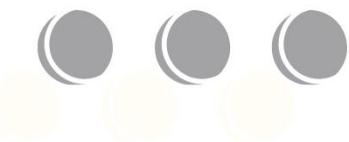


PC BANK



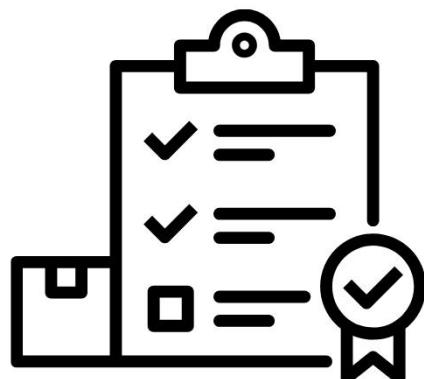
2025



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لเทคโนโลยيا المعلومات

KING ABDULLAH II SCHOOL OF
INFORMATION TECHNOLOGY

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1.0 Project Initiation

1.1 Project Overview

Due to the rapid turnover of technology products, varying profit margins, and the need to track both products and maintenance services, many computer shops struggle with efficient inventory management

This project focuses on developing a new **Inventory Management System** (IMS) specifically tailored for tech shops selling laptops, computers, parts, accessories, and offering maintenance services. This system, named "PC bank" is designed to help shop owners and staff easily track stock levels, sales, purchase orders, sale trends and maintenance services all in real time. The system will ensure accurate stock management, reduce overstocking and understocking, and improve the customer experience by minimizing stockouts and streamlining the repair process.

1.2 Problem definition

1.2.1 problem statement

Most shops choose to handle their inventory manually or use primitive databases or excel sheets to keep track of their inventory. This breeds a multitude of problems, especially in shops that carry different types of items. To name a few: frequent stockouts, inaccurate inventory tracking, challenges in tracking items used in maintenance services, and delays in maintenance. These issues lead to operational inefficiencies, and decreased customer satisfaction due to unfulfilled orders and delayed maintenance services.

1.2.2 Issues

Manual entry problems

Dealing with stock manually is a time-consuming process that is prone to human errors and will cause discrepancies between actual stock levels and what is registered thus causing problems when dealing with customers.

Report generation and sales insight problem.

Generating reports and analyzing sales data manually will require a very skilled employee. Training that employee will take time and resources and even with training, the process would be time consuming, and it would suffer from inaccuracies. Furthermore, future forecasting of sales and real-time business insights are not an option with the current system.

Warranty and Maintenance problems

Considering that the store offers maintenance, the current system poses a problem when tracking serial numbers for warranty purposes thus causing customer warranty status confusion which will allow for fraudulent activity like warranty fraud .Added to the previous point, the current system poses problems in tracking devices under repair ,the parts that were used in the repair and if the parts needed for the repair are currently available, Furthermore the system doesn't automatically update the records when a part is used for maintenance which will cause problems down the line .

Poor customer experience

Following from the previous point, not being aware of the status of repair items and current in stock items will cause the store to offer promises of timeframes for maintenance and promises of availability of items that they won't be able to uphold.

Managing suppliers

In the current system, there is no way to track all suppliers, their contact details and when the supplier is out of stock or has recently been stocked in one place. Added to that there is no automated and organized way to keep track of the orders and payments for each supplier. Without this information delays in ordering items and payments will happen, so having this information in one place in an organized manner is critical for smoothly running a business.

Low stock and old stock alert issue

In the current system there is no way to alert the business owner/inventory manager of low stocks in advance or to warn them about items that have been in storage for a long time.

1.2.3 Objectives for each issue

Objective for Manual Inventory Management: Automate inventory tracking to reduce human error, improve efficiency, and speed up operations. Implement a system that provides real-time inventory updates to ensure accurate stock levels are always visible.

Objective for Lack of Sales Insights and reporting problem: Introduce analytical charts that can track sales trends and instantly downloadable reports to support better decision-making regarding stock management.

Objective for Poor Maintenance and Warranty Tracking: Develop a tracking system for parts used in maintenance services and for items under warranty to ensure

inventory accuracy, prevent shortages of critical components and to avoid warranty fraud.

Objective for Poor Customer experience: ensure timely service for maintenance and accurate reporting of availability of items.

Objectives for managing suppliers: the system will include a list of all suppliers, their contact details, orders made by that supplier for ease of tracking.

Objectives for low stock and old stock problems: the system will provide notifications on the main dashboard of the system about low stock and old stock items.

1.2.4 Requirements

The following requirements are essential for any proposed system to address the identified issues:

- **Real-Time Inventory Tracking:** The system must provide real-time inventory updates to prevent stock discrepancies.
- **User-Friendly Interface:** The system should be easy for shop staff to use without extensive training.
- **Maintenance and Warranty Tracking:** A module to track warranties and parts used in repair services to ensure inventory accuracy.
- **Sales Analytics:** The system should provide sales insights and reporting features to facilitate data-driven decisions.
- **Supplier Tracking:** the system should track all supplier information for ease of access to all information about the supplier.
- **Documentation Requirement:** Comprehensive documentation is required for each part of the system.

1.2.5 Constraints

Budget Constraint: The design, development, and testing of the website should not cost over 35,000 JOD.

Time Constraint: The system must be ready for deployment by 5/1/2025.

Scalability: Ensuring the system can handle growth in inventory and user base.

Availability: Setting up a reliable system with minimal downtime.

1.3 Feasibility study

1.3.1 Technical feasibility

- The development of (**PC Bank**) is technically feasible with the use of modern development tools and web technologies. The chosen technology stack includes:
 - **Prototyping:** Bubble
 - **Design Language:**

HTML, CSS, JavaScript for front-end

PHP for back-end

MySQL for the database.

- **Hardware:**

- Any device with an internet browser and internet access can use this website.
 - A barcode scanner is required to allow for automated entry of sales.
- Given the current technical knowledge and expertise of the team, they are able to carry out the development of the proposed project without the need to hire or outsource services.

1.3.2 Operational feasibility

- The website interface is designed with the user in mind, with a focus on simplicity, ease of use, accessibility and visual data representation. This user-friendly interface, will make it accessible to shop staff with minimal training which will save time and reduce the administrative burden on the staff, allowing them to focus on more strategic activities which addresses all the issues the staff raised during the analysis stage.

1.3.3 Economic feasibility

Development Costs

Personnel:

Team Member	Number of Members	Cost per Month	Total Cost for 3 Months
Project Manager	1	1200 JD	3600 JD
System Analyst /Administrator	1	1000 JD	3000 JD

Developers and QAs	3	1312 JD	11800JD
UI/UX Designer	1	1000 JD	3000 JD

Total Personnel Costs = 21,400 JD

Hardware and Software:

Hardware/Software	Quantity	Cost	Total Cost
Tools:			
Development software	1	313 JD	939 JD
Cloud services	1	150 JD/month	450 JD (3 months)
Barcode scanner	1	150	150

Total Hardware and Software Costs = 1539 JD

Total Development Costs = 22,939 JD

Operating Costs

Operating Cost	Cost per Month	Total Cost for 12 Months
Domain Name	10 JD	120 JD
System Updates and Enhancements	100 JD	1200 JD
Hosting Server	30 JD	3600 JD

Total Operating Costs = 4920 JD

Tangible Benefits

Tangible Benefits	Estimated Savings
Reduced Inventory Errors	15000 JD
Reduced Overhead Costs	5000 JD
Time Saved Through Automation	6000 JD

Total Tangible Benefits = 26000 JD

Intangible Benefits

- Improved operational efficiency and accuracy in inventory management.
- Enhanced customer satisfaction through better stock availability and faster maintenance services.
- Stronger reputation and reliability, attracting repeat customers and positive word-of-mouth referrals.
- Data sale analytics such as best-selling items and busiest months of the year will improve decision making when it comes to resource allocation.

Payback Analysis

Yearly Breakdown of Costs and Benefits:

Year	Costs	Benefit	Discount 12%	Accumulated	Accumulated
				Costs	Benefits
Year 0	22,939 JD	\$ 0	1.000	22,939 JD	0
Year 1	4920	26,000	.893	27333 JD	23218 JD
Year 2	6592	34,000	.797	32587 JD	50316 JD
Year 3	7712	41,000	.712	38078 JD	79508 JD
Year 4	8868	55,000	.636	43718 JD	114488 JD
Year 5	9844	66,000	.567	49300 JD	151910 JD

The system is expected to achieve a payback period of approximately **2 years**, as accumulated benefits exceed the accumulated costs by the end of Year 2.

The Lifetime ROI is for the project is:

Lifetime ROI = (estimated lifetime benefits - estimated lifetime costs)/ estimated lifetime costs

$$(222,000 - 49300)/49,300=350\%$$

The Annual ROI is for the project is:

$$\text{Annual ROI} = 350\% / 5 \text{ years} = 70\%$$

Net Present Value= cumulative benefits-cumulative cost=102,610 JD

1.3.4 Schedule feasibility

Increments	Description	Start	End	Duration
1 Project initiation and management	<p>Project initiation:</p> <ul style="list-style-type: none">• Problem definition• Feasibility study• Recommended solution and expected project deliverables. <p>Project management</p> <ul style="list-style-type: none">• Project Organization• Assigning roles and responsibilities• Define software process model.	15/10/24	16/11/24	30 days

	<ul style="list-style-type: none"> • Define tools and techniques to be used. • Assign team members to tasks. • Project schedule • Risk analysis and plan. • Setting monitoring, reposting and controlling mechanisms 			
2 Software requirement specifications and design	<p>Software requirements</p> <ul style="list-style-type: none"> • Identify system stakeholders and requirement sources. • Define user requirements. • Use case diagrams. 	17/11/24	3/12/24	17 days

	<ul style="list-style-type: none"> • System functional requirement specification • Textual description for each use case • Non-functional requirements • Data requirements <p>Analysis and design</p> <ul style="list-style-type: none"> • Activity diagrams • Sequence diagrams • Class diagram • Architecture design • Classes and components design • Graphical user interface design 		
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	<ul style="list-style-type: none"> • Object to ER mapping 			
3 Implementation	<ul style="list-style-type: none"> • Graphic user interface implementation • User manual 	4/12/24	5/1/25	32 days

The project is estimated to be ready for deployment within 79 days from the start of development.

1.3.5 legal feasibility

Legal experts have reviewed the proposed platform, ensuring that it complies with local and global laws.

1.4 Recommended Solution and Expected project deliverables.

The available solution alternatives are:

Develop a new system.

Buy an existing system

Our recommended solution is to develop the inventory management website, **PCbank**, as the system is specifically designed to streamline inventory management for tech shops, offering features for sales, inventory control, and maintenance service tracking. The alternative, which is to buy an existing system, will not cover all the required features nor will it come with tech support.

1.5 Local and Global Impact of the Proposed Solution

Local Impact

Implementing this system will reduce the need for manual work which will improve the operational efficiency of tech shops by saving time and paperwork. It will also reduce inventory errors, improve stock visibility, and enhance customer satisfaction.

Global Impact

This solution can also serve as a model for similar businesses globally, potentially encouraging the adoption of inventory management systems in the tech retail sector.

1.6 Naming Conventions and Definitions (Terms, Acronyms, and Abbreviations)

JD – Jordanian Dinars

PCbank – The name of the website we are developing.

GUI – Graphical User Interface

UI- user interface

DB- data base

IMS -inventory management system

2.0 Project Management Plan

2.1 Project Organization

This project will be organized to optimize costs and ensure all project goals are met on schedule and in accordance with the requirements of the business owners. Tasks will

be distributed among team members according to their expertise, with collaboration encouraged to maximize efficiency and knowledge-sharing. The following sections outline the roles, responsibilities, and management approach for each phase of the project.

2.2 Roles and Responsibilities

Role	Responsibility
Project Manager:	<p>Responsible for:</p> <ol style="list-style-type: none">1. Setting the project schedule2. Assigning people to tasks3. Ensuring adherence to the budget4. Monitoring progress5. Assessing the risks and addressing any issues that arise.6. Report on the progress of the project to the business owner.
System analyst:	<ol style="list-style-type: none">1. Gather requirements2. Observe behavior of employees3. Listen to external feedback from customers and suppliers
Developer	<p>In charge of:</p> <ol style="list-style-type: none">1. Coding

	<ol style="list-style-type: none"> 2. Implementing system functionality 3. Conducting unit testing and debugging.
QA (Quality Assurance)	<ol style="list-style-type: none"> 1. Executes quality assurance tests. 2. Identifies and reports issues. 3. Verify fixes to ensure a robust final product. 4. Check output against performance criteria.
UI/UX Designer:	<ol style="list-style-type: none"> 1. Designs user interfaces, ensuring an intuitive and seamless experience for all users. 2. Prepares initial prototypes.

2.3 Software Process Model

The chosen software process model for this project is **Incremental development**. This model is suitable because the requirements for the system may change as the development proceeds based on the client's feedback and this model enables frequent adjustments based on that feedback and changes in requirements without much cost.

Added to that this model also allows for more rapid delivery and deployment of useful software to the customer.

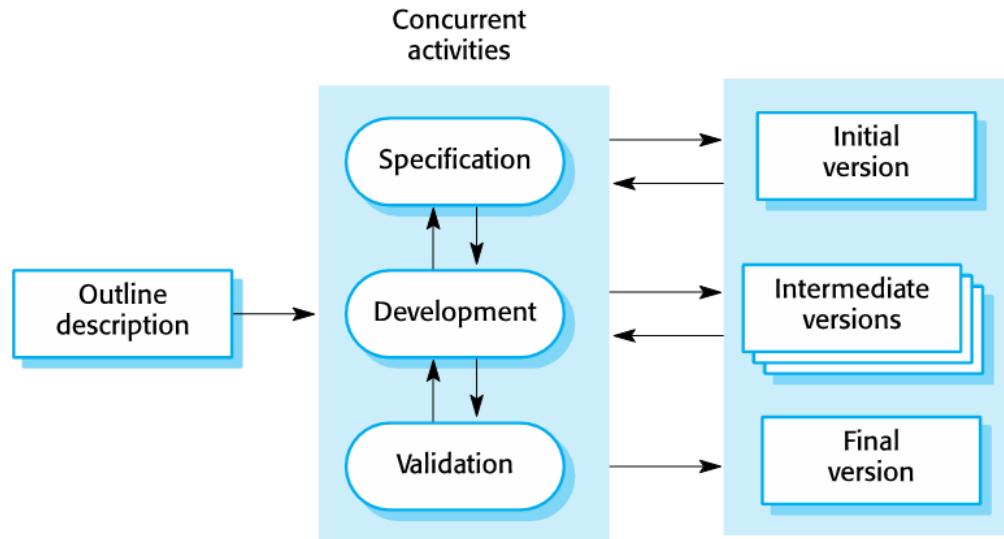


Figure 1 incremental model

2.4 Tools and Techniques

- **Bubble:** For creating prototype
- **StarUML:** For system modeling
- **Visual Studio Code:** For coding and interface design.
- **MySQL:** Database management system for handling and storing inventory data.
- **Jira:** Project management tools for task tracking, assignments, and scheduling.
- **Google meet and WhatsApp:** For team communication and collaboration.

2.5 Work Breakdown Structure (WBS)

2.5.1 Project Tasks

Phase	Task number	Description	Duration
Specification	T1	Gather user requirements	10 Days
	T2	Define scope and objectives	5 Days
	T3	Conduct feasibility study	5 Days
	T4	Conduct risk study	1 Day
	T5	Define system requirements	6 Days
	T6	Validate with stake holder	3 Days
Design	T7	Design user interface	5 Days
	T8	Design database schema	5 Days
	T9	Design system functionalities	5 Days
	T10	Validate with stake holder	2 Days
Implementation	T11	Implement UI	10 Days
	T12	Implement DB	5 Days
	T13	Implement functionalities	4 Days
	T14	Link implemented sides	5 Days
Testing	T15	Testing database connectivity	3 Days
	T16	Testing the functionality	3 Days

	T17	Final validation	2 Days
Sum			79 Days

2.5.2 Deliverables and Milestones

Phase	Milestone	Milestone number	Deliverable	Due Date
Specification	Project Kickoff	M1	Requirements Document	Day 10
			Project Plan	Day 30
Design and development	Interface Design	M2	UI Mockups	Day 35
	Schema Design	M3	Database Schema	Day 40
	Code Development	M4	Functional System	Day 42
Testing	Testing Completion	M5	Test Reports, Bug Fixes	Day 79

2.5.3 Resources Needed (Skills, HW, and SW)

- **Skills:** Project management, system analysis, software development, testing, UI/UX design, and communication.

- **Hardware:**

- Laptops/PCs (6 units)
- Barcode Scanner

- **Software:**

- Visual Studio Code (Development)
- Bubble (for prototyping)
- StarUML(for system modeling)
- MySQL (Database)
- Jira (Task management)
- Google meet /WhatsApp (Communication)

2.5.4 Dependencies and Constraints

Phase	Task number	Description	Dependency
Specification	T1	Gather user requirements	None
	T2	Define scope and objectives	T1
	T3	Conduct feasibility study	T2
	T4	Define system requirements	T3
	T5	Conduct risk study	T4

	T6	Validate with stake holder	T1, T2, T3, T4, T5
Design	T7	Design user interface	T6, T4
	T8	Design database schema	T4
	T9	Design system functionalities	T4, T7
	T10	Validate with stake holder	T7, T8, T9
Implementation	T11	Implement UI	T7, T10
	T12	Implement DB	T8, T10
	T13	Implement functionalities	T9, T10
	T14	Link implemented sides	T11, T12, T13
Testing	T15	Testing database connectivity	T12, T14
	T16	Testing the functionality	T13, T14, T15
	T17	Final validation	T16

- **Constraints:**

- Budget limitation of 50,000 JD.
- Project timeline capped at 82 days.

2.6 Assigning Team Members to Tasks

Task number	Description	Team member
T1	Gather user requirements	All team members
T2	Define scope and objectives	All team members
T3	Conduct feasibility study	All team members
T4	Define system requirements	All team members
T5	Conduct risk study	All team members
T6	Validate with stake holder	All team members
T7	Design user interface	All team members
T8	Design database schema	All team members
T9	Design system functionalities	All team members
T10	Validate with stake holder	All team members
T11	Implement UI	All team members
T12	Implement DB	All team members
T13	Implement functionalities	All team members
T14	Link implemented sides	All team members
T15	Testing database connectivity	All team members
T16	Testing the functionality	All team members
T17	Final validation	All team members

2.7 Project Schedule (Gantt Chart)

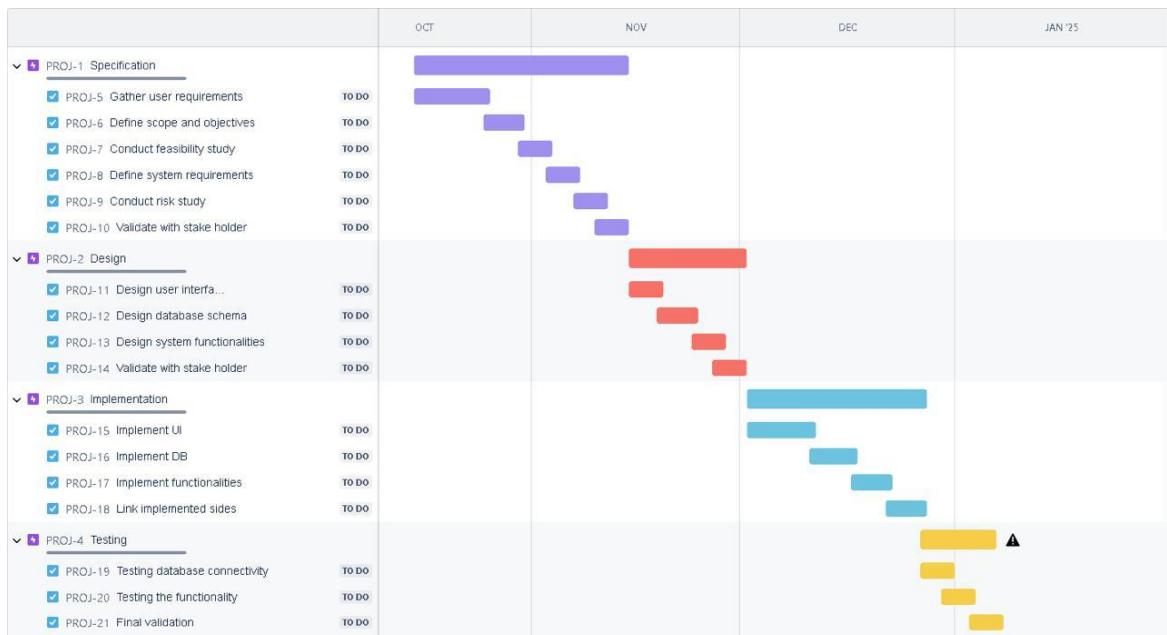


Figure 2 Gantt Chart

PERT chart

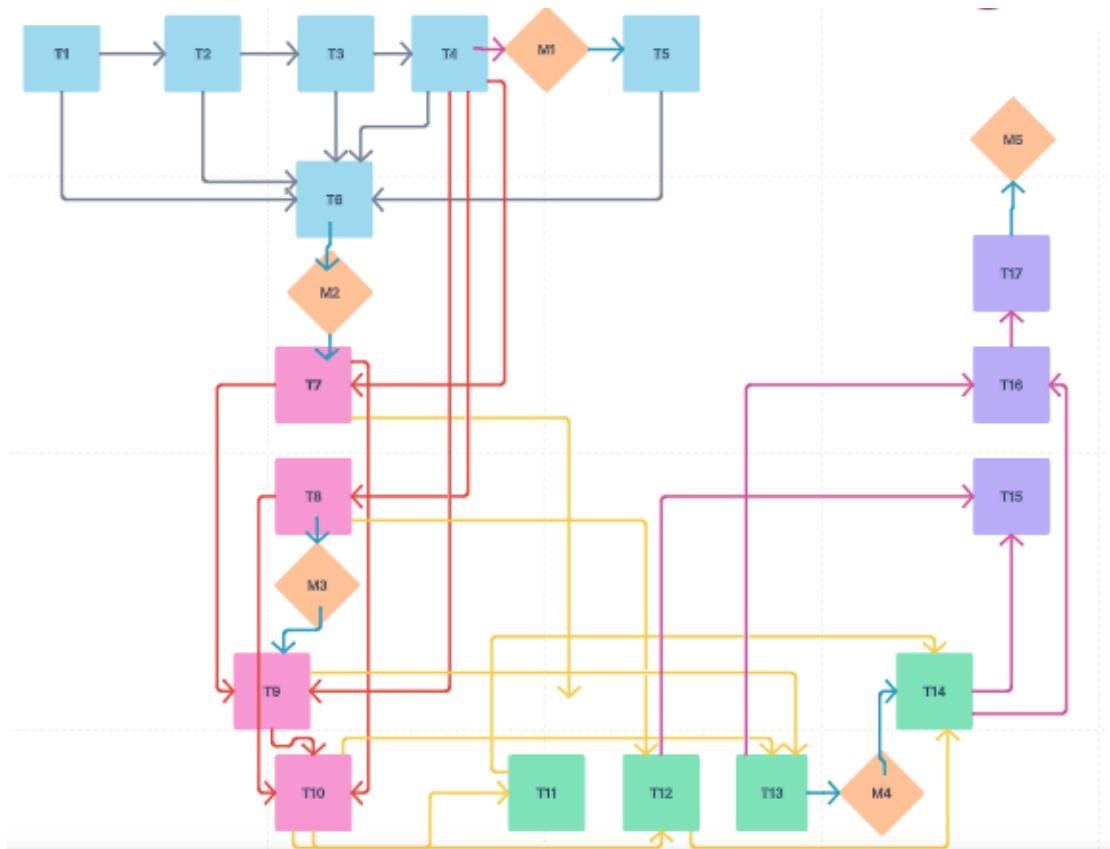


Figure 3PERT chart

2.8 Risk Analysis and Plans

Risk Analysis:

Risk	Affect	Impact	Probability	Description
Scope Creep	Project and product	High	Moderate	Changes to project scope beyond initial agreements.
Staff turnover	Project	Serious	Moderate	Team member may leave the project unexpectedly

Budget overrun	Product and Project	High	Low	Unexpected costs could exceed the allocated budget
Incomplete User Stories because of Stakeholder availability	Project and Product	Serious	Low	Lack of stakeholder availability/feedback delays user story completion.
Time estimation error	Product and Project	Serious	Moderate	Tasks taking longer than initially planned affecting the scheduling
Competitive products	Business	Moderate	High	A competitive product is marketed before the system is completed.
Rate of defect repair underestimated	Business and Project	Tolerable	Moderate	More defects than initially estimated taking longer to repair than anticipated.
Integration Challenges	Product and Project	High	Moderate	Problems occur when integrating different project components.

