



INVENTORY SYSTEM OF M&S COMPANY

A Program Presented to
The Faculty of the College of Computing Education
University of Mindanao
Davao City

In Partial fulfillment
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Software Engineering 1

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PRELIMINARY INVESTIGATION REPORT

Organization Name: M&S Company

Address: Purok Rancho, Upper Mainit, Malungon, Sarangani Province, 9503

Contact Details

Company Representative: Maricel Montecillo

Designation: Assistant Administrator

Contact Number: 09938676525

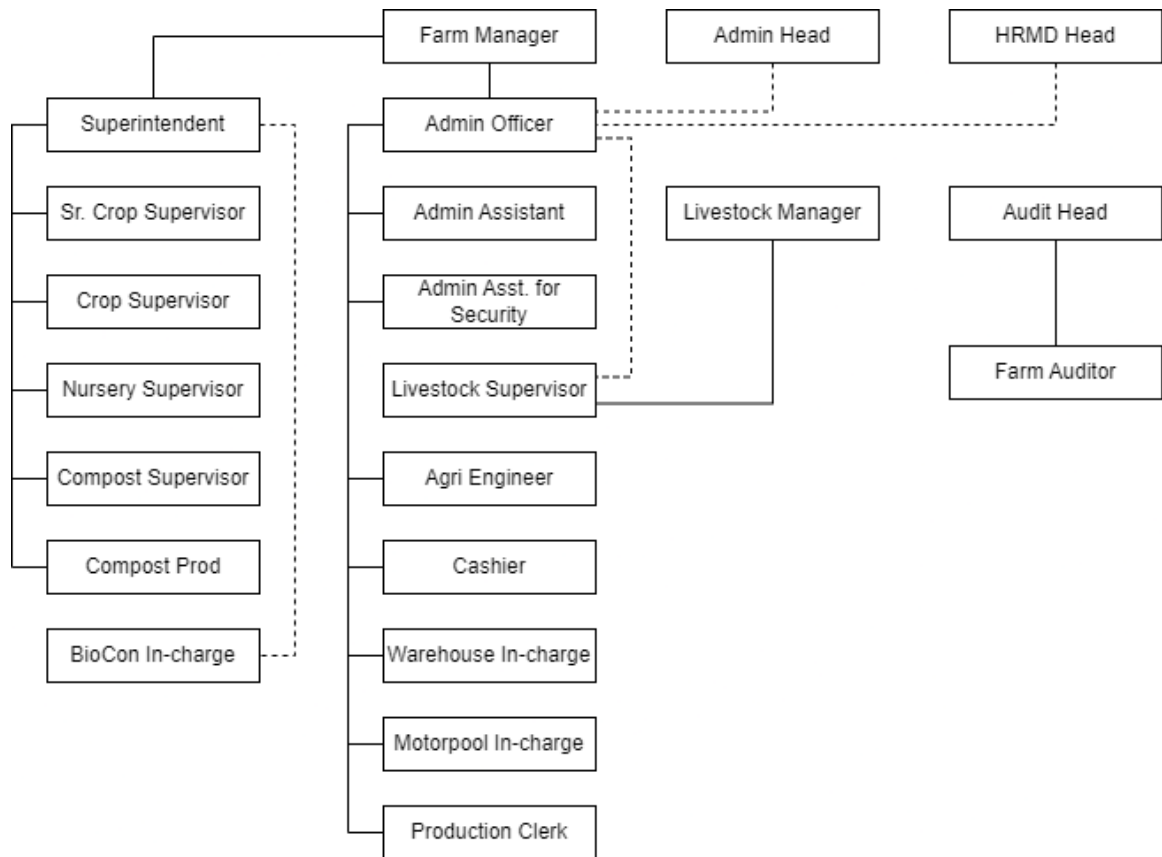
Introduction

M&S Company is a farm that operates under the South Davao Development Co., Inc., part of the Dacon Group of Companies. The farm is situated in Purok Rancho, Malungon, Sarangani, Philippines, and specializes in producing pomelo.

The farm is also known as “Rancho”, “B3 Farm” and “SODACO” by the locals. It has opened job opportunities to the locals since the early 90’s with their first product which is mango. And they started planting pomelo trees in the late 90’s. In 2005, the company had to lay off their workers due to the attacks of insects that led to the failure of their mango production. This made the pomelo the only produce that they supplied.

Most of the clients are businessmen who specialize in fruit retail. One of their frequent buyers during harvest season is a businesswoman named Maximina. They had also previously supplied for SunGee and SM.

Organizational Chart



Major Business Processes and Transactions

This section provides an overview of the core business processes and transactions within M&S Company, specializing in pomelo production.

- **Pomelo Harvest**

This process encompasses the planning and execution of pomelo harvesting.

Processing Steps:

1. Harvest Planning

Harvest planning involves strategic decision-making regarding the timing of pomelo harvesting. Factors such as weather conditions and the ripeness of the fruits are considered. This step ensures an organized and efficient harvest.

