

GetFreshFood IT Solution

Team 12

LI ZHENGYI

LIOU CHENG XIANG

SIVAKUMAR JAYACHELVI NIVVYA

STEPHANIE CHENG

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Background Information

After getting a better understanding of the workflow of GetFreshFood, we aim to build a system that will assist the company in minimizing the discrepancies in the sales and inventory record. We recognize that there are other challenges faced by the company as well, such as the low efficiency of staff and the company being less competitive, but our focus will remain on reducing the discrepancies in the sales and inventory record. That being said, if the system we have suggested is implemented, the low efficiency should be solved as a by-product as the system aims to reduce most of the manual labour.

We analysed the different types of workflow, for example, the movement of goods from the storeroom to the store and purchasing of the goods. Using the system, GetFreshFood should be able to keep track of the movement of its inventory from the storeroom, to the store, and out the store. At each point, the system will update the inventory records to represent how many items of each product remain in the storeroom. Once the goods have arrived at the storeroom, they are keyed into the system and the inventory record will be updated to reflect these goods in the storeroom.

The promoters will also have to make a request before goods can be moved to the store. At this point, the store man will receive a message from the promoter of the goods required and will generate barcodes for each product moved to the store. Once the promoter has confirmed that the goods are in the store, the inventory record is updated to reflect how many goods are in the store. The last step, which is when the customer purchases the good, will have the cashier scan the item. Once payment has been processed, the inventory for each item sold will be reduced in the inventory record. Concurrently, the sales record will be updated, both in the sales record table and in the cashier's table that processed the payment. The cashier's table is the auto-generated end-of-shift report. When the barcode is scanned at the cashier, the system will also be able to pull up the price as well as the product's name. The cashier will check the items shown on the screen and process the payment. Using the system, we aim to limit any discrepancies to the handling of cash.

Another function we have implemented is to account for items that have expired or are damaged. Currently, these items are not accounted for. With this system in place, when tallying the inventory during the monthly check, there should be minimal discrepancies as the inventory will be reduced whenever a staff enters into the system any damaged or expired goods.

Overview of Scope

The system to be built is aimed primarily at mitigating the discrepancies in the sales and inventory record, as well as to reduce the workload of the staff where possible. As such, we have only focused on the important workflows that occur day to day and have left out processes that involve monitoring by the manager or anyone else, which occur as and when they deem fit. We have chosen to include the monthly inventory check, as this will showcase the results of implementing the new system.

Additionally, in order to make GetFreshFood more competitive, we decided to build a mobile app for customers to purchase and self-collect and have limited the scope to the mobile app, as we believe that being a supermarket situated in a neighbourhood, GetFreshFood's customer base will be the residents living in the area and having the delivery service might not be as relevant. A mobile app would be more convenient for working adults who are shopping on the way home, and housewives who might not have access to a computer.

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Persona and Customer Journey map



Jane
(Customer)

“The supermarket is like my second home”

Jane is a housewife who regularly visits the supermarket in her neighborhood. She spends most of her time looking for discounted goods and records down price changes if there are any. She likes to come by to browse through the store regularly, and occasionally has problems reading some of the price tags. She frequently talks to the cashiers and promoters as she has become friends with them over the years. They sometimes tell her about discounts that she did not know about, and she gets excited if she hears that her favorite brands are on promotion. She tends to visit the store for a long amount of time as she has many items to check out.

Influencers

- How quickly goods are replenished when there is no more stock in the shelves.
- Clearly marked prices.
- Promotions.
- Ease of payment.
- Less waiting time to make payment.

Primary uses

- Make purchases.
- Exchange expired or damaged goods.
- Browse selection in store.

Goals

- Buy all the goods in their shopping list
- Buy products that are worth the price

Income



Age



Education Level





Frustration and Pain points

- Must carry a heavy basket while browsing as there is no space for a trolley.
- Takes a while to identify the prices of different goods.
- Occasionally there are no goods left in the shelves of the item she wants or there are only a few left.
- Sometimes amounts are labelled differently.
- Occasionally goods purchased are expired and she only notices it when she is home.
- Not allowed to exchange good as the staff cannot identify that the good was bought from the store without a receipt.
- Cashier takes a long time to process the payment.
- Worried that the cashier keys in the wrong price.
- Receipts are sometimes hard to understand.

stage of journey	Motivation	Getting there	Locating Products		Compare Pricing
activity	Want to buy grocery	Travel to GetFreshFood	Look through shopping list	Search the product shelves for the item they want.	Compare prices of products
feeling					
very happy	😊	😊			
overall satisfied			😊		
unhappy				😞	😞
experiences	Excited about going grocery shopping.	Happy as it is in the neighbourhood, easily accessible.	Slightly unhappy as she needs to look through the list to identify which products are in the same area and she usually needs to go all over the store to get everything.	Annoyed as the products occasionally shift positions which makes it harder for her to locate the products.	Unhappy as prices are not listed clearly at times and she has to clarify with a staff. Prices also fluctuate every now and then, and she has to take note when is a cheaper time to buy.
customer expectation	Store is easy to browse, all items are in stock.	Store is within walkable distance.	Products that are bought frequently will be placed around the same area.	Able to easily locate each product.	Prices are listed clearly and are easily readable. If prices are cheaper, they should be indicated as a promotion.

stage of journey	Complete Shopping		Make Payment		
activity	Fill up shopping basket	Look at queue	Get to the front of the queue	Wait for the cashier to input the price	Make payment
feeling					
very happy					
overall satisfied					😊
unhappy	😞	😞	😞	😞	
experiences	Frustrated that store is cramped and there are no trolleys, and can only carry the shopping basket while shopping, which could take a long time.	Annoyed to see the long queues and each cashier taking so long to serve each customer.	Annoyed from waiting in line for a long time.	Irritable that she must wait a long-time while the cashier types each product and price in, as she has a lot of items. She also must monitor if the cashier keys in the right price for each item.	Happy as she can easily make payment and receive the receipt. Unhappy as receipt sometimes contains mistakes or is vague which makes it slightly difficult to check her items.
customer expectation	Browse the goods in store beforehand so that she will not need to carry the basket around.	Cashiers should process payment faster by using the same automated tools as other bigger grocery stores.	Payment should be faster so that she does not need to waste time queuing.	Cashiers will just scan the barcodes on the item and calculate the total.	Receipt should be easily readable.

stage of journey	Exchanges	
activity	Notices expired or damaged good	Go back to store to request or exchange
feeling		
very happy		
overall satisfied		
unhappy		
experiences	Annoyed that good is expired or damaged. If damaged, believes that cashier must have done it while packing.	Annoyed that the manager does not allow her to exchange as she has left the store for a while and she can't find the receipt.
customer expectation	Good should be in good condition and not expired.	Store should be able to recognize their own goods.



“Everything needs to be accurate so I can better maintain the inventory record”

Tom maintains a high-performing and motivated attitude as he works the entire shift maintaining and updating the inventory. As his primary role is the maintenance of the inventory record, he wants accurate data about the goods from the cashiers' sales records and the promoters when they are withdrawing goods. He also feels that he wastes a lot of time in manually checking the goods. Tom believes that they need more hands as there is too much work to be handled only by 2 store men each shift.

Primary Use

- Update the inventory record based on end-of-day sales record.
- Update the inventory record when goods are taken by suppliers.
- Place orders when the inventory is running low.
- Recommend the quantity of the goods to be ordered.

Influence

- Accuracy of information in end-of-day sales record and goods taken by suppliers.
- To be able to tally the inventory during the monthly inventory check.
- Promoters filling in the request form.
- Deliveries arriving at different timings.

Work Experience



Education Level



Interpersonal Skill



Accounting Skill



Goals

- Maintain accurate inventory record.
- Maintain optimum inventory levels.
- Perform the monthly inventory check faster.

Frustration and Pain Points

- Manual maintenance of the inventory.
- Inaccurate records for sales (Cashier) and withdrawal of goods (Promoter)
- Monthly inventory records do not tally with actual amount of goods

Stage of journey	Motivation	Acceptance of goods		Moving goods	Maintaining the inventory records	
Activity	Stock is running low, to order new goods	Receive goods delivered	Update the inventory records	Assist promoter in re-stocking the shelves	Maintain a set of inventory record of all goods	Monthly inventory checks
feeling						
very happy	😊					
overall satisfied			😊		😊	
unhappy		😞		😞		😞
Experience	Happy as the products are ordered based on the classification of goods which is given to him by the manager.	Unhappy as goods are always coming in, there is not enough time and help.	Satisfied as he can maintain the inventory records of each product using a separate form for each product.	Frustrated as there is only one store man to assist 10 promoters during each shift and promoters do not always fill up the request form making it hard to keep track.	Satisfied as he will update the inventory record based on the sales provided by the cashier and he updates the inventory himself for any damaged or expired goods.	Frustrated as he often finds that the numbers recorded in the inventory do not tally with the actual goods.
Expectation	Clear guideline of how many products to order.	To be able to accept the goods faster and space out the delivery timings.	Better way of maintaining the records.	Promoters should fill in the request form and wait till the store man has time to assist them.	Have an easier way of updating the inventory record using the cashier's end-of-shift records, as there will be six each day.	Cashiers and promoters should not be making mistakes when they are recording the sales or withdrawing the goods

User Stories

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Store man

Information from Persona	User stories
Frustration: Manual maintenance of the inventory.	As a store man, he would like the inventory list to be automatically updated based on the end of day sales report so that he can will not need to manually updated each product's form.
Frustration: Inaccurate records of end of day sales report (cashier)	As a store man, he would like the inventory list to be updated accurately based on the sales of the day so that his monthly inventory check will go smoothly.
	As a store man, he would like sales to be tracked in a complete manner and all items to be accounted for so that the inventory list is updated accurately.
Frustration: Inaccurate records of withdrawal of goods (promoter)	As a store man, he would like to update the inventory record accurately when the promoters request for goods to be moved from the storeroom to the store so that he can easier tally the inventory during the monthly inventory check.
	As a store man, he would like the inventory list to be automatically updated when the goods are moved to the store to ensure accuracy of the inventory record.
Influencer: Promoters filling in the request form.	As a store man, he would like all promoters to fill in the request form when they want to re-stock the shelves as this helps him to keep track of all the requests.
Influencer: Deliveries arriving at different timings.	As a store man, he would like the deliveries to be made at different timings so that he will be able to handle the deliveries as there is only one store man handling the deliveries.

Branch Manager

Information from Persona	User Stories
Frustration: Different end-of-shift reports from different cashiers	As a branch manager, he would like the end-of-shift reports to look the same so that he has all the information that he needs and will be able to easily generate reports if necessary.
Influencer: End-of-shift reports tally with the cash on hand	<p>As a branch manager, he would like the sales records to tally with the cash on hand so that he will not need to generate a loss of sale report and have to inform the owners.</p> <p>As a branch manager, he would like better tracking of the sales so that he can easily identify where the discrepancy is coming from.</p> <p>As a branch manager, he would like product names to be standardized in the sales record so that he clearly knows which item is being sold.</p>
Primary Use: Update product forms	As a branch manager, he would like to be able to easily disseminate price changes to all the affected promoters.
Frustration: Low efficiency of staff	<p>As a branch manager, he would like the change in prices to be automatically reflected so that his staff will not have to take so long re-labelling the prices.</p> <p>As a branch manager, he would like the prices to be tagged to the products so that the cashiers will not take so long manually keying in the prices of each product.</p>
Goal: Increase sales	As a branch manager, he would like to be able to analyze the sales data so that he can increase sales.
Frustration: Generating loss of sale reports as sales and inventory records are not well maintained	As a branch manager, he would like the sales and inventory records to be accurate so that he will not have to generate loss of sale reports and have to inform the owners.

Promoters

Information from Persona	User Stories
Frustration: Manually write label the price tags	As a promoter, she would like the prices to be auto-generated from a barcode and scanned at the cashier so she does not need to manually label the prices.
	As a promoter, she would like the prices to be auto-generated from a barcode so that every time there is a price change, she will not need to re-label all the prices.
Frustration: Store man does not immediately assist in stocking goods	As a promoter, she would like the store man to assist her immediately when she needs more goods on the shelves so that the shelves she is in charge of are constantly stocked.
Frustration: Need to manually check for expired or damaged goods	As a promoter, she would like to know the expiry dates of products so she can immediately remove these at the start of the day.

Information from Persona	User Stories
Frustration: Manual input of product and price	As a cashier, she would like the system to identify every product in a shopping basket with their price so that she don't have to enter product's price into cash register manually.
	As a manager he would like to create/update list of product with their price in the system and have it updated automatically so that the price will be updated during the checkout process.
Frustration: Printed receipts might not be complete as she could physically lose them.	As a cashier, she would like the system to keep a record of the receipts so that she don't need to manually keep track of the printed receipts.
Frustration: Staying back after work to complete the end-of-shift report	As a cashier, she would like the system to generate the end-of-shift sale report itself so that she don't need to manually record down list of product sold.
Frustration: Waiting for the manager to come back to the store to pass him the end-of-shift report to report the discrepancies	As a cashier, she would like the end-of-shift report to be readily available to manager and store man so that she don't need to locate them and pass them the report.
	As a store man, he would like to be able to easily access the end-of-day sale report so that he can update the inventory list.
	As a store man, he would like the inventory to be updated automatically once the end-of-day sale report is generated so that he does not have to manually update each product's details.
	As a manager, he would like to be able to access the end-of-day sale report so that he can easily view the money collected against the sales record for that day.
Frustration: Making human errors in the day to day work	As a cashier, she would like the system to generate the end-of-shift sale report itself so that it prevent her from making human error in the report.
	As a manager, he would like the end-of-shift report to be in the same format so that he can easily understand the data from the report.
	As a cashier, she would like the price for each item to automatically be captured, so that she will not need to key in the amounts manually.
	As a cashier, she would like to have the cash register show the price and name of each item, so that she can double check that the goods are correct.

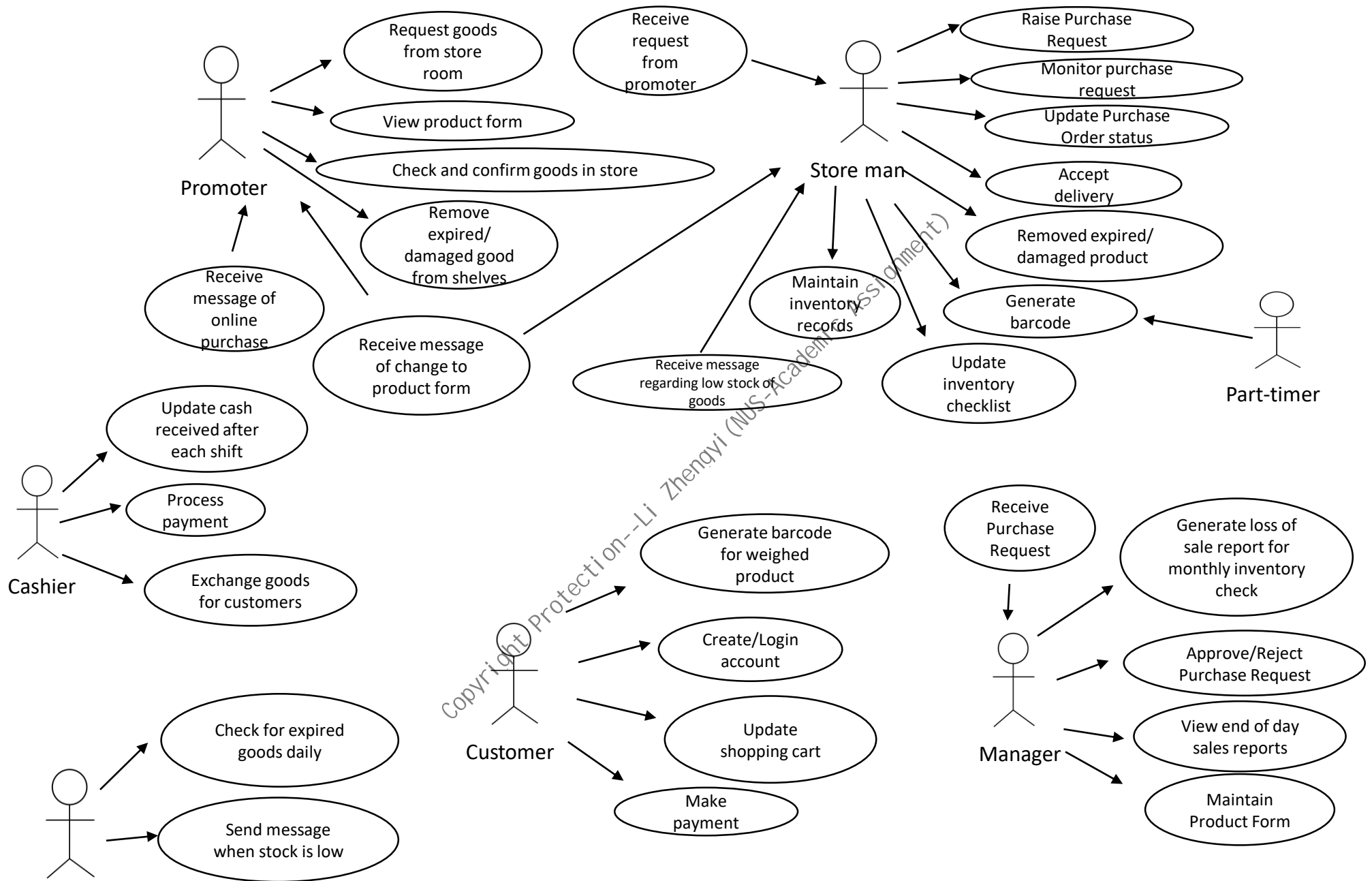
Customers – Housewives

Information from Persona	User Stories
Frustration: Takes a while to identify the prices of different goods.	As a customer, she would like to easily identify the prices of the goods at a glance so that she can compare it easily and choose the cheaper option.
Frustration: Sometimes amounts are labelled differently.	As a customer, she would like the prices to be clearly marked and standardized so that she knows how much each item costs and she is paying the same as everyone else.
Frustration: Has to carry a heavy basket while browsing as there is no space for a trolley.	As a customer, she would like to browse goods online so that she does not need to carry a heavy basket around while browsing.
Frustration: Occasionally there are no goods left in the shelves of the item she wants or there are only a few left.	As a customer, she would want the products to be well stocked so that she can purchase in bulk and will not waste time on finding a staff to get the item re-stocked.
Frustration: Cashier takes a long time to process the payment.	As a customer, she would like the cashier to scan a barcode and quickly tabulate the price of goods instead of manually keying in every item so that the payment process will be faster.
Frustration: Worried that the cashier keys in the wrong price.	As a customer, she would like the cashiers to scan the barcode rather than manually type it in so she will have more confidence that the prices are correct.
Frustration: Receipts are sometimes hard to understand.	As a customer, she would like standardized receipts so she can easily check against the items bought.
Frustration: Occasionally goods purchased are expired and she only notices it when she is home.	As a customer, she would like all the goods to not be expired so that she does not have to come back to exchange the goods.
Frustration: Not allowed to exchange good as the staff cannot identify that the good was bought from the store without a receipt.	As a customer, she would like the exchange process to be easier and that the store will be able to recognize that the good was bought from the store.