Inadequate Testing	Product	Tolerable	Moderate	Testing doesn't cover all necessary scenarios, leading to bugs.
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Risk Plans:

Risk	Avoidance plan	Contingency plan	Minimize plan
Scope Creep	Clearly define project scope with stakeholders from the start.	Have a change control process to handle new requests.	Regularly review project scope with stakeholders to limit changes.
Staff turnover	Draw contracts that require a month's notice. Maintain a positive work environment and ensure fair workloads.	Identify backup team members and onboard them if needed.	Pair programming and combined ownership to ensure all team members know the details of each task
Budget overrun	Create a detailed budget	Reserve a financial buffer	Review expenditures

	and closely monitor expenses.	to cover unforeseen costs.	regularly and adjust plans proactively.
Incomplete User Stories because of Stakeholder availability	Schedule regular stakeholder check-ins with buffer periods.	Have alternate communication channels for stakeholders.	Prioritize key user stories that are essential for early increment deliverables.
Time estimation error	Use past data and consult experts for realistic time estimates.	Add buffer time to the project schedule for adjustments. Identify backup team members and onboard them if needed. If necessary, purchase tools to finish tasks earlier	Break down tasks to estimate more accurately and refine timelines.
Competitive products	Conduct market analysis regularly to	convince stakeholder that	Focus on unique features that

	anticipate competitors.	competitive products won't be tailored for the requirements which will create problems down the line	differentiate the product.
Rate of defect repair underestimated	Implement good programing standards	Allocate additional resources if the defect rate exceeds expectations.	Rigorous testing to catch issues early.
Integration Challenges	Test integration points early with prototypes or phase- integration.	Dedicate time for integration fixes within the schedule.	Use standardized interfaces and clear documentation to ease integration.
Inadequate Testing	Define a comprehensive test plan	Extend testing time or perform patch updates if needed.	Automate tests to cover more scenarios and

	covering all critical areas.		reduce human error.
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2.9 Monitoring, Reporting, and Controlling Mechanisms

1. **Weekly Progress Reviews:** Weekly meetings to review progress, identify blockers, and adjust timelines as needed.
2. **Risk Management:** Regular assessment of risks with preemptive measures in place to manage potential challenges.
3. **Resource Management:** Ensure resources are allocated efficiently; reallocate if necessary.
4. **Feedback and Continuous Improvement:** Use team feedback to improve processes and implement quick adjustments.
5. **Project Reports:** Weekly reports on progress, risks, and task completions.
6. **Schedule chart**

3.0 Software requirement specification (SRS)

3.1 System stakeholders and requirement sources

Stakeholder	Description
Primary Stakeholders:	

<ul style="list-style-type: none"> • Shop Owner (Manager) • Shop Staff • Maintenance Technicians • Suppliers 	<ul style="list-style-type: none"> • Manager: Require accurate stock tracking, sales analytics, and supplier management. • Shop Staff: Direct users of the system for inventory management, sales tracking, and maintenance logging. • Maintenance Technicians: Need accurate tracking of repair parts and statuses. • Suppliers: Integrated into the system for order tracking and payment management.
Secondary Stakeholders:	
<ul style="list-style-type: none"> • Customers • Developers and testers • Project team members 	<ul style="list-style-type: none"> • Customers: Indirectly impacted through improved service quality, reduced delays, and accurate repair tracking. • Developers and Testers: Build, test, and maintain the system based on requirements.

	<ul style="list-style-type: none"> Project Team Members: <p>Provide technical expertise in design, development, and implementation.</p>
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Requirements Sources:

Since the system is being developed using the incremental model, the requirements will be gathered incrementally and defined at the beginning of each increment.

Interviews:

We relied on interviews done with all relevant stakeholders for requirement discovery and collection. These were formal one on one interviews, and a mix between closed interviews and open-ended interviews.

Ethnography:

We observed the staff to understand the workflow of tasks and evaluated the available manual databases, Excel sheets, or primitive systems used in the establishment to understand the limitations and gaps and used that knowledge to determine the requirements.

3.2 User requirement Definition

- 3.2.1 The PC Bank system shall generate monthly, quarterly, yearly reports showing the inventory status, sales performance, and the status of maintenance services.
- 3.2.2 The system shall send low-stock alerts for items that reach a predefined minimum threshold.
- 3.2.3 The system shall automatically generate a purchase order for the low-stock items, prompting the user to approve or edit the order.
- 3.2.4 The system shall track the status of devices sent for maintenance, including parts used, repair duration.
- 3.2.5 The system shall check for warranty validity.
- 3.2.6 The system shall provide suppliers with access to a dedicated page to view orders from their company and allow them to update item availability, offers, warranty details, and delivery options.
- 3.2.7 Shop staff shall scan Shipments and Enter the Price and Warranty Time
- 3.2.8 Shop staff shall scan Sold Items, the system will remove Them from Stock, Start Warranty Timer
- 3.2.9 Shop owner shall Log, Edit, Delete Supplier Information
- 3.2.10 Shop owner shall Create, Edit, and Remove Employee Account
- 3.2.11 The system shall provide Scheduled Deliveries, Payment, Shipping Progress Reports

3.2.12 The system shall provide a Login Page

3.3 Use case diagrams

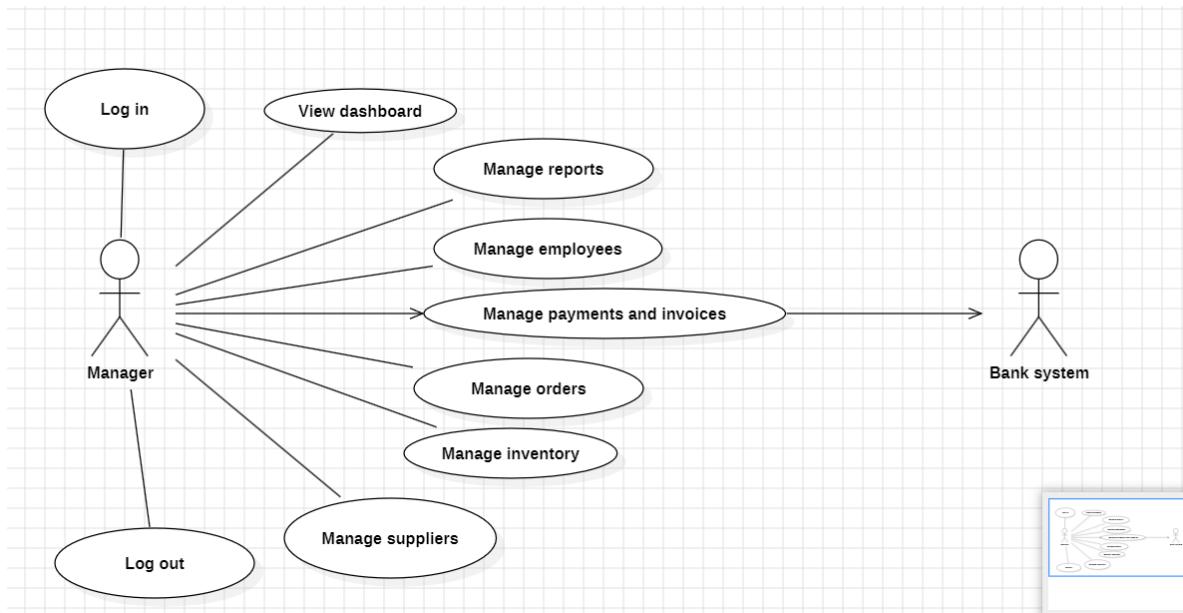


Figure 4 manager use case

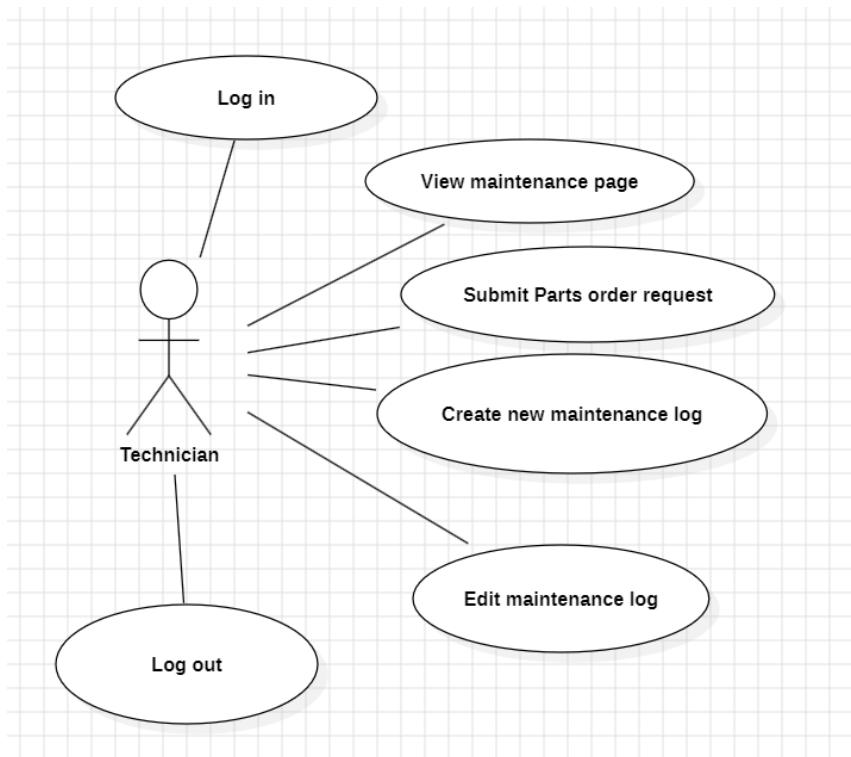


Figure 5 Technician

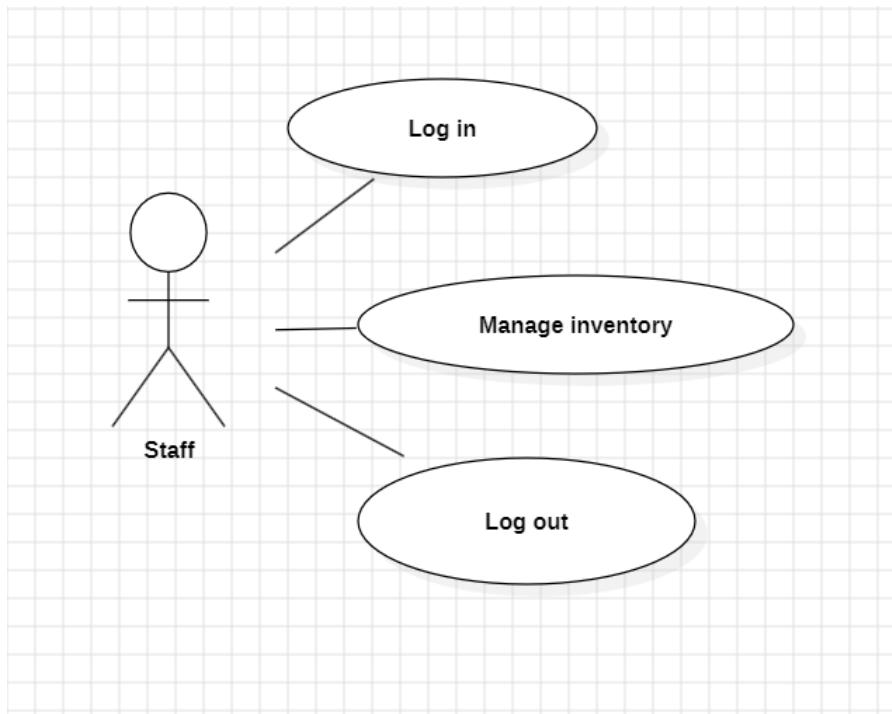


Figure 6 Staff use case

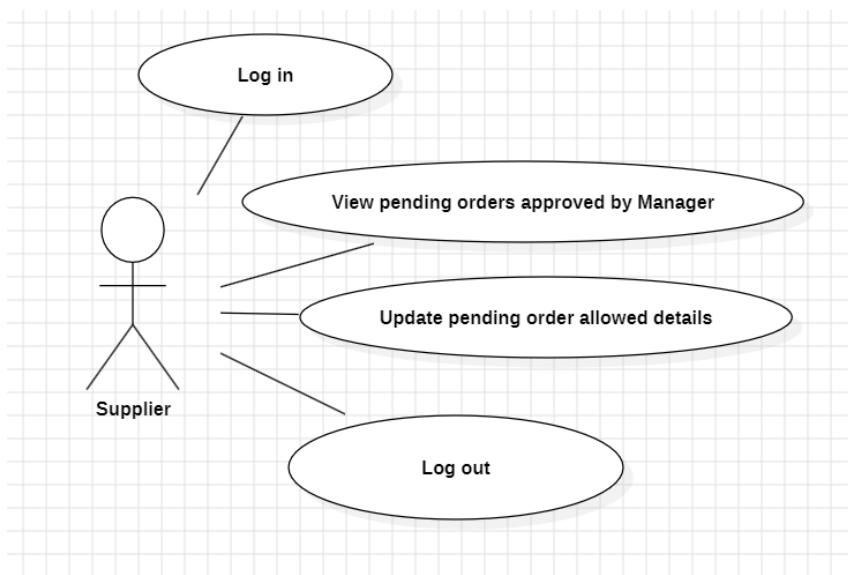


Figure 7 Supplier use cases

3.4 System functional requirement specification

We shall break down the system functional requirements needed for each user requirement mentioned earlier in section 3.2.

The PC Bank system shall generate monthly, quarterly, yearly reports showing the inventory status, sales performance, and the status of maintenance services.

System requirements

- On the last working day of each month, a summary of all stock levels, sales trends, and parts used in maintenance services shall be generated.
- The system shall generate the inventory report for printing after 17:30 on the last working day of the month.
- A report shall be created for each product category and shall list the individual product names, available quantities, purchase price, and total sales per item.
- If a product exists in different configurations (e.g., storage size, color), separate reports shall be generated for each configuration.
- Access to inventory and sales reports shall be restricted to authorized users listed in a management access control list.

Scenario: Generating Monthly, Quarterly, and Yearly Reports

Initial Assumption:

The manager is logged into the PC Bank system and has the required access permissions to generate reports.

Normal:

1. The inventory manager clicks the "Generate Reports" button in the system dashboard.

2. A pop-up window selects the report type: Monthly, Quarterly, or Yearly
3. The system automatically generates the report or displays the report if it has already been generated as is scheduled in the system.
4. The manager will be given the choice to select some or all of the following details:
 - o Inventory status (e.g., stock levels, low-stock alerts).
 - o Sales performance (e.g., best-selling items, total revenue).
 - o Status of maintenance services (e.g., completed repairs, parts used, ongoing repairs).
5. The system presents the report in a downloadable and printable format (e.g., PDF, Excel).
6. The manager reviews the report and saves or shares it with stakeholders.

What can go wrong:

- The manager selects the wrong reporting period, leading to incorrect data being displayed.
- Network issues interrupt the generation of the report.

Other activities:

While the report is being generated, the system continues to monitor stock levels and update sales data in real-time.

System state on completion:

The selected report is successfully generated, saved, and available for download or

printing.

The system shall send low-stock alerts for items that reach a predefined minimum threshold

System Requirements

- The system shall continuously monitor inventory levels in real-time to identify items that have reached or fallen below the predefined minimum stock threshold.
- Once a low-stock item is detected, the system shall generate a notification alert for the manager.

The system shall automatically generate a purchase order for the low-stock items, prompting the user to approve or edit the order.

System requirements

- The system shall automatically generate a purchase order draft containing the low-stock items, including the item name, current quantity, required reorder quantity, supplier details, and total cost estimate.
- The system shall allow users to review the purchase order draft and provide options to:
 - Approve the purchase order as-is.

- Edit the order details.
- Cancel o.

Once approved, the system shall log the approved purchase order and update the "Pending Orders" status.

- The system shall send an automated email or notification containing the purchase order details to the respective supplier(s).
- The system shall update the stock order status to "In Progress" once the purchase order is sent and shall track the order until delivery confirmation.

Scenario: Auto-Generation of Purchase Orders for Low-Stock Items

Initial

Assumption:

The manager is logged into the PC Bank system, which has real-time stock level monitoring enabled.

Normal:

1. The system detects that certain items have reached or fallen below the predefined minimum stock threshold.
2. An automated purchase order is generated, listing the low-stock items, required reorder quantities, and the associated supplier information.
3. The system displays the auto-generated purchase order to the inventory manager.
4. The inventory manager can:
 - Approve the purchase order as-is.

- Edit the order to change quantities, suppliers, or add notes.
5. Once approved, the system sends the purchase order to the corresponding supplier via email.

What can go wrong:

- An incorrect threshold causes the system to generate unnecessary purchase orders.
- The manager forgets to review and approve the order, delaying the procurement process.
- Supplier details are incomplete or outdated, preventing the order from being sent.

Other activities:

The supplier may simultaneously log in to confirm or edit the purchase order based on their stock availability.

System state on completion:

The purchase order is approved, saved, and sent to the supplier. The inventory manager is notified of the successful submission.

The system shall track the status of devices sent for maintenance, including parts used, repair duration.

System Requirements

- The system shall allow authorized users to log maintenance requests, including the device details (e.g., serial number), customer information, reported issue, and repair initiation date.
- The system shall allow users to record parts used during the repair process, including the part name, quantity, and cost.
- The system shall calculate and display the total repair cost, including labor and parts, for each maintenance job.
- The system shall track and display the repair duration by calculating the time elapsed from the repair initiation date to the repair completion date.
- The system shall allow users to update the repair status, including the following options:
 - "Under Repair"
 - "Waiting for Parts"
 - "Repaired."
 - "Delivered to Customer"
- Once a repair is completed, the system shall automatically update the inventory to reflect the reduction of any parts used during the repair process.
- The system shall maintain a repair history log for each device, which can be accessed by authorized users for future reference or warranty verification.

Scenario: Tracking Device Maintenance Status

Initial

Assumption:

A customer brings an item to the shop for repair. An authorized user (e.g., technician)

is logged into the PC Bank system to log the maintenance request and track the repair process.

Normal:

1. The technician logs into the system and navigates to the "**Maintenance**" page
2. The technician creates a new maintenance log and inputs:
 - o Device details (e.g., serial number).
 - o Customer information (contact details).
 - o Reported issue (e.g., "Device not booting").
 - o Repair initiation date.
3. The system saves the details and marks the repair status as "**Under Repair**".
4. During the repair process, the technician records the parts.
5. If the technician identifies a part shortage, they update the status to "**Waiting for Parts**", and the system notifies the inventory manager.
6. Once repairs are completed:
 - o The technician updates the repair status to "**Repaired**".
 - o The system calculates the total repair duration (e.g., 3 days) and displays it.
 - o The inventory is automatically updated to reduce the quantity of parts used.

7. When the device is returned to the customer, the technician updates the repair status to "**Delivered to Customer**".
8. The system logs all repair details in a **repair history log**, accessible for future reference or warranty verification.

What can go wrong:

- The technician forgets to input device details or parts used, resulting in incomplete data.
- A network issue occurs, preventing updates to repair status or inventory.
- Incorrect part quantities are entered, leading to inaccurate repair cost calculations.
- Parts required for repair are unavailable in the inventory, delaying the process.

Other activities:

While the repair is being logged, the inventory manager may simultaneously check stock levels and approve purchase orders for low-stock parts.

System state on completion:

The repair process is completed, and the system reflects the following:

- The repair status is updated to "Delivered to Customer."
- The inventory is reduced for the parts used.
- The total repair duration is saved and displayed.
- The repair history log is updated for future reference.

The system shall check for warranty validity.

System requirements.

- The system shall verify and display the warranty validity of the device based on the serial number and purchase date.
- If the warranty expires, the system shall suggest maintenance or replacement options with estimated costs.

The system shall provide suppliers with access to a dedicated page to view orders from their company and allow them to update item availability, offers, warranty details, and delivery options.

System Requirements

- The system shall allow suppliers to securely log in to their dedicated supplier portal using unique credentials provided by the system administrator.
- Upon login, suppliers shall have access to a dashboard that displays:
 - A list of all purchase orders sent to their company.
- For each order, the supplier shall be able to update the following details:
 - **Item Availability:** Indicate if the item is "In Stock," "Out of Stock," or "Available Soon."
 - **Special Offers:** Add any available discounts or promotions for the items in the order.
 - **Warranty Details:** Specify warranty availability, duration (e.g., 6 months, 1 year), and warranty terms.

- **Delivery Options:** Provide available delivery options

- The system shall allow suppliers to confirm or edit a purchase order.
- Once a supplier updates an order, the system shall notify the manager
- The system shall restrict supplier access to only the orders related to their company, ensuring that suppliers cannot view orders intended for other suppliers.

Scenario: Supplier Access to Update Orders

Initial Assumption:

The supplier has received credentials to access the PC Bank system. They log in using their unique supplier account to view pending orders from their company.

Normal:

1. The supplier logs into their dedicated portal in the PC Bank system.
2. For each order, the supplier updates the following details:
 - Availability status (e.g., In Stock, Out of Stock).
 - Special offers (e.g., 10% discount).
 - Warranty details (e.g., 1-year manufacturer warranty).
 - Delivery options
3. The supplier saves the updates, and the system notifies the manager that the order has been updated.
4. The updated information is reflected in the order

What can go wrong:

- The supplier inputs incomplete or incorrect data, leading to an error message prompting correction.
- Network issues prevent the supplier from saving updates.
- A supplier forgets their credentials and cannot access the portal.