2. Area Harvesting

The harvesting process involves deploying the production team to pomelo orchards to pick ripe fruits. Efficient area harvesting ensures a timely and comprehensive collection of pomelos while minimizing waste.

- **Inventory Management**

Inventory management involves the monitoring of pomelo inventory, production scheduling, inventory record maintenance, and the reception of newly harvested pomelos.

Processing Steps:

1. Receive Newly Harvested Pomelo

This process involves the reception of freshly harvested pomelos. Upon arrival, the team receives the pomelos and meticulously records details such as the specific area of harvest and the quantity of the batch. This ensures accurate documentation of the origin and volume of each pomelo batch, contributing to efficient inventory management and traceability within M&S Company's production operations.

2. Quality Assessment

The Quality Assessment process encompasses meticulous sorting and grading of freshly harvested pomelos. Employees inspect each pomelo for attributes such as size, color, and texture. This step ensures the quality of Pomelo that moves forward in the production process.

3. Packing of Order

The Packing of Order process involves carefully packing the available pomelos of the ordered grade. Orders may consist of different grades and quantities, and the packing process ensures accurate fulfillment. It's important to note that an order may not be fulfilled in one go; rather, it could be scheduled for loading on different dates based on the availability of the pomelos.

4. Loading of Orders

In the Loading of Orders process, the freshly packed pomelos are loaded onto trucks provided by the buyers. This final step not only includes the physical loading but also involves meticulous recording of the stock out, ensuring precise documentation of the transaction. It's noteworthy that orders, due to varying pomelo availability, may be scheduled for loading on different dates.

- **Order Processing**

Order processing includes customer order intake, verification, inventory checks, order confirmation, documentation, scheduling for loading and delivery, and delivery and payment processing.

Processing Steps:

1. Order Intake

The order Intake process serves as the starting point in customer engagement. During this phase, the employee receives customer orders, accommodating both immediate requests and preorders. This involves attentive reception and meticulous recording of customer orders. Efficient communication is essential to avoid errors in subsequent processing steps.

2. Inventory Check

The inventory check involves a swift assessment to verify the current availability of pomelos in the inventory. This check ensures that the requested quantity is on hand, taking into account dynamic changes, and potential preorders, and facilitating strategic decision-making.

3. Order Confirmation

After verifying product availability, order confirmation involves communicating with the customer to confirm the order and allocate the products. Clear communication enhances customer satisfaction and reduces the likelihood of misunderstandings.

4. Payment

Payment processing ensures the financial aspect of the transaction is completed. This step may involve various payment methods, such as online transactions or collection upon delivery, depending on the company's policies.

5. Order Documentation

Documentation of the order is crucial for record-keeping and reference. It includes creating an order confirmation for the customer and notifying relevant departments for further processing.

6. Scheduling for Loading

The Scheduling for the Loading process involves strategically planning pomelo loading activities. Orders, especially those comprising various grades and quantities, may not be fulfilled in a single operation. Instead, they could be scheduled for loading on different dates based on the availability of pomelos. This systematic scheduling ensures an organized and efficient loading process, accommodating variations in product availability and contributing to timely order fulfillment.

- **Quality Control**

Quality control checks ensure product freshness and quality during the harvest and within storage facilities.

Processing Steps:

1. Quality Assessment (Harvest)

Quality assessment during harvest ensures that only pomelos meeting specific quality standards are included in the production process.

This step contributes to delivering consistent and high-quality products.

2. Quality Control Checks (Storage)

Periodic quality control checks in storage facilities ensure that pomelos maintain their freshness and quality throughout the storage period. This step prevents the distribution of subpar products to customers.

- **Documentation and Reporting**

Documentation and reporting encompass maintaining records related to the entire process, contributing to tracking and reporting accuracy.

Processing Steps:

1. **Documentation and Record-Keeping**

Documentation and record-keeping involve maintaining detailed records of all aspects of the production and distribution process. This includes harvest dates, order details, inventory levels, quality assessments, and financial transactions. Accurate documentation supports tracking, reporting, and decision-making processes.

Event Tables

- **Inventory Management**

Event	Trigger	Source	Activity	Response	Destination
Receive pomelo	New pomelo batch	Employee	Record newly received Pomelo	Pomelo availability record	Employee
Quality assessment	Pomelo availability	Employee	Record pomelo grade.	Pomelo grades record	Employee
Pack order	Customer order		Update order status: Packed	Order status update	Employee Customer
Load order	loading schedule date and customer pickup	Employee	Record stockout details, Update order status: Fulfilled	Stock out record, Order status update	Employee Customer