Customers – Working Adults with families

Information from Persona	User Stories
Influencers: Be able to purchase goods in her spare time as she already knows what to buy.	As a customer, she would like to purchase goods online so that she does not need to spend time looking for the goods in the store and can purchase it in her spare time.
Frustration: Occasionally there are no goods left in the shelves of the item she wants or there are only a few left.	As a customer, she would want the products to be well stocked so that she can purchase in bulk and will not waste time on finding a staff to get the item re-stocked.
Frustration: Takes a while to identify the prices of different goods.	As a customer, she would like to easily identify the prices of the goods at a glance so that she can compare it easily and choose the cheaper option.
Frustration: Cashier takes a long time to process the payment	As a customer, she would like the cashier to scan a barcode and quickly tabulate the price of goods instead of manually keying in every item so that the payment process will be faster.
Frustration: Worried that the cashier keys in the wrong price.	As a customer, she would like the cashiers to scan the barcode rather than manually type it in so she will have more confidence that the prices are correct.
Frustration: Occasionally goods purchased are expired and she only notices it when she is home.	As a customer, she would like all the goods to not be expired so that she doesn't have to come back to exchange the goods.

Use Case Model

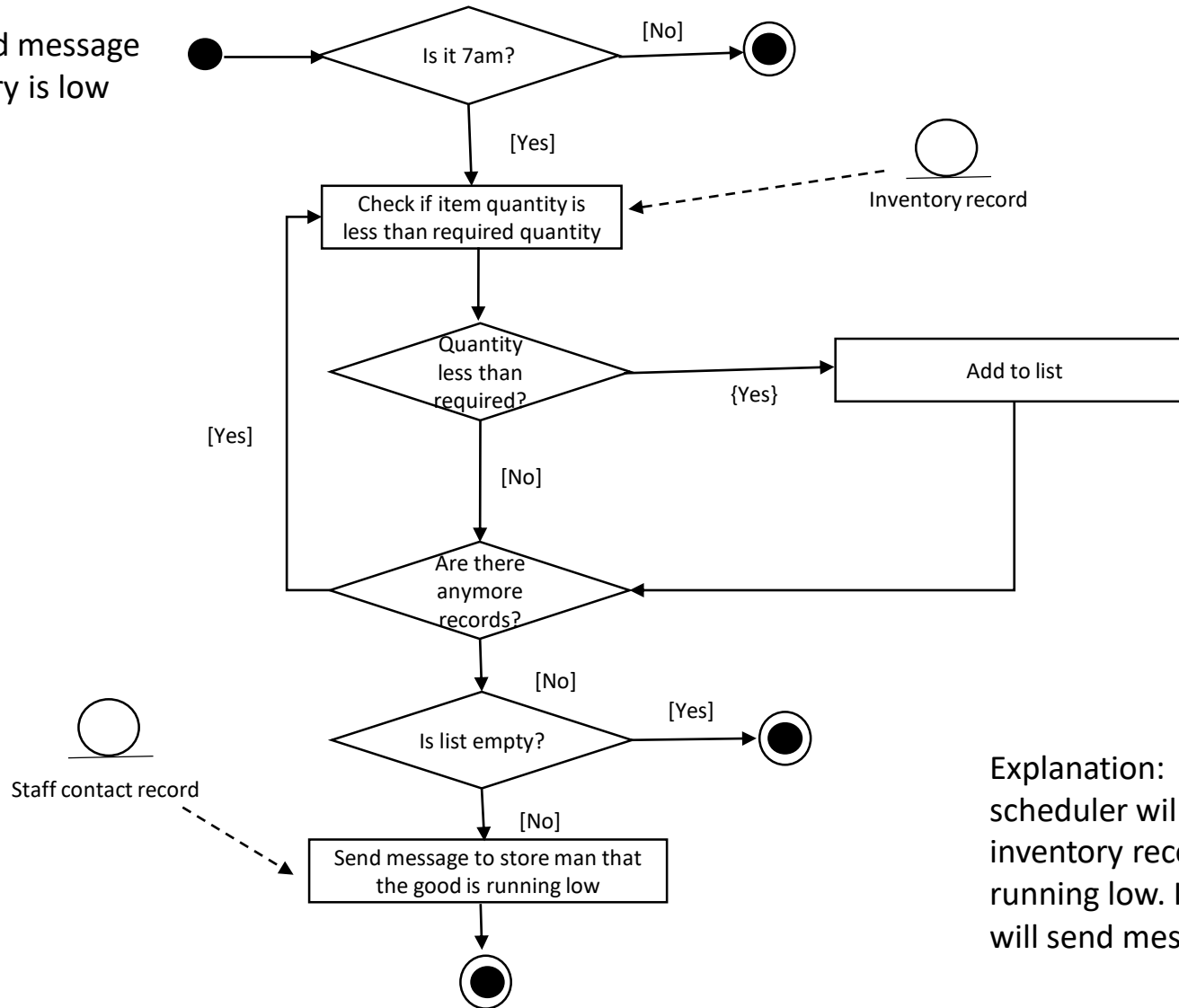


Functional Requirement

Ordering of Goods

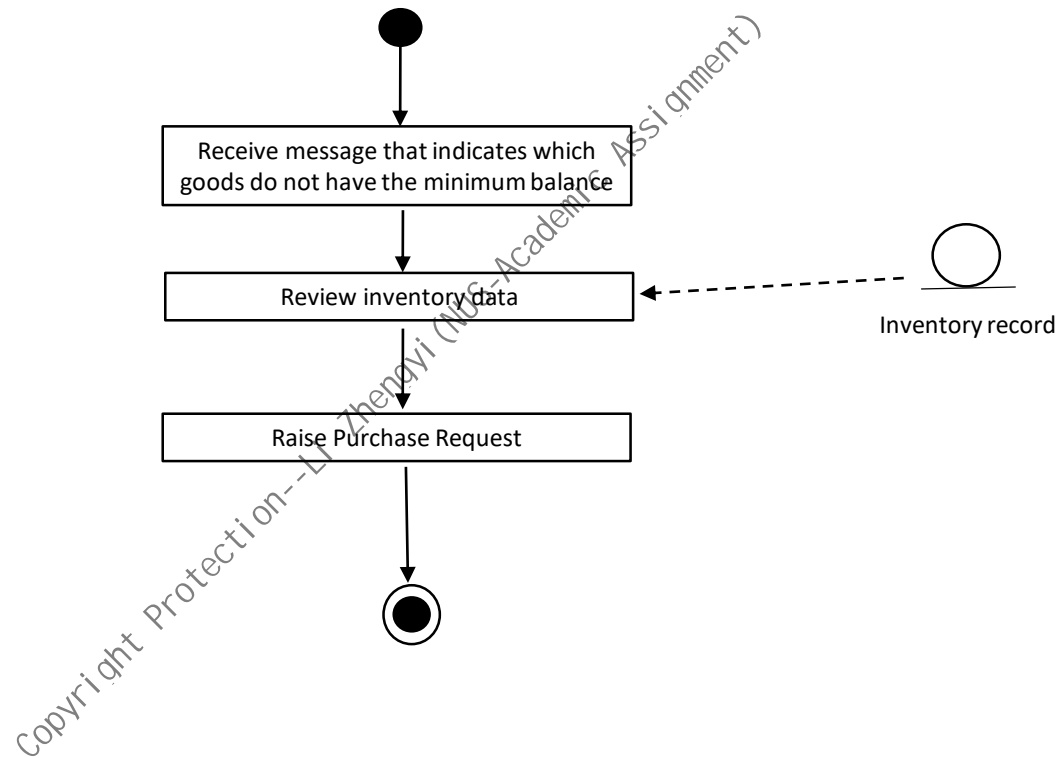
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Use case: Send message when inventory is low (scheduler)

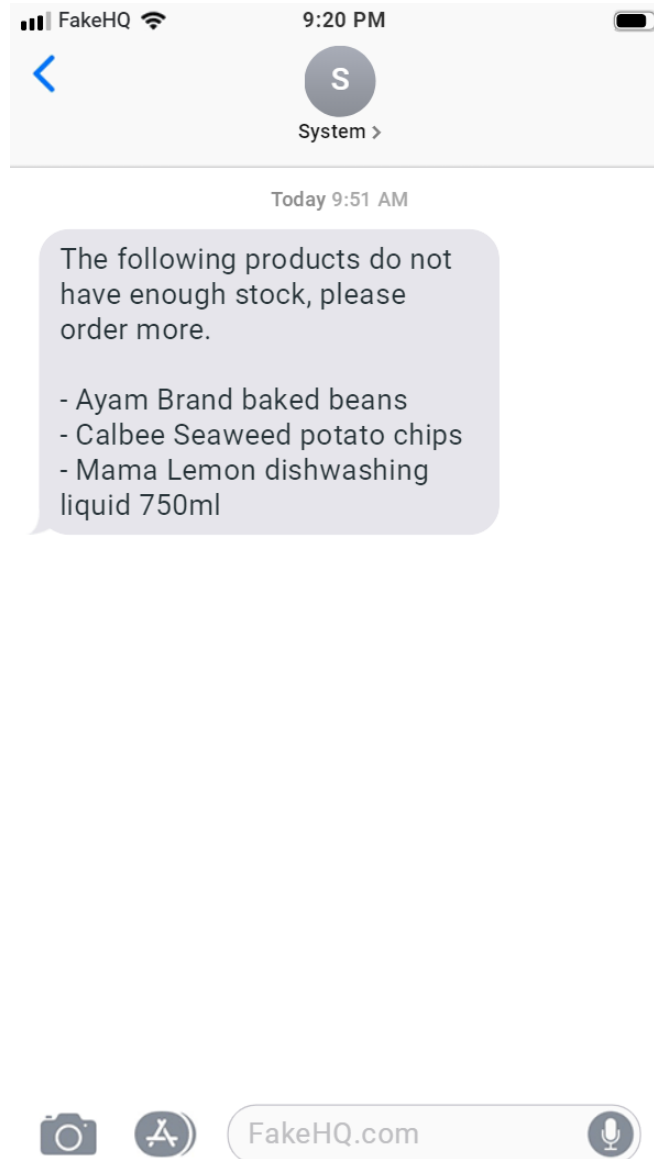


Explanation: At 7 am every day, the scheduler will look through the inventory record and see if they are running low. If they are, scheduler will send message to store man.

Use case: Receive message
regarding low stock of
goods(store man)



UI of message



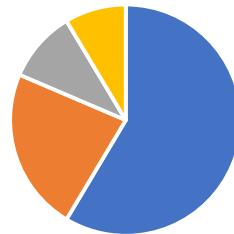
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Inventory Dashboard

Inventory running low

No	Product Name	Product ID	Product Category	Product Qty in stock	Min Product Qty required in stock	Comments
1	Coca Cola Coke Classic (320ml)	123311	Can drink	248	300	
2	JAPAN NESTLE KITKAT MINI	126722	Snack	221	300	
3	MMs Chocolate Candies - milk	126745	Snack	156	200	
4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	288	300	

Inventory Types



■ Vegetable ■ Beverage ■ Bakery ■ Poultry

Inventory Record table

Search

Predictive analysis by system,
can be overwritten by staff

Retrieve record

	No	Product Name	Product ID	Product Category	Product Qty in stock	Product Qty required in stock	Recommended Qty to order	Comments
<div>View</div>	1	Coca Cola Coke Classic (320ml)	123311	Can drink	248	300	200	
<div>View</div>	2	JAPAN NESTLE KITKAT MINI	126722	Snack	221	300	350	
<div>View</div>	3	MMs Chocolate Candies - milk	126745	Snack	156	200	200	
<div>View</div>	4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	288	300	200	

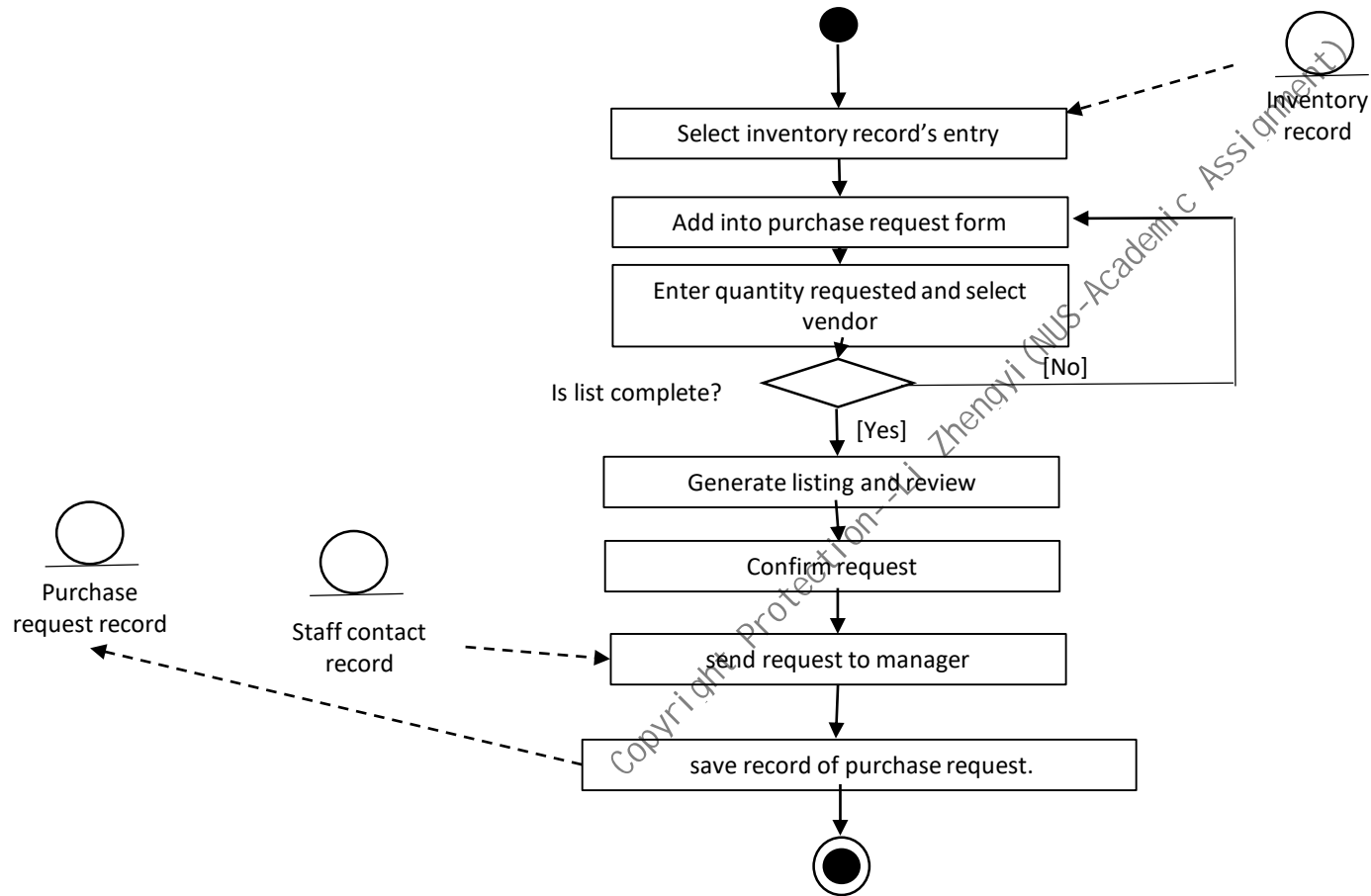
Create

Modify

Delete

Clear all selection

Use case: Raise purchase request(store man)



Home screen for Storeman
(generate new purchase request)

Staff	Tom
-------	-----

Generate purchase request	Inventory Dashboard	Generate Inventory checklist	Maintain Inventory record
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Inventories running low

No	Product Name	Product ID
1	Coca Cola Coke Classic (320ml)	123311
2	JAPAN NESTLE KITKAT MINI	126722
3	MMs Chocolate Candies - milk	126745
4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798

Promoter Stock Request Status

Request No	Status
#123442143	Closed
#134435453	Closed
#122444454	Pending
#1255657676	Pending

Purchase Request Status

Request No	Status
#1244234	Pending
#1244345	Approved
#1244345	Approved
#1244235	Pending

Explanation: Store man will raise purchase request through his home screen via the "generate purchase request Button" .

Search

Snack

Retrieve record

<input type="checkbox"/> Check All	No	Product Name	Product ID	Product Category	Product Qty in stock	Min Product Qty required in stock
<input type="checkbox"/>	1	JAPAN NESTLE KITKAT MINI	126722	Snack	221	300
<input checked="" type="checkbox"/>	2	MMs Chocolate Candies - milk	126745	Snack	156	200
<input type="checkbox"/>	3	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	288	300

Add to purchase request

Clear search

Explanation: In this UI, Store man will be able to search for product and add them to the purchase request.