Other activities:

The system tracks all changes for audit purposes.

Shop staff shall Scan Shipments and Enter the Price and Warranty Time

System Requirement Specification:

1. The system shall support barcode scanning for shipment item identification.
2. The system shall validate scanned data against the database for accuracy.
3. The system shall provide fields for entering price and warranty time for each scanned item.
4. The system shall save shipment data, including price and warranty time, in the inventory database.

Scenario: Scan Shipments and Enter the Price and Warranty Time

Initial assumption:

The staff logs into the **PCBANK** system and accesses the "inventory" page. A new shipment arrives at the warehouse, and the items in the shipment are labeled with barcodes.

Normal Flow of Events:

1. The user clicks on the "Add item" button in the inventory page.
2. The user scans the barcode of the first item using a barcode scanner integrated with the system.
3. The system retrieves the item details from the inventory database and displays them on the screen.
4. The user inputs the price and warranty time (if it existed) for the scanned item in designated fields.
5. The system validates the input and stores the details in the database.
6. The user repeats the process for all items in the shipment until completed.

What Can Go Wrong:

- **Barcode Issues:** The scanner cannot read a damaged barcode, and the system displays an error message.
- **Item Not Found:** The system cannot find the scanned barcode in the database, prompting the user to manually enter item details.
- **Input Errors:** The user enters an invalid price or warranty time (e.g., negative numbers), and the system rejects the input.
- **Connectivity Problems:** The system loses connection to the database and cannot save shipment data.

Concurrent Activities:

- Other users may be updating stock levels or generating reports in PCBANK.
- Notifications for low stock items may be processed and sent to relevant users.

System state on completion:

The item details are successfully logged, all data is saved in PCBANK, and the Inventory levels are updated accordingly.

Shop staff shall scan Sold Items, the system shall remove Them from Stock, Start Warranty Timer

System Requirement Specification (SRS):

1. The system shall allow users to scan barcodes for sold items to match them with inventory records.
2. The system shall decrease stock quantities for sold items in real-time.
3. The system shall start a warranty timer for each sold item based on its warranty duration.
4. The system shall generate a sales log, including item details, date of sale.

Scenario Scan Sold Items, Remove Them from Stock, Start Warranty Timer

Initial assumption:

A customer purchases items from the store. The staff logs into the **PCBANK** system and accesses the inventory page to record the transaction.

Normal Flow of Events:

1. The cashier scans the barcode of the sold item using the barcode scanner.
2. The system retrieves the item details from the database, reduces the stock level, and displays the updated stock quantity.

3. The system automatically starts the warranty timer for the item based on the specified warranty period.
4. The cashier finalizes the transaction, and the system logs the sale, including the date, item details

What Can Go Wrong:

- **Warranty Timer Failure:** The system fails to initiate the warranty timer for the sold item, requiring manual correction.
- **Scanner Malfunction:** The barcode scanner does not work, and the cashier must enter the item information manually.

Concurrent Activities:

- Another user in PCBANK might be updating stock levels or adding new shipments.
- Real-time alerts for low stock levels might be sent to the manager.

System state on completion:

The sale is successfully recorded, the inventory is updated, and the warranty timer is initiated for the sold items.

shop owner shall Log, Edit, Delete Supplier Information

System Requirement Specification (SRS):

1. The system shall provide a user-friendly interface to input supplier details (e.g., name, contact, address).
2. The system shall allow users to search for suppliers using filters (e.g., name)

3. The system shall enable users to edit supplier information.
4. The system shall allow authorized users to delete supplier

Scenario: Log, Edit, Delete Supplier Information

Initial assumption:

The manager logs into **PCBANK** and accesses the "Supplier Management" to add, edit, or delete supplier records.

Normal Flow of Events:

1. To add a supplier:
 - The manager clicks "Add New Supplier" and fills out the required fields (e.g., supplier name, contact details, address).
 - The system validates the input and saves the supplier record in the database.
2. To edit a supplier:
 - The manager searches for the supplier by name or ID and selects the record.
 - The manager updates the details (e.g., phone number,) and saves the changes
3. To delete a supplier:
 - The manager selects a supplier and clicks "Delete."
 - The system creates a popup to ask the manager if they want to go through with the delete.

- Once the choice is confirmed, the supplier is deleted

What Can Go Wrong:

- **Duplicate Entry:** The system detects that the supplier's name or contact details already exist in the database and rejects the entry.
- **Input Errors:** The manager enters incomplete or invalid information, and the system prompts corrections.

Concurrent Activities:

- Other users might be scheduling deliveries or processing shipments linked to the supplier.

System state on completion:

The supplier is added, updated, or removed successfully, and the system confirms the changes with an appropriate message.

Shop owner shall Create, Edit, and Remove Employee Account

System Requirement Specification (SRS):

1. The system shall allow authorized users to create employee accounts with unique usernames, passwords, and assigned roles.
2. The system shall enable editing of employee details, including roles, permissions, and contact information.
3. The system shall restrict unauthorized access to employee account management features.

4. The system shall allow administrators to deactivate or delete employee accounts while maintaining an audit log.

Scenario: Create, Edit, and Remove Employee Account

Initial assumption:

The system administrator logs into **PCBANK** and accesses the "Employee" page to manage accounts.

Normal Flow of Events:

1. To create an account:
 - The admin clicks "Add Employee" and enters details such as name, username, password, role, ID, and contact information.
 - The system validates the data and creates the account.
2. To edit an account:
 - The admin selects an existing employee account and updates the fields (e.g., role or contact details).
3. To delete an account:
 - The admin selects an employee account and confirms the deletion.
 - The system deactivates the account .

What Can Go Wrong:

- **Duplicate Username:** The system detects that the username already exists and prompts the admin to choose a different one.

- **Input Errors:** The admin enters incomplete or invalid details, and the system rejects the input.

Concurrent Activities:

- Employees might be actively using the system while accounts are being managed.
- Background processes might update user activity logs.

System state on completion:

The employee account is successfully created, updated, or deleted, and the changes are reflected in PCBANK.

The system shall Schedule Deliveries, Payment, Shipping Progress Reports

System Requirement Specification (SRS):

1. The system shall provide a calendar interface for scheduling and managing dates.
2. The system shall allow users to input and track payment status for each delivery.
3. The system shall generate real-time shipping progress reports, showing milestones.

The system shall provide a Login Page

System Requirement Specification (SRS):

1. The system shall authenticate users based on their credentials stored securely in the database.

2. The system shall provide input fields for:
 - o Email.
 - o Password.
3. The system shall redirect authenticated users to the designated page upon successful login.
4. The system shall implement secure login protocols:
 - o Use HTTPS for secure data transmission.
 - o Store passwords using hashing algorithms (e.g., bcrypt or Argon2).
5. The system shall include a "remain signed in" option for users to remain logged in for a session's duration.

Scenario: Login Page Leading to Dashboard

Initial assumption:

The manager attempts to log in to **PCBANK** with their credentials to access their dashboard.

Normal Flow of Events:

1. The user navigates to the login page and enters their email and password.
2. The system validates the credentials and checks the user's account role.
3. If credentials are correct, the user is redirected to their personalized dashboard based on their role (e.g., Manager).

What Can Go Wrong:

- **Server Issue:** The system fails to load the dashboard due to a technical error.

Concurrent Activities:

- Other users may be logging in simultaneously.
- Background processes may be updating notifications or user logs.

System state on completion:

The user successfully logs in and gains access to the PCBANK dashboard.

3.5Textual description for each case

3.5.1Manage Inventory

Actor	Manager, Shop staff
Description	Manage inventory by adding, updating, deleting, and viewing items in real-time
Stimulus	User logs in and interacts with the inventory system.
Response	System updates the inventory database and displays updated stock levels.
Data	Item details (name, category, quantity, price), inventory status, notifications
Comments	Ensure user-friendly interface and support for barcode scanning.

3.5.2Create new maintenance log

Actor	Maintenance staff
Description	Track maintenance services for devices under repair, including parts used and repair status.
Stimulus	Maintenance staff logs a new maintenance request with device details
Response	System tracks parts usage, updates inventory, and maintains repair logs.
Data	Device details, parts inventory, repair status ("Under Repair", "Repaired").
Comments	Add notifications for low stock to avoid repair delays.

3.5.3Manage Reports

Actor	Manager
Description	Generate reports for inventory, sales, and maintenance services.

Stimulus	Manager requests a report from the dashboard
Response	System fetches data, generates the report, and provides it in a downloadable format.
Data	Sales trends, inventory levels, maintenance activity logs, revenue per product.
Comments	Ensure customizable reports with relevant analytics.

3.5.4 Manage Supplier Information

Actor	Manager
Description	Enables the manager to log, update, or delete supplier information, including contact details
Stimulus	The manager logs into the system and selects the "Suppliers" option from the dashboard Side bar
Response	The system displays the list of suppliers, allows logging new suppliers, editing existing records, or deleting outdated entries.

Data	Supplier details: Name, contact information (email, address)
Comments	Ensure secure access to the feature and validate data to avoid duplicate entries or invalid information.

3.5.5 Employee account management

Actor	Manager
Description	Manage employee accounts by creating, editing, or removing accounts.
Stimulus	Owner logs in and accesses the employee management page.
Response	System saves changes and updates access permissions.
Data	Employee details (name, contact info, role, permissions)
Comments	Ensure only authorized users (managers) can access this feature.

3.5.6 Supplier view and update pending orders

Actor	Supplier
Description	Update availability, warranty, and delivery options for orders.
Stimulus	Supplier logs in to update order-related details.
Response	System updates supplier's order details and notifies the manager.
Data	Order details (item name, quantity, availability, warranty, delivery option).
Comments	Ensure updates are logged and visible to managers for review.

3.5.7 Create maintenance log

Actor	Maintenance Technician
Description	Record and track parts used during repairs to update the inventory and calculate total repair costs.
Stimulus	A technician adds parts to the repair log for a specific device.

Response	The system updates the inventory, calculates the total repair cost, and logs the details.
Data	Part details (name, quantity, cost), repair log, inventory levels.
Comments	Enable the system to flag critical low-stock parts immediately after updates

3.5.8 Submit parts order request

Actor	Maintenance Technician
Description	Submit an order for missing parts when repairs are delayed due to part unavailability.
Stimulus	A technician updates the repair status to "Waiting for Parts."
Response	The system sends a notification to the inventory manager and suggests generating a purchase order.
Data	Repair job ID, part details, notification timestamp.

3.5.9. Update repair status

Actor		Maintenance Technician
Description		Update the repair status of devices as they progress through various stages.
Stimulus		The technician changes the status of a repair (e.g., from "Under Repair" to "Repaired").
Response		The system updates the repair log and records the repair duration.
Data		Repair job ID, updated status, Warranty status, timestamps for initiation and ending repairs

3.5.10. Manage orders

Actor		Manager
Description		Enables the manager to create, update, and track purchase orders for inventory replenishment.

Stimulus	The manager logs into the system and selects the "Orders" option from the dashboard.
Response	The system allows the manager to view, create, or update purchase orders and track their statuses (e.g., pending, shipped).
Data	Order details: Item name, quantity, supplier, order date, status.

3.5.11. Manage payments and invoices

Actor	Manager
Description	Allows the manager to review, approve, and track payments to suppliers and generate invoices.
Stimulus	The manager logs into the system and selects the "Payments & Invoices" section from the dashboard.
Response	The system displays pending payments, allows invoice generation, and records payment details.

	Data	Payment details: Supplier name, invoice number, payment amount, due date, payment status.
	Comments	Include alerts for overdue payments

3.6 Nonfunctional requirements

The following requirements focus on the system's performance, reliability, security, usability, and maintenance to ensure a high-quality inventory management system.

3.6.1 Performance Requirements

1-Scalability: The system should be able to handle an increasing number of devices without significant degradation in performance.

2-Availability: The system should have a minimum uptime of 99.9%, ensuring availability for users to access and update inventory data at any time.

3-Data Synchronization: Updates made to the inventory should be reflected in the system within 1 minute, ensuring real-time data accuracy.

3.6.2 Dependability Requirements

1-Reliability: The system should be designed to handle hardware and software failures gracefully, with minimal disruption to users.

2-Fault Tolerance: In case of a failure, the system should automatically recover within 5 minutes, maintaining data integrity and availability.

3-Backup and Restore: The system should allow for regular backups (daily) and support easy recovery of data from the last backup in case of failure.

4-Error Handling: The system should provide meaningful error messages that guide the user towards resolving any issues.

3.6.3 Security Requirements

1-Authentication and Authorization:

User Authentication: Users must log in with a username and strong password, with multi-factor authentication (MFA) enabled for critical roles.

Role-Based Access Control (RBAC): Access to different parts of the inventory system should be controlled based on user roles (e.g., admin, user, guest), with the least privilege applied.

2-Data Protection:

Encryption: All sensitive data (e.g., device details, user credentials) should be encrypted be encrypted both at rest (AES-256) and in transit (TLS 1.2+).

Secure Storage: Sensitive information such as passwords must be stored securely using hashing algorithms.

3-Audit and Logging:

Access Logs: The system should maintain an audit trail of user activity, including logins, data modifications, and access to sensitive information.

4-Log Retention: Logs should be retained for at least 90 days for security auditing and troubleshooting purposes.

3.6.4 Usability Requirements

- Ease of Use: The Inventory Management System (IMS) should feature an intuitive user interface that allows shop owners and staff to navigate between functions such as inventory tracking, order management, and service records with ease.

- Accessibility: The system should be accessible from various devices (e.g., desktop computers, tablets, mobile phones) to meet different user needs and provide flexibility for staff who may need to work from different locations.
- User Training: A comprehensive user manual and interactive training modules should be available to facilitate quick learning and adoption of the system by staff.
- Error Prevention and Feedback: The system should include built-in features to prevent errors, such as real-time data validation, and provide user guidance with clear error messages when needed.
- Search and Filtering: The IMS should have robust search and filtering tools to help users quickly find products, service records, or transactions.

3.6.5 Operational and Environmental Requirements

- System Performance: The system should be able to handle large volumes of data and support a high number of concurrent users without significant performance degradation, ensuring smooth operation, especially during peak times.
- Compatibility: The system should be compatible with common operating systems such as Windows, macOS, and Linux.
- Data Security: The IMS should incorporate strong security protocols, including multi-factor authentication, data encryption, and regular backups to protect sensitive information.
- Scalability: The system should be designed to scale and accommodate future growth in product offerings and services without major overhauls.

- Network Requirements: The system should be optimized to function effectively over both wired and wireless networks to support shop operations in various environments.
- Maintenance and Technical Support: There should be a clear maintenance and support plan in place to ensure timely updates, issue resolution, and continuous system improvement.

3.6.6 Maintainability Requirements

- Modular Architecture: The system should be built with a modular architecture to make updates, modifications, and maintenance more efficient and less disruptive.
- Documentation: Comprehensive documentation should be provided, including user guides, technical specifications, and API documentation (if applicable).
- Automated Updates: The system should support automated updates to minimize downtime and ensure that the software remains up to date with the latest features and security patches.
- Error Logging and Monitoring: The IMS should include built-in error logging and real-time monitoring tools to identify and resolve issues quickly.
- Backup and Recovery: Automatic backups should be scheduled regularly (daily), and a recovery plan should be in place to restore the system in case of data loss or failure.
- Technical Support: Dedicated technical support should be available to help resolve more complex issues and maintain the system's stability.

3.7 Data requirements

1. Entities and Data Fields

Products

- Product ID (unique identifier)
- Product Name
- Category (e.g., desktops, laptops, peripherals, components)
- Brand
- Model
- Description
- Quantity in Stock
- Reorder Level (minimum stock level for alerts)
- Purchase Price
- Selling Price
- Supplier ID (link to supplier details)
- Status (e.g., available, out of stock)

Suppliers

- Supplier ID (unique identifier)
- Supplier Name

- Contact Name
- Phone Number
- Email Address
- Address (e.g., street, city, zip code)

Orders (Sales)

- Order Date
- Product IDs and Quantities
- Total Amount

Purchases (Restocking)

- Purchase ID (unique identifier)
- Purchase Date
- Supplier ID (link to supplier details)
- Product IDs and Quantities
- Total Cost
- Payment Status (e.g., paid, pending)

Inventory Logs

- Log ID (unique identifier)

- Date and Time
- Action Type (e.g., add stock, remove stock, transfer stock)
- Product ID
- Quantity Changed
- Updated By (user ID)

Users

- User ID (unique identifier)
- User profiles: Name, contact information, email address, preferred language.
- Username
- Role (owner, staff, supplier)
- Password (encrypted)