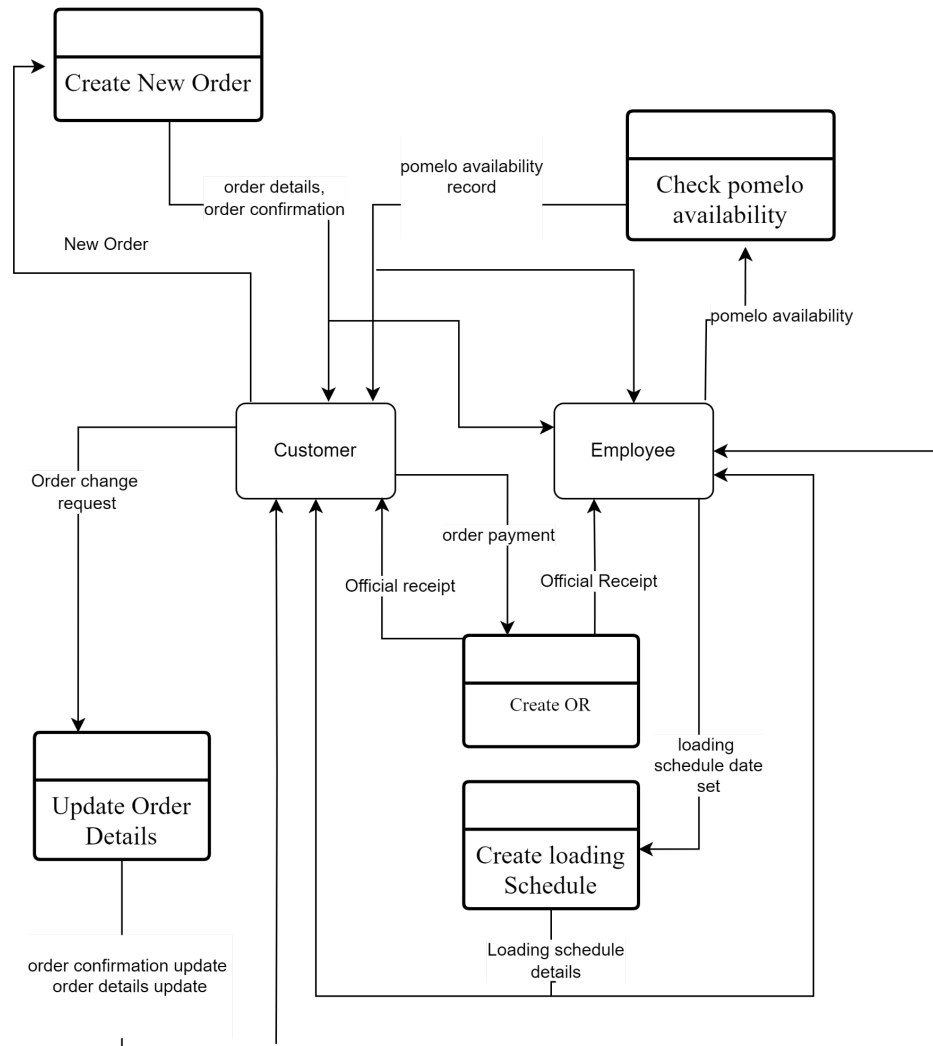
- **Order Processing**

Event	Trigger	Source	Activity	Response	Destination
Inventory Check	Pomelo availability	Employee	Check pomelo availability	pomelo availability record	Employee Customer
Customer place order	new order	Customer	Create new order	order confirmation order details	Customer Employee
Customer changes or cancels order	order change request	Customer	update order details	order confirmation update, order details update	Customer Employee

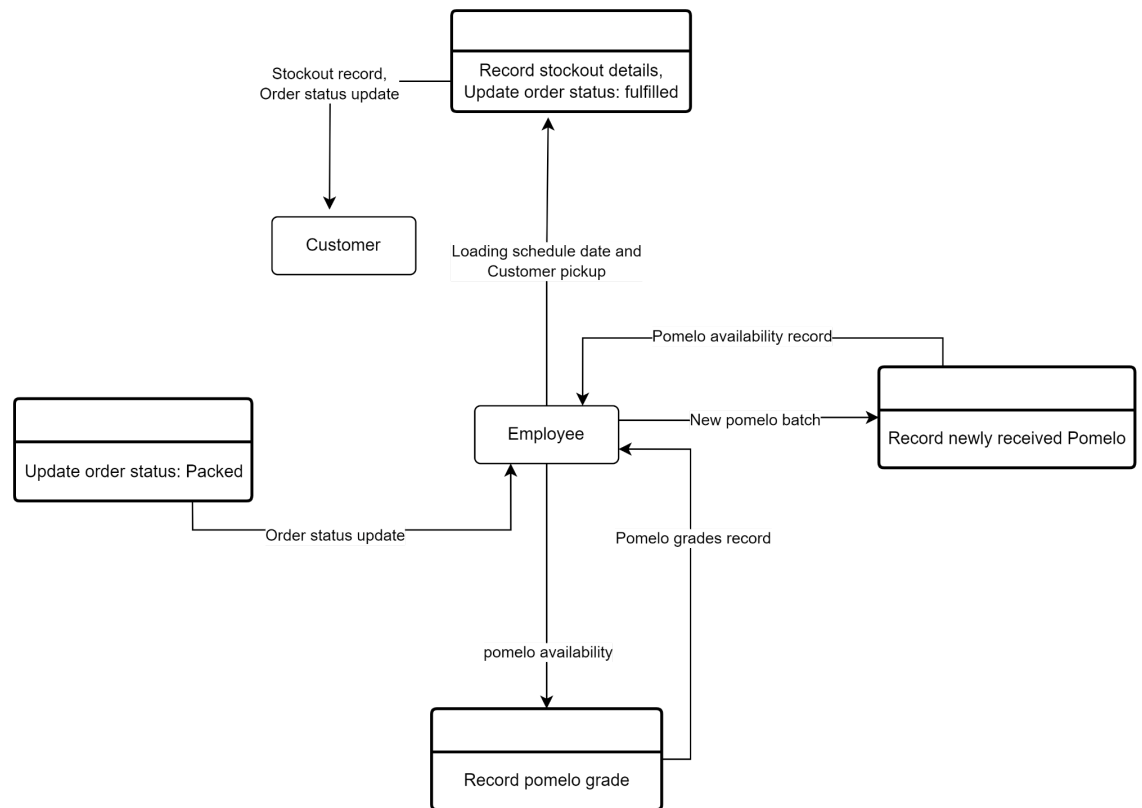
Customer payment	Order payment	Customer	Create Official Receipt	Official receipt	Employee Customer
Schedule confirmation	loading schedule date set	Employee	Create loading schedule	Loading schedule details	Employee Customer

