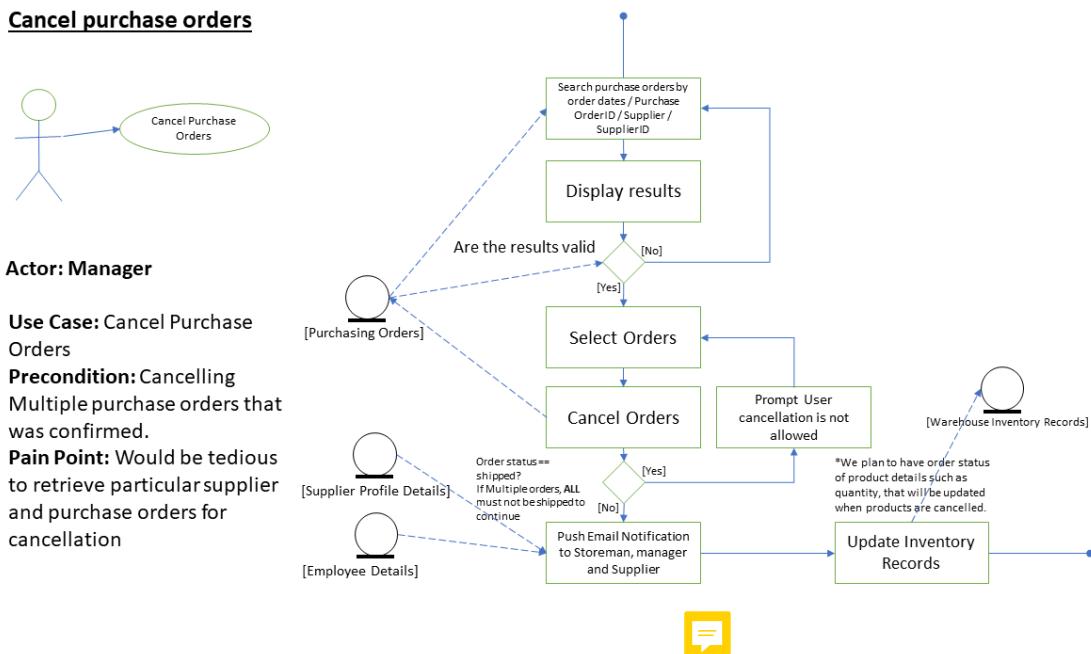
Pending deliveries

Supplier ID	Supplier Name	Quantity	Status
A12345	Fishman's Haven	100	Distribution
Q45678	Meat's Nightmare	150	arrived
W99877	All Things Seafood	130	Distribution

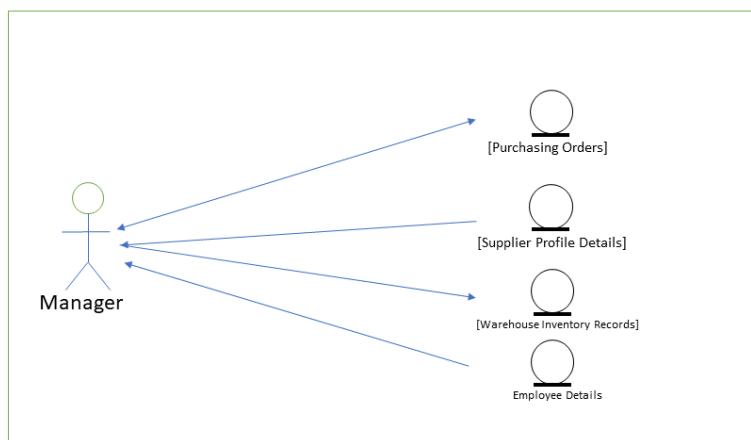
Manager can select a specific item and click More Details to view more details

Upon clicking More Details, Manager will see this screen with supplier list and order delivery status for the item selected.

## Cancel Purchase Order – Activity Diagram



## Cancel Purchase Order – Class Diagram



## Cancel Purchase Order – Screens



### ≡ Purchase Order Details

From:  To:



The screenshot shows a mobile application interface for managing purchase orders. At the top, there is a header bar with a back arrow, a home icon, the "GetFreshFood" logo, and a user profile for "Edward". Below the header, there are input fields for "From" and "To" dates, a search icon, and a message icon. A yellow callout box labeled "Purchase Order Details" points to a note stating: "If the range of dates do not have any results, the results will be as such". To the right, there is a sidebar titled "Filter By" with options for "Order Status", "Search By" with fields for "Order ID", "SupplierID", and "Supplier Name", and a "Cancel Order" button at the bottom.

From: DD/MM/YYYY To: DD/MM/YYYY

No Purchase Orders Found. Please Try Again.

Purchase Order Details

If the range of dates do not have any results, the results will be as such

Filter By:

Order Status

Search By:

Order ID

SupplierID

Supplier Name

Cancel Order

Edward

From:
To:

12/01/2020

DD/MM/YYYY

Providing the date  
(either 1 date or a  
range) will display a list  
of purchase orders  
Not providing the date  
will show all Purchase  
Order History

Purchase Order Details

X Number of Purchase Orders Found

Date	Purchase Order ID	Supplier ID	Supplier Name	Order Status
x/xx/xx	QWERT	A12345	Fisherman's Haven	Shipped
a/xa/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
b/xb/xx	XCVBN	W09877	All Things Seafood	Confirmed
c/xc/xx	XCVBN	A12345	Fisherman's Haven	Confirmed
d/xd/xx	XCVBN	A12345	Fisherman's Haven	Confirmed
e/xe/xx	QWERT	Y66432	Veggie Delight	Shipped
f/xf/xx	QWERT	Q45678	Meat's Nightmare	Confirmed
g/xg/xx	SDFGH	Q45678	Meat's Nightmare	Shipped
h/xh/xx	POIUY	M54321	Do-Me-All	Shipped
i/xi/xx	QWERT	M54321	Do-Me-All	Confirmed
j/xj/xx	POIUY	Y66432	Veggie Delight	Confirmed
k/xk/xx	XCVBN	A12345	Fisherman's Haven	Confirmed
1/x1/xx	SDFGH	A12345	Fisherman's Haven	Confirmed
2/x2/xx	QAZXS	A12345	Fisherman's Haven	Confirmed
3/x3/xx	POIUY	A12345	Fisherman's Haven	Confirmed
4/x4/xx	QWERT	A12345	Fisherman's Haven	Confirmed
5/x5/xx	XCVBN	Q45678	Meat's Nightmare	Shipped

Filter By:

Order Status

Search By:

Order ID

SupplierID

Supplier Name

Cancel Order

miro


 From:  To:

Edward 

### Purchase Order Details

X Number of Purchase Orders Found

Date	Purchase Order ID	Supplier ID	Supplier Name	Order Status
a/xa/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
f/xf/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
g/xg/xx	SDFGH	Q45678	Meat's Nightmare	Shipped
5/x5/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed

- 1) Can be more specific with our results with "Sort By" (To arrange) Or "Filter By" (To filter)  
 2) Displaying the Filtered Results

Filter By:

Search By:

miro



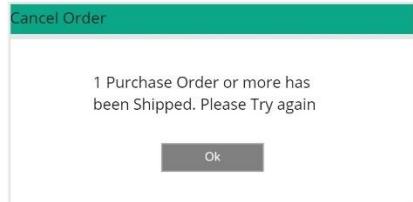
Edward 

**From:**   
**To:**

### Purchase Order Details

X Number of Purchase Orders Found

Date	Purchase Order ID	Supplier ID	Supplier Name	Order Status
a/xa/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
f/xf/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
g/xg/xx	SDFGH	Q45678	Meat's Nightmare	Shipped
5/x5/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed



1) Select Purchase Orders we want to cancel  
 2) Select "Cancel Order"  
 3) IF ANY Purchase Orders "Order Status" == Shipped  
 >  
 System will prompt user cancellation is not allowed.

**Filter By:**

**Search By:**

miro



From: To:

DD/MM/YYYY  DD/MM/YYYY

Edward 

### Purchase Order Details

X Number of Purchase Orders Found

Date	Purchase Order ID	Supplier ID	Supplier Name	Order Status
a/xa/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
f/xf/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed
g/xg/xx	SDFGH	Q45678	Meat's Nightmare	Shipped
5/x5/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed

**Cancel Order**

Confirm Cancellation?