4.0 Analysis and design

4.1 Activity Diagrams

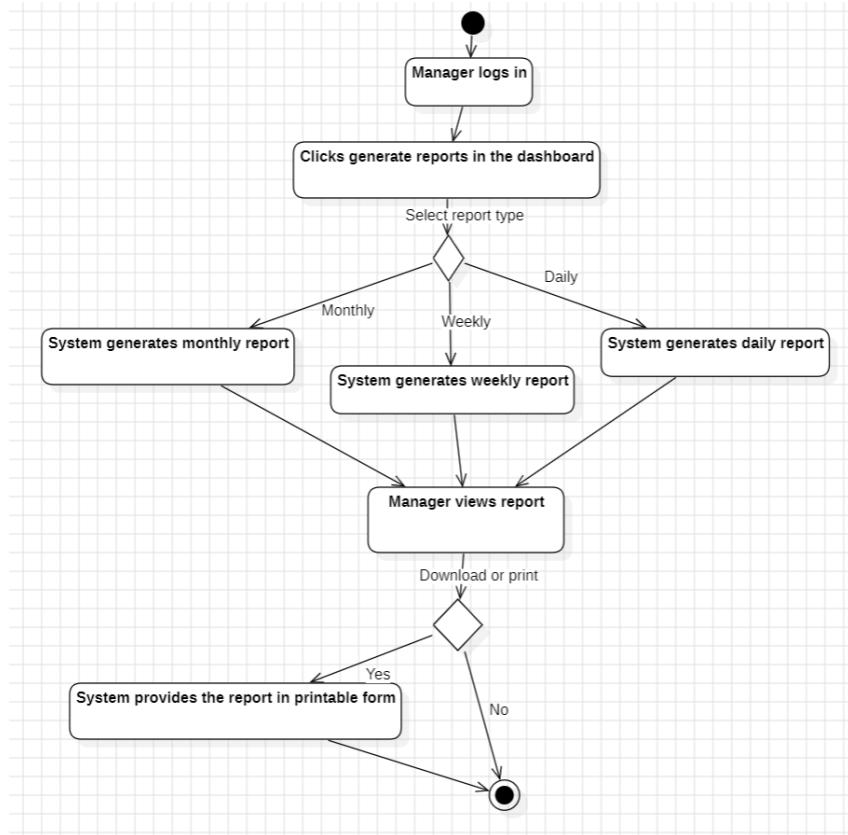


Figure 8 Activity diagram

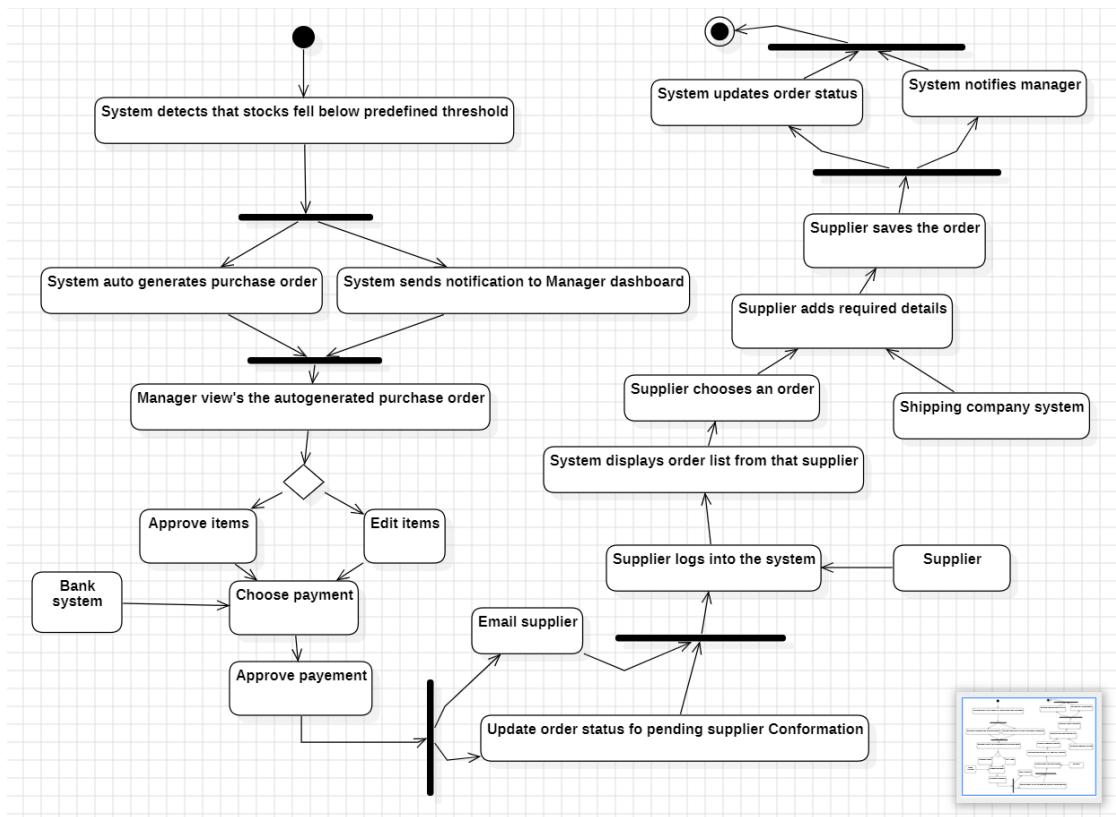


Figure 9 Order activity diagram

4.2 Sequence Diagrams

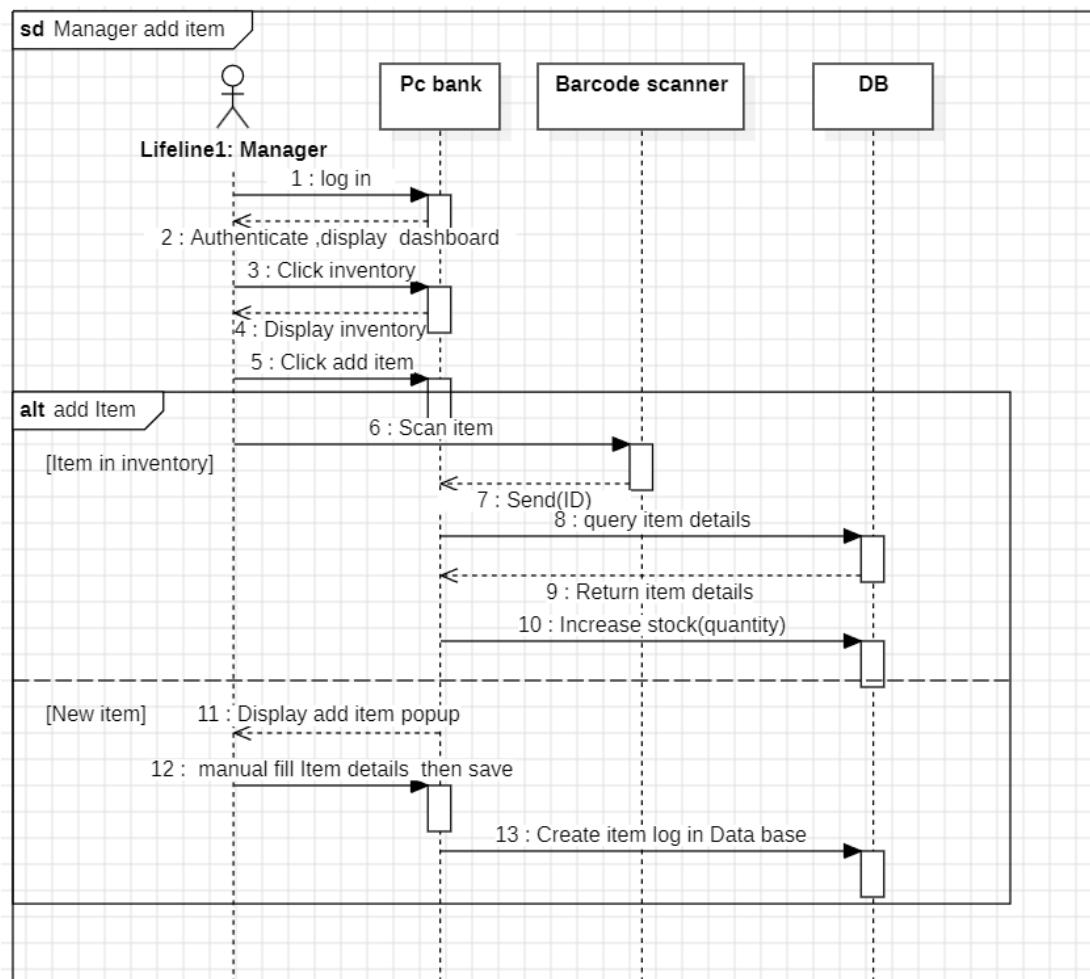
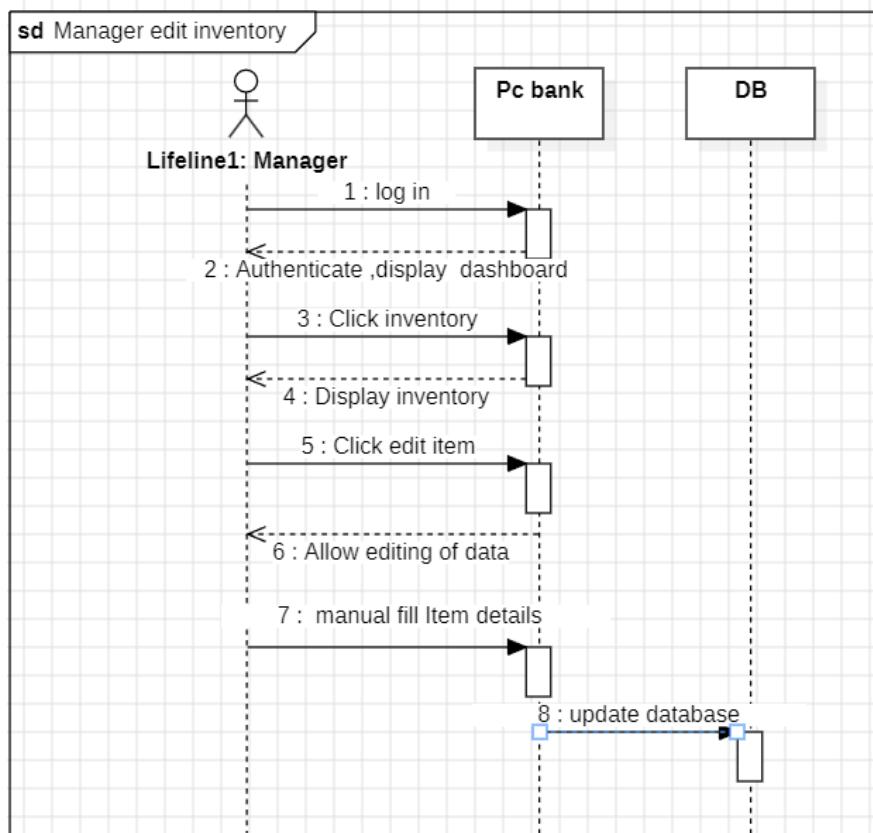
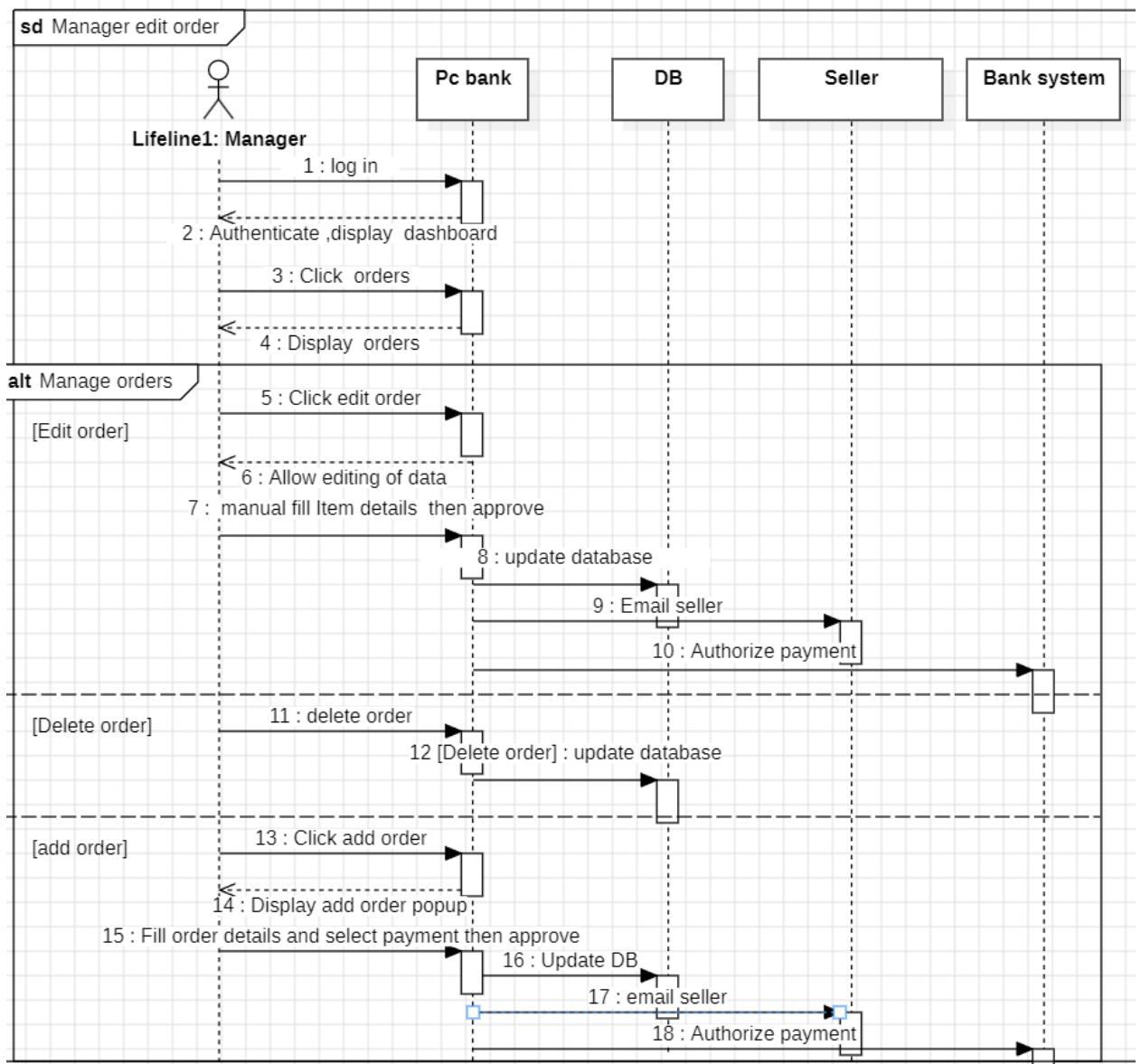


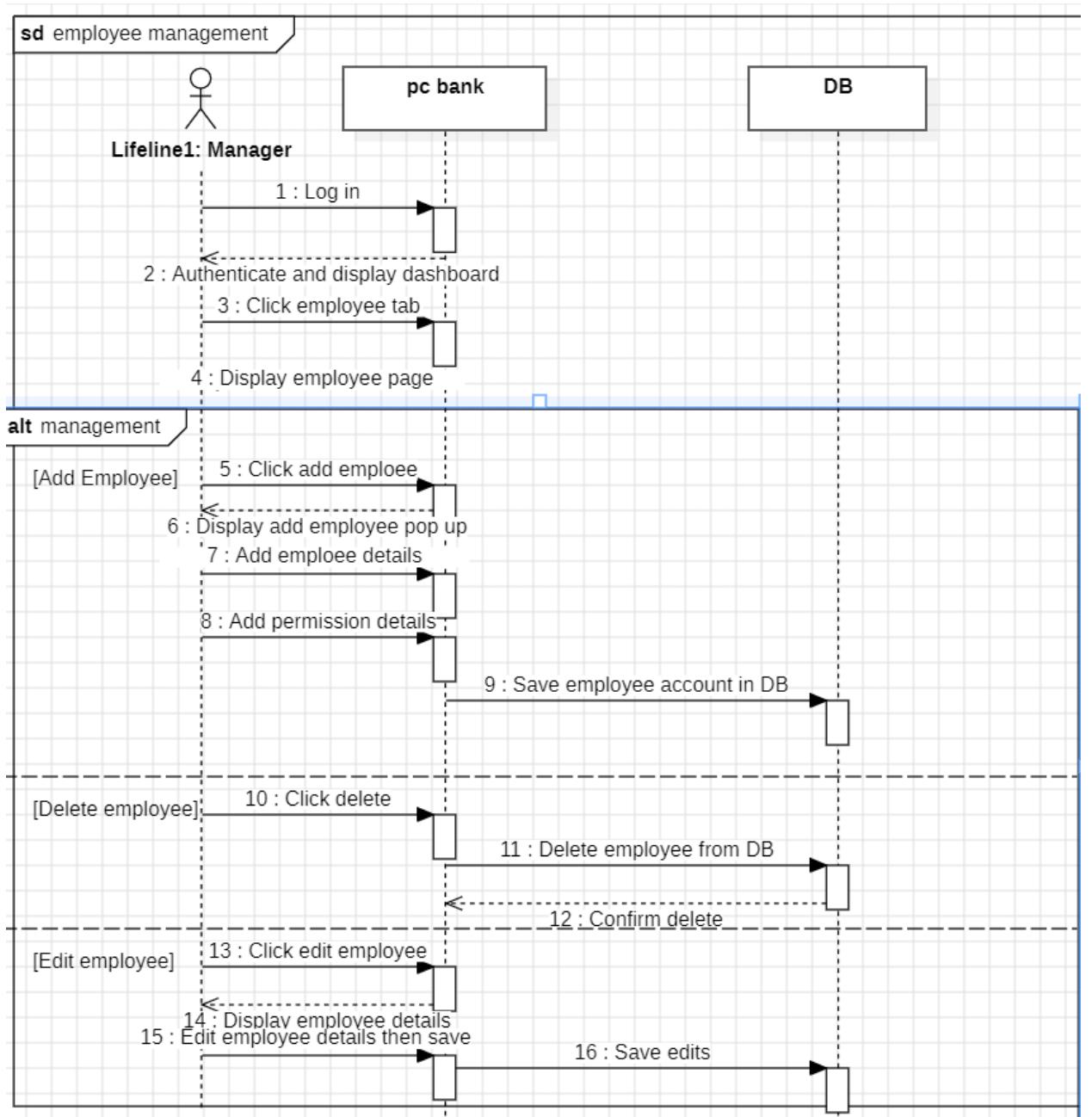
Figure 10 Manager sequence



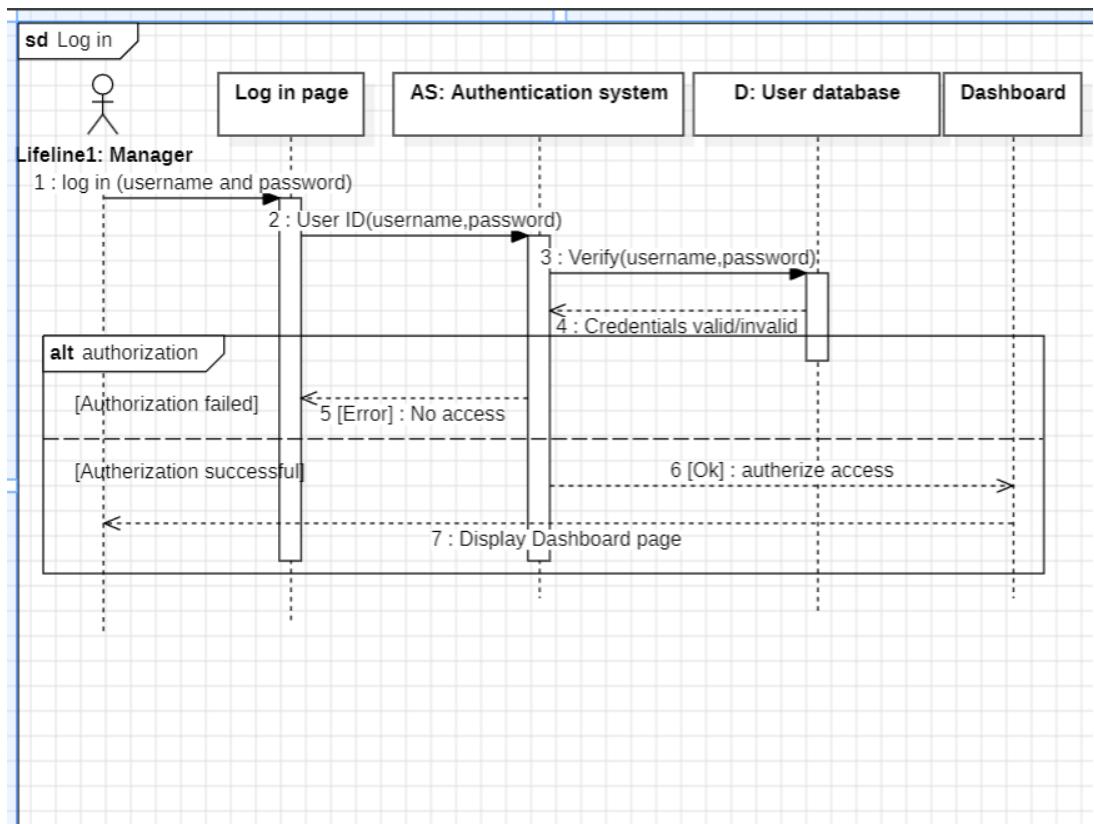
manager edit inventory11 Figure



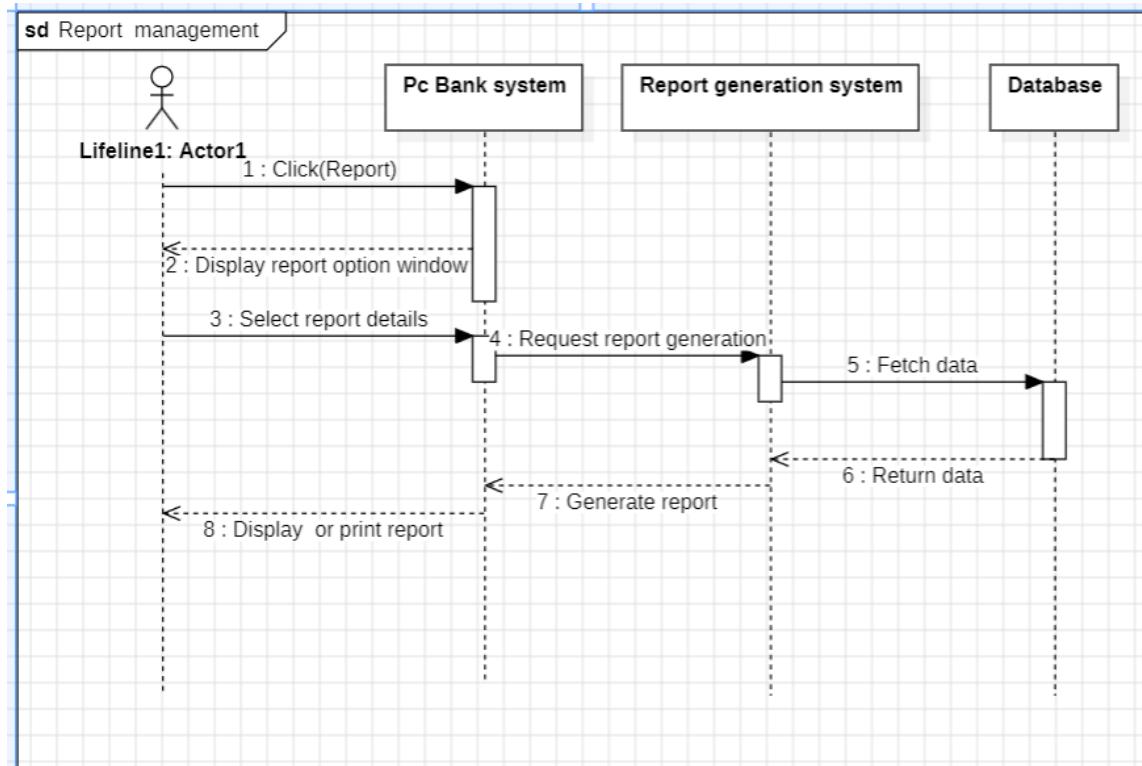
manager edit order sequence 12 Figure



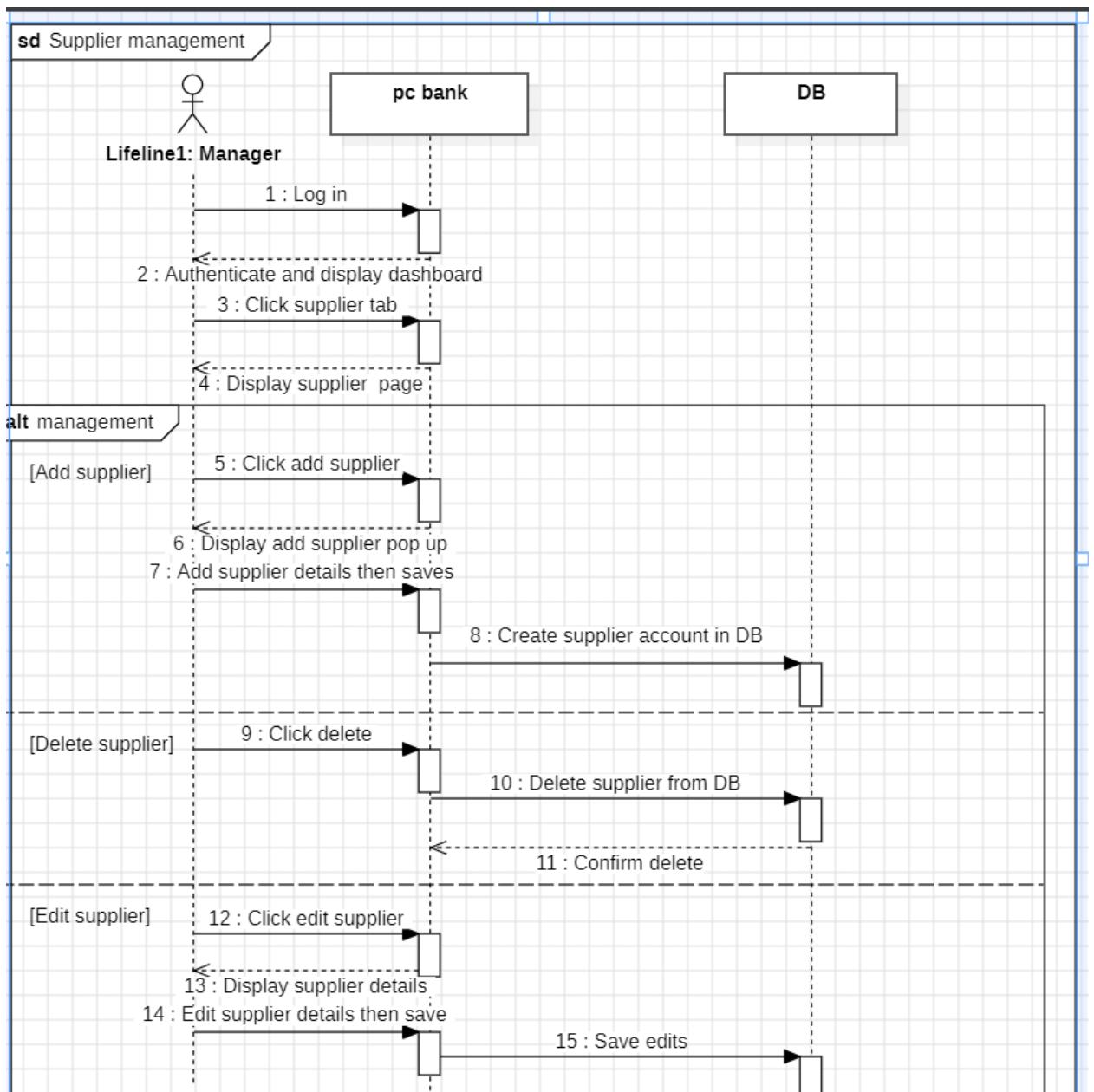
Manager manage employees sequence 13 Figure