Data Flow Diagrams

- Order Processing**



- **Inventory Management**



Technical Feasibility

1. Project/Process Description

The project aims to enhance inventory management by implementing a QR code or barcode system. Each order will be assigned a unique code, facilitating real-time tracking and management of inventory levels.

2. Technological Requirements

Hardware: A barcode scanner and a computer are required.

Software: Develop software for generating QR codes or barcodes, database management, and real-time tracking.

Network Resources: A Wi-Fi network for online functionality.

3. Expertise and Skills:

Operators should be proficient in code scanning. Training may be required for operators.

4. Compatibility

The new QR code/barcode system must be compatible with existing systems to ensure seamless integration. Special attention should be given to data transfer and software compatibility.

5. Resource Availability

Computers are readily available within the company.

6. Scalability and Maintainability

The system will be designed to scale with company growth. Provisions for future inventory management needs will be considered for the system's long-term sustainability.

7. Technical Resources

Network Resources: Ensure a secure and reliable Wi-Fi network for real-time data transfer.

8. Resource Availability:

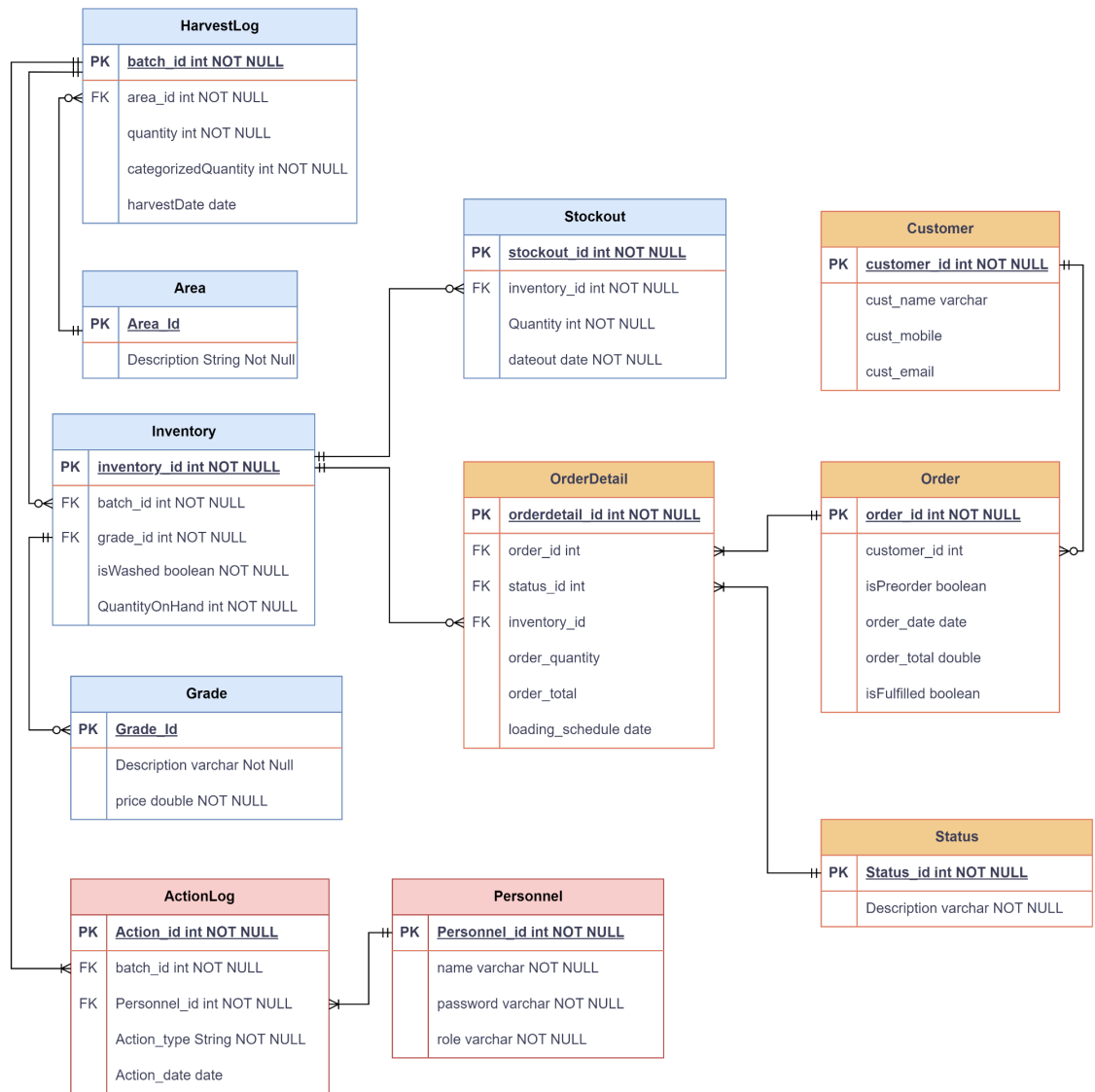
Hardware and Software: Confirm the availability of hardware and budget for additional software development resources.