Purchase request # 123456

Requested by	Employer ID	Date of request
Tom	938493292	22-Aug-19

No	Product Name	Product ID	Product Classification	Qty in stock	Qty to order	Vendor	Unit Price	Total
1	Coca Cola Coke Classic (320ml)	123311	Fast Selling	248	100	ABC Pte Ltd	\$0.25	\$25.00
2	JAPAN NESTLE KITKAT MINI	126722	Normal	221	100	ABC Pte Ltd	\$1.50	\$150.00
3	MMs Chocolate Candies - milk	126745	Normal	156	100	Sky Distributor Pte Ltd	\$1.00	\$100.00
4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	288	100	Sky Distributor Pte Ltd	\$1.30	\$130.00

Grand Total	\$630.00
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Modify

Back to selection

Confirmation Page

Dear Tom, your request has been submitted.

Purchase request # 123456

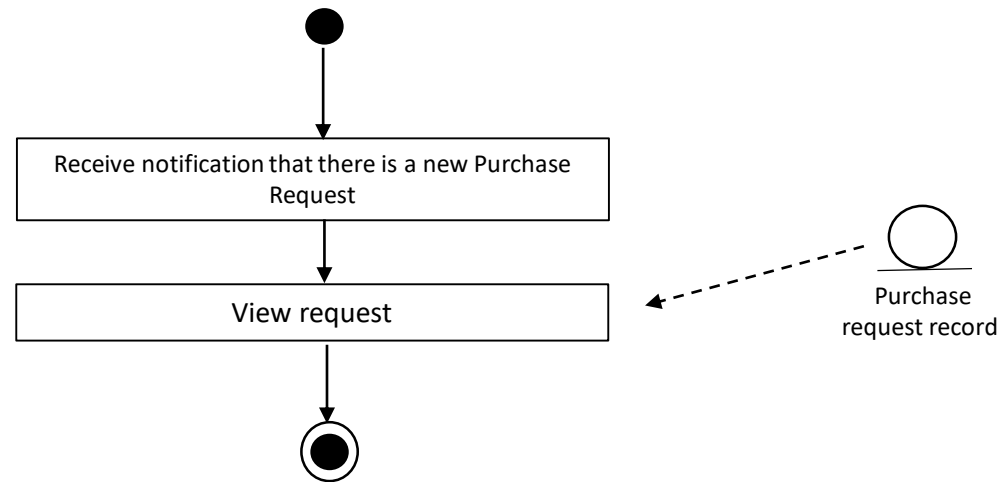
Requested by	Employer ID	Date of request
Tom	938493292	22-Aug-19

No	Product Name	Product ID	Product Classification	Qty in stock	Qty to order	Vendor	Unit Price	Total
1	Coca Cola Coke Classic (320ml)	123311	Fast Selling	248	100	ABC Pte Ltd	\$0.25	\$25.00
2	JAPAN NESTLE KITKAT MINI	126722	Normal	221	100	ABC Pte Ltd	\$1.50	\$150.00
3	MMs Chocolate Candies - milk	126745	Normal	156	100	Sky Distributor Pte Ltd	\$1.00	\$100.00
4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	288	100	Sky Distributor Pte Ltd	\$1.30	\$130.00

Grand Total	\$630.00
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Exit

Use case: Receive purchase
request(manager)



Home screen for Manager

End of Days Sale Reports

Product Forms

Generate loss of Sale
report

Manager

Edward

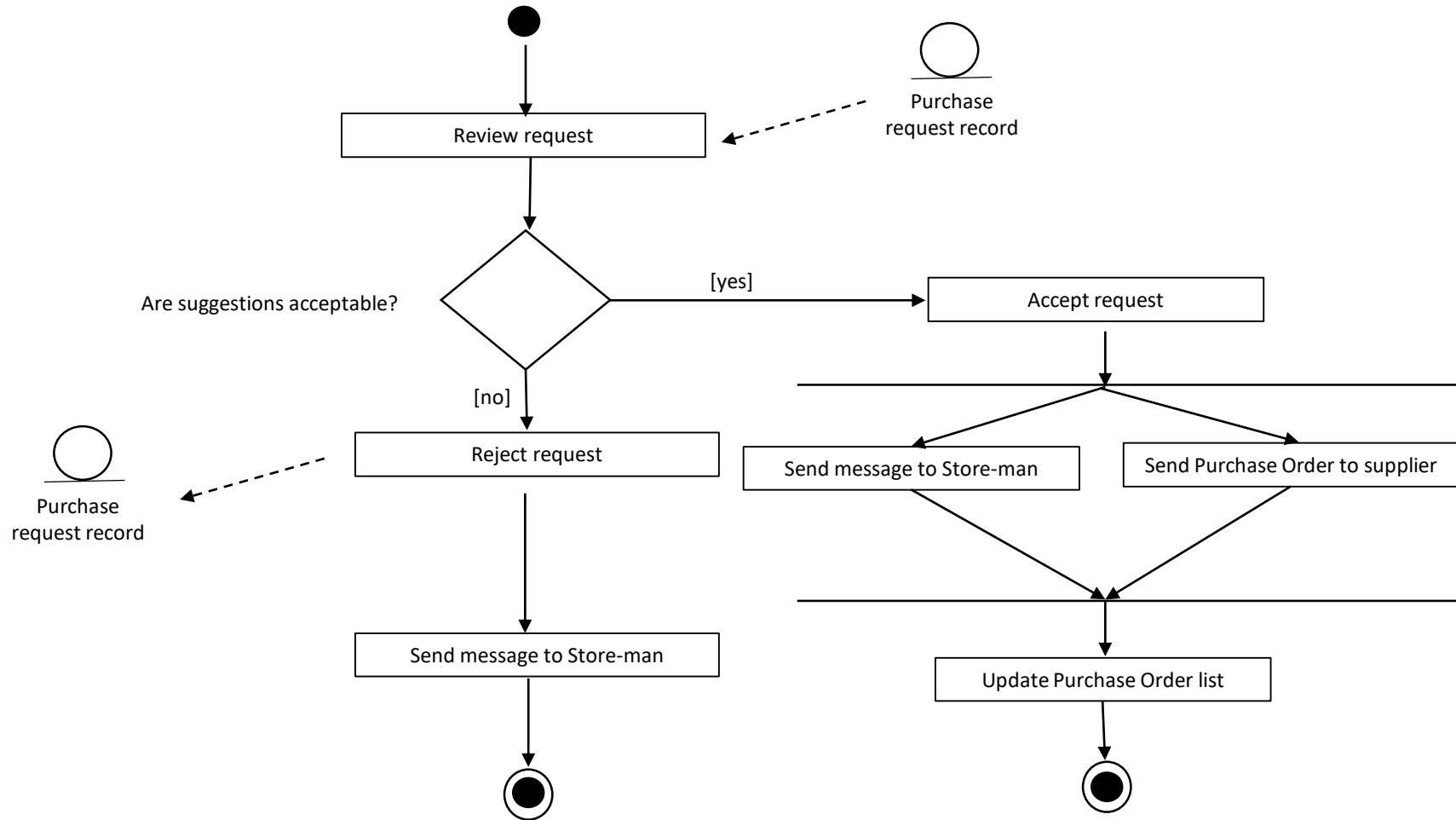
Inventories running low

No	Product Name	Product ID
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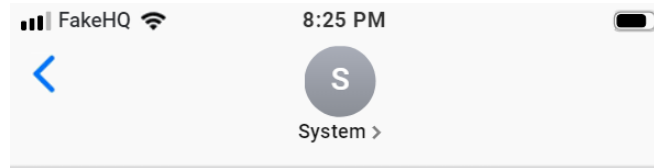
New Purchase Request Notifications

Request No	Raised by
#1233452	Tom
#1233345	Jerry
#1231113	Tom
#1233345	Tom

Use case: Approve / reject purchase request (Manager)



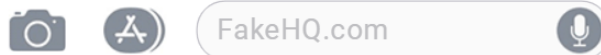
Message received by store man



Today 8:57 AM

Purchase Request #123456
has been approved. Purchase
Order has been sent to Supplier
A.

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Credit: <https://fakehq.com/iphone/>

Purchase order sent
to supplier in email

GetFreshFoods

764 Eunos Ave 1
Singapore 475764
Phone: 68452159
Fax: 65874515

PURCHASE ORDER

TO:
Supplier A

123 Bedok Street 12
Singapore 785147
6574 1248

P.O. NUMBER:
0123556

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
50	6.0	Coca Cola Coke Classic (320ml)	\$0.35	\$105.00
			SUBTOTAL	\$105.00
			TAX	\$7.35
			TOTAL	\$112.35

This is a computer-generated document. No signature is required.

Credit: <http://templatelab.com/purchase-order-templates/>

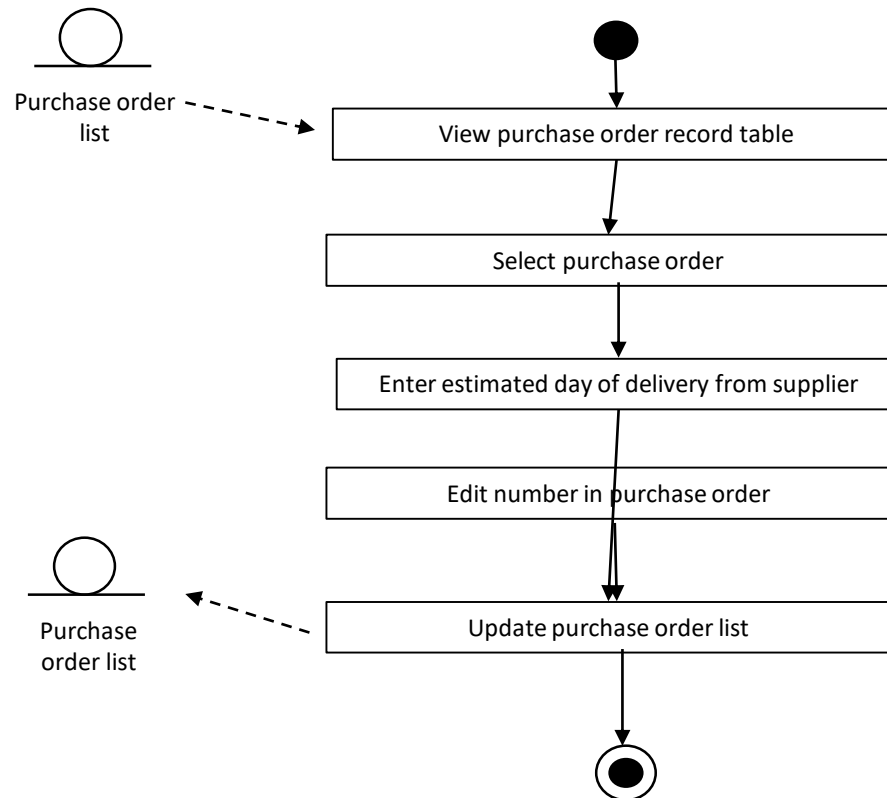
Monitor Purchase Request (includes modifying purchase request after rejection)

Purchase Requests Record

	No	Purchase Request Ref No	Raised by	Date of request	Status	Comments
View	1	123567	Tom	10-Aug-19	Pending manager's approval	
View	2	123445	Peter	02-Sep-19	Pending manager's approval	
View	3	122457	Tom	02-Sep-19	Draft	
View	4	123423	Jerry	12-Sep-19	Rejected	
View	5	123456	Tom	23-Aug-19	Approved	

Explanation: If manager reject the purchase request, store man will be able to access the purchase request record and modified them if required.

Use Case: Update Purchase Order status(store man)



Purchase order list

Search

Please enter Order Ref No or Vendor name

Retrieve record

	No	Order Ref No	Vendor	Estimated Date of delivery	Delivery Date	Comments
View	1	123567	Sky Distributor Pte Ltd			
View	2	123445	Sky Distributor Pte Ltd			
View	3	122457	Sky Distributor Pte Ltd			
View	4	123456	Sky Distributor Pte Ltd			

Order Ref No : 123567

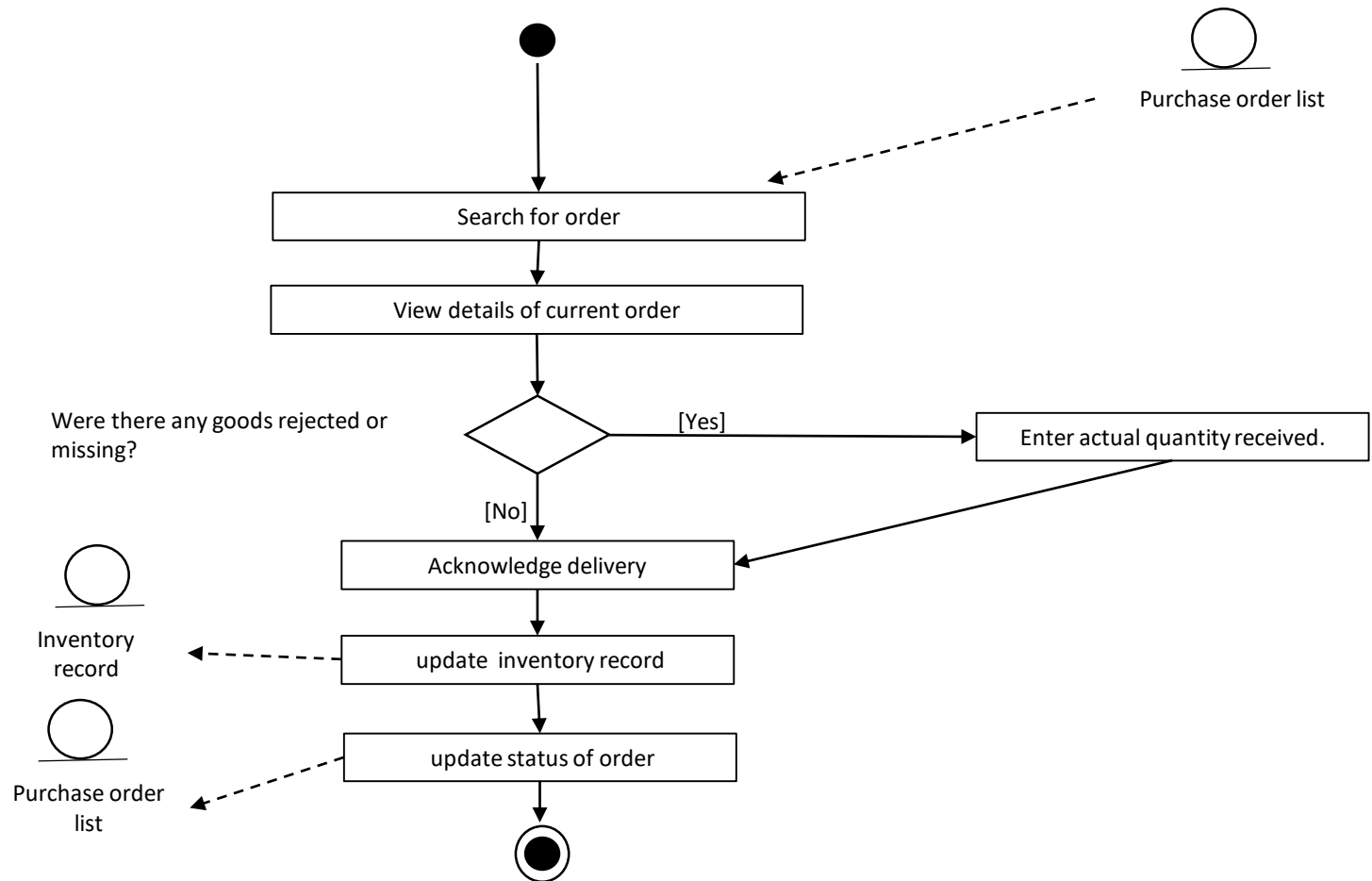
Order Ref No	Vendor	Estimated Delivery Date
123567	Sky Distributor Pte Ltd	<div>DD/MM/YY</div>

No	Product Name	Qty Ordered	Qty Supplier can deliver
1	Coca Cola Coke Classic (320ml)	100	<div>100</div>
2	JAPAN NESTLE KITKAT MINI	100	<div>100</div>
3	MMs Chocolate Candies - milk	150	<div>150</div>
4	OREO Milk Chocolate 246G (2 In 1 Pack)	300	<div>300</div>

Receiving the delivery

Copyright Protection--Li Zhengyi (US-Academic Assignment)

Use case: Accept
delivery(store man)



Purchase Order List

Search

Please enter Order Ref No or Vendor name

Retrieve record

	No	Order Ref No	Vendor	Estimated Date of delivery
View	1	123567	ABC Pte Ltd	01-Sep-19
View	2	123445	Sky Distributor Pte Ltd	01-Sep-19
View	3	122457	Sky Distributor Pte Ltd	01-Sep-19
View	4	123456	Long Long Pte Ltd	01-Sep-19

After clicking ‘view’