Manager log in sequence 14 Figure



manager report management 15 Figure



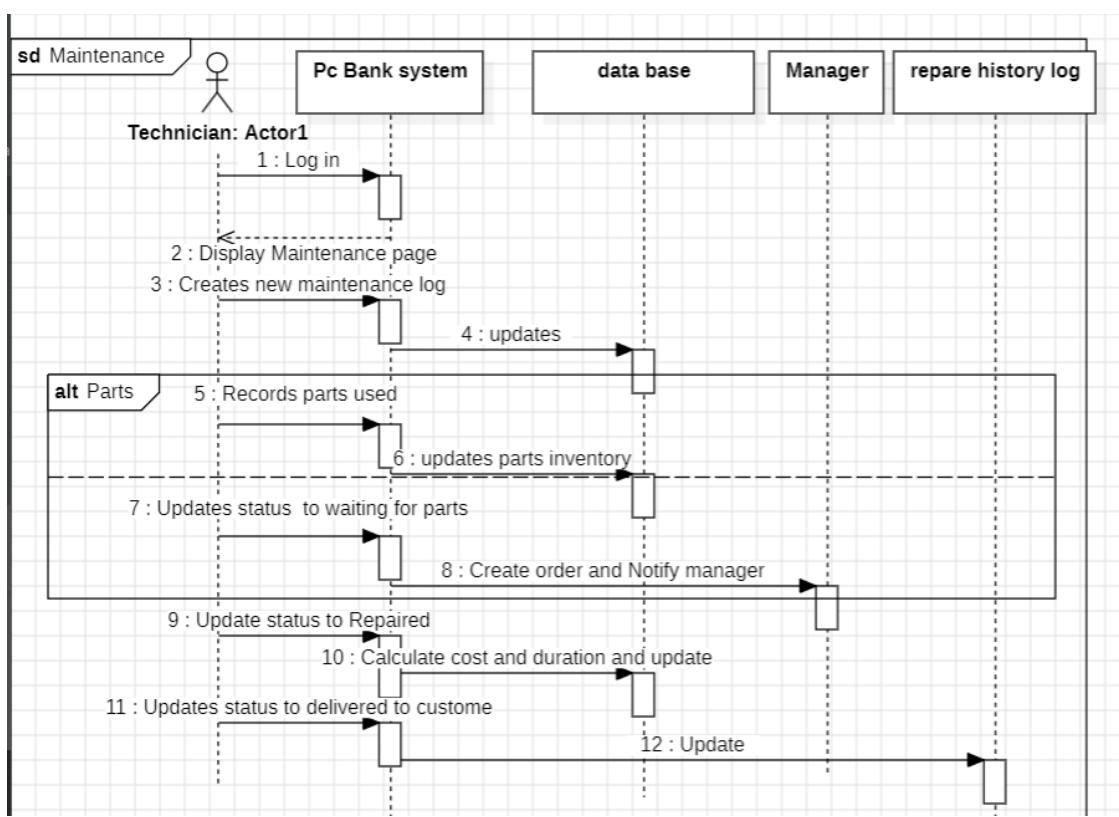
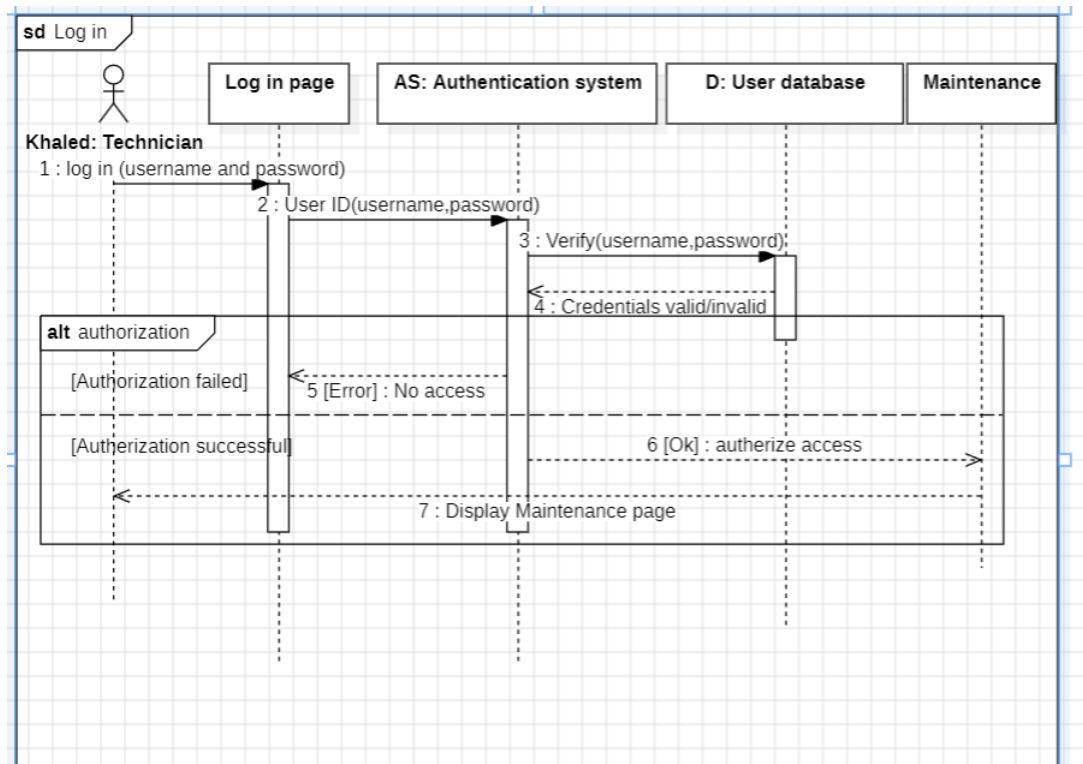
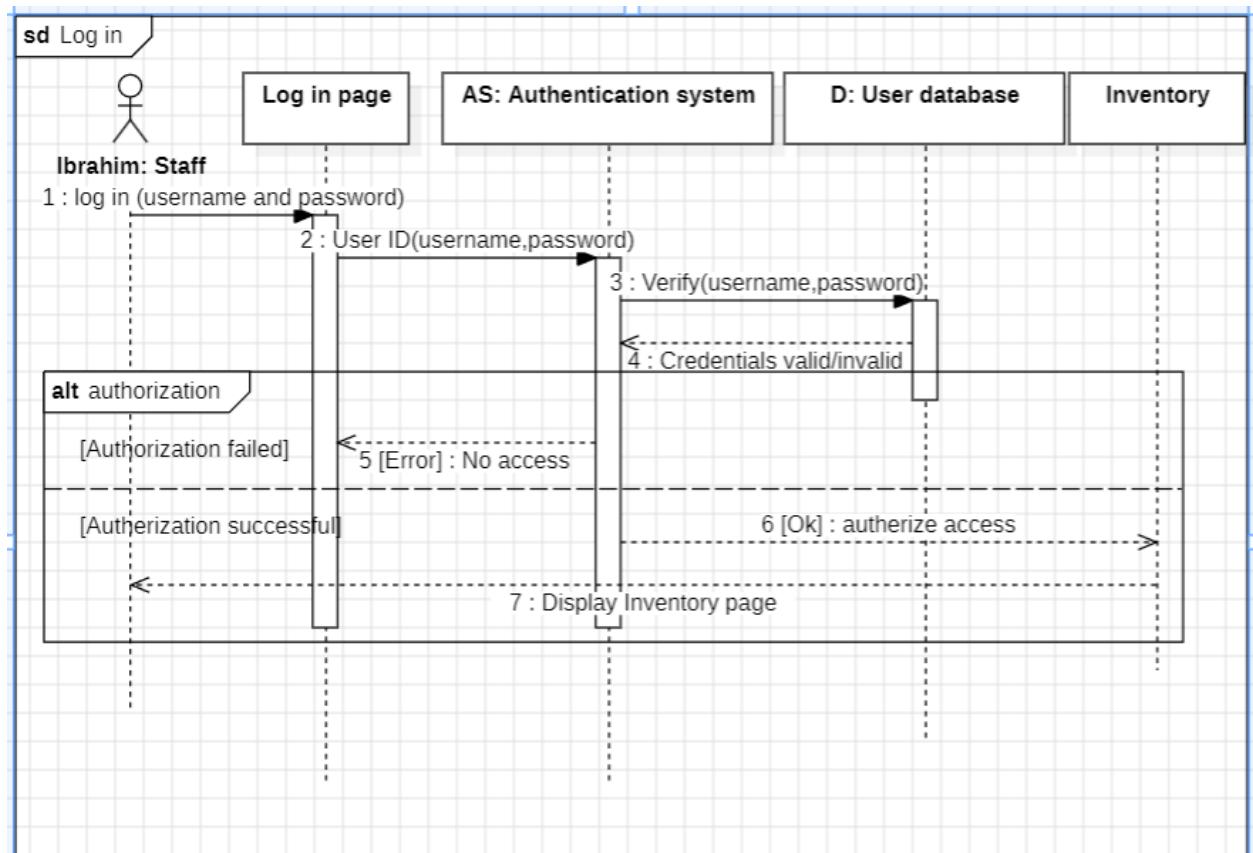
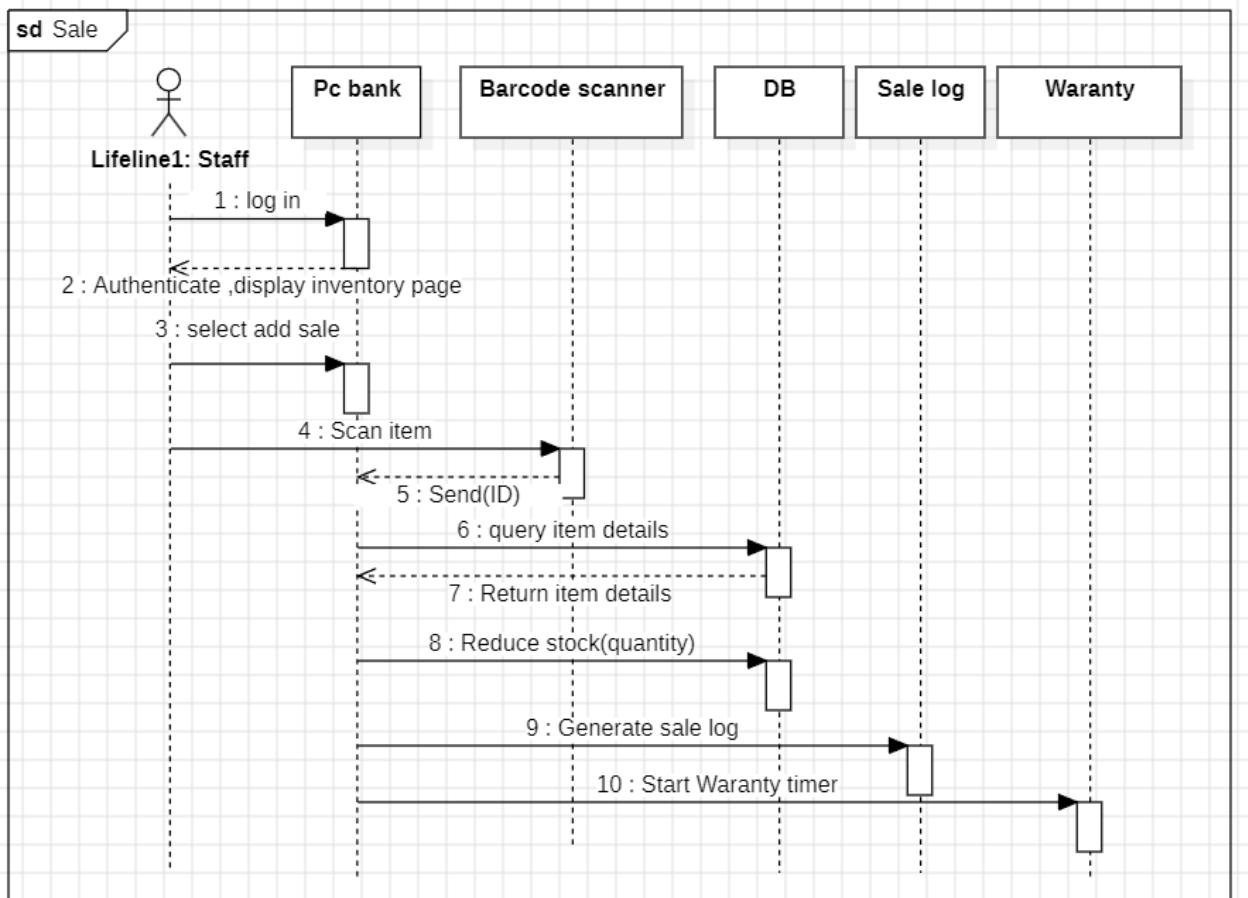


Figure 16 maintainance sequence



Staff sequence 17 Figure



staff sale sequence 18 Figure

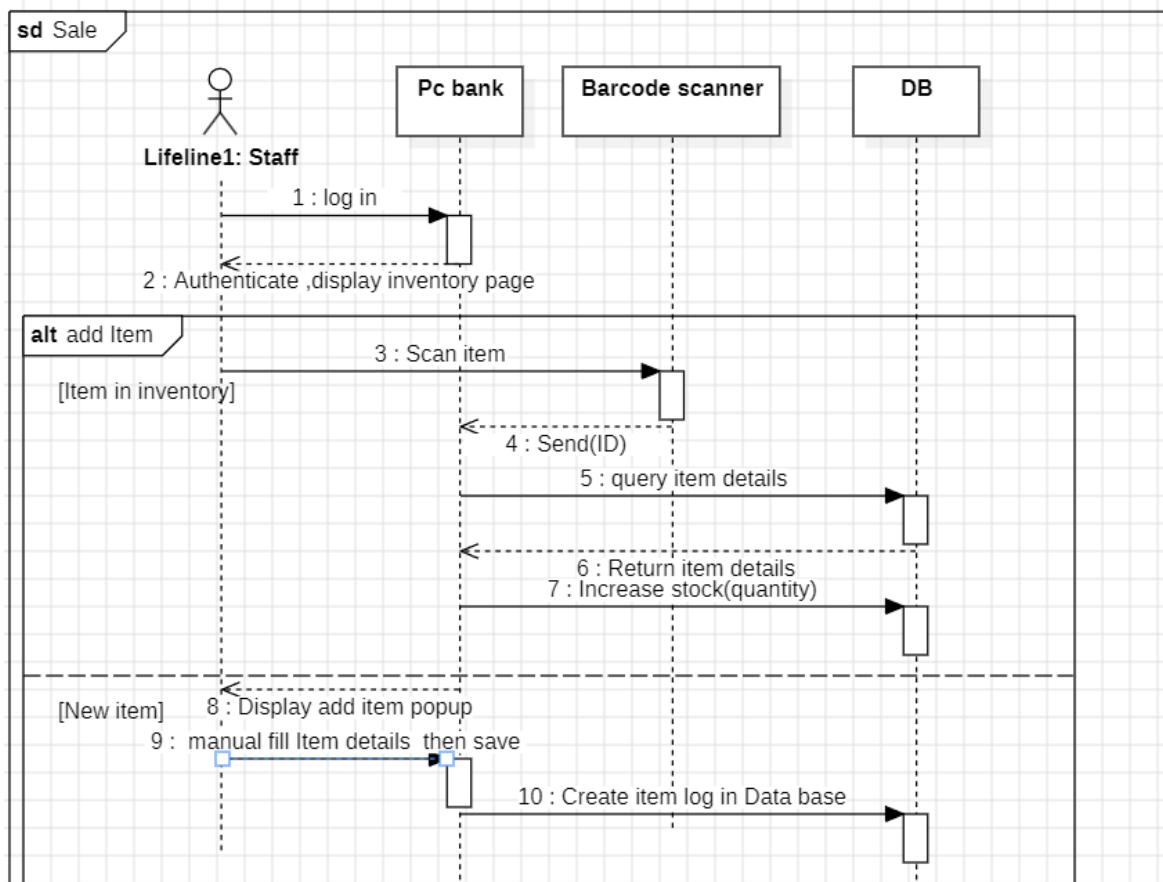
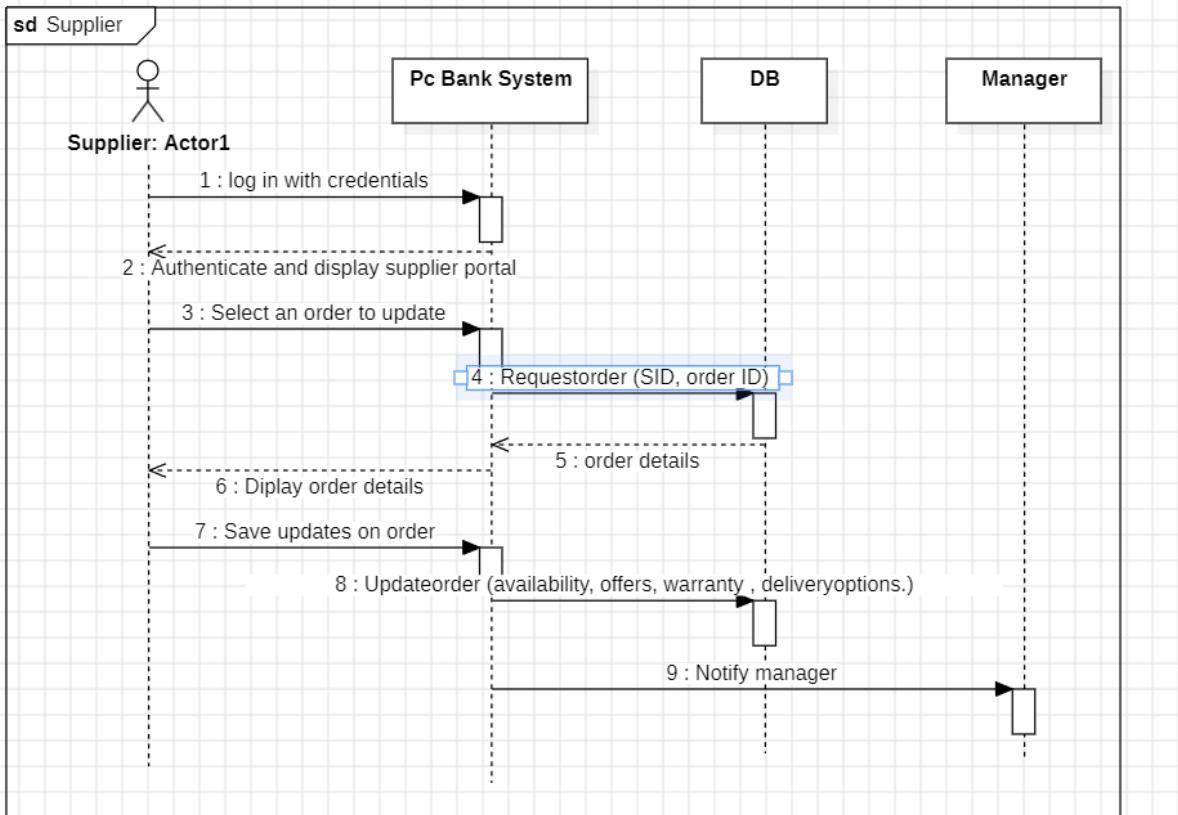
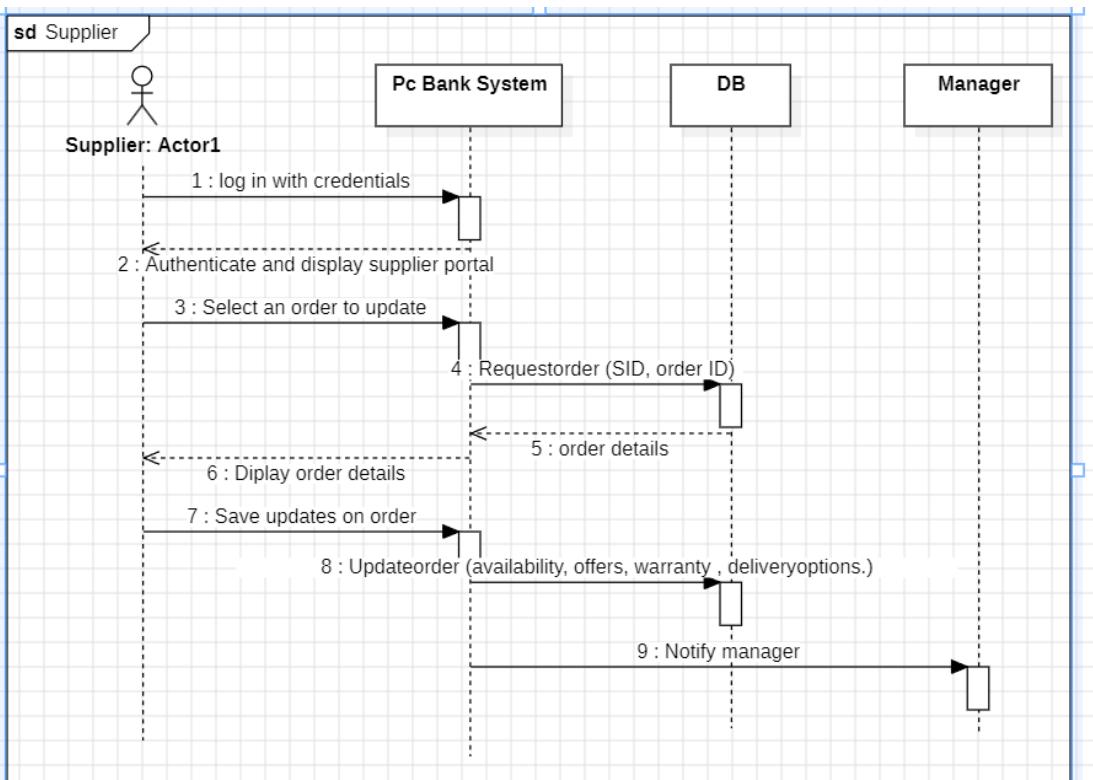