9. Capacity for Future Needs:

Design the system to adapt to future growth and changes in inventory management requirements.

This technical feasibility analysis indicates the project has a strong foundation for success. It aligns with the company's objectives and operational needs, with a well-thought-out plan for development, user training, and future scalability.

Database Entity Relationship Diagram



UI Design

Login

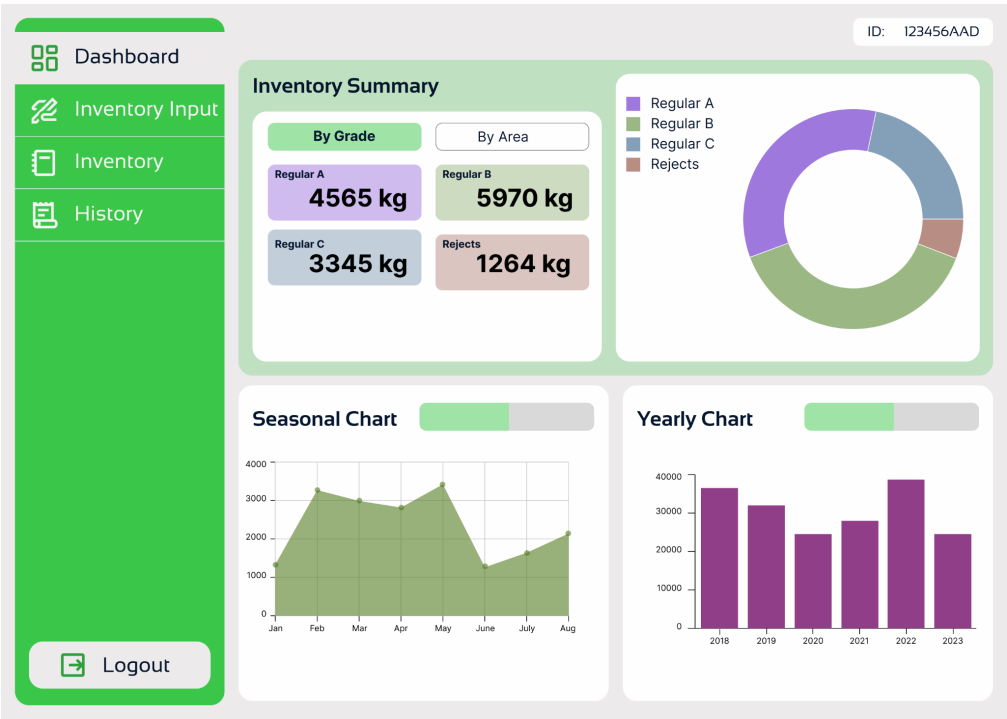
M&S Company

ID

Password

Login

Dashboard



Inventory Inputs

Dashboard

Inventory input

Inventory

History

Logout

ID: 123456AAD

Add Inventory

Categorize

Date:

Area:

Quantity:

Date:

Area:

Quantity:

Save

Dashboard

Inventory input

Inventory

History

Logout

ID: 123456AAD

Add Inventory

Categorize

Batch ID:

Area:

Unclassified:

Grade:

Quantity:

Grade:

Quantity:

Save

Inventory

Dashboard

Inventory Input

Inventory

History

Logout

ID: 123456AAD

Inventory

Inventory Inputs

Area	Grade	Quantity	Washed	Price
Block 1	Regular A	1340	Yes	80.0
Ranch 4	Reject OS	534	No	40.0
Block 13	Regular B	2453	No	72.0
Ranch 4	Regular A	1632	Yes	78.0