Order Ref No	Vendor	Estimated Date of delivery
123567	ABC Pte Ltd	01-Sep-19

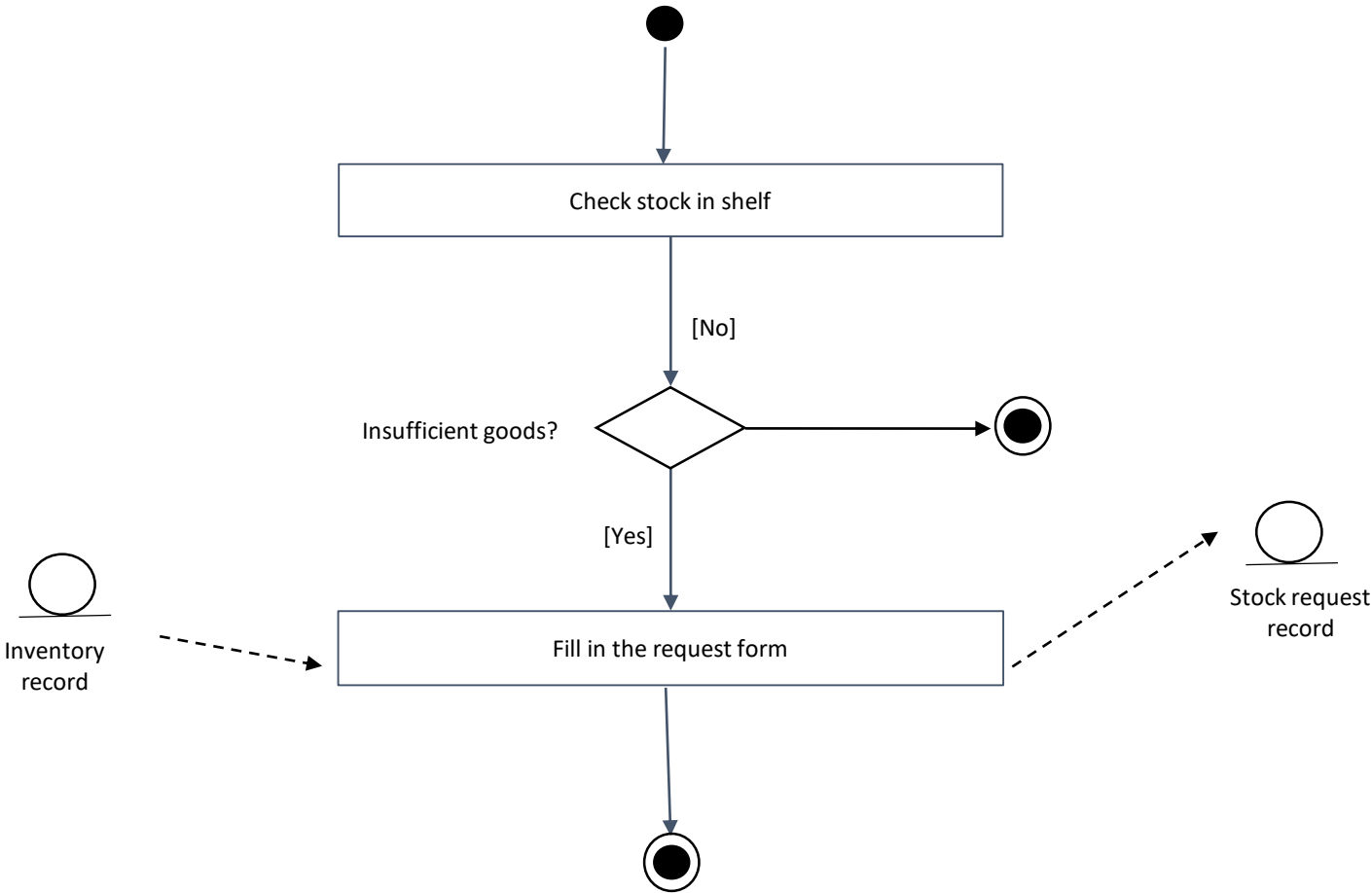
No	Product Name	Product ID	Product Category	Qty ordered	Qty Received	Expiry Date
1	Coca Cola Coke Classic (320ml)	123311	Can drink	300	<div>300</div>	<div></div>
2	JAPAN NESTLE KITKAT MINI	126722	Snack	300	<div>300</div>	<div></div>
3	MMs Chocolate Candies - milk	126745	Snack	200	<div>200</div>	<div></div>
4	OREO Milk Chocolate 246G (2 In 1 Pack)	126798	Snack	300	<div>300</div>	<div></div>

Acknowledge Delivery

Goods moving from Storeroom to Store

Copyright Protection--Li Zhenyi (NUS Academic Assignment)

Use case: Request goods from store room
(Promoter)



UI to search for item

Search

Retrieve record

Product Name	Product ID	Product category	Qty in stock
Coca Cola Coke Classic (320ml)	646597	Fast	234

Add to stock request

Request number: 2498244

No	Product Name	Product ID	Product category	Qty in stock	Qty requested
1	Coca Cola Coke Classic (320ml)	646597	Fast	234	<div>100</div>
2	M&Ms Chocolate Candies - milk	856697	Moderate	116	<div>160</div>

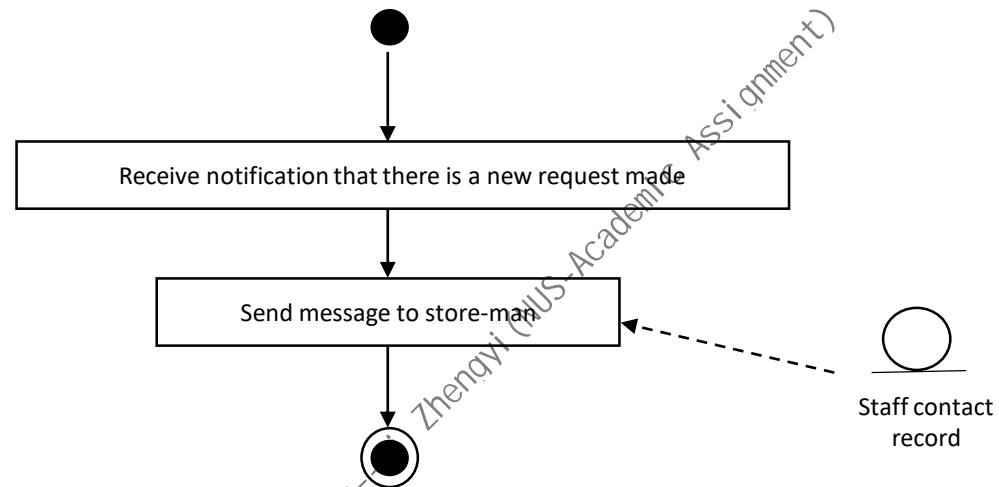
Submit

Cancel

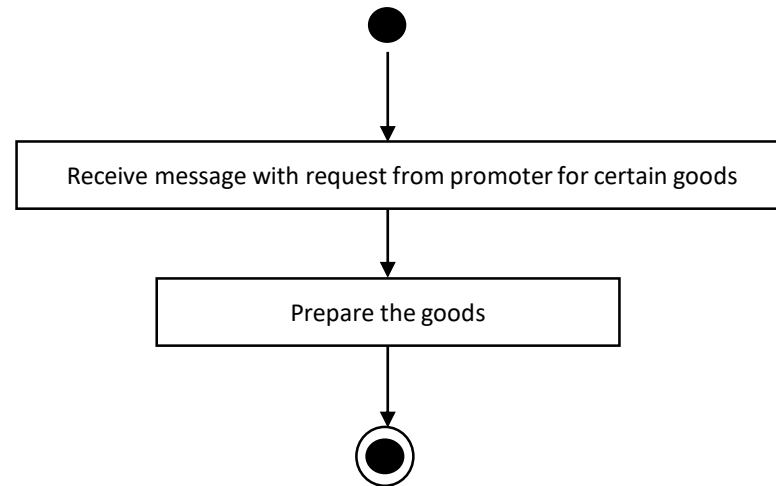
Back to selection

Save in draft

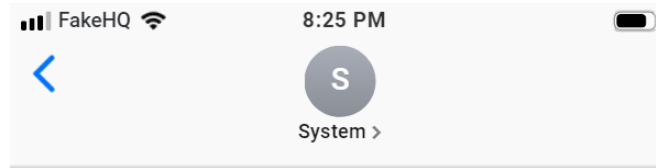
Use Case: Send message when promoter requests for goods (scheduler)



Use Case: Receive request from promoter
(Storeman)



UI of message



Today 8:56 AM

Jennifer has requested for the following items to be stocked in shelf 12:

- 20 x Campbell Mushroom Soup
- 15 x Ayam Brand Baked Beans

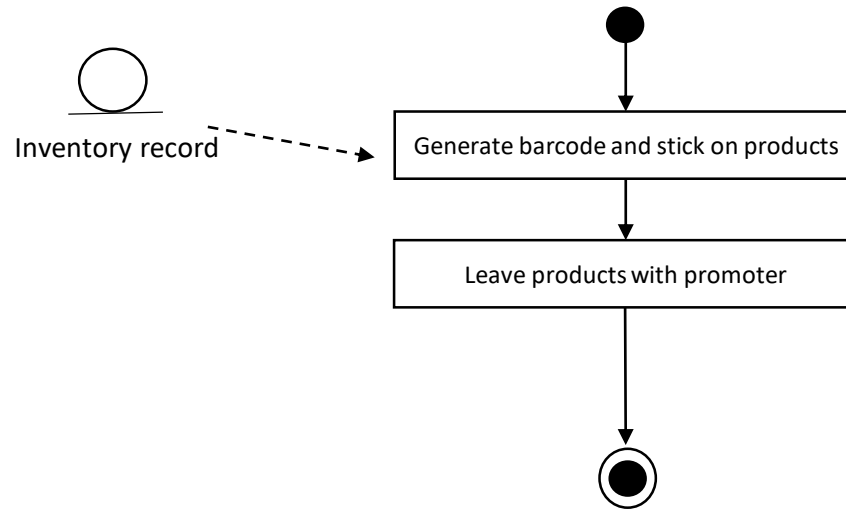


FakeHQ.com



Credit: <https://fakehq.com/iphone/>

Generate barcode
(Store man/Part-timer)



UI to search for item

Search

Search by Product ID / Product Name

Retrieve record

	No	Product Name	Product ID	Product Category	Product Qty in stock	Predicted Product Qty required in stock	Recommended Qty to order	Comments
View	1	Coca Cola Coke Classic (320ml)	123311	Can drink	248	300	200	
View	2	JAPAN NESTLE KITKAT MINI	126722	Snack	221	300	350	
View	3	MMs Chocolate Candies - milk	126745	Snack	156	200	200	

Barcode UI

Product Name	Product ID	Product Category
Coca Cola Coke Classic (320ml)	123311	Can drink

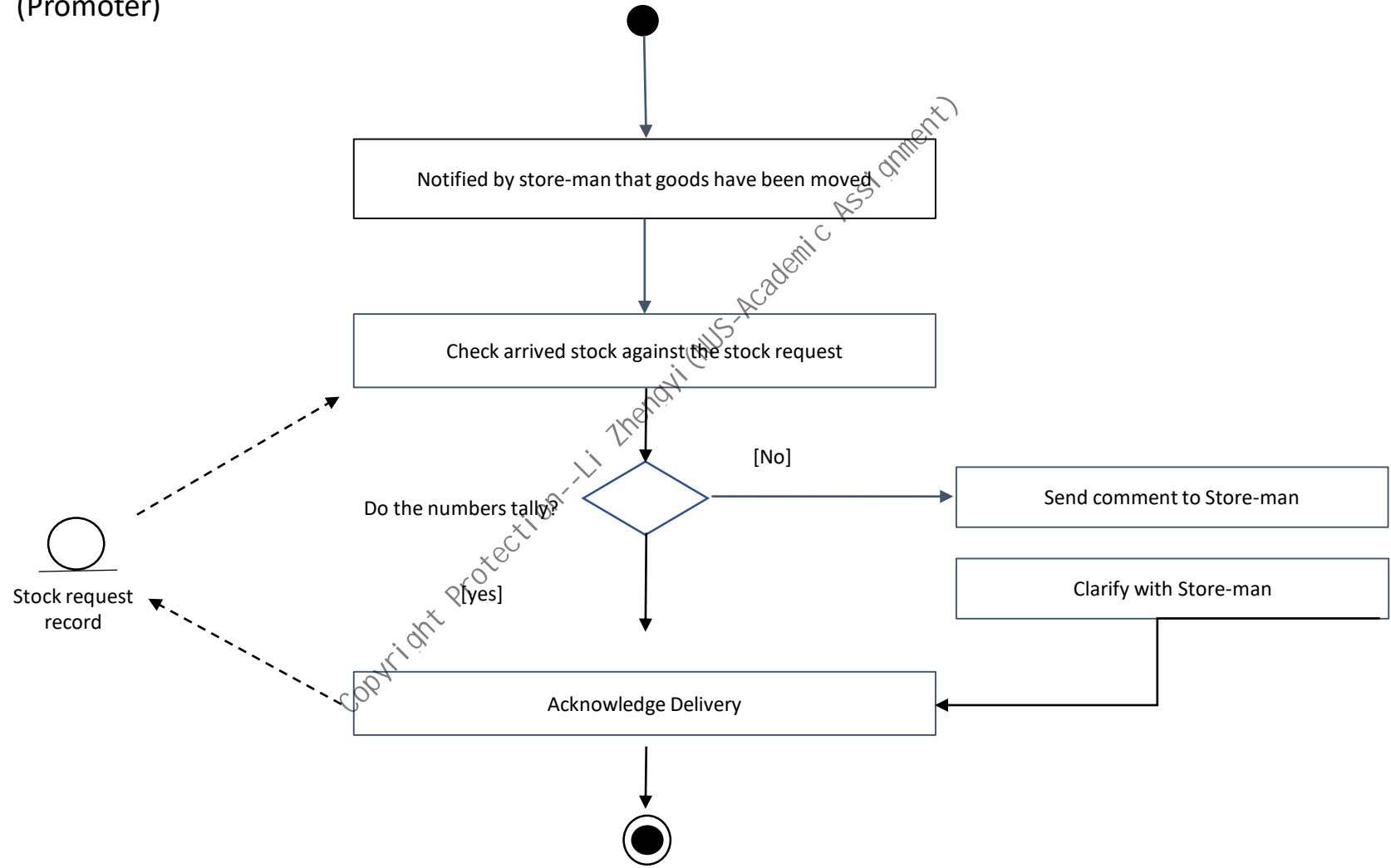
Order Number	Vendor	Expiry Date	Qty in store room	
#123435	ABC Pte Ltd	18-Oct-22	30	<button>Generate Barcode Tag</button>
#132443	Sky Distributor Pte Ltd	20-Oct-22	122	<button>Generate Barcode Tag</button>
#122245	Sky Distributor Pte Ltd	20-Oct-22	200	<button>Generate Barcode Tag</button>

Please insert quantity:

ConfirmCancel

The team has assumed that the expiry date for each batch will be provided by the supplier in the delivery order. Items of the same name in the same batch will be generated the same barcode.

Use Case: Check and confirm goods in store
(Promoter)



Delivery confirmation form

Request No : #67890 Requested by : Jennifer

No	Product ID	Product Name	Qty requested	Qty received	Received by
xx	xx				

Comments:

Acknowledge Receipt

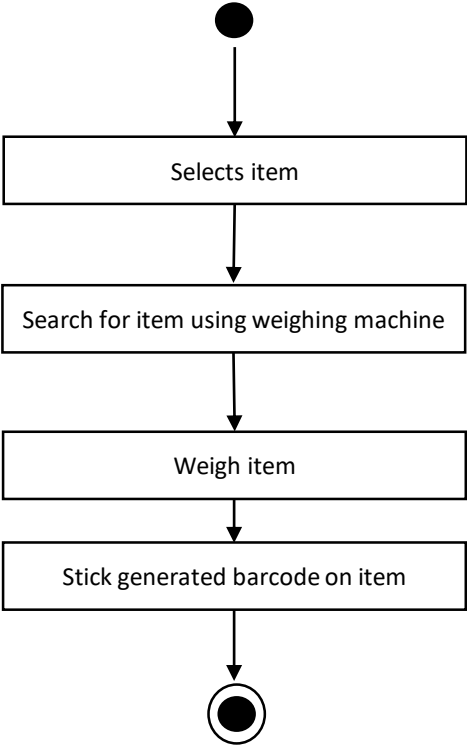
Send Comment to Store-man

Back

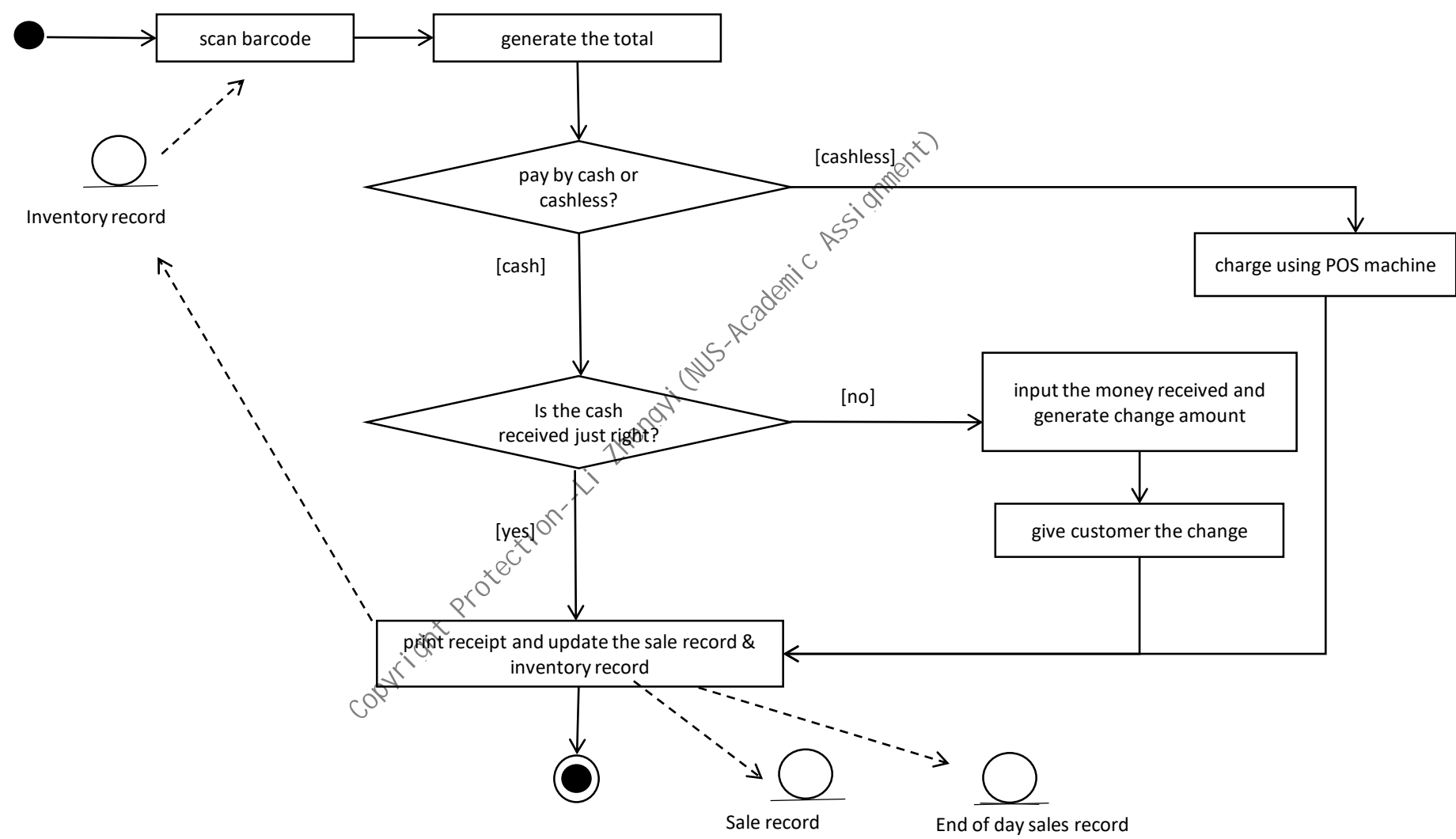
Customer Experience (in-store)