1  
2  
3

1) Select Purchase Orders we want to cancel  
2) Select "Cancel Order"  
3) IF Confirmed, System will push email notification to storeman, manager and supplier

Filter By:

Search By:

miro



Edward

From:

To:

DD/MM/YYYY

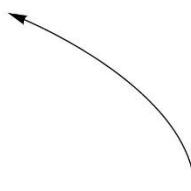
DD/MM/YYYY



### Purchase Order Details

X Number of Purchase Orders Found

Date	Purchase Order ID	Supplier ID	Supplier Name	Order Status
g/xg/xx	SDFGH	Q45678	Meat's Nightmare	Shipped
5/x5/xx	SDFGH	Q45678	Meat's Nightmare	Confirmed



After Cancellation,  
purchase order get  
removed from the list and  
the warehouse inventory  
records column ("Order  
status") is updated to  
"Cancelled"

Filter By:

Order Status

Search By:

QWERT

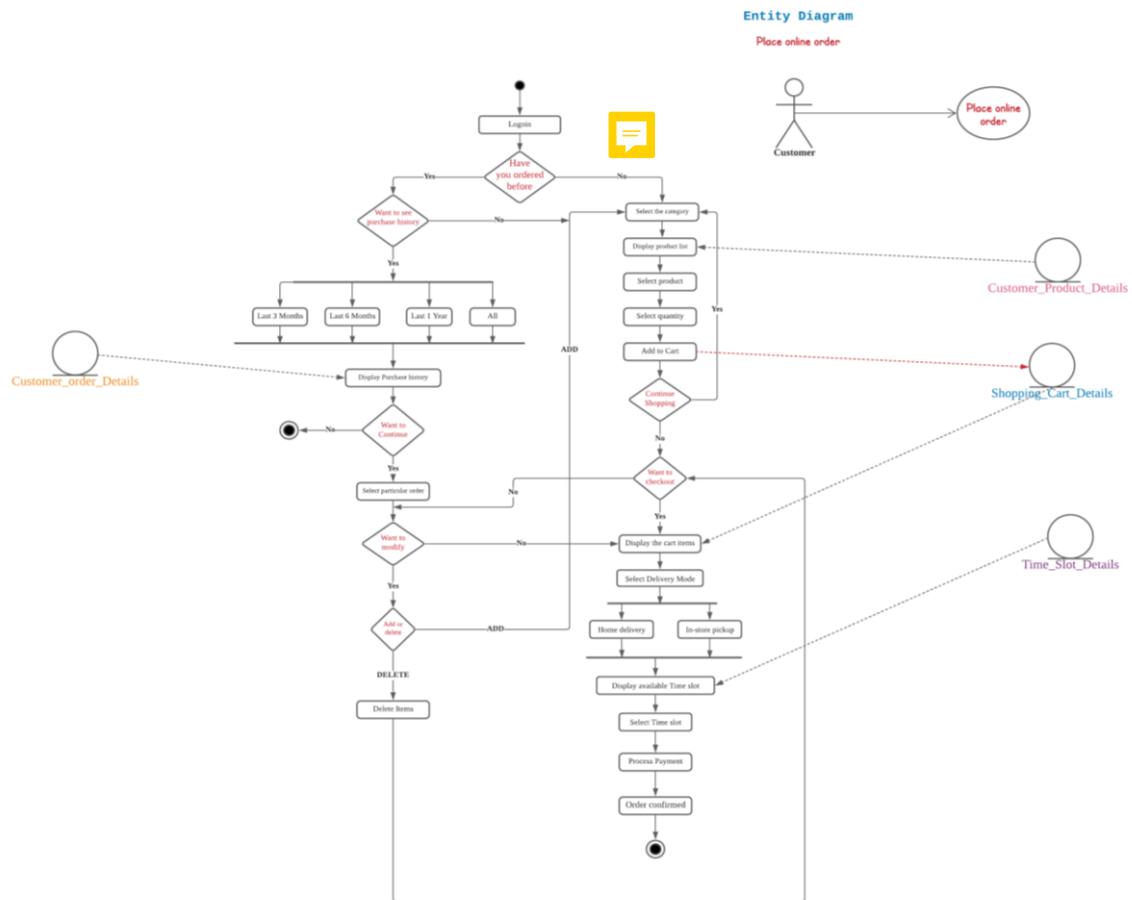
SupplierID

Supplier Name