Dashboard

Inventory Input

Inventory





History

Logout


ID: 123456AAD


Inventory


Inventory Inputs


Batch ID	Harvest Date	Area	Grade	Quantity	Actions
B101	10/10/2023	Block 1	Unclassified	Area	 
R403	09/28/2023	Ranch 4	Regular A	1632	 


History

 Dashboard

 Add Inventory



 Inventory

 History

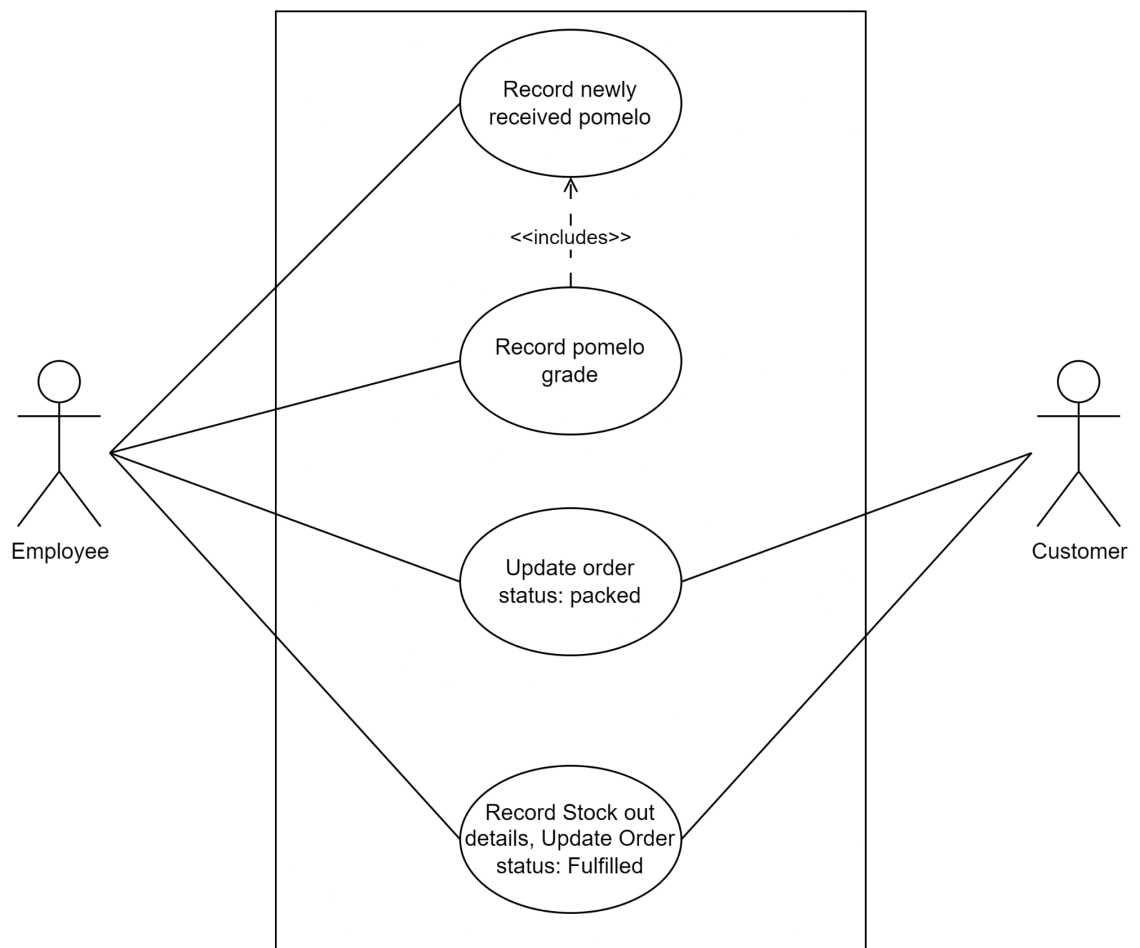
 Logout

ID: 123456AAD

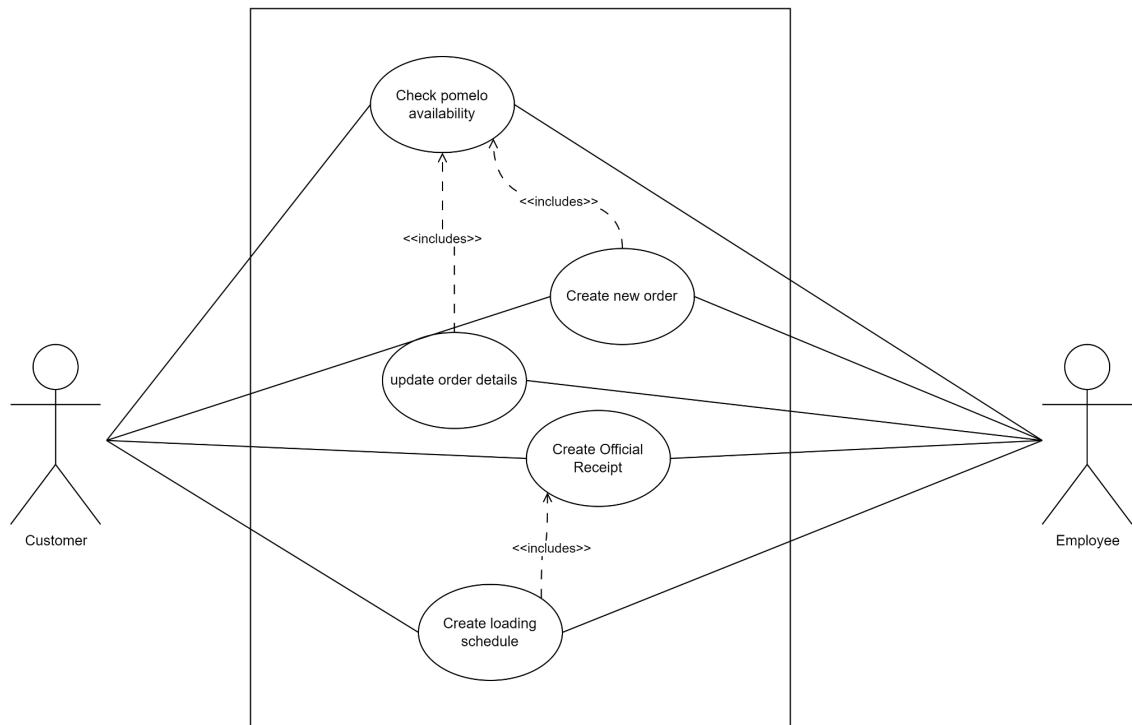
Activity Log

Batch ID	Date	Action	Personnel ID	Action
B302	10/24/2023	Add Inventory	123456AAD	
A01	10/24/2023	Categorized	123456AAD	

Use Case of Inventory Management Subsystem



Use Case of Order Processing Subsystem



Use Case Description

Use Case Name:	Record pomelo grade	
Triggering Event:	Uncategorized pomelos are available for sorting and grading.	
Actors:	Employee	
Related Use Cases:	Includes: Record newly received Pomelo	
Preconditions:	Pomelo record must exist and is uncategorized.	
Postconditions:	An inventory record must be created.	
Flow of activities:	Actor	System
	<ol style="list-style-type: none">1. Employees manually grade and sort Pomelo.2. Employee manually records the quantity of graded pomelo.3. The employee initiates the creation of a new inventory record.	<ol style="list-style-type: none">3.1 Create inventory record.
Exception Conditions:	<ol style="list-style-type: none">3.1 If pomelo is a reject, it must be recorded in the stockout.3.2 If an employee recorded the wrong quantity or grade, then the employee must update the inventory record.	

Cost Benefit Analysis

Project A: Inhouse Estimated Costs and Benefits of Inventory System

Development Costs