Copyright Protection--Li Zhenyi (NUS Academic Assignment)

Use Case: Generate barcode for weighed goods
(customer)



Use Case: Process payment (Cashier)



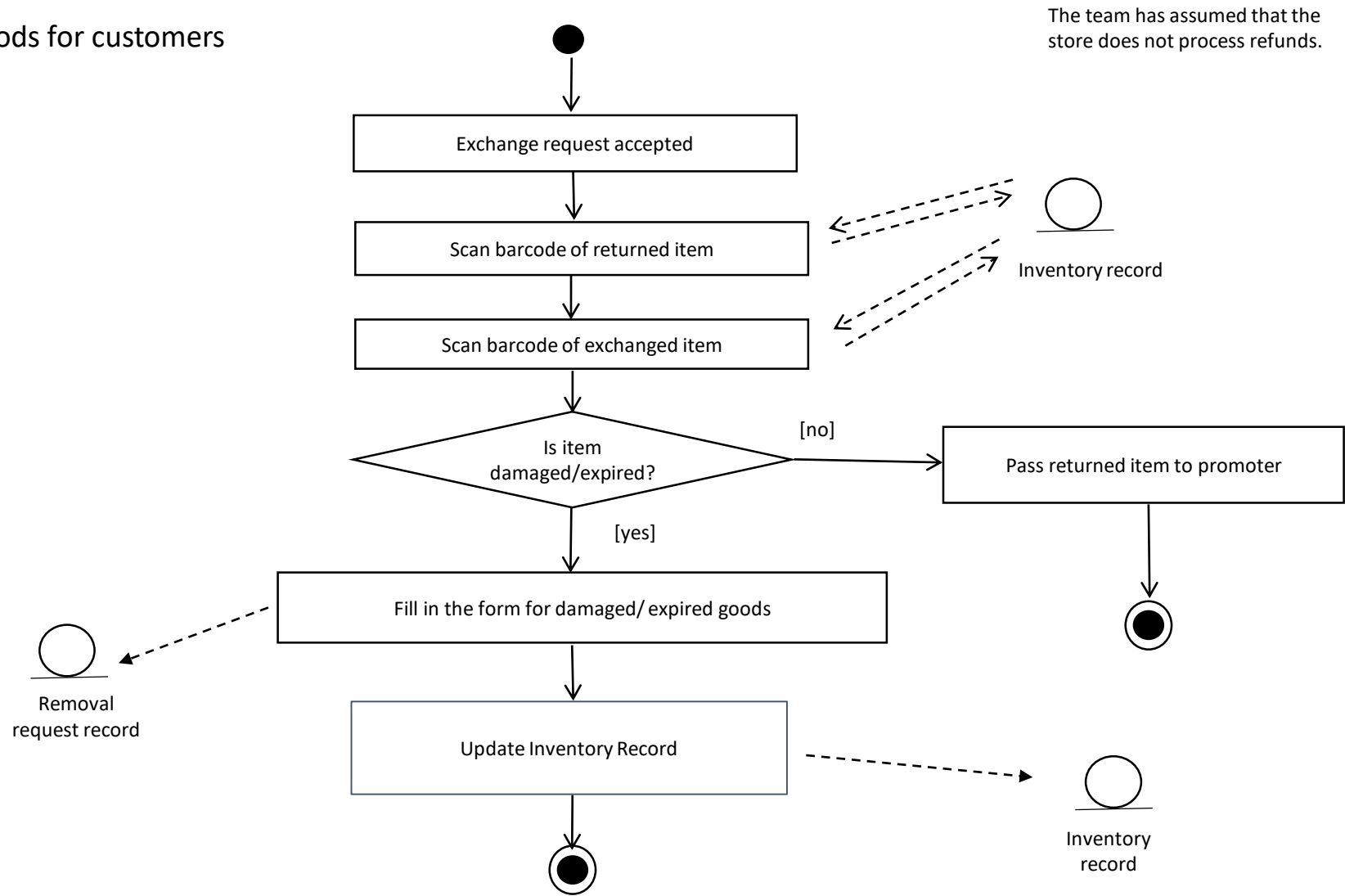
Cash Register Screen

[BACK TO THE HOME SCREEN](#)

No	Product Name	Product ID	Qty	Amount
1	CAM CHIPS	673748	1	1.25
2	NUTRISOY H-C SOYA MILK 1L	789409	2	3.50
3	LAY'S CHIPS	789409	5	3.50
4	DOVE CHOCOLATE 70g	188896	1	2.80
			Total Amount	\$28.55
			Payment	\$30.00
			Change Due	\$1.45

[Print receipt](#)

Use case: Exchange goods for customers
(Cashier)



UI of exchange page

<input type="checkbox"/> Exchange for expired items
<input type="checkbox"/> Exchange for damaged items

Scan barcode of returned items

No	Product Name	Product ID	Qty	Amount
1	NUTRISOY H-C SOYA MILK 1L	789464	1	3.50

Submit removal request
record

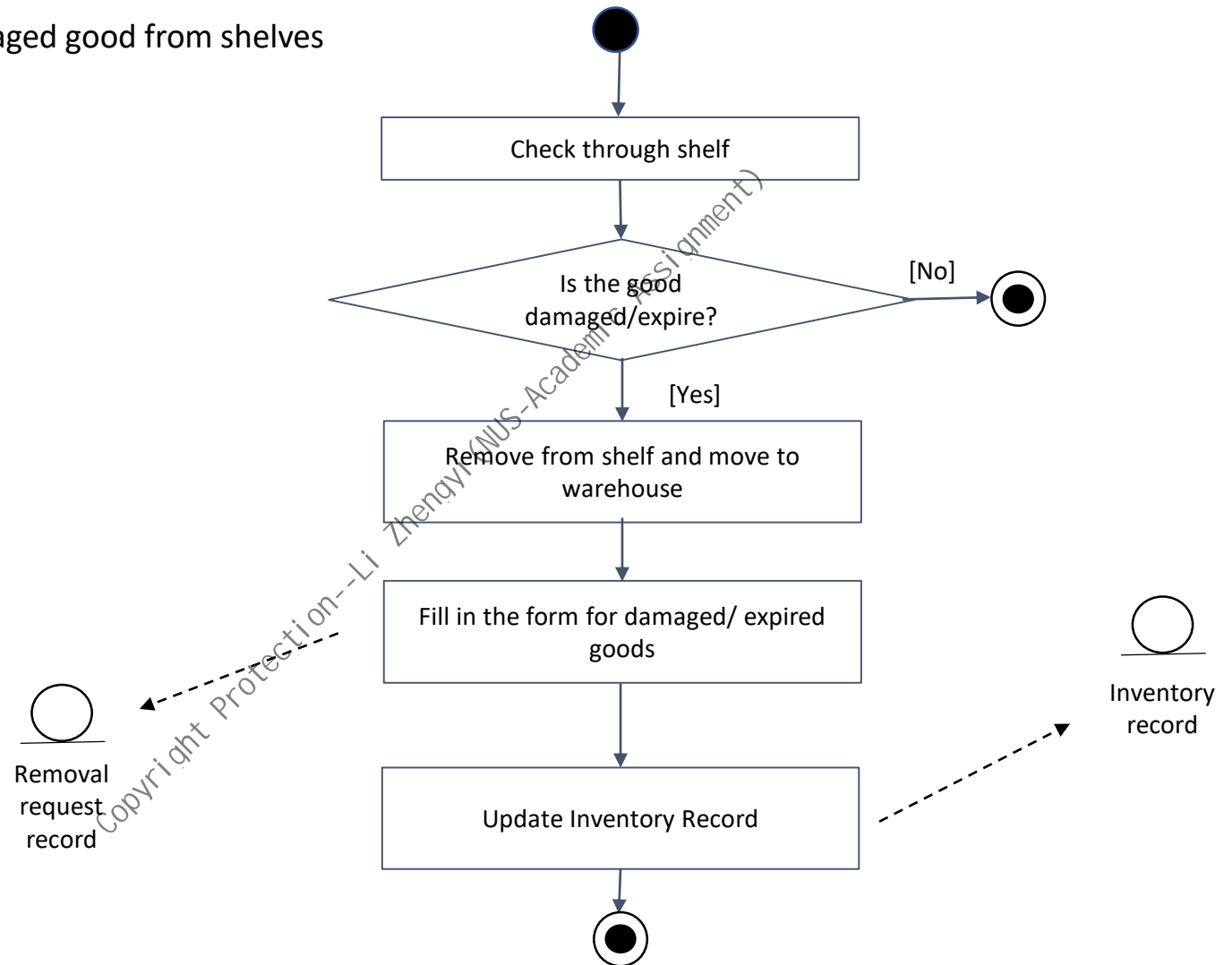
Scan barcode of exchanged items

No	Product Name	Product ID	Qty	Amount
1	NUTRISOY H-C SOYA MILK 1L	789464	1	3.50

Update inventory
record

Removal of damaged/expired goods (other than cashier)

Use case: Remove expired/ damaged good from shelves
(Promoter)



UI to search for product

Search

Retrieve record

Product Name	Product ID	Product Category
Coca Cola Coke Classic (320ml)	123311	Can drink

Add to removal request

UI of Removal request form

Removal request # 123456

No	Product Name	Product ID	Product category	Qty to remove	Reason
1	Coca Cola Coke Classic (320ml)	123311	Can drink	<input type="text" value="6"/>	<input type="text" value="D"/>
2	Janpan Nestle KitKat Mini	588662	Snack	<input type="text" value="3"/>	<input type="text" value="E"/>

Submit

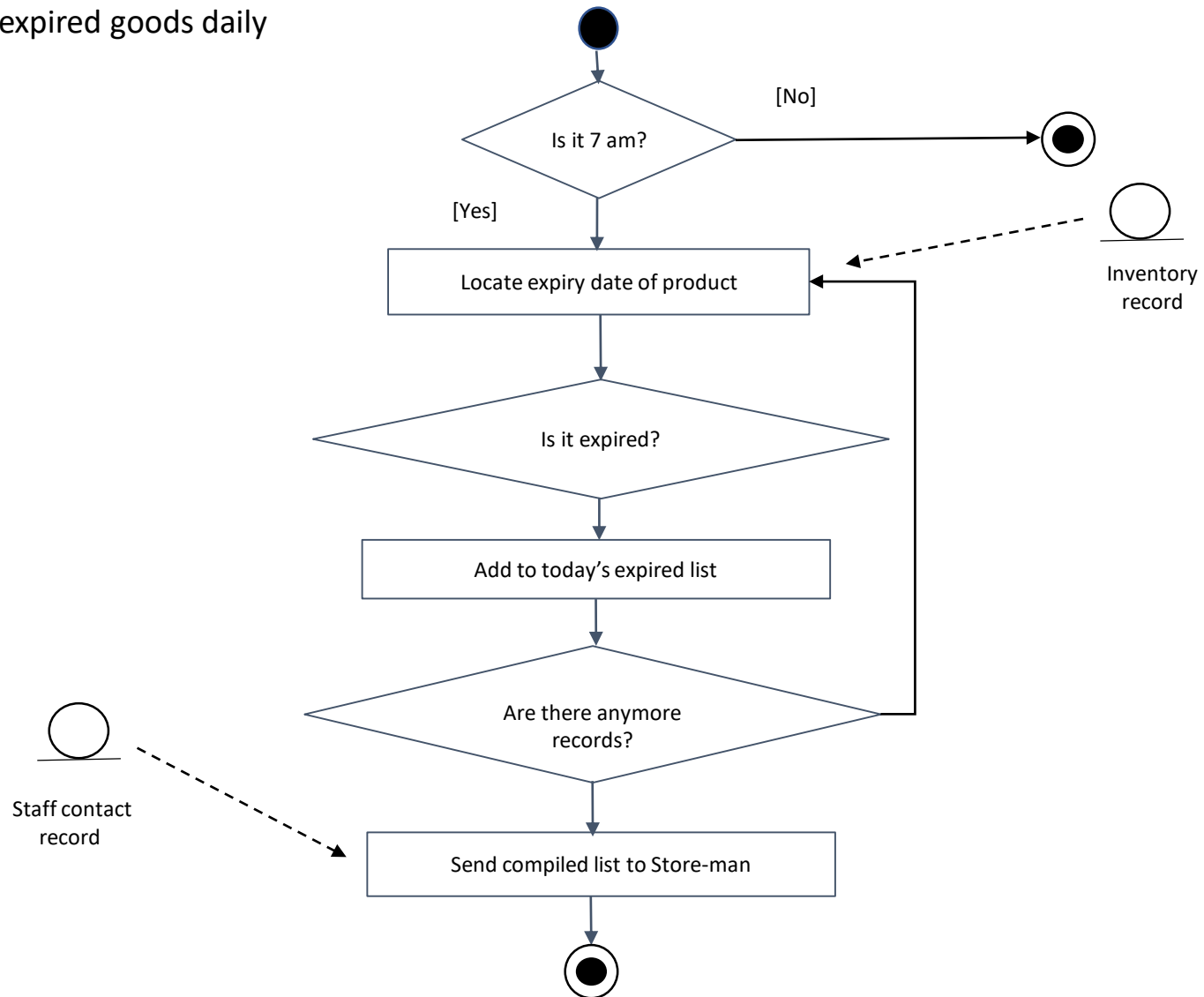
Cancel

Back to selection

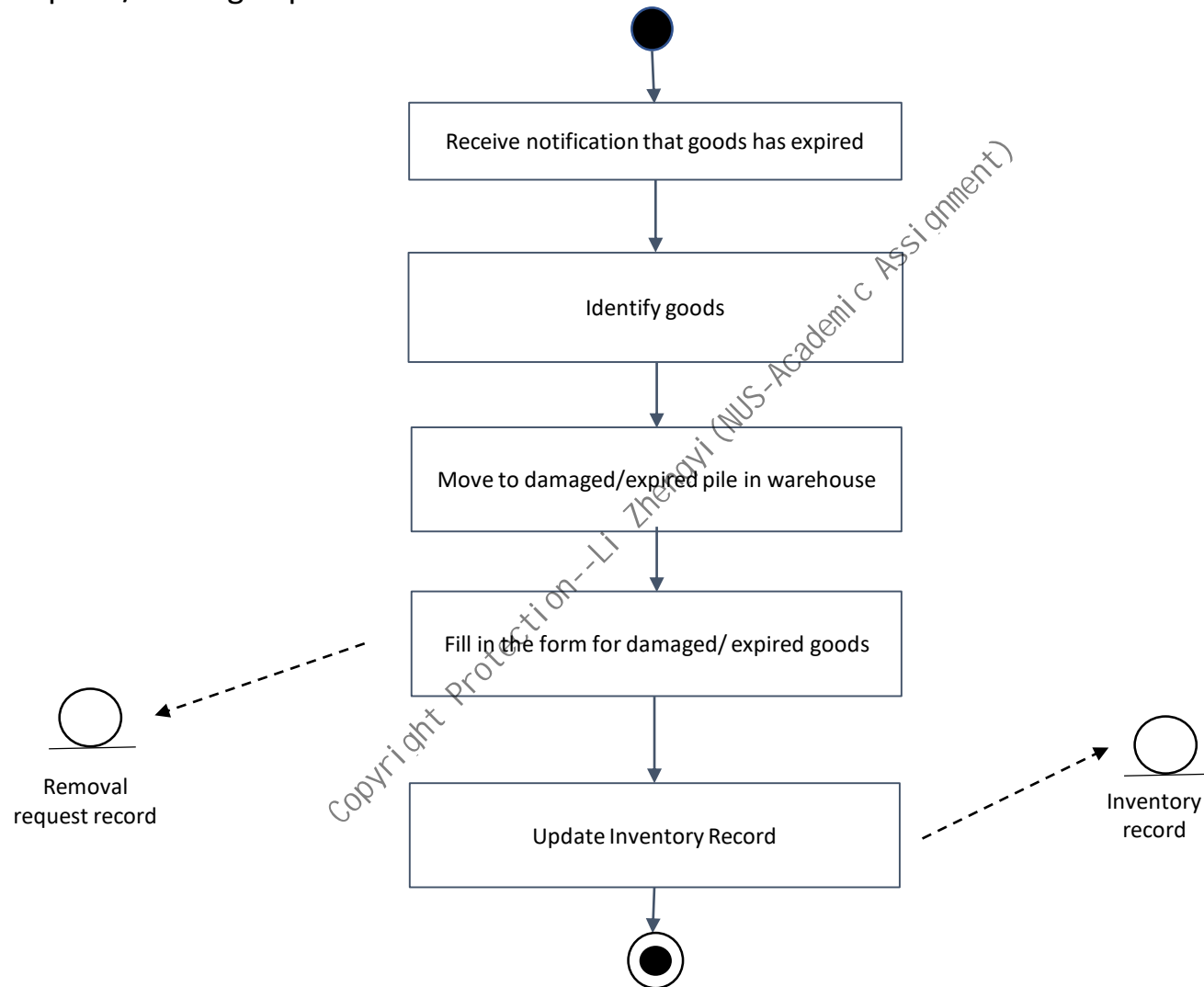
Save draft

D stands for damaged
E stands for expired

Use case: Check for expired goods daily
(Scheduler)