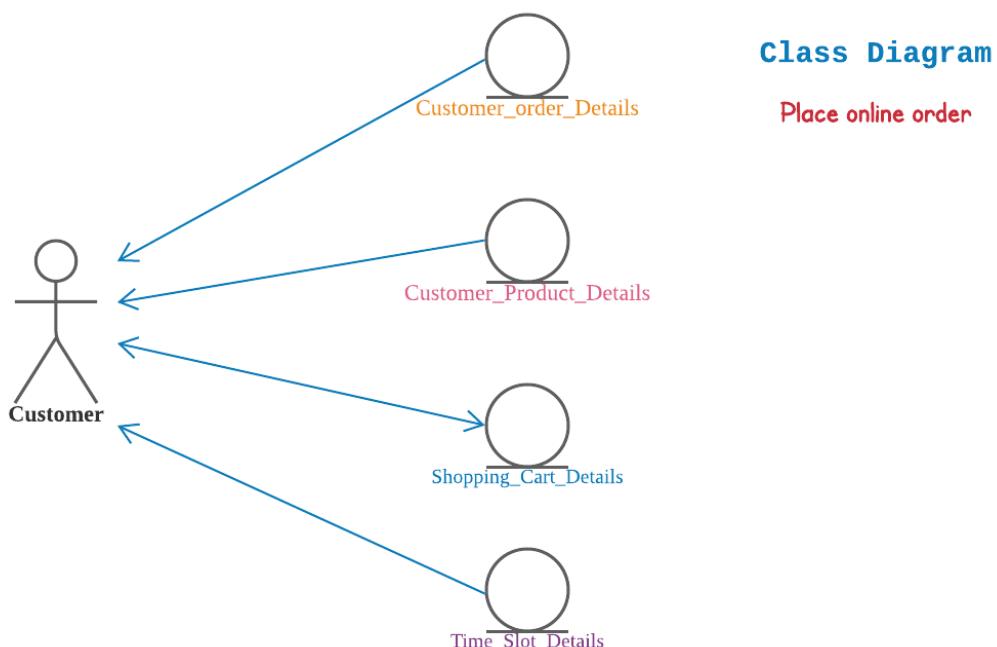
Cancel Order

miro

## Place Online Order (For Customer) -Activity Diagram

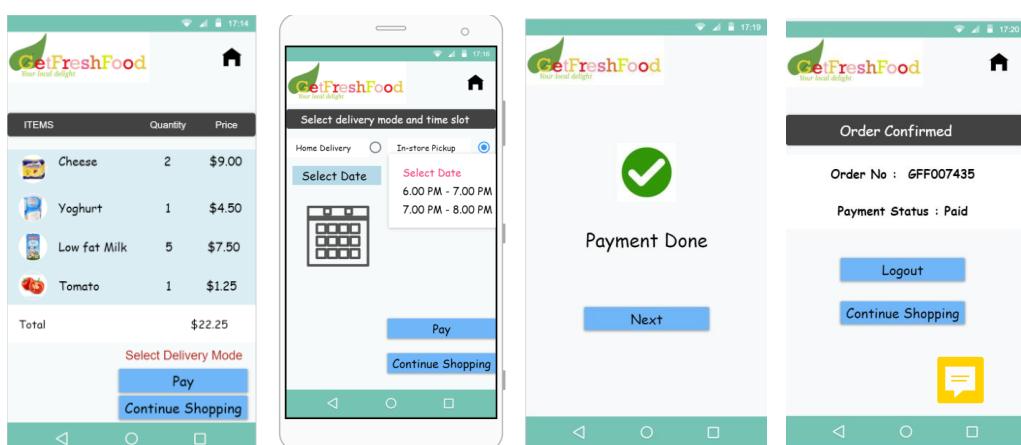
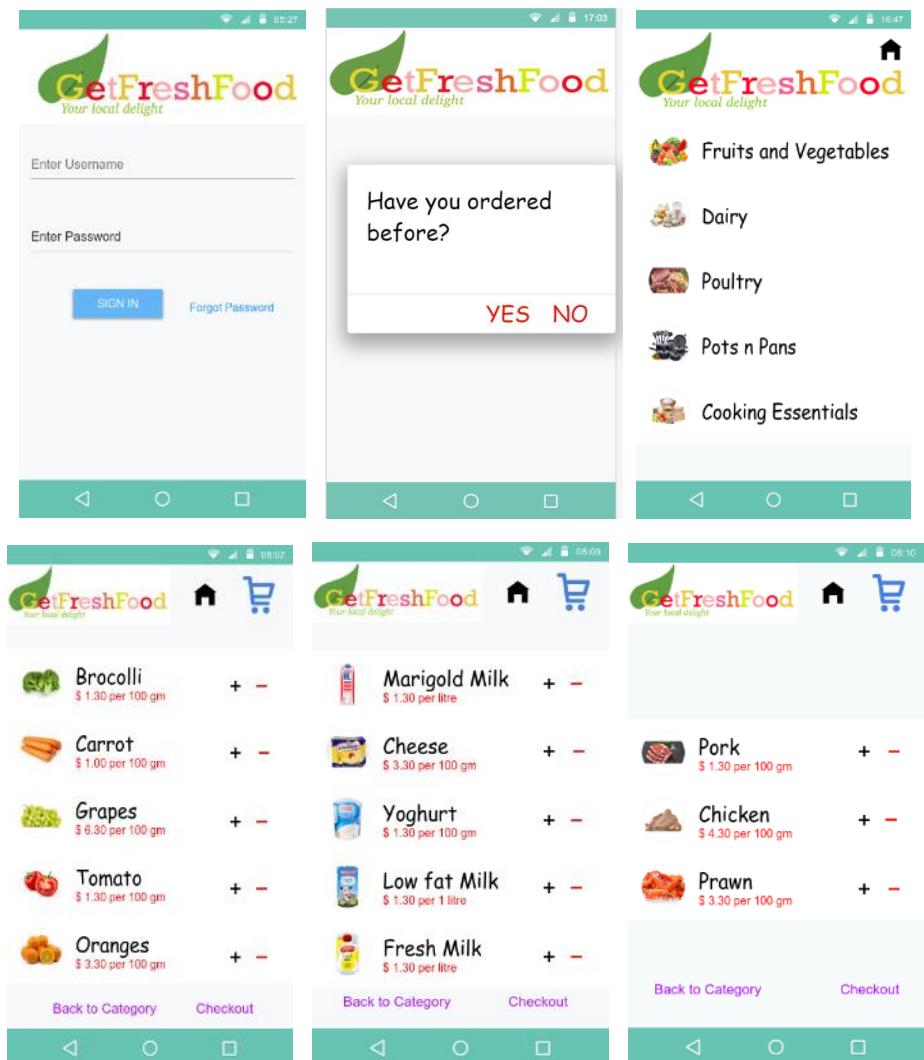


## Place Online Order (For Customer) – Class Diagram

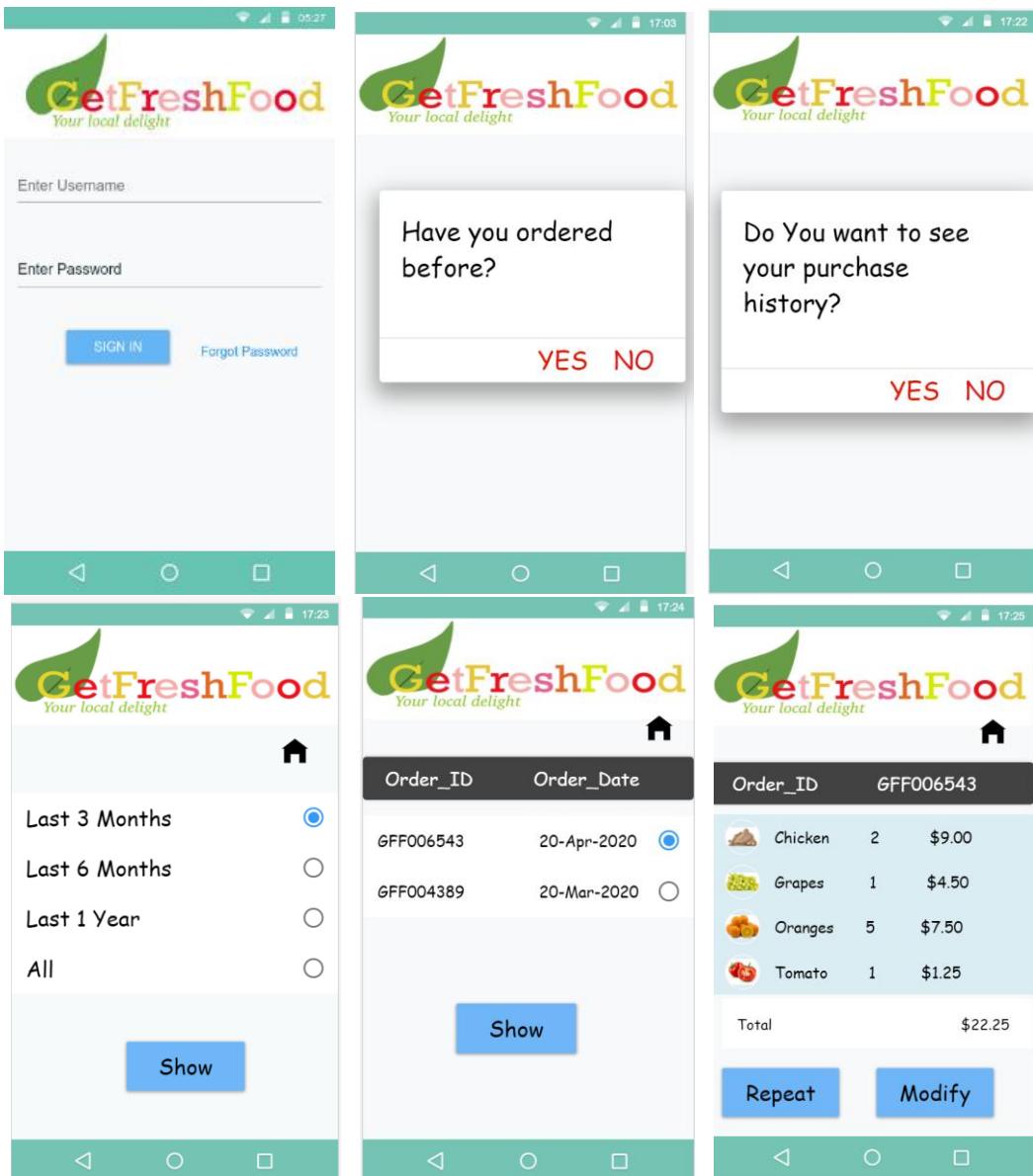


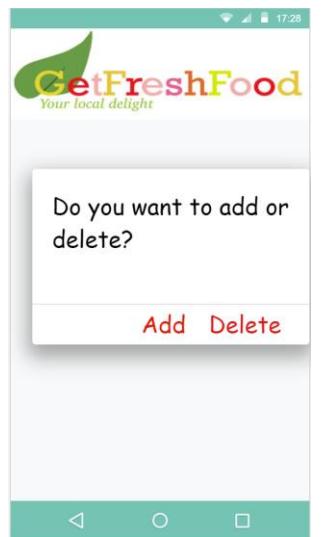
## Place Online Order (For Customer) – Screens

### For First Time Buyer



**For Existing Buyer**





Order_ID GFF006543			
ITEMS	Quantity	Price	
Chicken	2	\$9.00	<input checked="" type="checkbox"/>
Grapes	1	\$4.50	<input checked="" type="checkbox"/>
Oranges	5	\$7.50	<input type="checkbox"/>
Tomato	1	\$1.25	<input type="checkbox"/>
Total		\$22.25	
			Delete

Select Delivery Mode			
ITEMS	Quantity	Price	
Oranges	5	\$7.50	
Tomato	1	\$1.25	
Total		\$8.75	
			Pay
			Continue Shopping