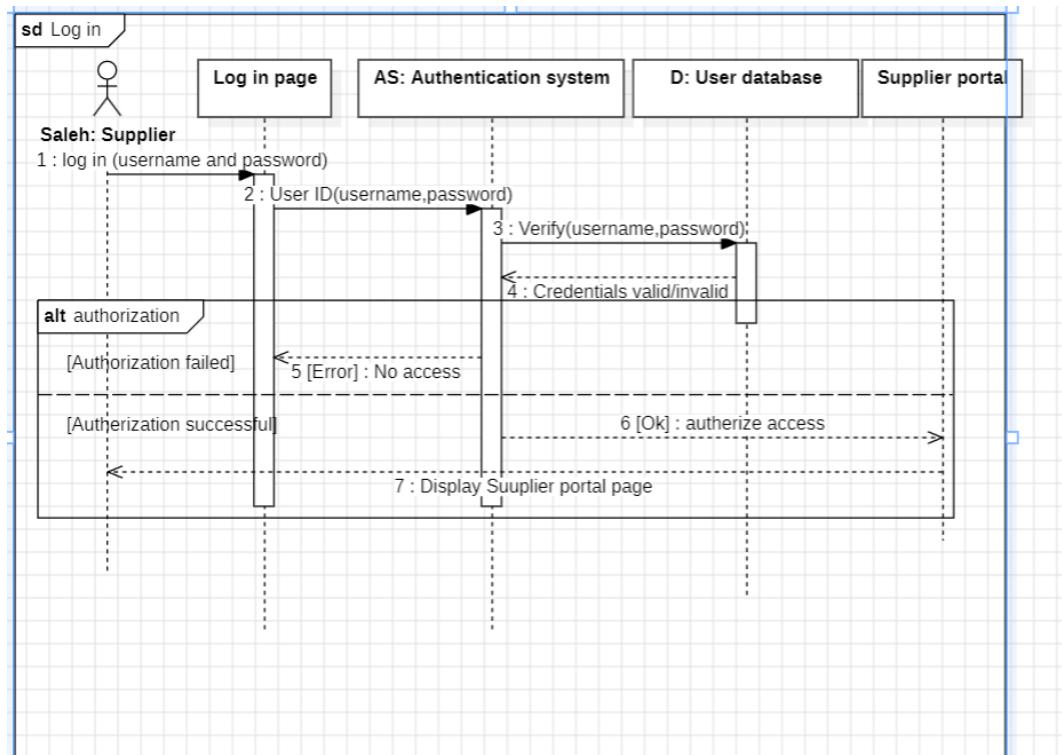
Figure 19 Staff sale sequence



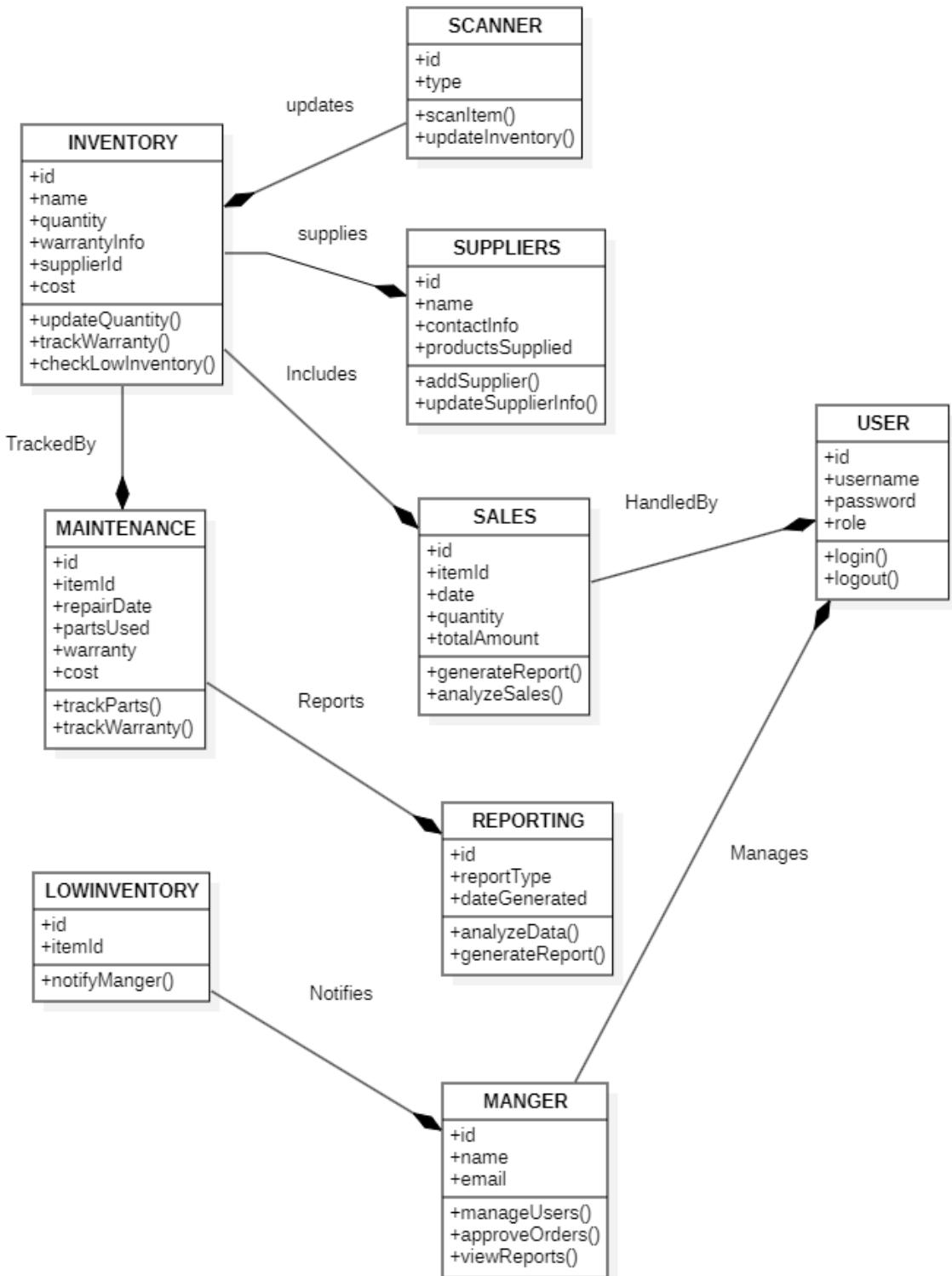
supplier sequence20 Figure



supplier edit order sequence21 Figure

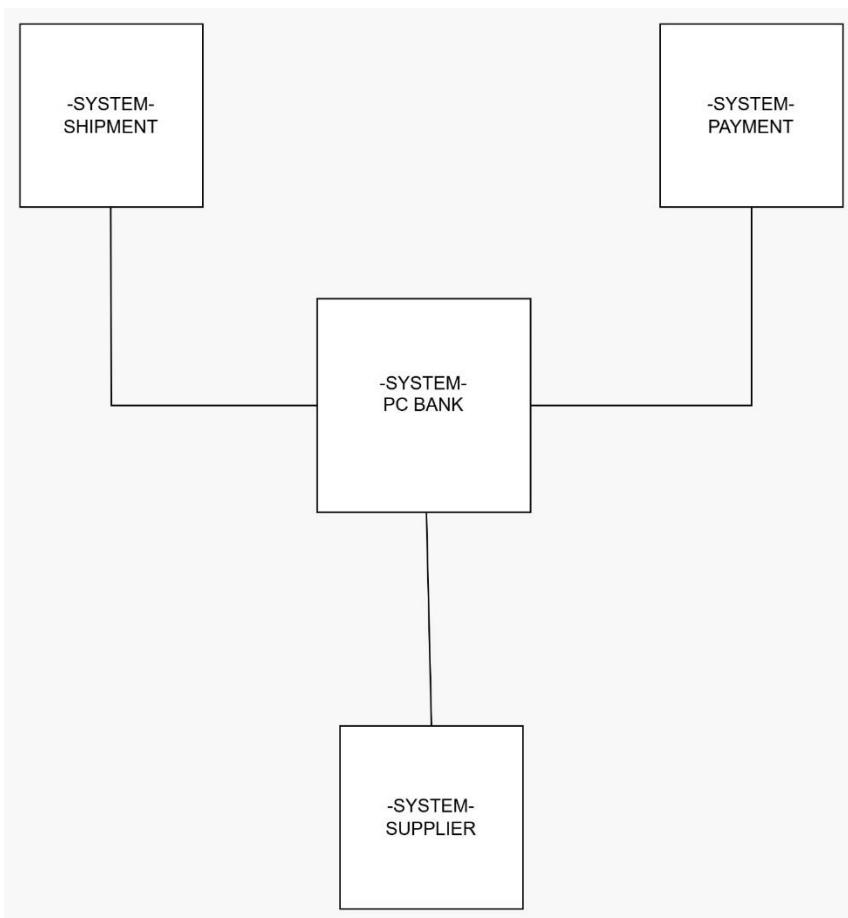


4.3 Class Diagram



class diagram 22 Figure

4.4 Architecture Design



architecture sequence 23 Figure

4.5 Classes and Components Design

Inventory Management ()
Input: Enter product details (product name, type, quantity, price, reorder level), scan barcodes to add products and edit or delete products from the inventory.
Output: Display the list of available products, notifications for low stock or old stock items and updated inventory reports.

Sales Management ()
Input: Enter sales data (product name, quantity, price), scan barcodes to record sold items.
Output: Sales update with warranty details, Real-time stock updates after sales and sales reports (best-selling items, revenue trends).

Supplier Management ()
Input: Add supplier details (name, contact, email, order history), edit or delete supplier information. Output: Display a list of active suppliers and reports on supplier orders and payments.

Maintenance and Warranty Management ()
Input: Log maintenance requests (serial number, issue, parts used), update maintenance status (Under Repair, Waiting for Parts, Completed).
Output: Maintenance history logs, notifications about repair status and reports on active or expired warranties.

Reporting and Analytics ()
Input: Select report type (daily, monthly, custom) and choose data to include (inventory, sales, maintenance).
Output: Downloadable reports (PDF/Excel) and visual analytics for sales trends and inventory insights.

Account Management ()
Input: Create employee accounts with roles and permissions and edit account details or delete accounts.
Output: Display a list of accounts with roles and permissions and notifications when accounts are modified.

System Notifications and Alerts ()
Input: Define stock thresholds for low-stock alerts and set a timeframe for unsold items.
Output: Low-stock alerts and notifications for old or unsold items.