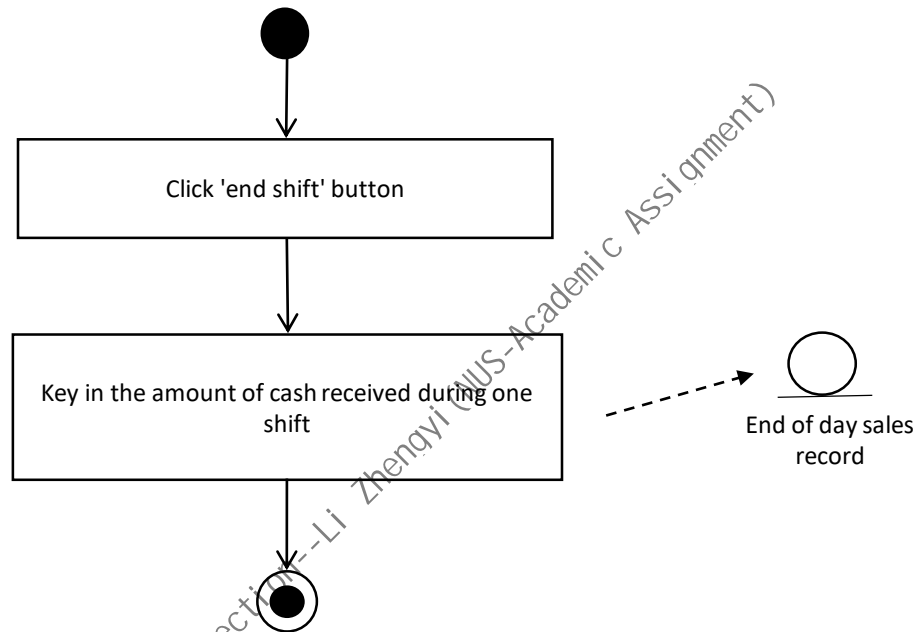


Use case: Remove expired/ damaged product
(Store man)



Maintain sales record

Use case: Update cash received after each shift(cashier)



Explanation: System will calculate the income of this shift in cashless form and will combine with the cash amount, then update the end of day list

UI of home screen of cashier

TERMINAL	C11044
LOG IN TIME	6:53 A.M. 16/09/2019
EMPLOYEE ID	XXXXXXX
EMPLOYEE NAME	ANN MOR

LOG OUT

OPERATION OPTION

CHECK OUT

EXCHANGE

END SHIFT

UI of System end of day sales record

Back to home screen

CASHIER: ANN MOR
TERMINAL: C11044
SHIFT: 7:00-15:00 16/09/2019

No	Product Name	Product ID	Qty	Amount	Total price for each
1	CAM CHIPS	673748	50	1.25	62.50
2	NUTRISOY H-C SOYA MILK 1L	789464	34	3.50	119.00
3	LUX SHAMPOO	089465	12	10.20	122.40
4	DOVE CHOCOLATE 70g	188896	27	2.80	65.60
...					
				Total Amount	XXX

Income	Cashless	Cash
amount	xxx	

submit

UI of sales record

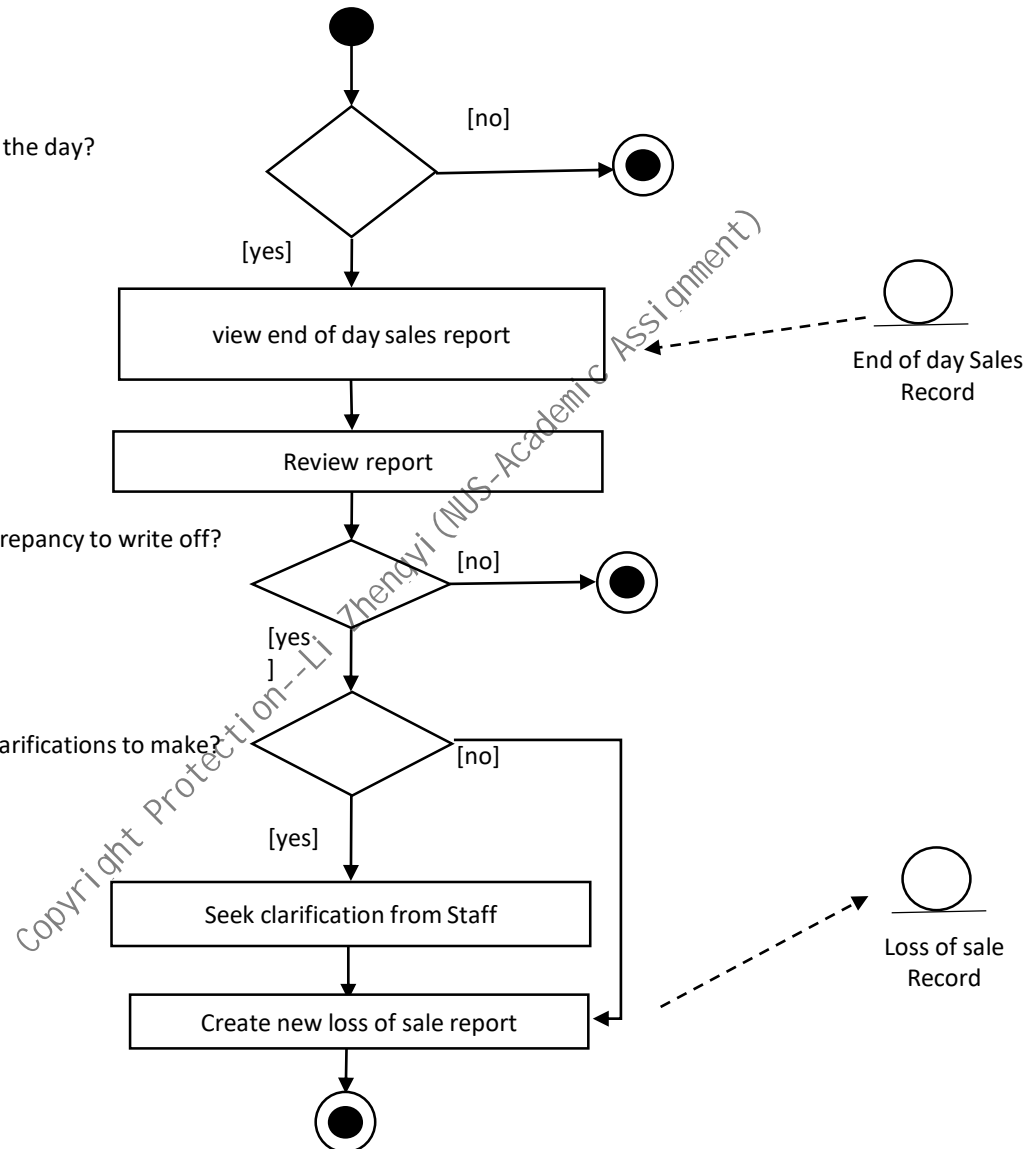
No	Product Name	Product ID	Qty	Amount	Total price for each
1	CAM CHIPS	673748	50	1.25	62.50
2	NUTRISOY H-C SOYA MILK 1L	789464	34	3.50	119.00
3	LUX SHAMPOO	089465	12	10.20	122.40
4	DOVE CHOCOLATE 70G	188896	27	2.80	65.60
5	MEJI YOGURT	673384	15	2.4	62.50
6	MEJI LOW-FAT MILK 1L	012536	34	3.55	119.00
7	LUX BODY CREAM	849367	12	12.60	122.40
8	SANQUAN PORK DUMPINGS 1KG	384990	27	2.80	65.60
...					
45	GX HOTPOT INGREDIENTS	253649	3	8.40	25.20
				Total Amount	XXX

Use case: Tally at the end of Shift (Manager)

Is it the end of the day?

Is there any discrepancy to write off?

Are there any clarifications to make?



UI of End of day Sales Report
(Manager)

Search

Please enter Date

Retrieve record

Employee	Cash (\$)	Cashless (\$)	Total (\$)	Does cash on hand tally with Sales Record?	Is cash on hand less than sales?	
Ann	250.65	548.90	799.55	No	Yes	<div>View</div>
Cashier 2	271.10	357.23	628.33	Yes	No	<div>View</div>
Cashier 3	xxx	xxx	xxx	xxx	xxx	<div>View</div>
Cashier 4	xxx	xxx	xxx	xxx	xxx	<div>View</div>
Cashier 5	xxx	xxx	xxx	xxx	xxx	<div>View</div>
Cashier 6	xxx	xxx	xxx	xxx	xxx	<div>View</div>

UI of End of day sales record (after clicking view)

CASHIER: ANN MOR
TERMINAL: C11044
SHIFT: 7:00-15:00 16/09/2019

No	Product Name	Product ID	Qty	Amount	Total price for each
1	Cam Chips	673748	50	1.25	62.50
2	Nutrisoy H-C Soya Milk 1L	789464	34	3.50	119.00
3	Lux Shampoo	089465	12	10.20	122.40
4	Dove Chocolate 70g	188896	27	2.80	65.60
...					
				Total Amount	XXX

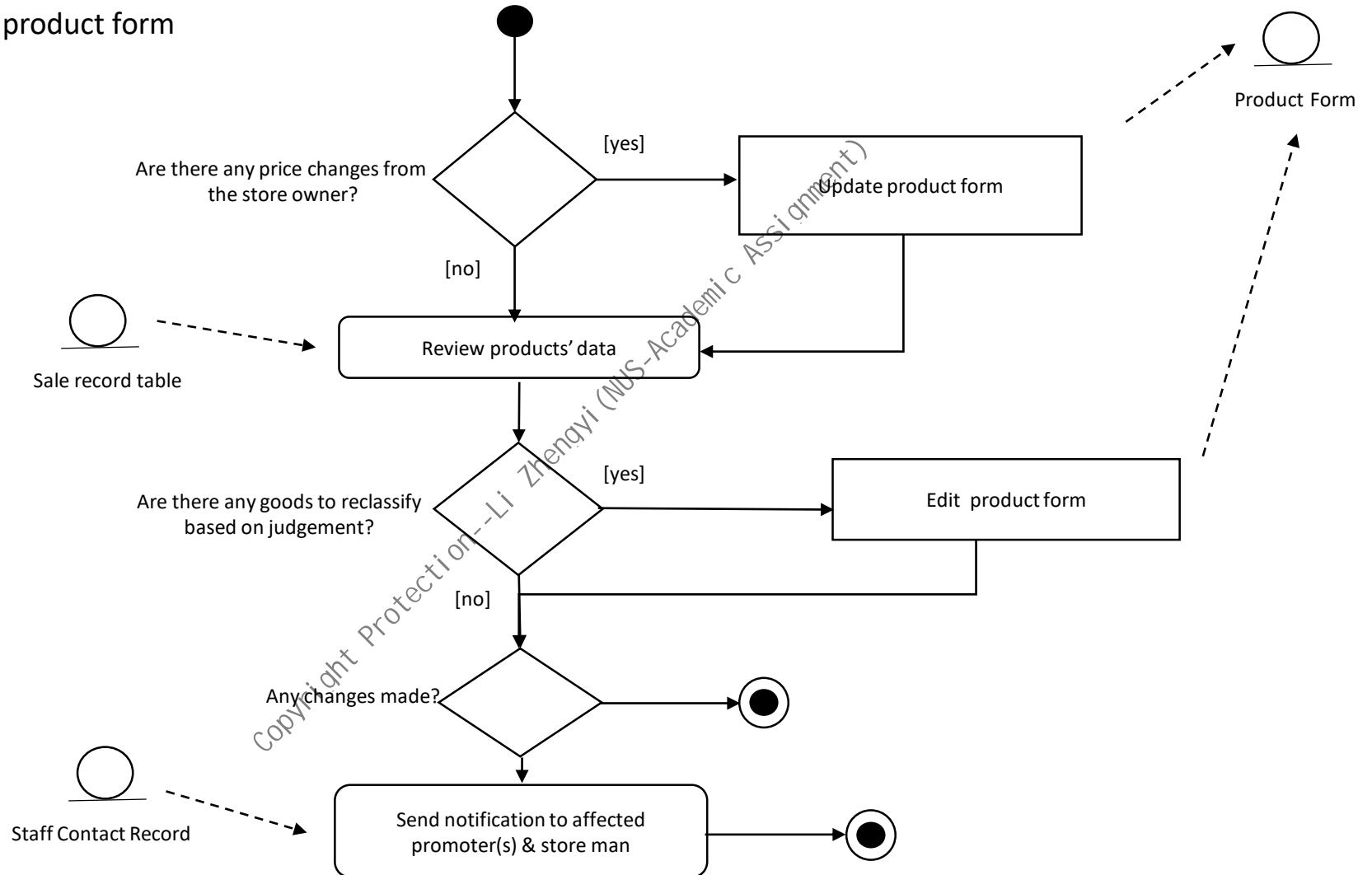
Cash on Hand (\$)	Cash sales recorded in Sales record table (\$)	Discrepancy (\$)
248.85	250.65	1.80

Create new loss of sale report

(option will be greyed out if there is no discrepancy)

Product Form Changes

Use case: Maintain product form (Manager)



UI of Product form

Product Form will be sorted by Product Type to facilitate shelving

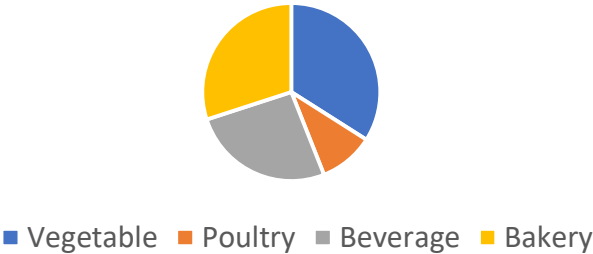
Product Name	Price	Category	Product Type
Heinz Beanz Baked Beans	\$1.50	Slow Selling	Baked beans
Ayam Brand Baked beans	\$1.00	Moderate Selling	Baked beans
...			

Each promoter will only be able to see the goods that they are in charge of.

Sale Dashboard

Weekly Sale	Monthly Sale YTD (August)	Sale YTD	Target Sale
\$10,000.00	\$21,000.00	\$137,000.00	\$160,000.00
+ 4 % from last week			

Weekly Sales(SGD)

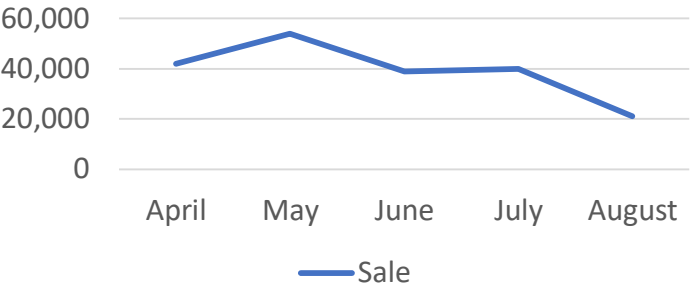


Product Type	Weekly Sale (\$GD)
Vegetable	\$3400.00
Poultry	\$1000.00
Beverage	\$2600.00
Bakery	\$3000.00