Select delivery mode and time slot

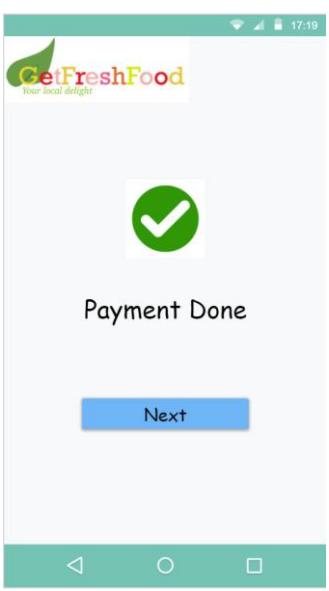
Home Delivery  In-store Pickup

Select Date

6.00 PM - 7.00 PM  
7.00 PM - 8.00 PM

Pay

Continue Shopping



Order Confirmed

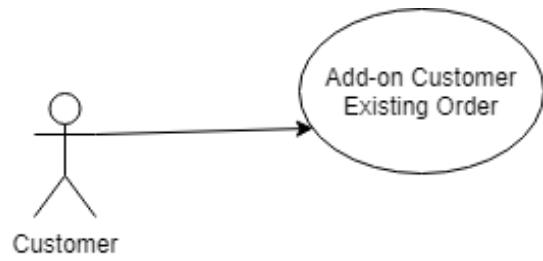
Order No : GFF007435

Payment Status : Paid

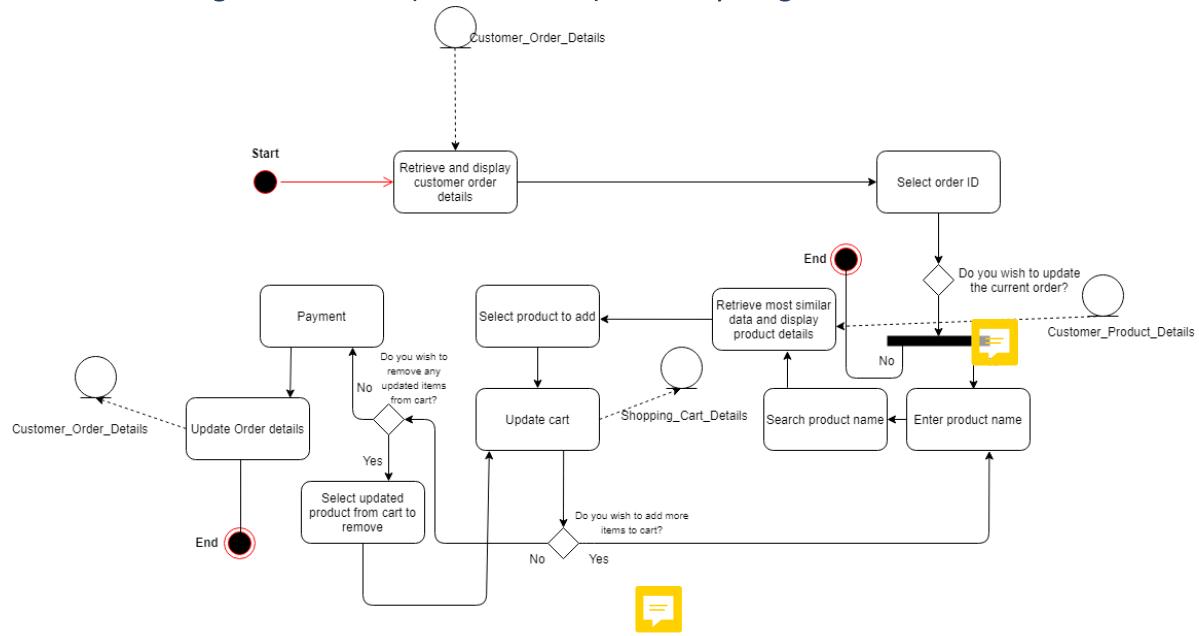
Logout

Continue Shopping

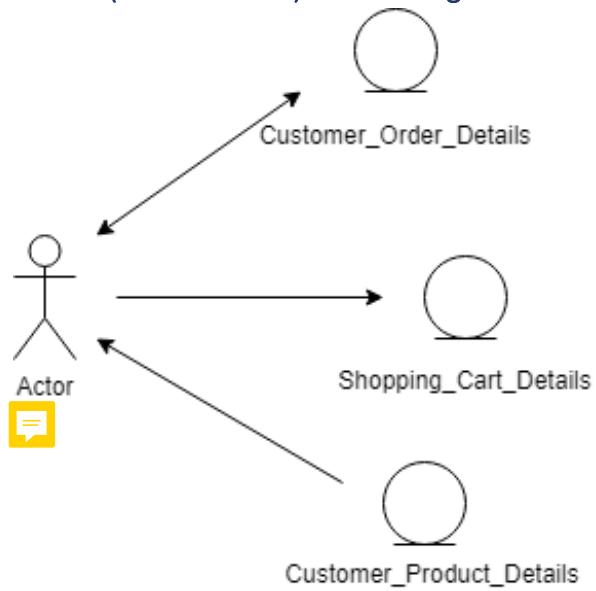
### Add-in to Existing Online Order (For Customer) – Use Case Diagram



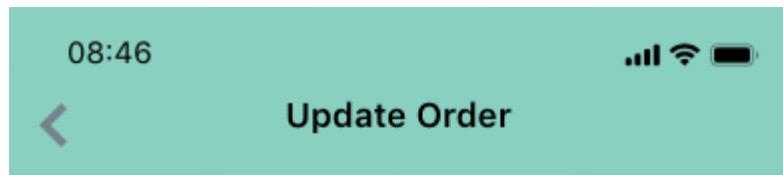
### Add-in to Existing Online Order (For Customer) – Activity Diagram



### Add-in to Existing Online Order (For Customer) – Class Diagram



Add-in to Existing Online Order (For Customer) – Screens



Welcome to GetFreshFood, from here you can also add-in more items to your previous order.

Search Eligible Order List

08:18



## Update Order



Order ID: 961810



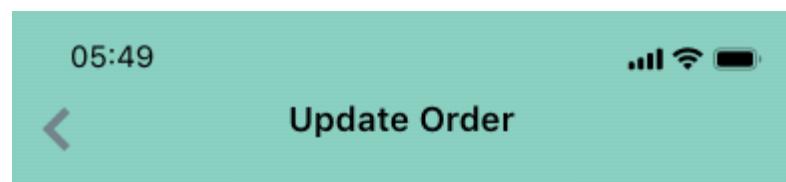
Order Date: 03/03/2021

Order Items:

Name	Quantity	Price	Total
------	----------	-------	-------

Pencil	3	\$1.00	\$3.00
--------	---	--------	--------

Update Current Order



## Search Product

Product Name

Search



08:19



Update Order



Search: Vegetable

Broccoli



\$1.30 per 100 gm

Potato



\$1.00 per 100 gm

Next

08:29



Update Order



**Search: Vegetable**

Selected: 200 G



Brocoli: 100 G - \$1.50

Potato: 200 G - \$2.00



Onion: 100 G - \$1.50

**Total: \$5.00**

Add to Cart

09:24



## Update Order



Order ID: 961810

Order Date: 03/03/2021

Order Items:

Name	Quantity	Price	Total
------	----------	-------	-------

Pencil	3	\$1.00	\$3.00
--------	---	--------	--------

(Added on 21/03/2021)

Brocoli	100 G	\$1.50	\$1.50
---------	-------	--------	--------

Potato	200 G	\$2.00	\$1.00
--------	-------	--------	--------

Onion	100 G	\$1.50	\$1.50
-------	-------	--------	--------

---

Total payable: \$5.00

Add more item

Remove item

Payment

09:19



Update Order



**Remove item:**

Brocoli: 100 G - \$1.50

Potato: 200 G - \$2.00



Onion: 100 G - \$1.50

**Total: \$3.00**

Update Cart

09:22



## Update Order



Order ID: 961810

Order Date: 03/03/2021

Order Items:

Name	Quantity	Price	Total
------	----------	-------	-------

Pencil	3	\$1.00	\$3.00
--------	---	--------	--------

(Added on 21/03/2021)