classes and components design 24 Figure

4.6 Graphical User Interface Design

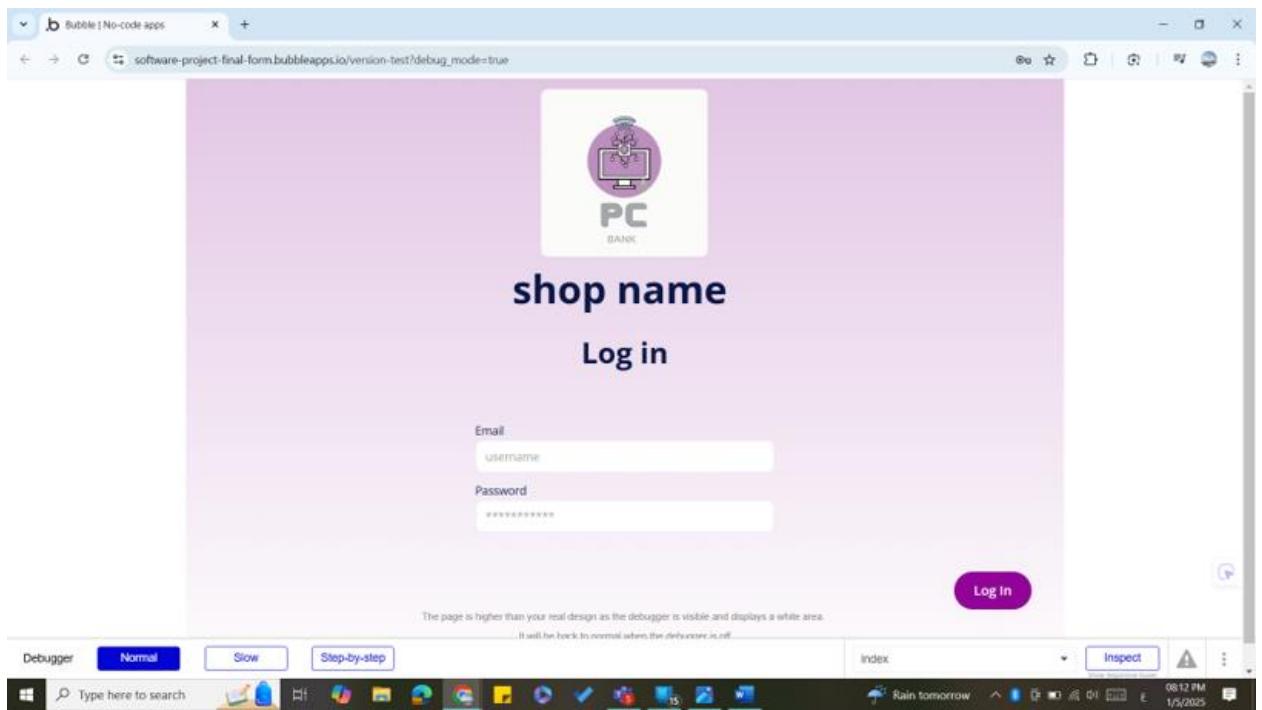


Figure 25graphic user interface

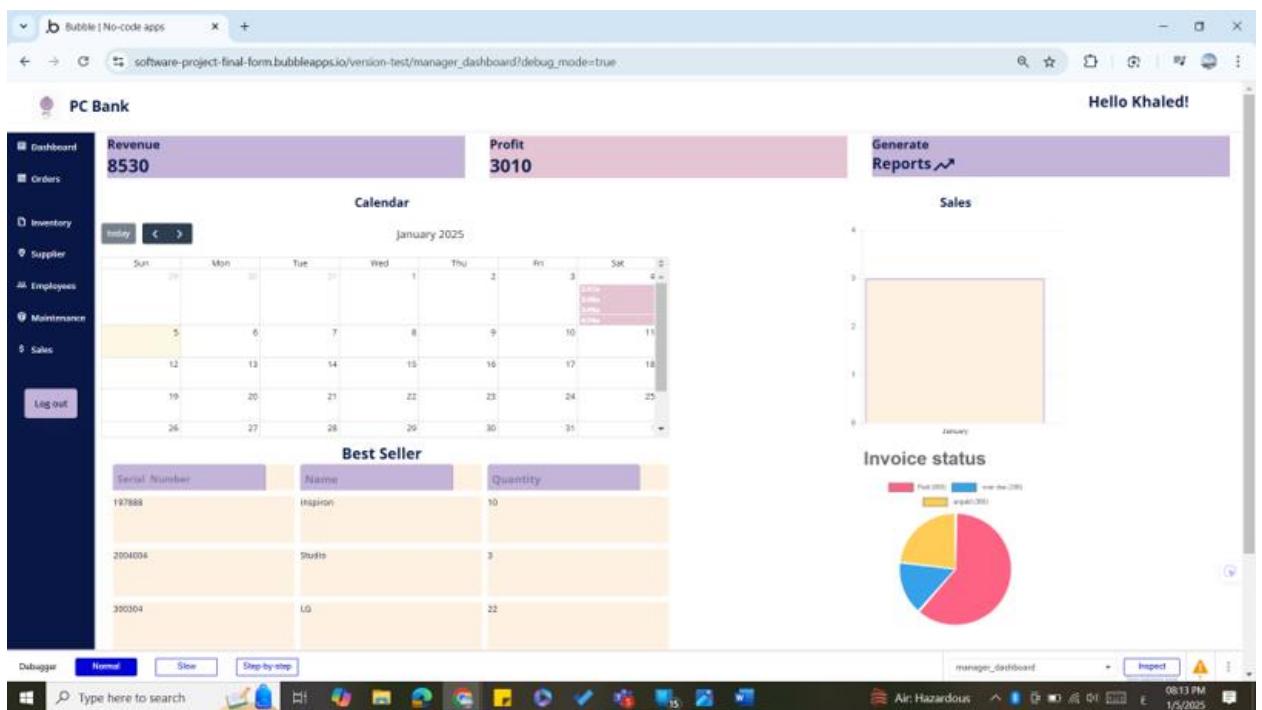


Figure 2

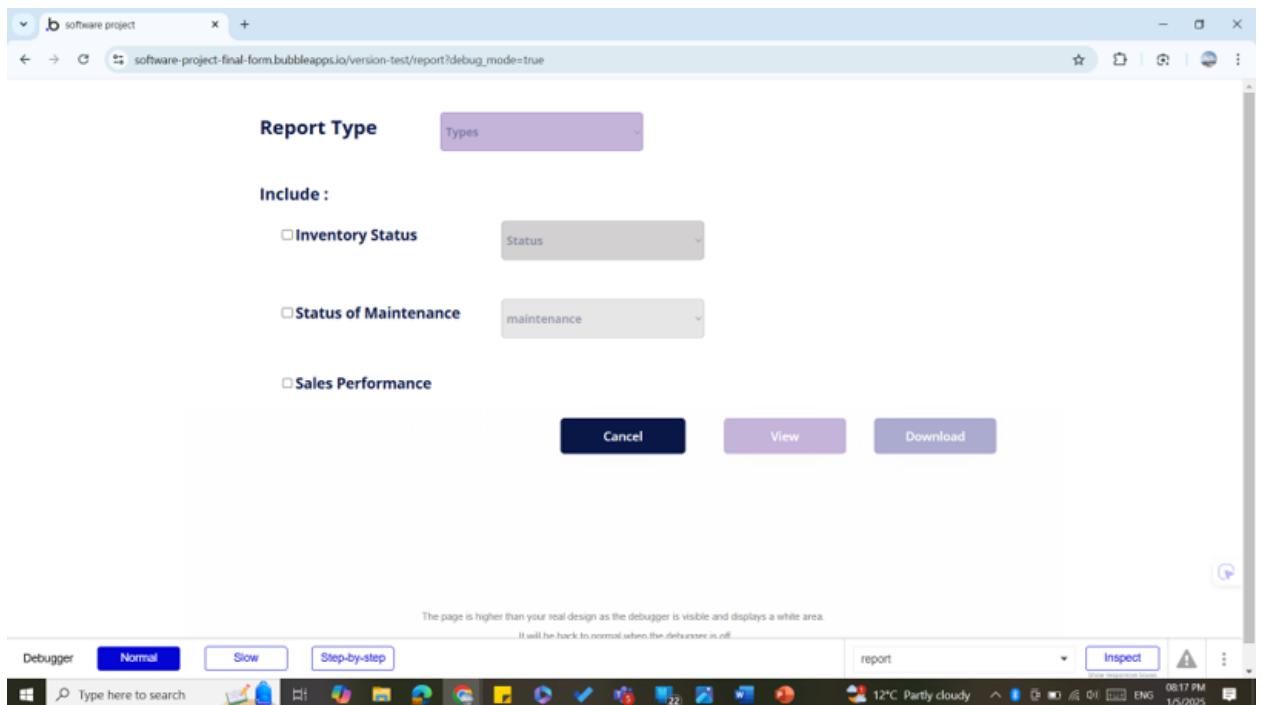


Figure 3

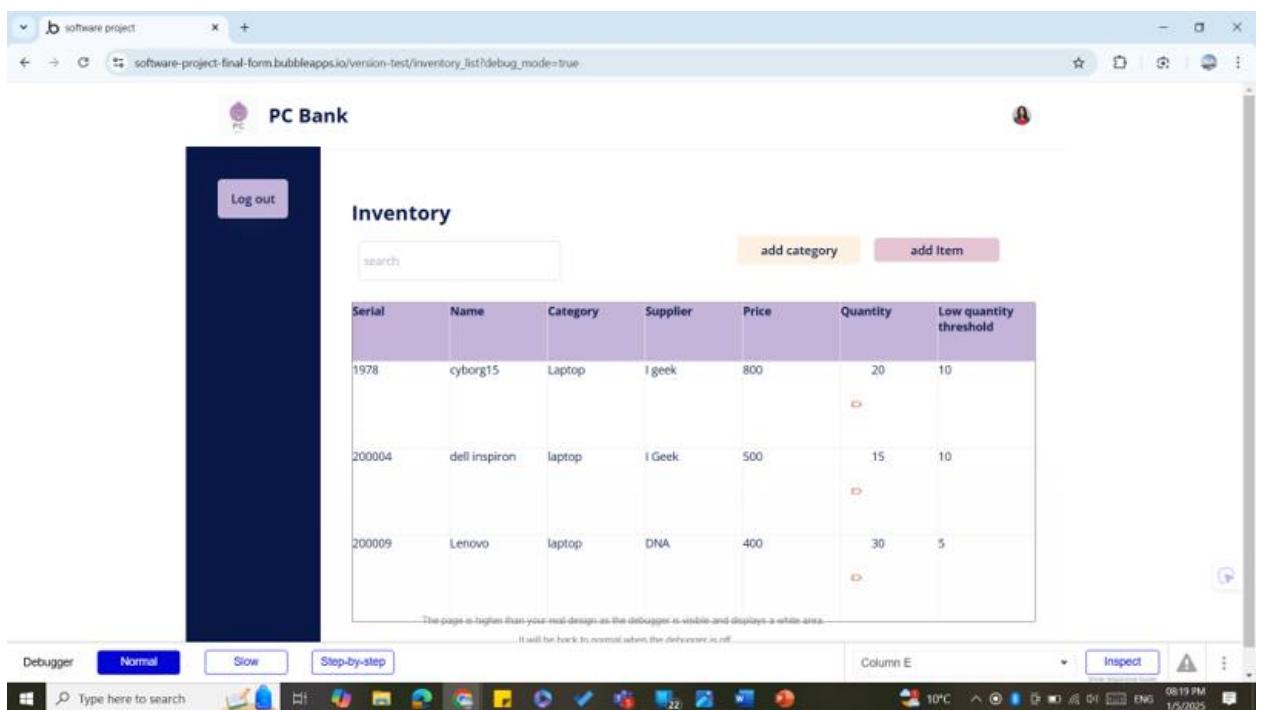


Figure 4

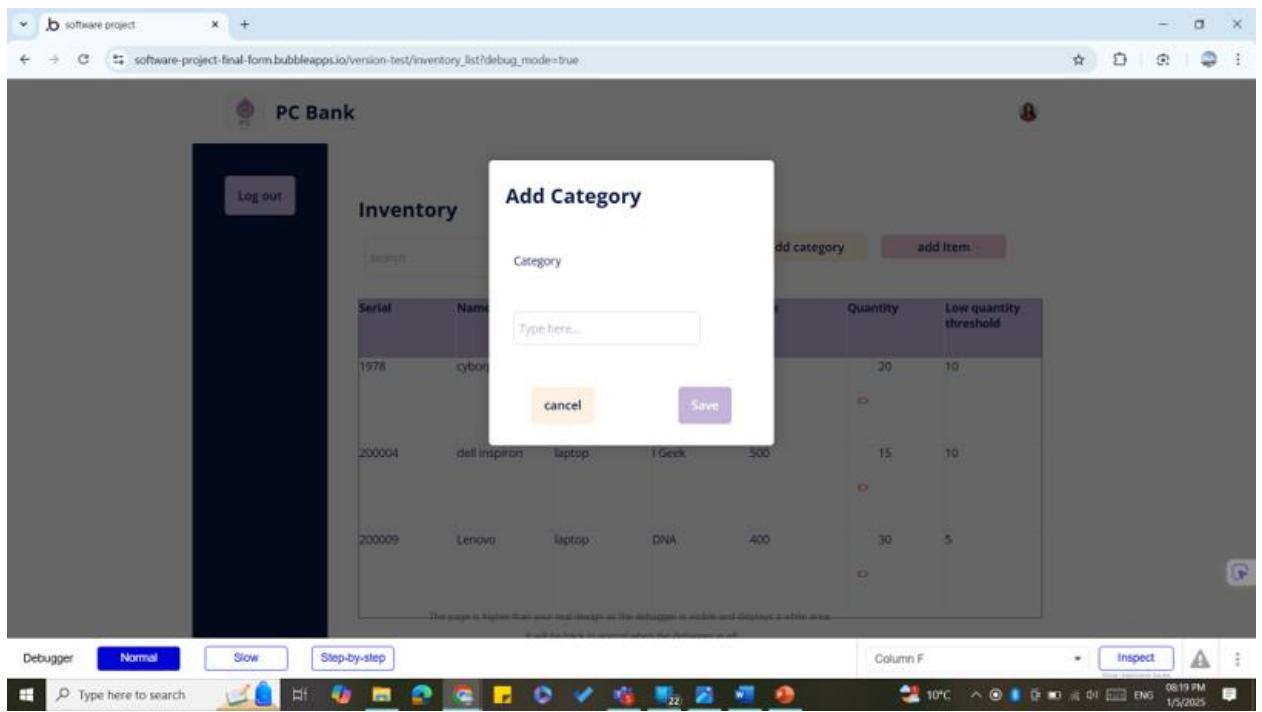


Figure 26

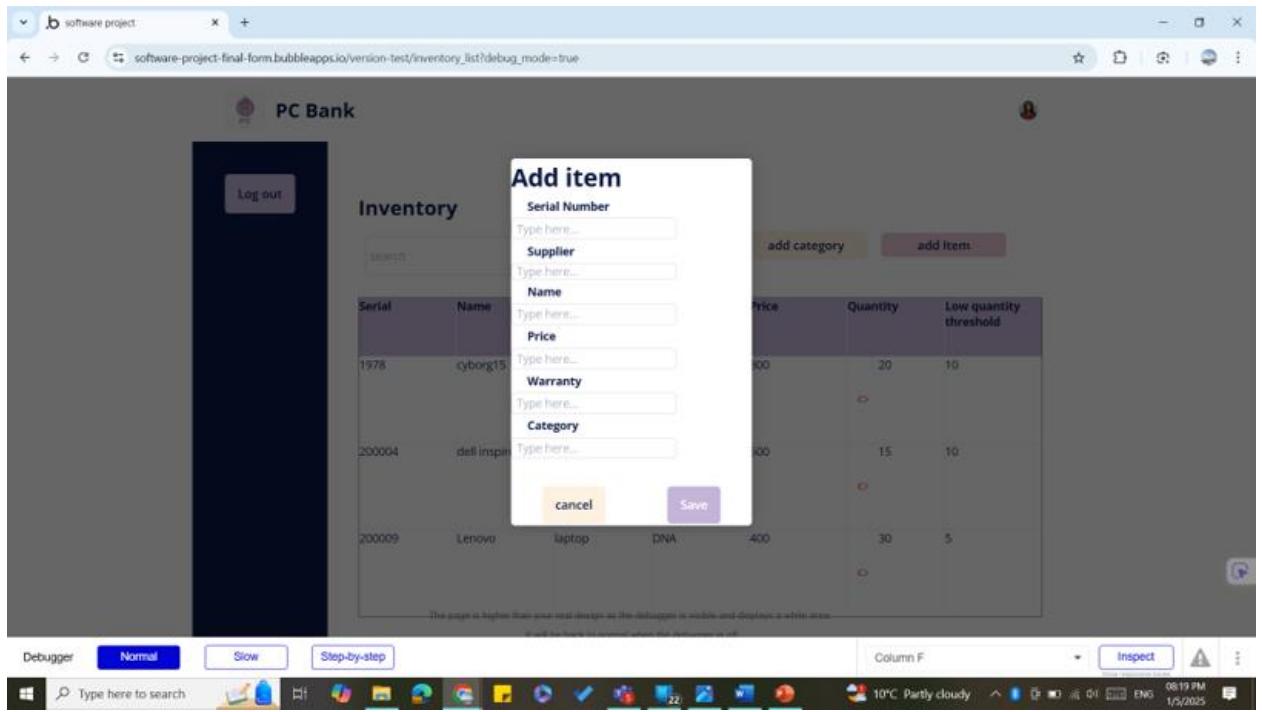


Figure 27

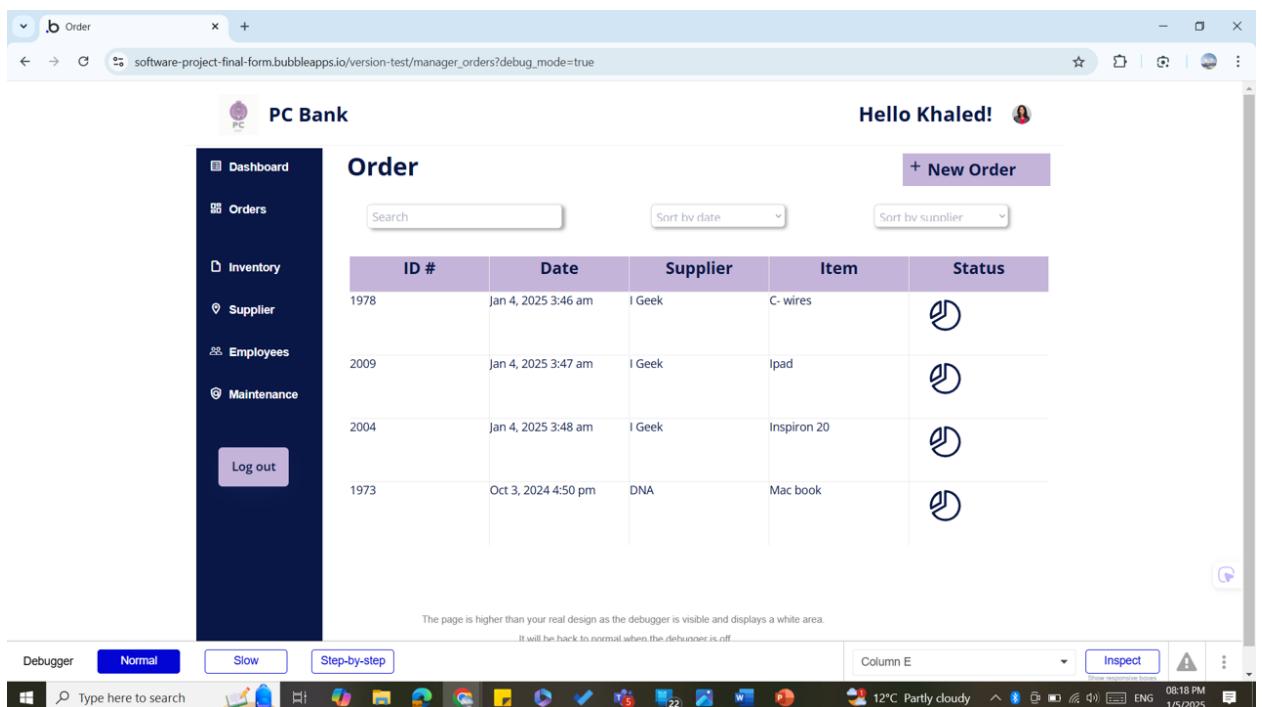


Figure 28

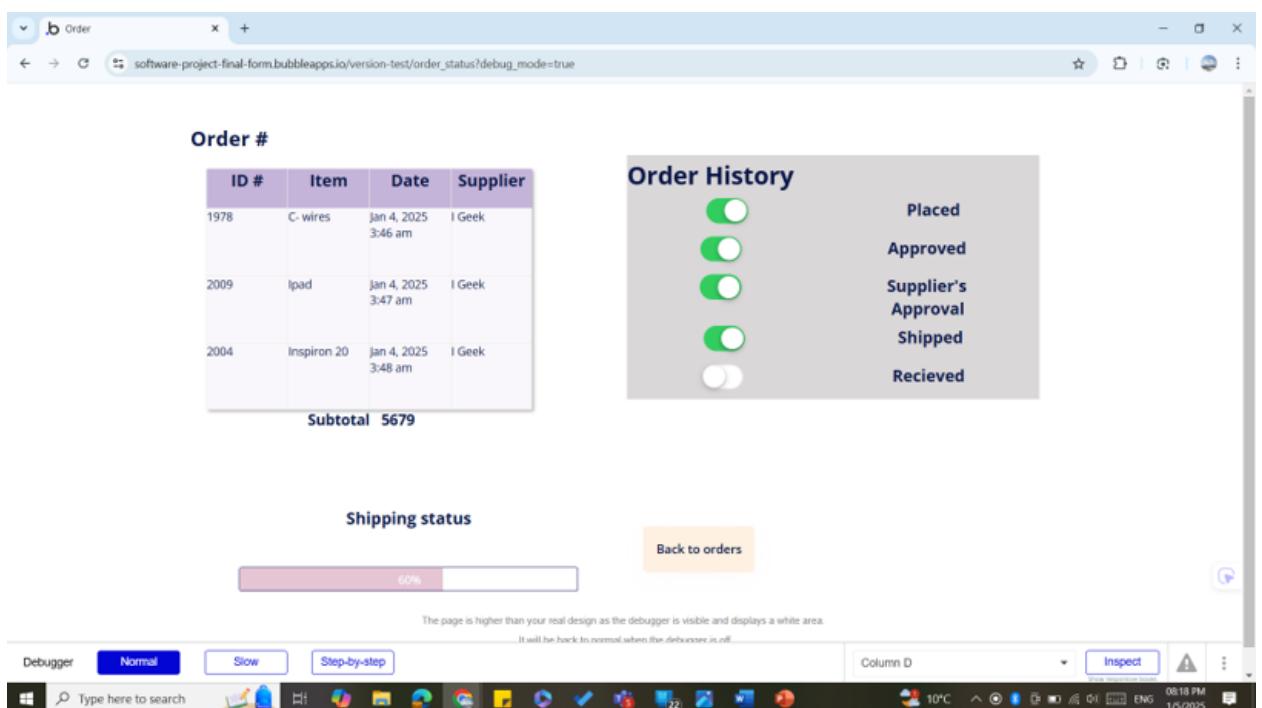


Figure 29

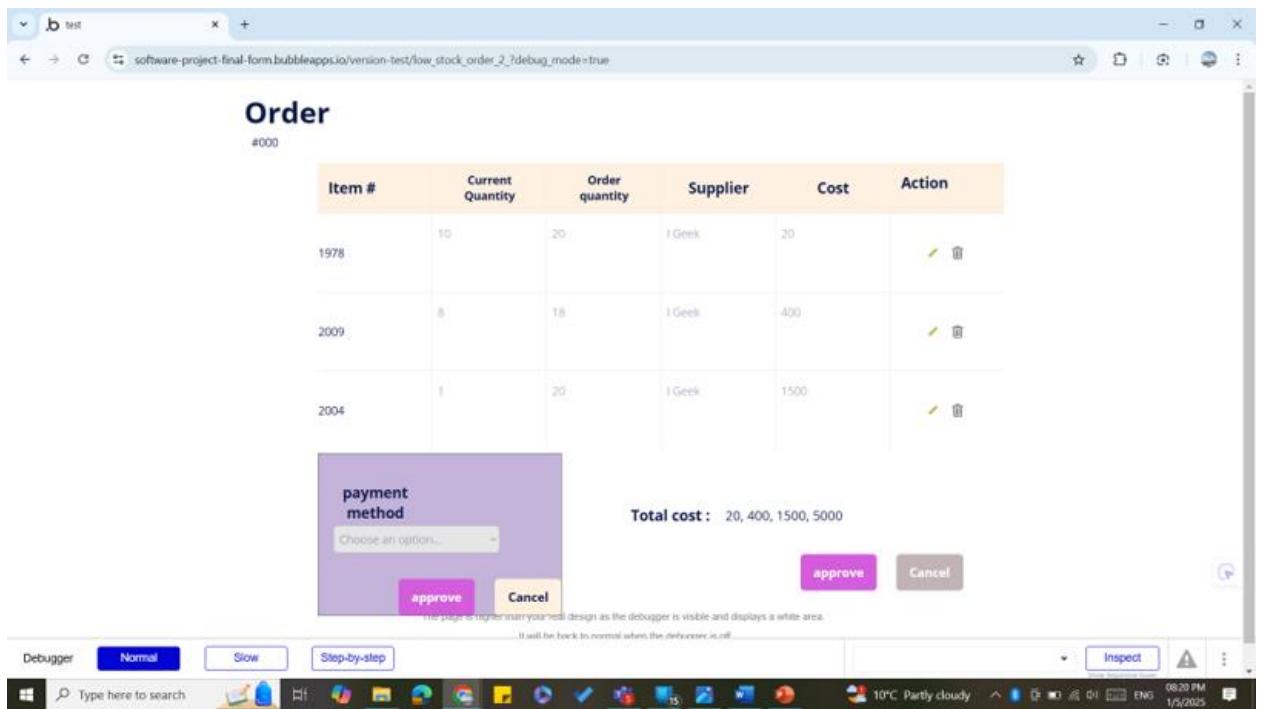


Figure 30

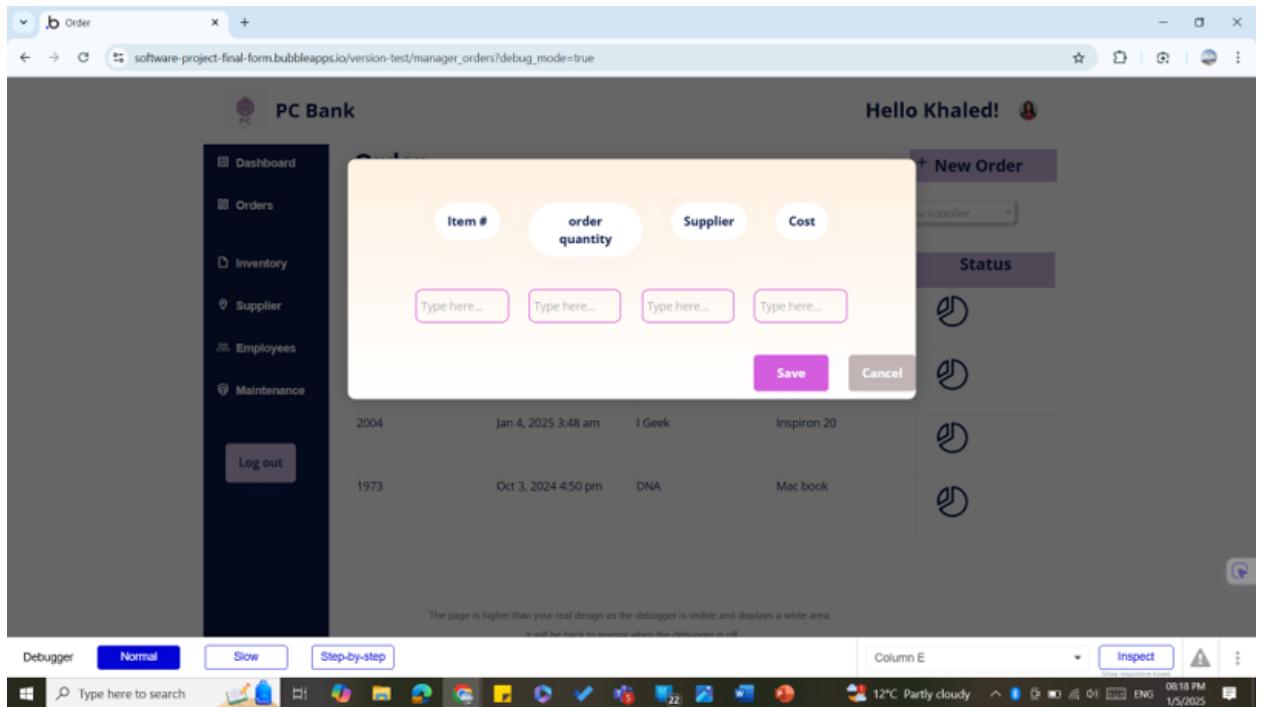


Figure 31

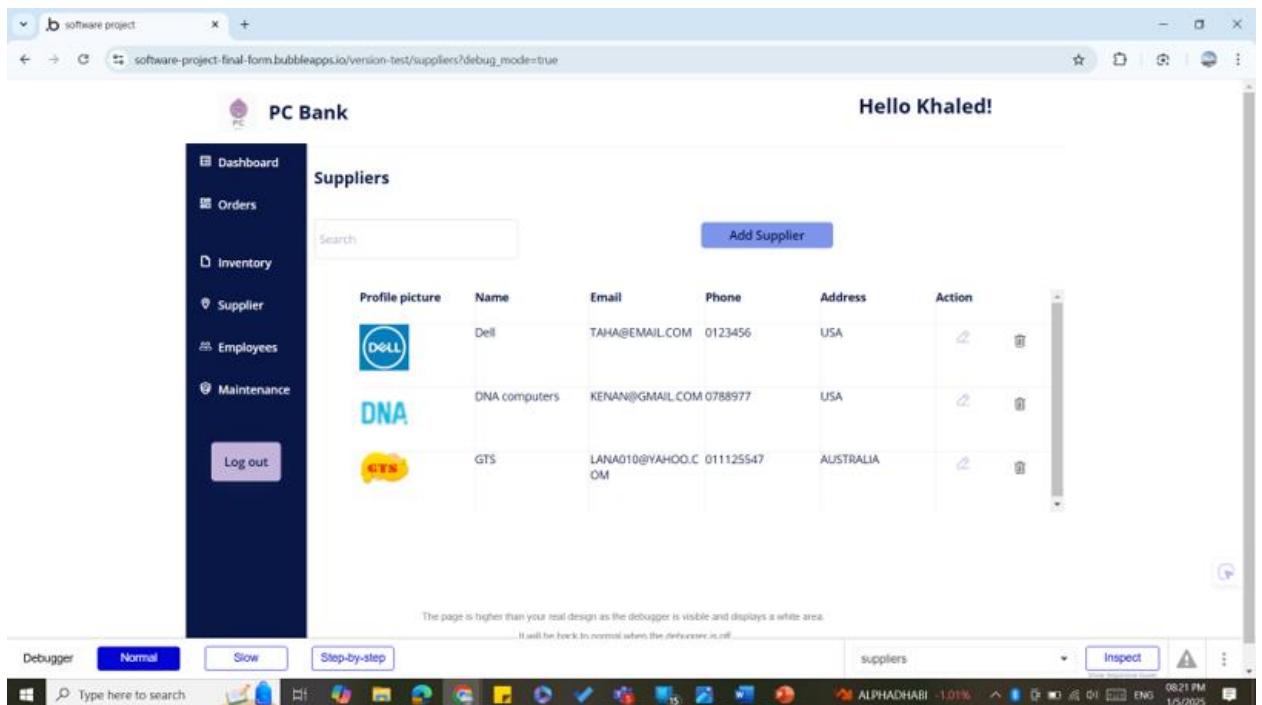


Figure 32

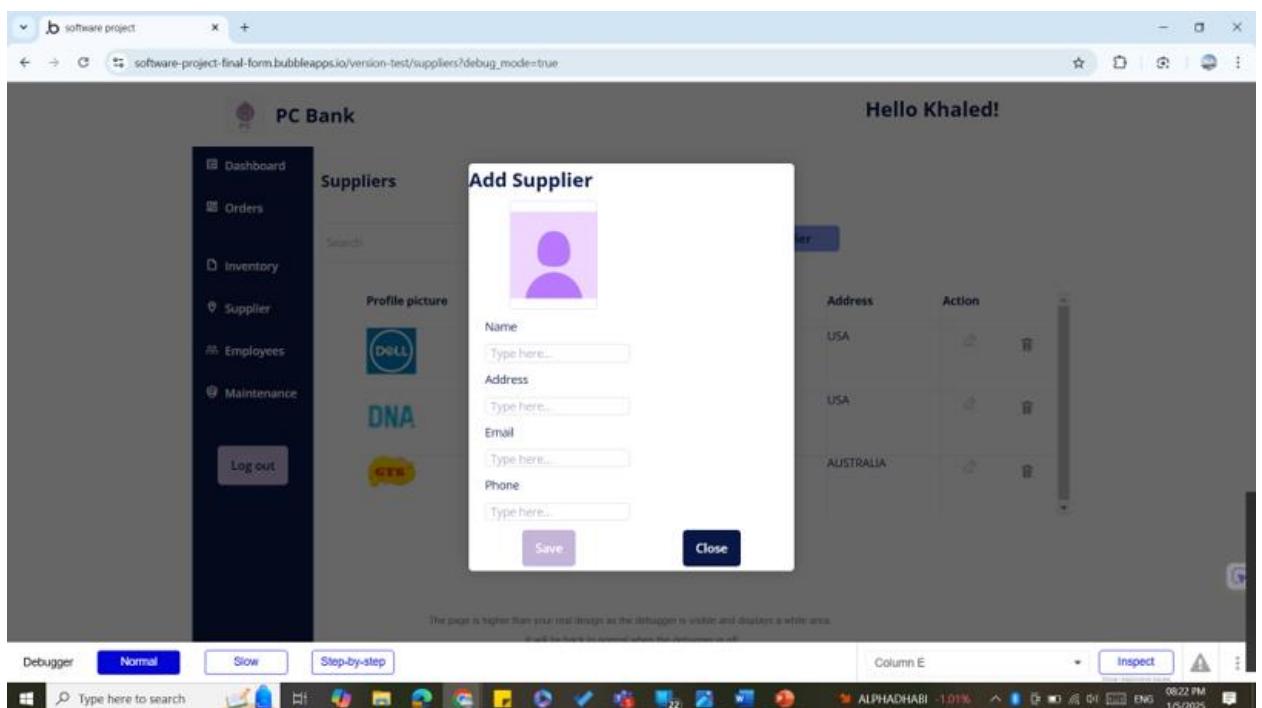


Figure 33

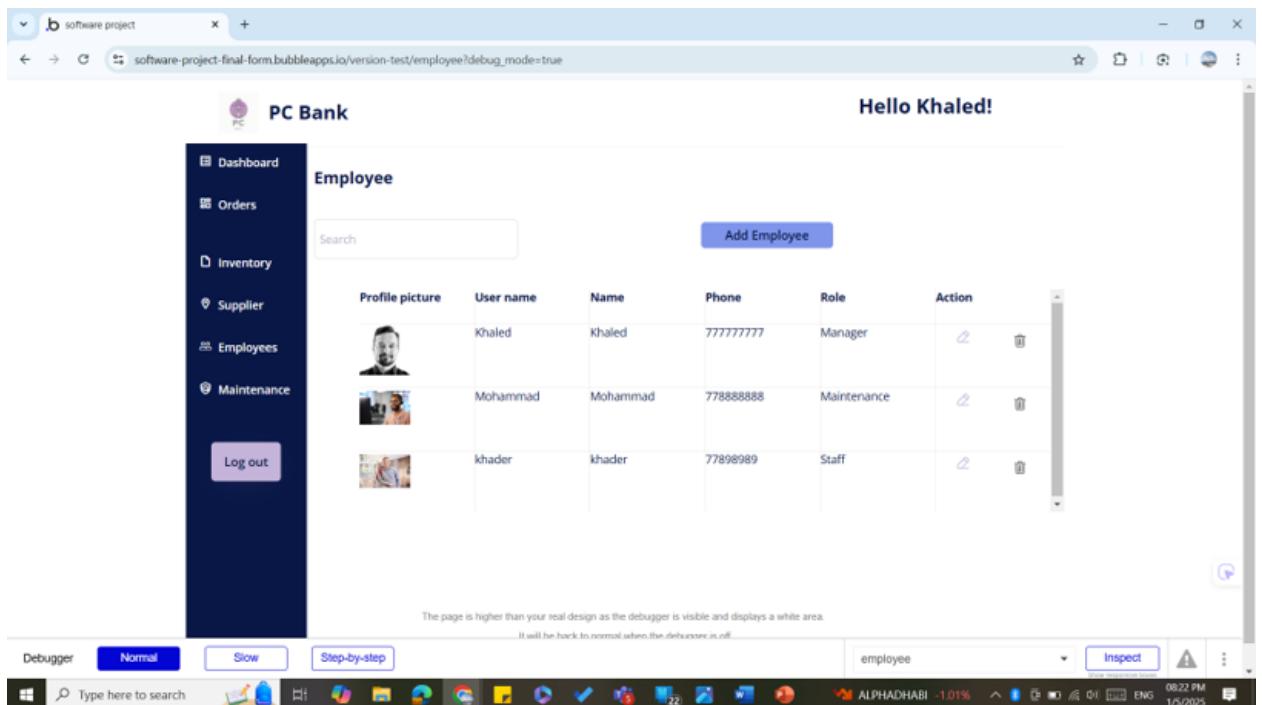


Figure 34

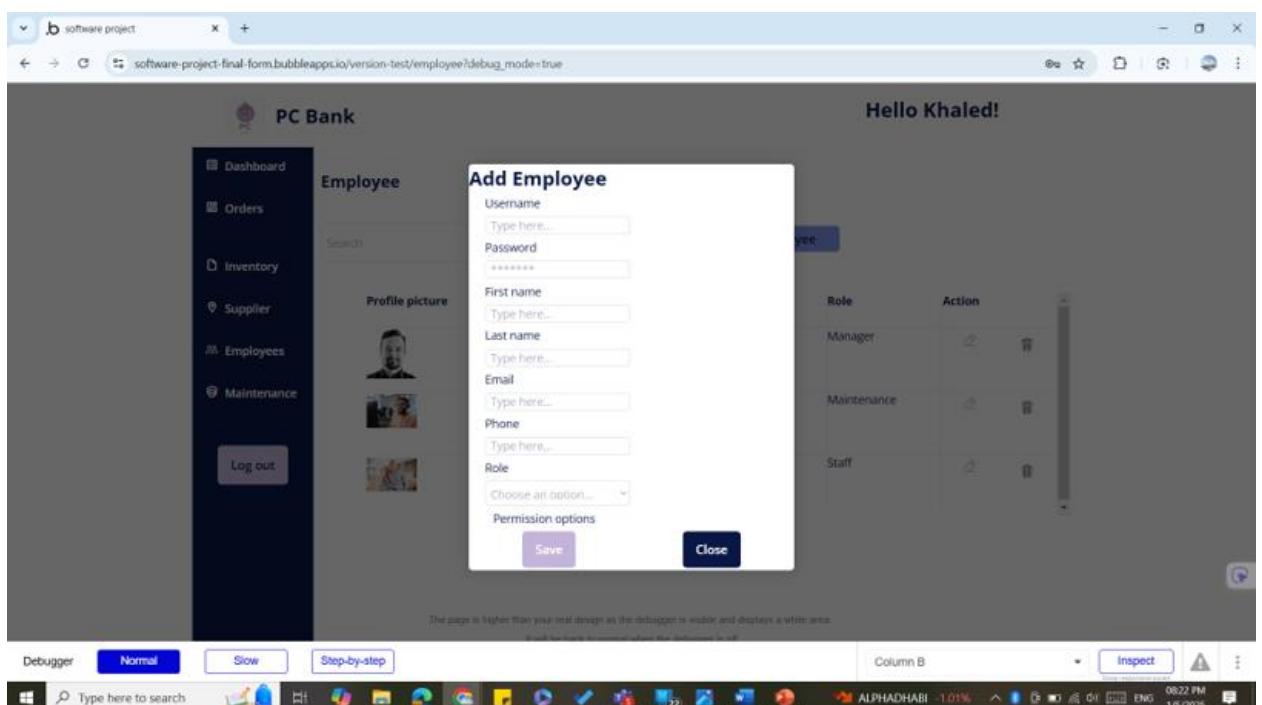


Figure 35

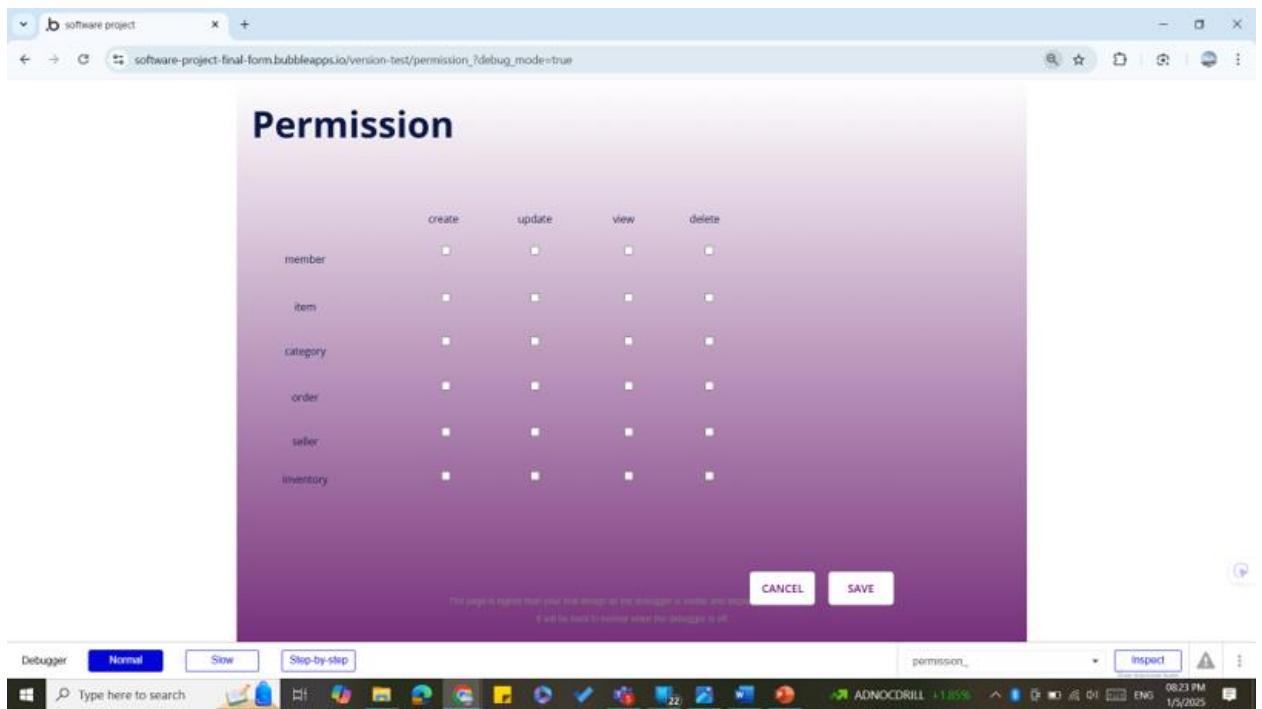


Figure 36

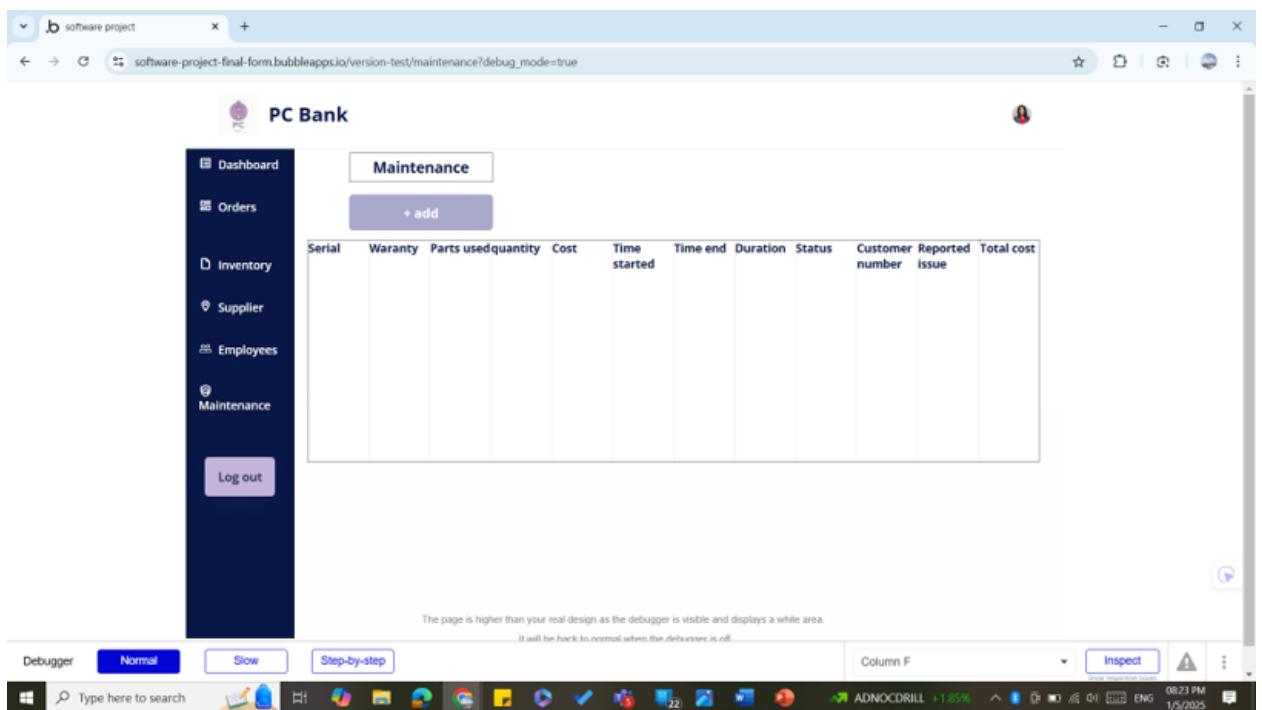


Figure 37

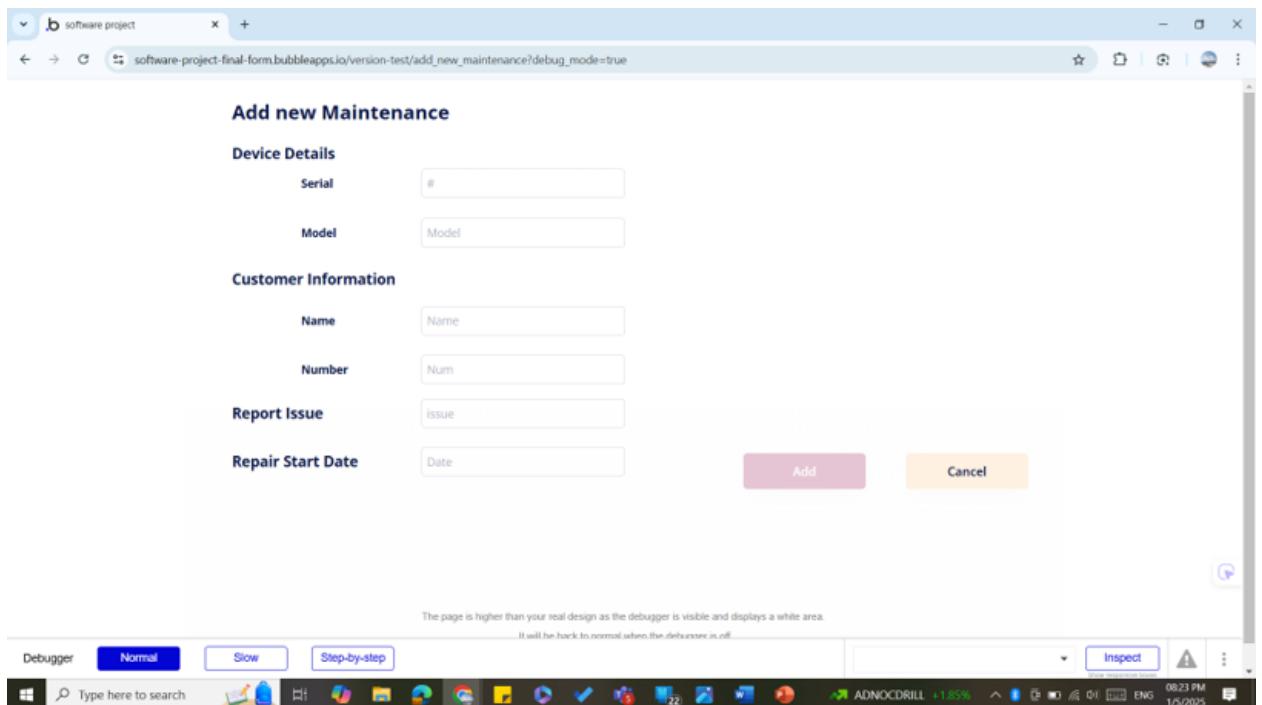


Figure 38

Figure 39

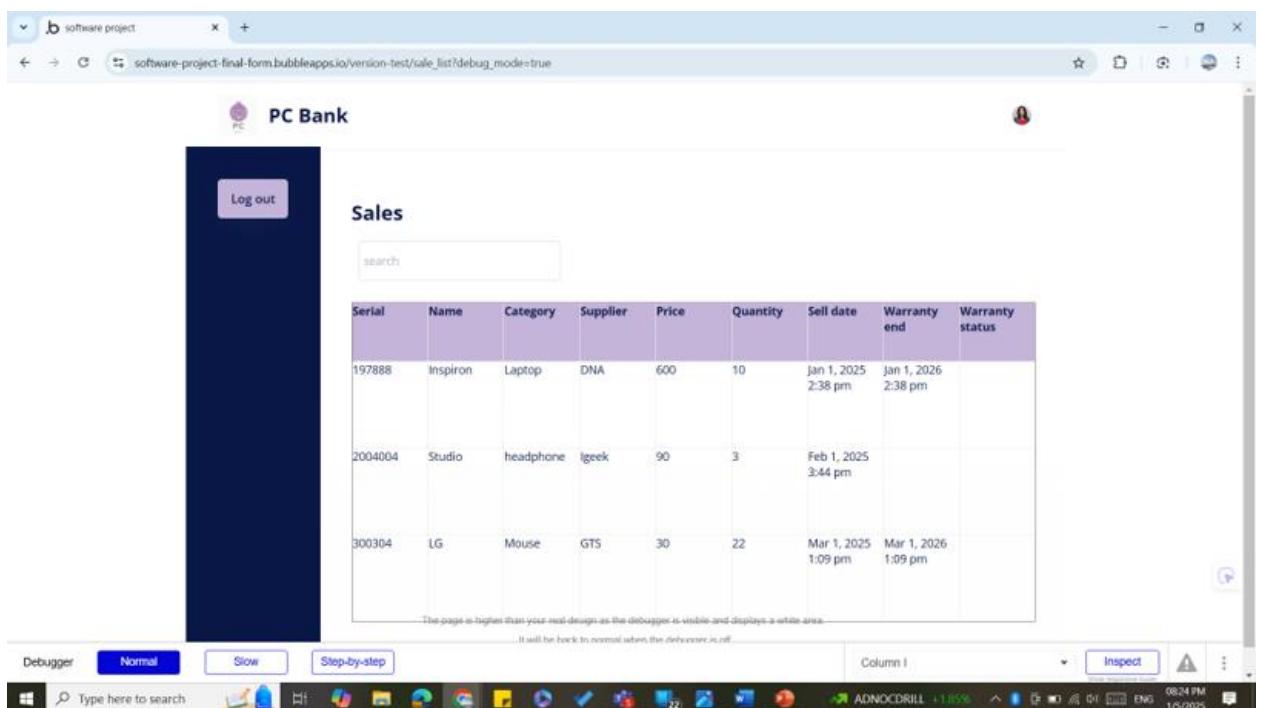


Figure 40

5.0 Implementation

5.1 Graphical user interface implementation

<https://bubble.io/home/software-project-final-form.bubbleapps.io>

Manager email: godieh@gmail.com

password: ygd25

6. User Manual

Welcome to pcbank This manual will guide you through using the app efficiently and effectively.

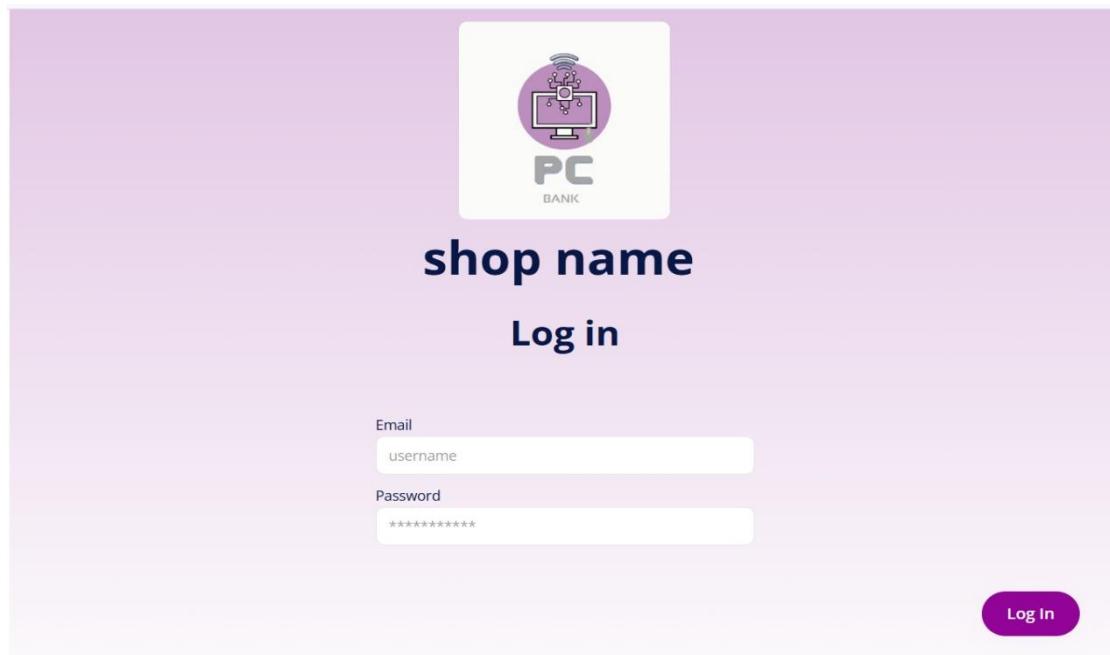


Figure 1

User manual41 Figure

log in using the email and password the manager provides you

1.Dashboard

Figure 2

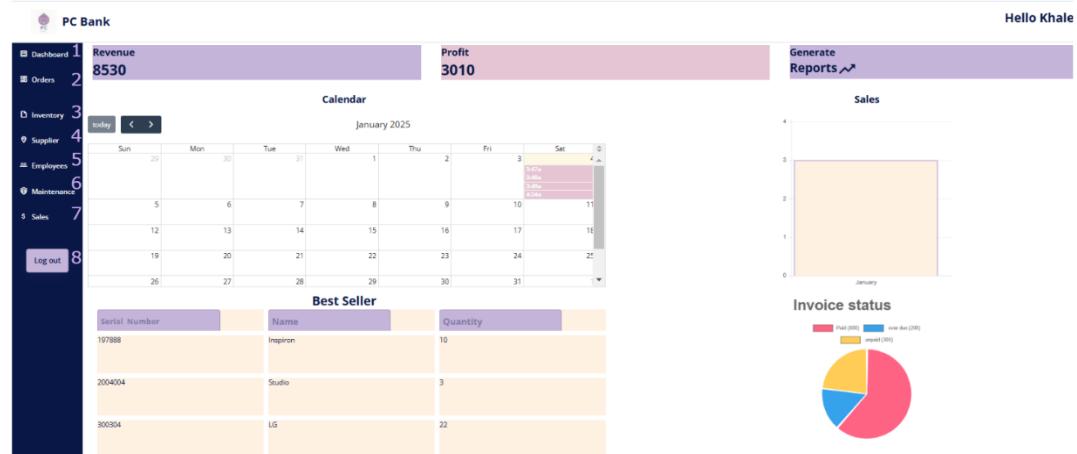
The screenshot shows a user interface for generating reports. At the top left is a dropdown menu labeled "Report Type" with "Types" selected. Below it is a section titled "Include:" with two checkboxes: "Inventory Status" (unchecked) and "Status of Maintenance" (unchecked). Each checkbox has a dropdown menu next to it: "Status" for "Inventory Status" and "maintenance" for "Status of Maintenance". At the bottom right are three buttons: "Cancel", "View" (highlighted in purple), and "Download".

1.2.a To view a report **click on view button**

1.2.b To download a report **click on download button**

1.1 The dashboard provides an overview of your activities.

1.2 To generate reports **click on generate reports button at the top right corner.**



2.Order

ID #	Date	Supplier	Item	Status
1978	Jan 4, 2025 3:46 am	I Geek	C- wires	
2009	Jan 4, 2025 3:47 am	I Geek	Ipad	
2004	Jan 4, 2025 3:48 am	I Geek	Inspiron 20	