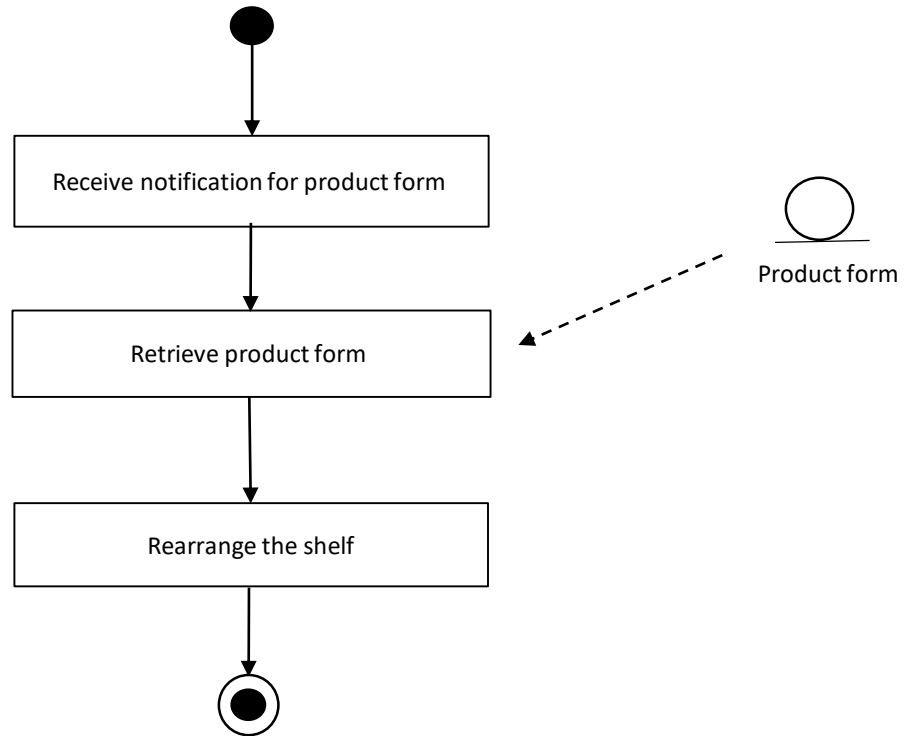
Sale YTD to Target Sale



Monthly Sale



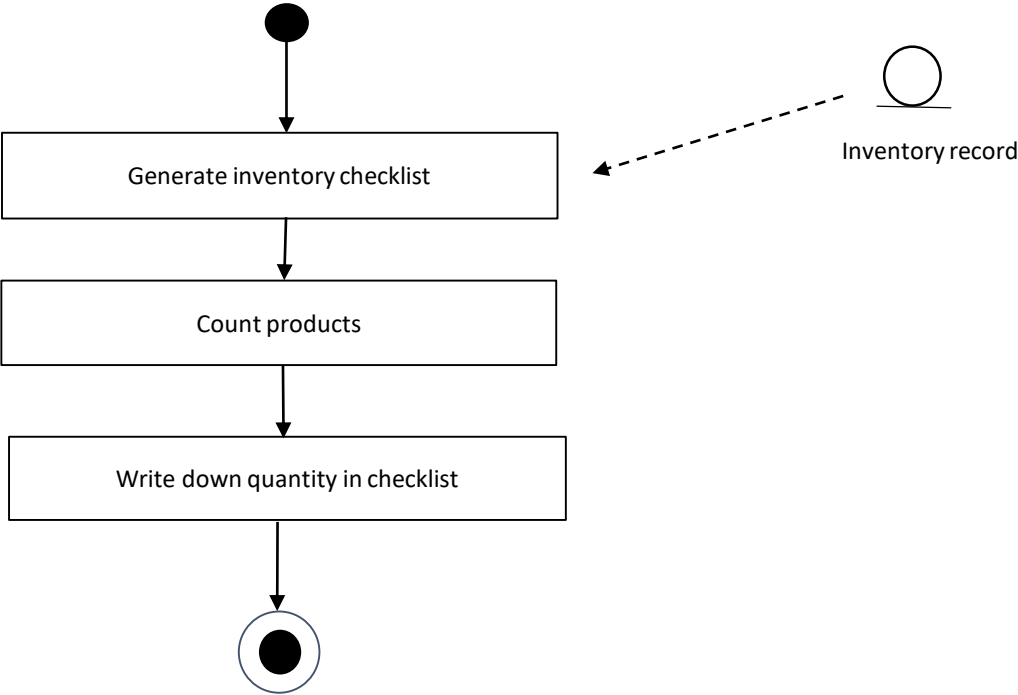
Use case: View product form
(Promoter)



Monthly Inventory Check

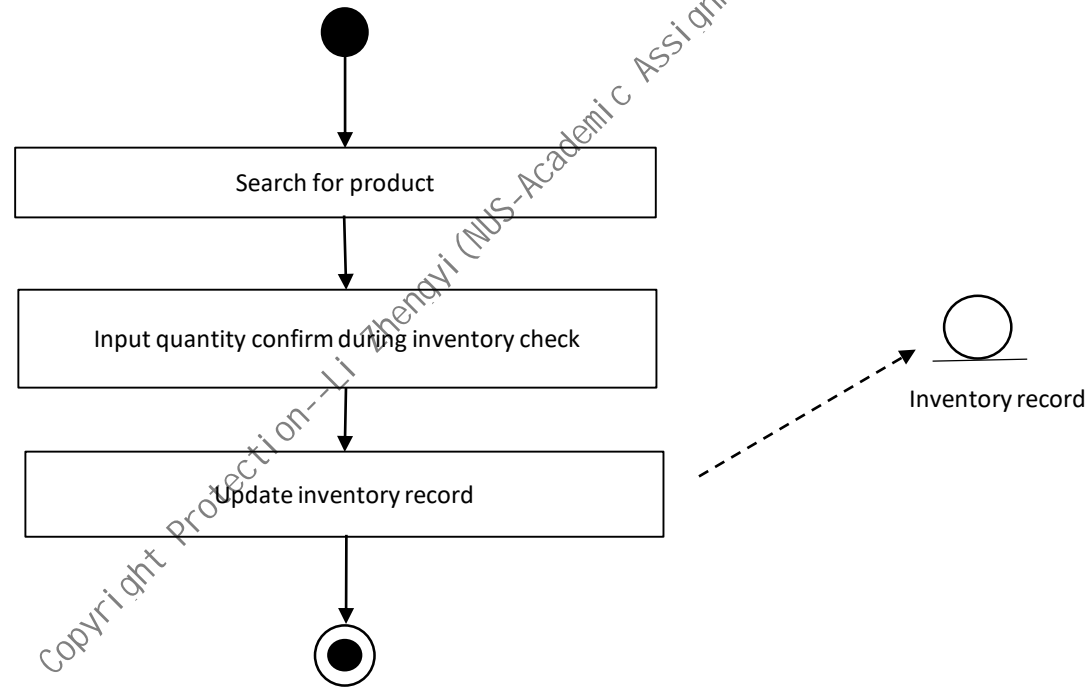
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Use case: Update inventory checklist
(Store man)



Use case: Maintain inventory records

(Store man)



Stock taking session

Date	Staff	Month
29-Aug -19	Tom	August

Input Quantity

Exit Session

Monthly Inventory check

Search

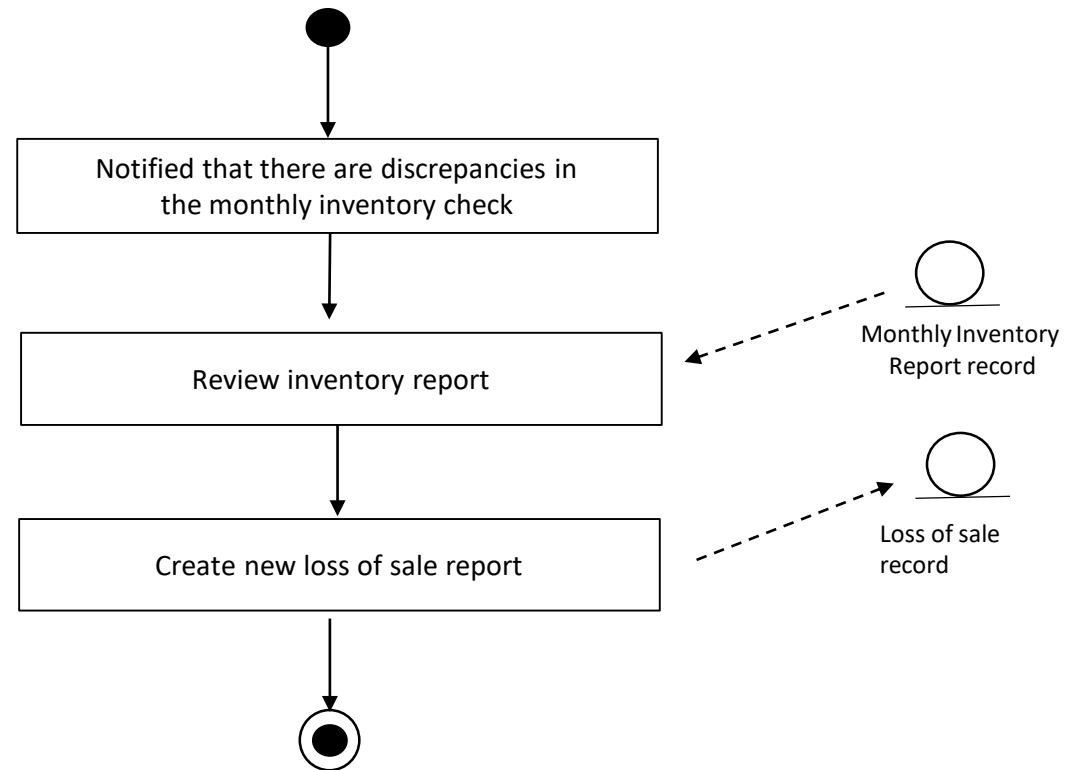
Retrieve record

No	Product Name	Product ID	Product Category	Product Qty in stock	Qty in Stock taking
23	Coca Cola Coke Classic (320ml)	123311	Can drink	248	<input type="text" value="100"/>

Confirm

Exit

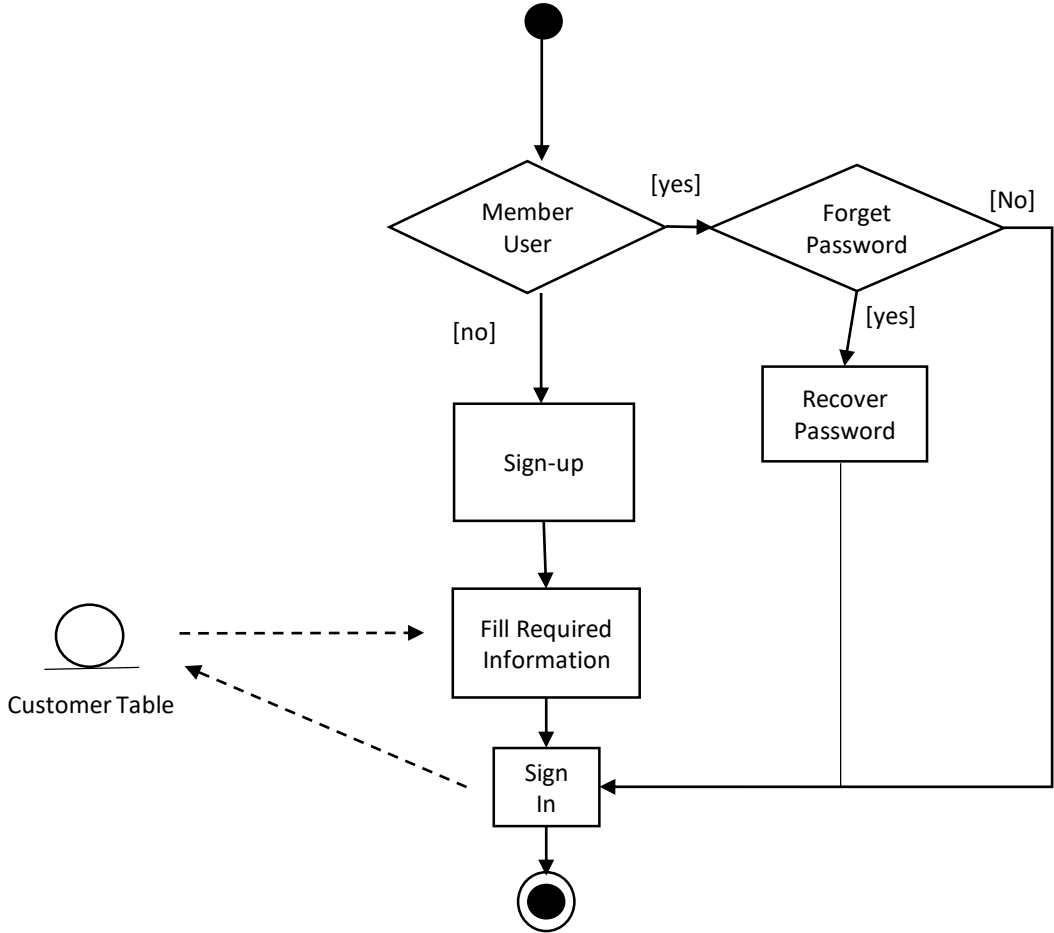
Use Case: Generate loss of sale report for monthly inventory check
(Manager)



Customer Experience (mobile app)

Copyright Protection - Zhengyuan Academic Assignment

Use case: Create/ Login account
(Customer)



Homepage



Sign up page

The image shows a tablet screen displaying the 'GetFreshFood' website. A sign-up modal is open in the center, featuring a user icon, input fields for 'First Name', 'Last Name', 'mail', 'password', and 'confirm password', a 'Sign Up' button, and a 'forget password' link. The background website has a navigation bar with 'Home', 'About', 'Contact', and 'Login'. Below the modal, there are product categories: 'Apples and Pomegranate', 'Fresh Vegetables', 'Edible Corn', and 'Herbs and Cut F&V'. At the bottom, a 'Reasons to shop with us' section highlights 'Delivery or collection', 'Handled with care', and 'Freshness Guarantee'.

GetFreshFood

Home About Contact Login

First Name Last Name

mail

password

confirm password

Sign Up

[forget password](#)

@copyright. nus.edu

Apples and Pomegranate

Fresh Vegetables

Edible Corn

Herbs and Cut F&V

Reasons to shop with us

Delivery or collection
7 days a week, plus semi-day collection also available

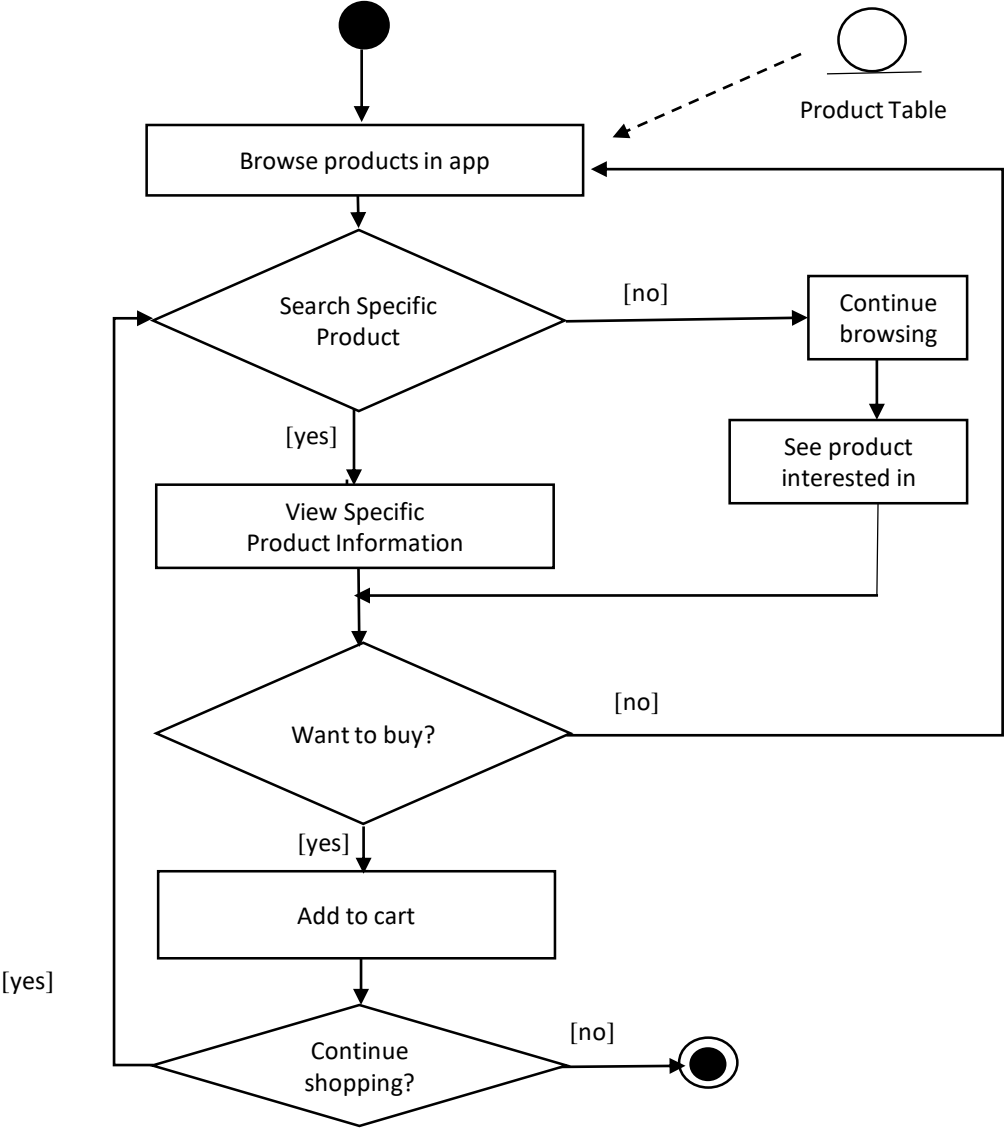
Handled with care
Great quality products picked and packed with care