Brocoli	100 G	\$1.50	\$1.50
Onion	100 G	\$1.50	\$1.50

Total payable: \$3.00



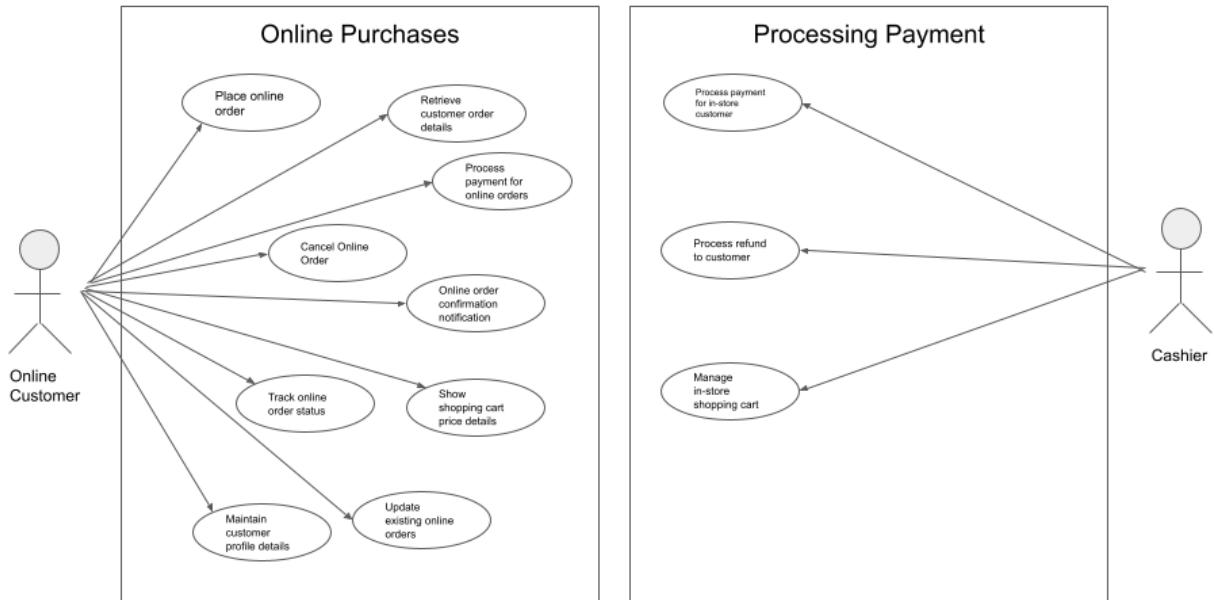
Add more item

Remove item

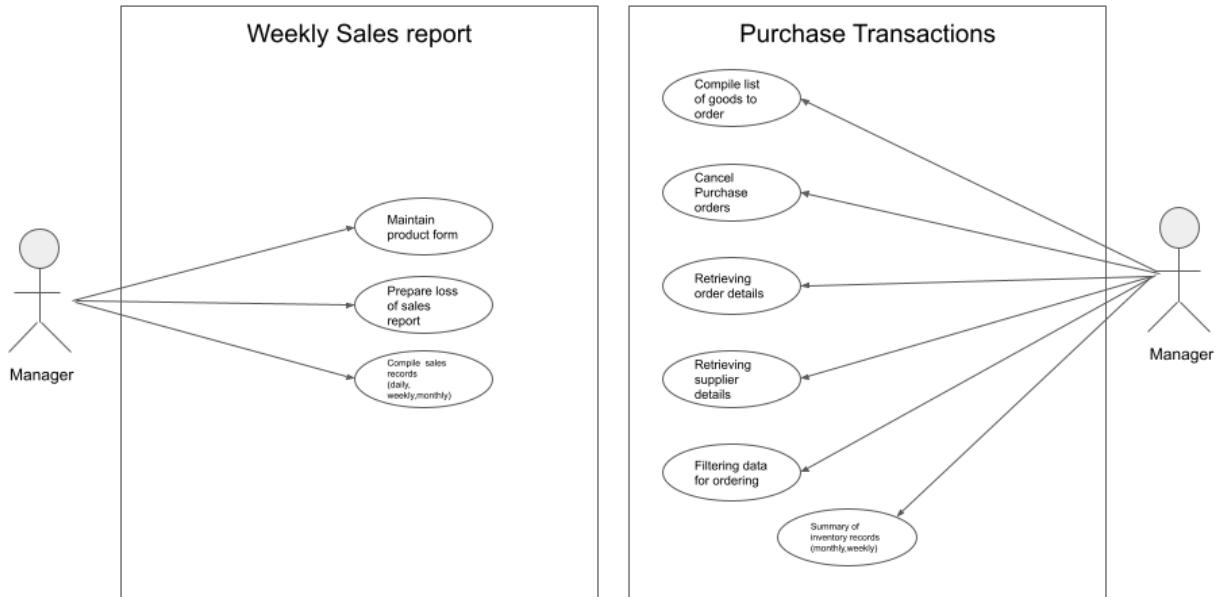
Payment

## Use Case Packaging

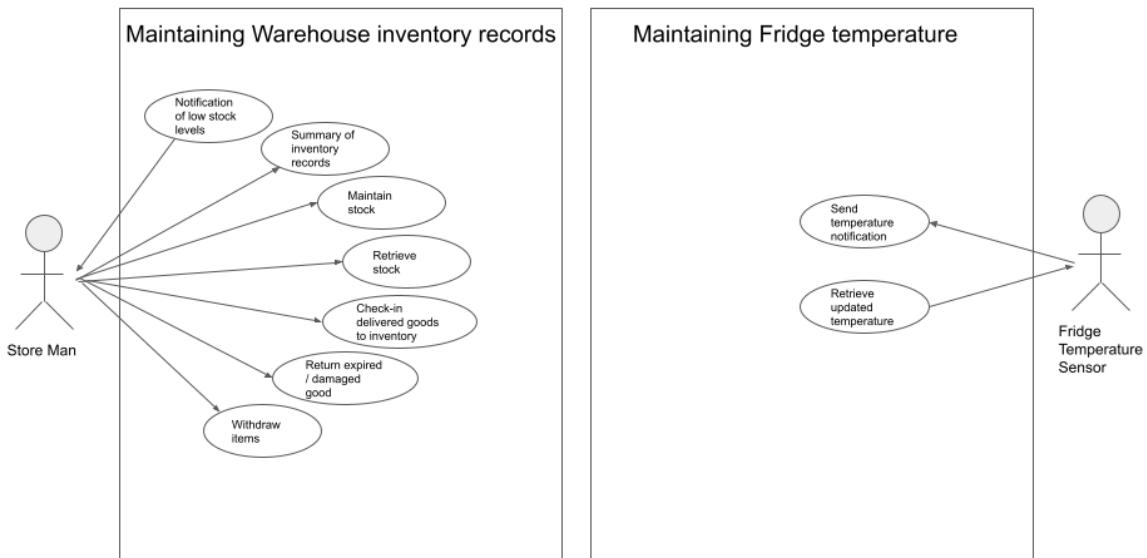
### Use Case Package (Based on type of usage) 1 of 3



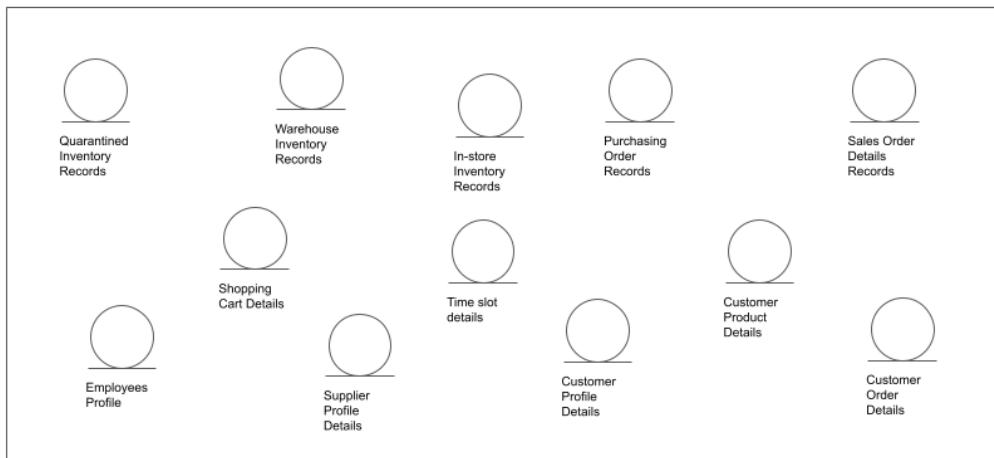
### Use Case Package (Based on type of usage) 2 of 3



### Use Case Package (Based on type of usage) 3 of 3



## Domain Model



## Entity Description

### Quarantined Inventory Records

- Comprises recorded damaged and expired goods in the supermarket.
- Easier to retrieve information of expired and damaged goods that need to be viewed and updated.