Personnel		
3	Programmer/Analysts (192 hours, Php 200/hour)	₱115,200.00
2	Trainer (20 hours, 250/hour)	₱5,000.00
New Hardware & Software		
3	PC Set i3 12100 8G with 19-inch Monitor	₱59,876.16
2	Wireless Barcode Scanner	₱4,400.00
2	Portable Thermal Barcode Printer	₱3,820.00
1	Epson LQ-590II Impact Printer (33, 495.00 each)	₱33,495.00
Total Development Costs		₱221,791.16

Projected Annual Operating Costs:

Personnel		
3	Programmers/Analysts (96 hours, Php 180/hour)	₱32,400.00
Expenses		
1	Development Server (\$50/month)	₱33,252.00
6	Epson LQ-590II Ribbon Cartridge (Php 600 each)	₱3,600.00
6	Box Continuous Paper (Php 600 each)	₱3,600.00
1000	Thermal Paper Sticker (Php 99 each)	₱99,000.00
Total Projected Annual Cost		₱171,852.00

Projected Annual Tangible Benefits:

Reduced Employee Overtime Fee (Inventory System) (110/hr * 72 hours * 12 months)	₱95,040.00
Reduced Employee Overtime Fee (Ordering System) (110/hr * 24 hours * 12 months)	₱31,680.00
Reduced Tracking Waste (Inventory System) (12000 * 12 months)	₱144,000.00
Reduce Material Waste (Ordering System) (₱106,200.00 * 10%)	₱10,620.00
Reduce Material Waste (Inventory System) (₱8,199,000.00 * 5%)	₱409,950.00
Total Projected Annual Cost	₱691,290.00

Project B: Outsourced Estimated Costs and Benefits of Inventory System

Development Costs

New Hardware & Software		
3	PC Set i3 12100 8G with 19 inch Monitor	₱59,876.16
2	Wireless Barcode Scanner	₱4,400.00
2	Portable Thermal Barcode Printer	₱3,820.00
1	Epson LQ-590II Impact Printer (33, 495.00 each)	₱33,495.00
Total Development Costs		₱101,591.16

Projected Annual Operating Costs:

Expenses		
1	Thrive by Shopventory (\$249/month)	₱165,397.44
6	Epson LQ-590II Ribbon Cartridge (Php 600 each)	₱3,600.00
6	Box Continuous Paper (Php 600 each)	₱3,600.00
1000	Thermal Paper Sticker (Php 99 each)	₱99,000.00
Total Projected Annual Cost		₱271,597.44

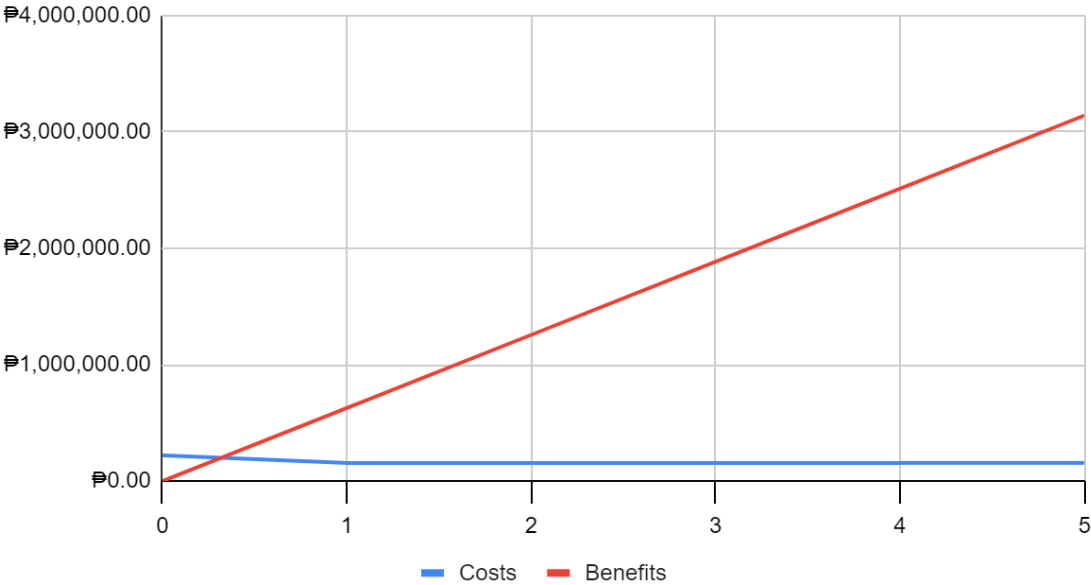
Projected Annual Tangible Benefits:

Reduced Employee Overtime Fee (Inventory System) (110/hr * 72 hours * 12 months)	₱95,040.00
Reduced Employee Overtime Fee (Ordering System) (110/hr * 24 hours * 12 months)	₱31,680.00
Reduced Tracking Waste (Inventory System) (12000 * 12 months)	₱144,000.00
Reduce Material Waste (Ordering System) (₱106,200.00 * 10%)	₱10,620.00
Reduce Material Waste (Inventory System) (₱8,199,000.00 * 5%)	₱409,950.00
Total Projected Annual Cost	₱691,290.00

Payback Period and Return on Investment

Project A Development				
YEAR	COSTS	CUMMULATIVE COSTS	BENEFITS	COMMULATIVE BENEFITS
0	₱221,791.16	₱221,791.16	₱0.00	₱0.00
1	₱156,213.47	₱378,004.63	₱628,382.61	₱628,382.61
2	₱156,144.73	₱534,149.36	₱1,256,488.70	₱1,884,871.31
3	₱156,163.63	₱690,312.99	₱1,884,670.84	₱3,769,542.15
4	₱156,226.01	₱846,539.00	₱2,513,103.91	₱6,282,646.06
5	₱156,248.89	₱1,002,787.89	₱3,141,629.00	₱9,424,275.06
ROI				839.81%

Project A Payback Analysis



Project B Development				
YEAR	COSTS	CUMMULATIVE COSTS	BENEFITS	COMMULATIVE BENEFITS
0	₱101,591.16	₱101,591.16	₱0.00	₱0.00
1	₱246,882.07	₱348,473.23	₱628,382.61	₱628,382.61
2	₱246,773.43	₱595,246.67	₱1,256,488.70	₱1,884,871.31
3	₱246,803.31	₱842,049.98	₱1,884,670.84	₱3,769,542.15

PROJECT B							
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Benefits	₱0.00	₱691,290.00	₱760,419.00	₱836,460.90	₱920,106.99	₱1,012,117.69	
Factor	1	0.909	0.826	0.751	0.683	0.621	
PV of Benefits	₱0.00	₱628,382.61	₱628,106.09	₱628,182.14	₱628,433.07	₱628,525.09	₱3,141,629.00
Costs	₱101,591.16	₱271,597.44	₱298,757.18	₱328,632.90	₱361,496.19	₱397,645.81	
Factor	1	0.909	0.826	0.751	0.683	0.621	
PV of Costs	₱101,591.16	₱246,882.07	₱246,773.43	₱246,803.31	₱246,901.90	₱246,938.05	₱1,335,889.93
Net Present Value							₱1,805,739.07