Freshness Guarantee
We only sell the freshest groceries

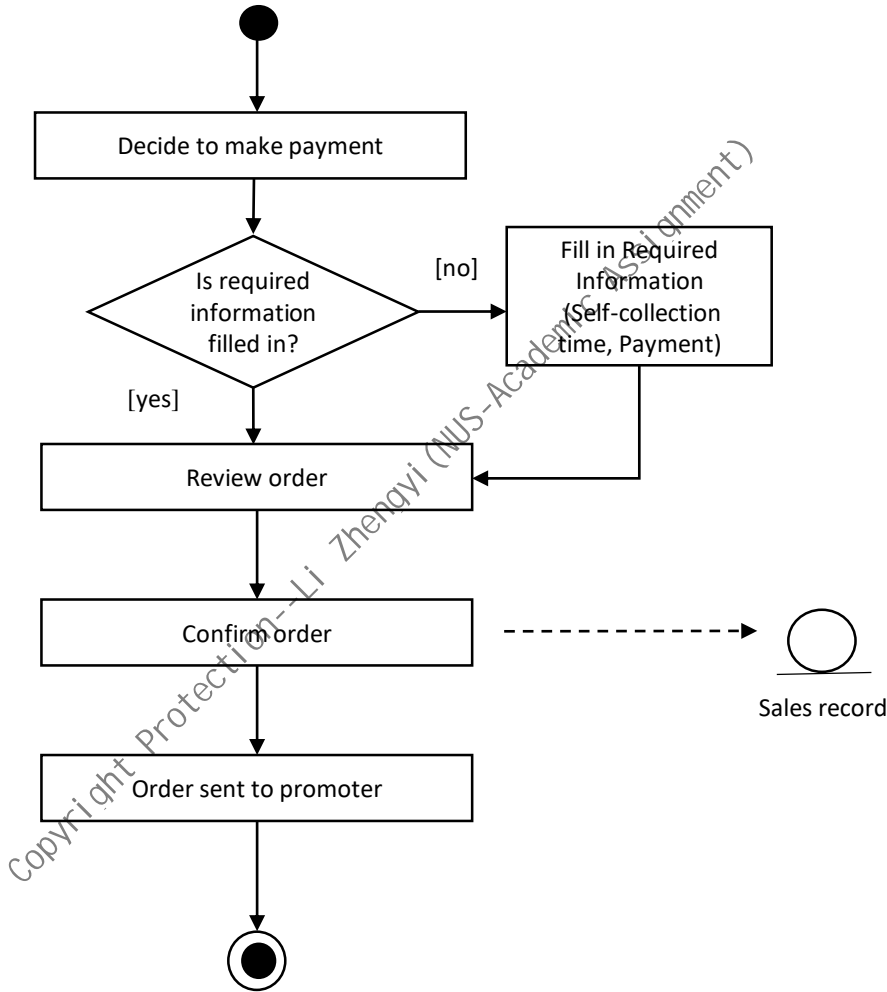
Login page



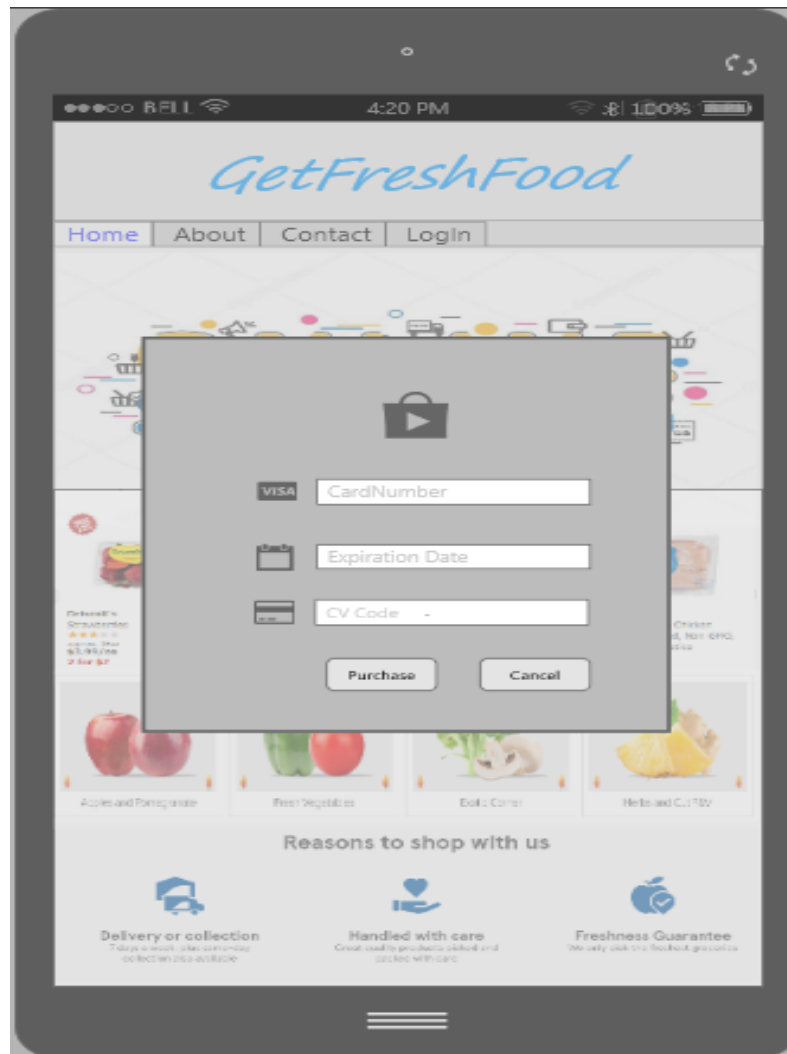
User case: Update shopping cart
(Customer)



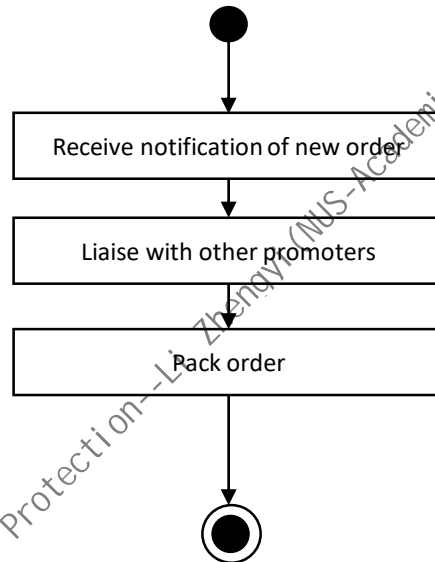
Use case: Sales record Table
(Customer)



Payment page



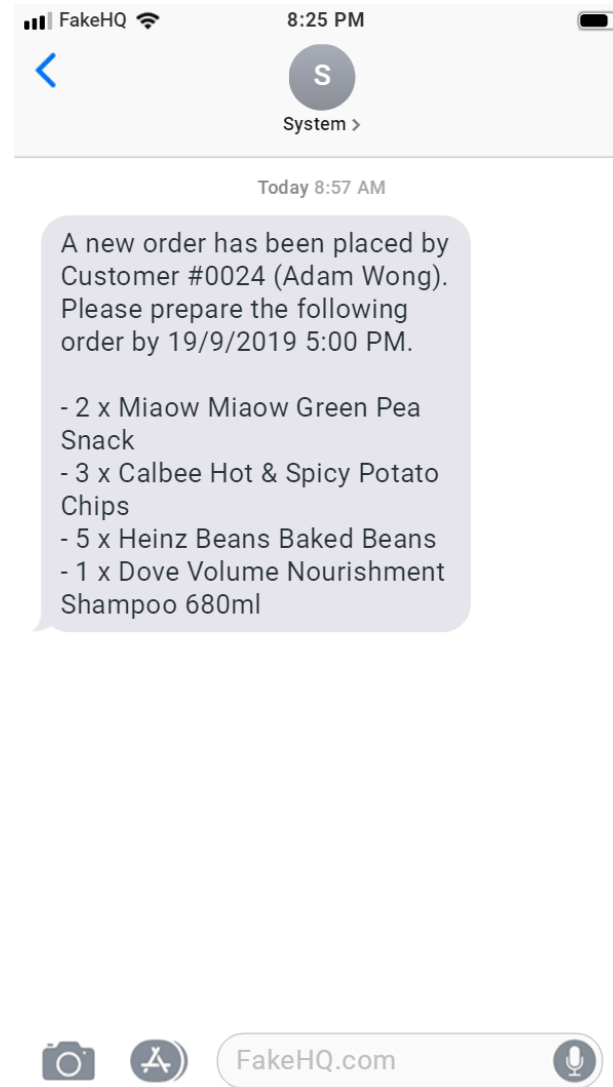
User case : Receive message of online purchase
(Promoter)



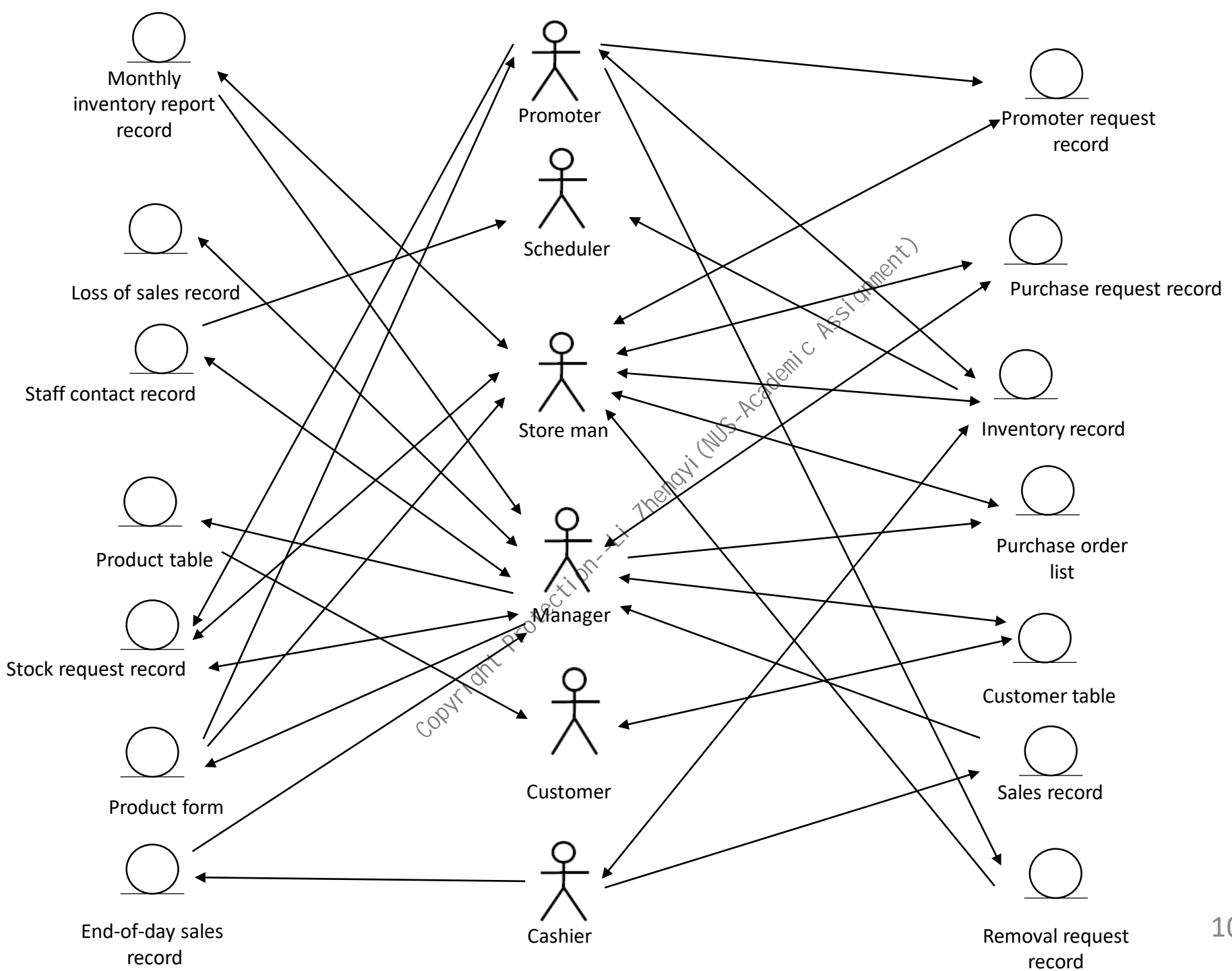
UI for message received by promoter

Message will be sent to a promoter on duty (system will choose the promoter will the most items on the list)

The promoter will then have to liaise with other promoters to complete the order.



Credit: <https://fakehq.com/iphone/>



Non Functional Requirement

Non functional requirements

- System Performance Requirements
 - Volume of user
 - Volume of transaction of use cases
 - Volumes of data
- Security Requirements
- Reliability Requirements

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System Performance Requirements

User Volume Table

User Group	Country/location/count	Remarks
Cashier	S'pore / Eunost / 6	Cashier need to use the system every day at the store
Promoter	S'pore / Eunost / 20	Promoter need to use the system every day at the store
Store man	S'pore / Eunost / 4	Store man need to use the system every day at the store to maintain inventory
Branch Manager	S'pore / Eunost, Home / 1	Manager need to use the system every day to check the end-of-day reports in office or monitor the store when he is on break
Customer	S'pore / Around the island / 300	Online customers will need to access the store daily. Assuming customer base will expand after online offering.

System Performance Requirements

Business Transaction Volume Table

Biz Transaction (use case)	Business Criticality	No of user	Transaction information	Concurrent Important Activities
Send message when stock is low	Critical	1	One time per day	
Receive message regarding low stock of goods	Critical	4	One time per day	
Raise purchase request	Critical	4	Non peak – 2-3 times a week Peak – one time per day	
Receive Purchase Request	Critical	1	Non peak – 2-3 times a week Peak – one time per day	
Approve /reject purchase request	Critical	1	Non peak – 2-3 times a week Peak – one time per day	
Monitor Purchase Request	Critical	4	Non peak – 2-3 times a week Peak – one time per day	
Update Purchase Order status	Critical	4	Non peak – one time a week Peak – 2 – 3 times a week	
Accept delivery	Critical	4	8 times a day	8 during 2 hours
Request goods from storeroom	Critical	24	One time per week per staff	4 staff during 2 hours

System Performance Requirements

Business Transaction Volume Table

Biz Transaction (use case)	Business Criticality	No of user	Transaction information	Concurrent Important Activities
Receive request from promoter	Critical	4	40 times a day	4 times during 2 hours
Generate barcode	Critical	6	40 times a day	40 times within 1 hour
Check and confirm goods in store	Critical	20	2 times a day	One time during 1 hour
Generate barcode for weighed goods	Moderate	250	250 times a day	125 times during 1 hour
Process payment	Critical	6	Peak - 250 per day Non peak – 50 per day	
Exchange goods for customers	Low	6	One time per day	
Remove expired/damaged good from shelves	Critical	20	One time per day	
Check for expired goods daily	Critical	20	One time per day	

System Performance Requirements

Business Transaction Volume Table

Biz Transaction (use case)	Business Criticality	No of user	Transaction information	Concurrent Important Activities
Remove expired/damaged product	Critical	4	One time per day	
Update cash received after each shift	Critical	6	6 times per day	6 times during 1 hour
View end of day sales reports	Critical	5	Two time per day	
Maintain product form	Critical	1	1-2 times per day	
Receive message of change to product form	Critical	1	1 time per week	
View product form	Critical	24	One time per week per staff	12 staff within 1 hour
Update inventory checklist	Critical	4	One time per month	
Maintain inventory records	Critical	4	One time per month	
Generate loss of sale report for monthly inventory check	Low	1	Once per month	

System Performance Requirements

Business Transaction Volume Table

Biz Transaction (use case)	Business Criticality	No of user	Transaction information	Concurrent Important Activities
Create/login account	Critical	300	100 per day	6 during 1 hour
Update shopping cart	Critical	300	100 per day	6 during 1 hour
Make payment	Critical	300	30 per day	3 during 1 hour
Receive message of online purchase	Critical	300	100 per day	6 during 1 hour

System Performance Requirements

Data Volume Table

Business Entity Class	Source Document	Retention Period	Target Volume
Purchase request	Purchase Request form	1 Year	125 Purchase Request forms
Inventory	Inventory record table	1 year	1000 tables
Staff	Staff file	5 Years	33 x 5 years = 165 files
Purchase Order	Purchase Order document	3 Years	2500 x 3 years = 7500 documents
Promoter request	Promoter Request form	3 Years	300 x 3 years = 900 forms
Stock request	Stock Request form	1 Year	300 forms
Removal request	Removal Request form	1 Year	300 forms
Product	Product form	5 Years	45 x 5 years = 220 forms
Sales Record	Sales Record table	5 Years	300 x 5 years = 1500 tables

System Performance Requirements

Data Volume Table

Business Entity Class	Source Document	Retention Period	Target Volume
End of day sales report	End of day sales record table	1 year	300 tables
Loss of sale report	Loss of sale record table	1 year	300 tables
Monthly inventory report	Monthly inventory report record table	1 year	12 tables
Customer	Customer record table	5 years	2000 x 5 years = 10000 tables
Product	Product table	3 years	1500 x 3 years = 4500 tables

Security Requirements

From data point of view

Data (Entity class) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer
Purchase request record			C,r,u,d	r	
Inventory record			C,r,u	r	
Staff contact record				C,r,u,d	
Purchase Order record			R,u	C,r,u,d	
Promoter request record		C,r,u,d	r		
Removal request record	C,r,u,d	C,r,u,d	C,r,u,d		
Product form		r	r	C,r,u,d	
Sales Record	C,r,u			R,u,d	

Security Requirements

From data point of view

Data (Entity class) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer
End of day sales record	r,u			R,u	
Loss of sale record				C,r,u,d	
Monthly inventory report record			C,r,u,d	R,u,d	
Customer record					C,r,u
Product table				R,u	r

Security Requirements

From use case point of view

Biz Transaction (use case) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer	Scheduler
Send message when stock is low						X
Receive message regarding low stock of goods			X			
Raise purchase request			X			
Receive Purchase Request				X		
Approve/ reject purchase request				X		
Monitor Purchase Request			X			
Update Purchase Order status			X			
Accept delivery			X			
Request goods from storeroom		X				

Security Requirements

From use case point of view

Biz Transaction (use case) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer	Scheduler
Receive request from promoter			X			
Generate barcode			X			
Check and confirm goods in store		X				
Generate barcode for weighed goods					X	
Process payment	X (Main user)				X	
Exchange goods for customers	X					
Remove expired/ damaged good from shelves		X				
Check for expired goods daily						X

Security Requirements

From use case point of view

Biz Transaction (use case) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer	Scheduler
Remove expired/damaged product			X			
Update cash received after each shift	X					
View end of day sales reports	X			X (Main user)		
Maintain product form				X		
Receive message of change to product form		X (Main user)	X			
View product form		X (Main user)	X			
Update inventory checklist			X			
Maintain inventory records			X			
Generate loss of sale report for monthly inventory check				X		

Security Requirements

From use case point of view

Biz Transaction (use case) \ User Role(actor)	Cashier	Promoter	Store man	Manager	Customer	Scheduler
Create/login account					X	
Update shopping cart					X	
Make payment					X	
Receive message of online purchase		X				

Reliability Requirements

- Operation time
Online User – 24 hours, 7 days a week
- Hardware failure(servers, network)
Recovery duration – not more than 30 minutes
Data concurrency – not more than 30 minutes
- Disaster recovery
Maximum one hour of down time
Data currency – one day back
- Improve reliability
Put in place spare resources (disk, servers, etc)
Data duplication (back up, mirroring)
Better design

System Architecture