### Warehouse Inventory Records

- Providing the user information on existing inventory in the storeroom.
- Mainly accessed to update and maintain existing inventory in the storeroom.

### In-store Inventory Records

- Stock level of goods in-store
- Contains Withdrawn product information from Warehouse Inventory Records
- In-store Inventory Records allows users to keep track of Displayed stocks

- Triggers notification to promoter when stocks in-store runs low.

#### **Purchasing Order Records**

- Holding all on purchasing order details done with the suppliers
- This record is able to provide users with details needed to view and edit purchasing orders

#### **Customer Order Details**

- Contains Order Details when a customer has made an online purchase
- Accessing this entity gives the users permission to view and update online purchases

#### **Customer Profile Details**

- A record of customer profiles needed when extracting or updating customer information
- Provides information needed for Customer verification as well as online customer's addresses

#### **Supplier Profile Details**

- Contain existing Supplier details available for purchasing orders.
- Provide access to supplier details when purchasing or editing purchase orders

#### **Shopping Cart Details**

- Contains product details of customers possible purchases.
- We are able to process and confirm purchase via this entity when customer confirms possible purchases.

#### **Sales Order Details Records**

- An entity containing all details of Sales recorded at the end of the day.
- It forms as an archival of sales made. Allowing us to review sales details or print sales details when required.

#### **Employee Profile**

- Detailed information including designation and department on every employee in the company
- Access rights of users to the system is derived from this entity as well.

#### **Time Slot Details**

- Available time slot for home delivery or in-store pickups

#### **Customer Product Details**

- Providing selected details that are essential to Customers.  
(Details such as Product Name, ID and price.)

## Non-Functional Requirement

### Pre-condition introduction

The supermarket, GetFreshFood, has 1 manager, 4 storemen, 20 promoters, and 6 cashiers. For each shift, the store will have 2 storemen, 10 promoters, and 3 cashiers.

Peak Time	Normal Time
6pm – 9 pm	7am – 6pm

Assumption of customer number:

Total Cash and cash equivalents of year / number of stores = the received payment of each store  
\$414,535,000 / 230 = \$1802326.09

Calculate the received payment of each day  
\$1802326.09 / 365 = \$4937.87969



Assume that every customer who bought product spent \$10  
\$4937.87969 / 10 = 493.787969 = 440 customers (who are in store)

The Total Cash and cash equivalents are from <https://s3-ap-southeast-1.amazonaws.com/www8.fairprice.com.sg/fpol/media/pdf/corpcomms/FinancialStatement/2005/FairpriceFR2019.pdf>

Products data is from <https://s3-ap-southeast-1.amazonaws.com/www8.fairprice.com.sg/fpol/media/pdf/corpcomms/AnnualReport/2005/FairPriceAR2019.pdf>

**The number of customers in the supermarket: 440**

**The number of customers online: 132**

**(assume that the number of online customers is 30% of the in-store customers)**

**The number of products in the supermarket: 3500**

**(the original data is 35000, but for this design, we use 3500 as the number of products of the supermarket)**

### User Volume Table

User Group	Country/ Location/ count	Remarks
Manager	Singapore / Bishan Place 9, #B1/ 1	<p>The manager's office is in the supermarket. Normally, he walks around the supermarket during the time from 7 am-10 pm for overseeing the performance of employees.</p> <p>He would use the system to look at the data of the summary of inventory records, at that time, if he decides to add some inventory he would use other functionalities of the system to get accurate suppliers information and timely organized inventory records. Due to dynamically changing of the market, the manager would use the system to filter the data from different departments. He would use the system to maintain product forms for updating price tags and display shelves and to maintain employee details.</p>
Storemen	Singapore / Bishan Place 9, #B1/ 4	<p>The storemen are stationed at the warehouse and have to use the system every day for recording and compiling the inventory from suppliers and goods exchanging from promoters and cashiers so that they can organize control inventory.</p>

		<p>He would receive notifications from the fridge sensor for controlling the temperature of the warehouse.</p> <p>He would use the system to retrieve online customer's order details efficiently and timely check the delivered goods.</p>
Promoter	Singapore / Bishan Place 9, #B1/ 20	<p>Promoters are stationed all around the supermarket shelves during their working time. They aim to provide information when customers need help during their shopping time.</p> <p>The promoters would use the system to adjust price tags when they need it and to exchange expired/ damaged goods more efficiently.</p>
Cashier	Singapore / Bishan Place 9, #B1/ 6	Cashiers work at cashier count and have to use this system every day. They will use the system to check each item bought by customers to avoid calculating wrongly due to non-timely updating product information.
Customer	Singapore / Bishan Place 9, #B1/ 440(in-store) + 132(online)	The supermarket is located near Bishan MRT station, where has huge crowd in daily. People who have been in this place would like to buy some fresh foods and household items.
Accountant	Singapore / Bishan Place 9, #B1/ 2	The accountant's office is in the supermarket. They would use this system to handle financial things at least twice a week.
Fridge Temperature Sensor	Singapore / Bishan Place 9, #B1/ 20	The sensor can collect data by the system per hour, if the temperature is not suitable for storing it will send a notification to storemen.

Business Transaction Volume Table

Actors	Biz Transaction (Use Case)	Business Criticality	No. of user	Transaction information	Concurrent Important Activities
Manager / Storemen / Promoter / Cashier /Online Customer	Login / Logout	Critical	16 per shift + 132(online customer)	37 per hour	37
Manager / Storemen / Promoter / Cashier /Online Customer	Change password	Critical	16 per shift + 132(online customer)	56 per hour	56
Manager	Cancel purchase order	Critical	1	At least twice a month (base on the supermarket would order goods from suppliers twice a month)	1
Manager	Filtering data for ordering	Moderate	1	At least once a week (base on the supermarket would order goods from suppliers twice a month, so the manager would check data once a week)	1

Manager Storemen	/	Summary of inventory records (Monthly, Weekly)	Critical	1 + 2 per shift(storemen)	At least once a day	2
Manager Storemen	/	Retrieve supplier details	Moderate	2	At least twice a month	2
Manager Storemen	/	Retrieve stock	Moderate	2	At least once a day	2
Manager Storemen	/	Retrieve order details	Moderate	2	At least twice a month	2
Manager	Purchase stock	Critical	1	At least twice a month	1	
Manager	Maintain product form	Critical	1	At least once a week	1	
Manager	Update product details (including price)	Critical	1	At least once a week	1	
Manager	Maintain employee details	Low	1	Once a year(assume that employees signed one year contract)	1	
Manager	Prepare loss of sales report	Critical	1	Twice a month		
Manager	Extended Customer Details	Moderate	1	For every three months (normally supermarket would do product and customer analysis for every three months)	1	
Manager	Compile a list of goods to order	Critical	1	At least twice a month	1	
Manager Storemen Cashier	/	Compile sales record (Daily, Weekly, Monthly, etc.)	Critical	3	At least once a day	6
Storemen	Notification from the fridge temperature sensor	Moderate	2	At least twice a month	2	
Storemen	Notify storeman of low stock levels	Critical	2	Every day	2	
Storemen	Maintain freezer temperature	Moderate	2	At least twice a month	2	
Storemen Online Customer	/	Retrieve customer order details	Critical	2 + 132	9 per hour (use 15 hours as the length of the operation time, 135 / 15)	9 per hour
Storemen	Maintain stock	Critical	2	At least once a day	2	
Storemen	Order confirmation notification to	Moderate	2	twice a month	2	

	<b>supplier and storemen</b>				
Storemen	<b>Return expired/ damaged goods</b>	Critical	2	Every day	2
Storemen	<b>Check-in delivered goods to inventory</b>	Critical	2	At least once a day	2
Storemen / Promoter	<b>Withdraw items</b>	Critical	2 + 10	At least once a day	2 + 10
Promoter	<b>Check product details</b>	Critical	10	At least once a day	10
Promoter	<b>Retrieve product form</b>	Critical	10	At least once a week	10
Promoter	<b>Return damaged item to storemen</b>	Critical	10	At least once a week	10
Cashier	<b>Process payment for in-store customer</b>	Critical	3	30 per hour (440 / 15 = 30)	3
Cashier	<b>Process refund to the customer</b>	Critical	3	1 per day (assume that would have 3% customer who are in store want to refund, 30 * 3% = 1)	3
Cashier	<b>Manage in-store shopping cart</b>	Moderate	3	440 per day	3
Accountant	<b>Handle payment</b>	Moderate	2	At least twice a month (assume that the accountant will do a financial report twice a month)	2
Accountant	<b>Retrieve stock order from storemen</b>	Low	2	At least twice a month (assume that the accountant will do a financial report twice a month)	2
Online Customer	<b>Maintain customer profile details</b>	Critical	132	132 per day (assume that every online customer wants to maintain their profile)	132
Online Customer	<b>Place online order</b>	Critical	132	53 per day (assume that 40% of all the online customer will buy, 132 * 40% = 53)	53 per day
Online Customer	<b>Process payment for online order</b>	Critical	132	53 per hour (assume that 40% of all the online customer will buy)	53 per hour

Online Customer	Show Shopping Cart price details	Critical	132		
Online Customer	Cancel online order	Critical	132	15 per hour (assume that 40% of all the online customer will cancel)	15 per hour
Online Customer	Update existing online order	Critical	540	5 per hour (assume that 30% of customer who bought already want to update their existing online order )	5 per hour
Online Customer	Online order confirmation notification	Critical	540	15 per hour (assume that 40% of all the online customer will buy)	15 per hour
Online Customer	Track online order status	Critical	540	15 per hour (assume that all customer who bought products will track their ordering)	15 per hour
Fridge Temperature Sensor	Send temperature notification	Moderate	20	At least twice a month	20
Fridge Temperature Sensor	Retrieve updated temperature	Critical	20	Once an hour	20
Supplier	Notification for purchase order	Moderate	(because the number of suppliers is changing )	Twice a month	(because the number of suppliers is changing )
Delivery partner	Online order notification	Moderate	3	15 per hour (assume that all customer who bought products will track their ordering)	3



Data Volume Table

Business Entity Class	Source Document	Retention Period	Target Volume	
Quarantined Records	Inventory	Damaged and expired goods form	1 year	365

<b>Warehouse Records</b>	<b>Inventory</b>	warehouse inventory record	<b>5 years</b>	<b>336000</b>
<b>In-store Inventory Records</b>		In-store Inventory record	<b>5 years</b>	<b>279960</b>
<b>Purchasing Order Records</b>		Purchasing Order record	<b>3 years</b>	<b>144</b>
<b>Sales Order Details</b>		Sales record	<b>5 years</b>	<b>1043900</b>
<b>Customer Order Details</b>		Customer Order record	<b>5 years</b>	<b>240900</b>
<b>Customer Profile Details</b>		Customer Profile record	<b>5 years</b>	<b>308</b>
<b>Supplier Profile Details</b>		Supplier Profile record	<b>5 years</b>	<b>256</b>
<b>Shopping Cart Details</b>		Shopping Cart	<b>1 year</b>	<b>2450</b>
<b>Customer Product Details</b>		Customer Product	<b>3 years</b>	<b>17500</b>
<b>Employee Profile</b>		Employee Profile form	<b>5 years</b>	<b>155</b>
<b>Time Slot Details</b>		Time slot form	<b>1 year</b>	<b>19345</b>

## Documented Calculation for Data Volume table

### Quarantined Inventory Records

The quarantined inventory records entity contains the records of damaged or expired goods in the Supermarket. Assume that the damaged and expired goods form is generated per day. In a year, the system will generate a total of 365 forms, so the target volume will need to save 365 forms.

### Warehouse Inventory Records

Assume the supermarket has over 35000 products, and the storemen would deal with about 80% of the total items every half a month. In a year, the system will be generated 672000 records. Since the data of the inventory records are retained for 5 years, the target volume will need to save 3360000.

$$3500 * 80\% = 2800 \text{ records for half a month}$$

$$2800 * 24 * 5 = 336000 \text{ records}$$

### In-store Inventory Records

Assume that the supermarket using the inventory ratio is 4 to 6(it is a good inventory ratio from <https://www.webretailer.com/b/inventory-turnover-ratio/>), the in-store inventory is 2333 records every half a month.

$$2333 * 24 * 5 = 279960 \text{ records}$$

### Purchasing Order Records

Assume that the supermarket would have 2 records every month

$$2 * 24 * 3 = 144 \text{ records}$$

### Sales Order Details Records

Assume that the supermarket would have 1802 customers in-store per day and has 540 online customers per day.

$$440 + 132 = 572 \text{ records for per day}$$

$$572 * 365 = 208780 \text{ records per year}$$

$$208780 * 5 = 1043900 \text{ records for 5 years}$$

### Customer Order Details

Assume that the online customer has 132 persons.

$$132 * 365 * 5 = 240900 \text{ records}$$

### Customer Profile Details

Assume that 20% of in-store customer's profiles be saved by the supermarket.

$$440 * 20\% = 88 \text{ records}$$

$$88 + 132 = 220 \text{ records}$$

### Supplier Profile Details

Assume that the supermarket has 200 suppliers. The number increase rate is 10% every year, and the number of decrease rate is 5%.

$$200 + (200 * 10\% - 200 * 5\%) = 210 \text{ records}$$

$$210 + (210 * 10\% - 210 * 5\%) = 220 \text{ records}$$

$$220 + (220 * 10\% - 220 * 5\%) = 231 \text{ records}$$

$$231 + (231 * 10\% - 231 * 5\%) = 243 \text{ records}$$

$$243 + (243 * 10\% - 243 * 5\%) = 256 \text{ records}$$

### Shopping Cart Details

Assume that the supermarket has 3500 products, and the popular rate is about 70%.

$$3500 * 70\% = 2450 \text{ records}$$

## Customer Product Details

Assume that the supermarket has 3500 products.

$$3500 * 5 = 17500 \text{ records}$$

## Employee Profile

Assume that the supermarket has 1 manager, 4 storemen, 20 promoters, and 6 cashiers.

$$1 + 4 + 20 + 6 = 31 \text{ persons}$$

$$31 * 5 = 155 \text{ forms}$$

For each person, the supermarket has a profile form for recording their information. Since the data of the forms are retained for 5 years, the target volume will need to save 155 forms.

## Time Slot Details

Assume that the customers who did payment are 40% percent of all online customers

Calculate how many customers need the time slot form:

$$132 * 40 \% = 53 \text{ persons}$$

Because each of the customers who did payment need a form to make the delivery time, so the number of forms is equal to the number of customers who did payment:

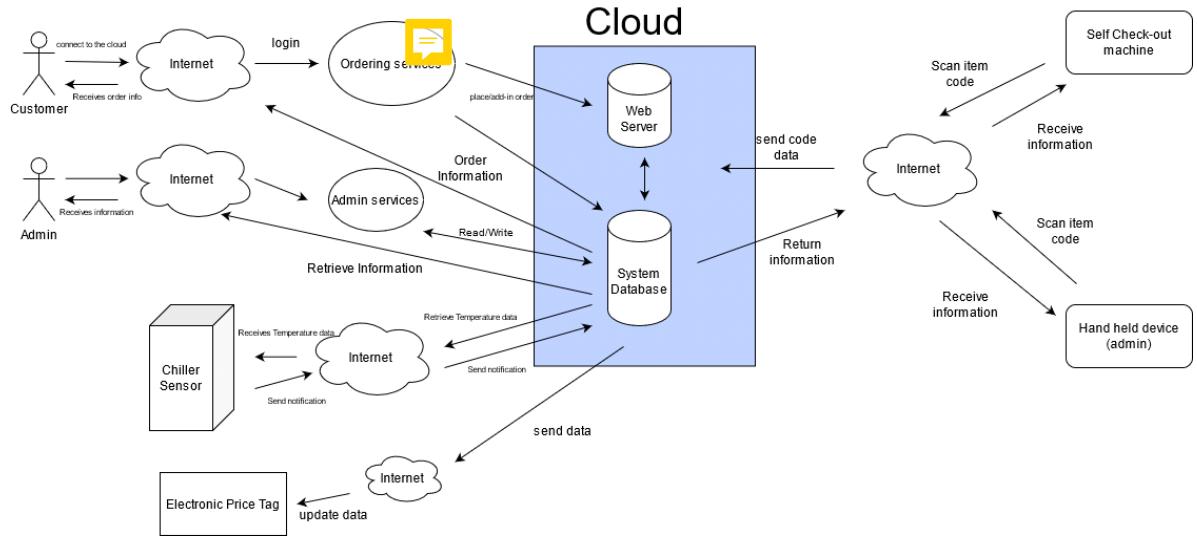
$$53 \text{ persons} = 53 \text{ forms}$$

For 1 year:



$$53 * 365 = 19345 \text{ forms}$$

# System Architecture (High Level Diagram)



## System Performance Requirements

### Performance Requirement

The performance requirement of the system will be expressed in terms of response time. Response time will be measured as response time for each screen / window.

Normal Period: 1 sec / screen

Peak Period: 2 sec / screen

### Peak Period Definition

For weekdays, the peak periods are as follows:

- 1) From 10:30 am to 11:30 am. The supermarket receives goods from its suppliers during this period and as a result, there would be high volume of business transactions.
- 2) From 12 pm to 1 pm during lunch hour AND
- 3) From 5 pm to 8 pm during after standard office hours. The supermarket receives many customers during the above 2 time periods, resulting in a high volume of business transactions.

For weekends, the peak periods are as follows:

- 1) From 9:30 am to 10:30 am. The supermarket receives many customers during this time period because a large number of customers prefer to conduct their weekend shopping early in the day.
- 2) From 10:30 am to 11:30 am. The supermarket receives goods from its suppliers during this period and as a result, there would be high volume of business transactions.
- 3) From 12 pm to 1 pm during lunch hour AND
- 4) From 5 pm to 8 pm during after standard office hours. The supermarket receives many customers during the above 2 time periods, resulting in a high volume of business transactions.

There are exceptions to the standard weekly peak cycle and they are as follows:



- 1) Public Holidays (excluding Chinese New Year). The peak periods are public holidays are similar to the peak periods for standard weekends, regardless of the day of the week that the public holiday falls on.
- 2) Chinese New Year. During the first 3 days of the Chinese Lunar New Year, the supermarket receives a high volume of customers throughout the opening hours of the store.

## Security Requirements

### Entity Access

From Data Point of View Table

Data entity-user access table:

Data (entity class) / User Role (actor)	Storeman	online customer	Manager	Cashier	Delivery partner	Promoter	Accountant	Supplier	Fridge Temperature Sensor
Quarantined Inventory Records	U,R		R			U,R			
Warehouse Inventory Records	R,U		R,U,C,D	R		R	R		R,U 
In-store inventory records	R		R,D	R		C,U,R	R		
Purchasing Order Records	R	R	C,R,U,D	R	R		R	R	
Sales Order details Records	R	R	C,R,D,U	R,C,D,U	R	R	R		
Customer Order Details	R	R,C,U,D	R,U,D	R	R		R		
Customer profile details	R	R,U	R,D,U	R	R		R		
Supplier profile details	R		C,R,U,D			R	R		
Time slot detail	R	R,U,D	C,D,R		R				
shopping cart details	R	C,U,R,D	U,R,D	C,U,R,D	R		R		
Customer product details	R	R	C,R,U,D	R		R			

References:

C = Create, U = Update, R = Read, D = Delete References for Security (Data entity-user access table)

## Use Case Access

## Reliability Requirement

### Operation Time

Considering the operating hours of GetFreshFood, our proposed system and self-checkout system will be up and operating from 6am to 11pm for 7 days a week. As for the online website and online app, it will operate 24 hours a day, 7 days a week to ensure maximum convenience for online customers.

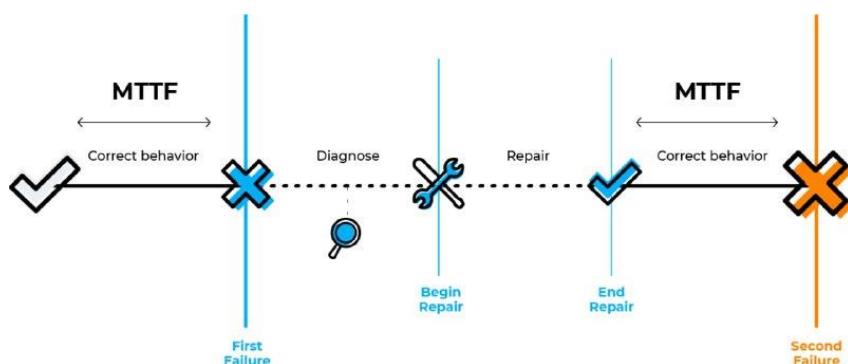
Operation Time	Online Website and Online App	The operation time for both the online website and the online app (i.e. online ordering platform) is 24 hours a day, 7 days a week.
	Self Checkout System	The operation time will be from 6am to 10pm, 7 days a week.
	System for Employees	The operation time will be from 6am to 11pm, 7 days a week because they work in two shifts, 7am to 3pm and 3pm to 10pm.

### Down Time

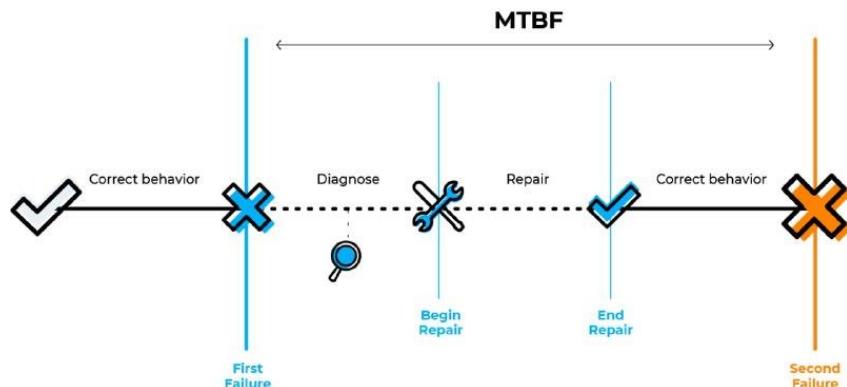
Down Time	Online Website and Online App	The down time for maintenance can take place from 1 am to 4 am because a smaller number of users will be logging into the system to place an order.
	Self Checkout System	The down time for maintenance can occur from 10 am to 6 am. Because supermarket operates from 7am to 10pm.
	System for Employees	The down time for maintenance can occur from 12 am to 6 am, which is the period when GetFreshFood supermarket closes.

### Failure Time

Failure Time	Mean Time To Failure (MTTF)	First failure should not occur during first 3 months of operation
	Mean Time Between Failure (MTBF)	Down time should not occur more than 1 time each month



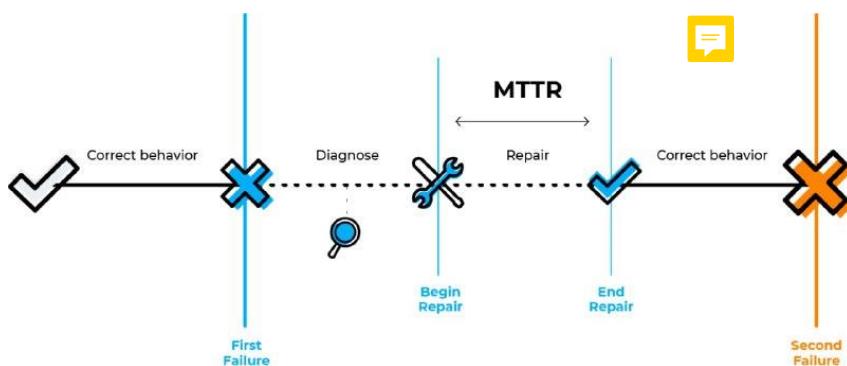
### Mean Time To Failures (MTTF)<sup>[1]</sup>



### Mean Time Between Failures (MTBF)<sup>[1]</sup>

#### Recovery Time

Recovery Time	Mean Time To Recovery (MTTR)	Recovery time should take no more than 2 hours
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### Mean Time To Recovery (MTTR)<sup>[1]</sup>

#### Hardware Failure

Hardware Failure	Server Network	In the event of hardware failure, recovery time should take no more than 7 hours Data concurrency after recovery should not be from the last operating time of system
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## References

- [1] Plutora. (2021). Failure Metrics in Depth: MTTR vs. MTBF vs. MTTF. Retrieved 24 March 2018 from <https://www.plutora.com/blog/failure-metrics-mttr-vs-mtbf-vs-mttf>