1973	Oct 3, 2024 4:50 pm	DNA	Mac book	

Figure 4

The modal dialog has the following fields:

- Item # (input field: Type here...)
- order quantity (input field: Type here...)
- Supplier (input field: Type here...)
- Cost (input field: Type here...)
- Status (dropdown menu: Sort by supplier)

Figure 5

2.1 Manage and track your orders on the Orders page

2.2 To place a new order you have to **click new order button** and the page shown in figure 5 will appear

2.3 To see your orders status **click on the pie chart icon** as shown in figure 6 & 7

2.4 Sort orders by date or supplier using the sorting options.

2.5 search for orders using the search bar

3.Inventory

Figure 6

The screenshot shows a user interface for managing inventory. At the top, it says "Hello Khaled! 🎉". Below that is a button labeled "+ New Order". A dropdown menu is open, showing "Sort by supplier". The main area has two columns: "Item" and "Status". The "Item" column lists "C-wires", "Ipad", "Inspiron 20", and "Mac book". The "Status" column for each item shows a pie chart icon. An arrow points from the "Status" column of the "Ipad" row towards Figure 7.

Item	Status
C-wires	
Ipad	
Inspiron 20	
Mac book	

Order #

ID #	Item	Date	Supplier
1978	C-wires	Jan 4, 2025 3:46 am	I Geek
2009	Ipad	Jan 4, 2025 3:47 am	I Geek
2004	Inspiron 20	Jan 4, 2025 3:48 am	I Geek

Subtotal 5679

Figure 7

The screenshot shows a user interface for managing orders. On the left, there's a section titled "Order History" with five toggle switches. From top to bottom, they are labeled: "Placed" (off), "Approved" (on), "Supplier's Approval" (on), "Shipped" (on), and "Received" (off). In the center, there's a table with the same data as Figure 6. At the bottom, there's a progress bar showing "60%" and a button labeled "Back to orders".

Placed
Approved
Supplier's Approval
Shipped
Received

Order History

Placed

Approved

Supplier's Approval

Shipped

Received

Shipping status

Back to orders

60%

Serial	Name	Category	Supplier	Price	Quantity	Low quantity threshold
1978	cyborg15	Laptop	I geek	800	20	10
200004	dell inspiron	laptop	I Geek	500	15	10
200009	Lenovo	laptop	DNA	400	30	5

Figure 8

3.1 View and manage all categorized and priced items in the inventory

3.2 To add a category **click add category button** (see figure 9)

3.3 To add a new item to you inventory **click add item button** (see figure 10)

3.4 In case of low stock item as an urgent action **click on the battery icon** (see the figures 11 & 12)

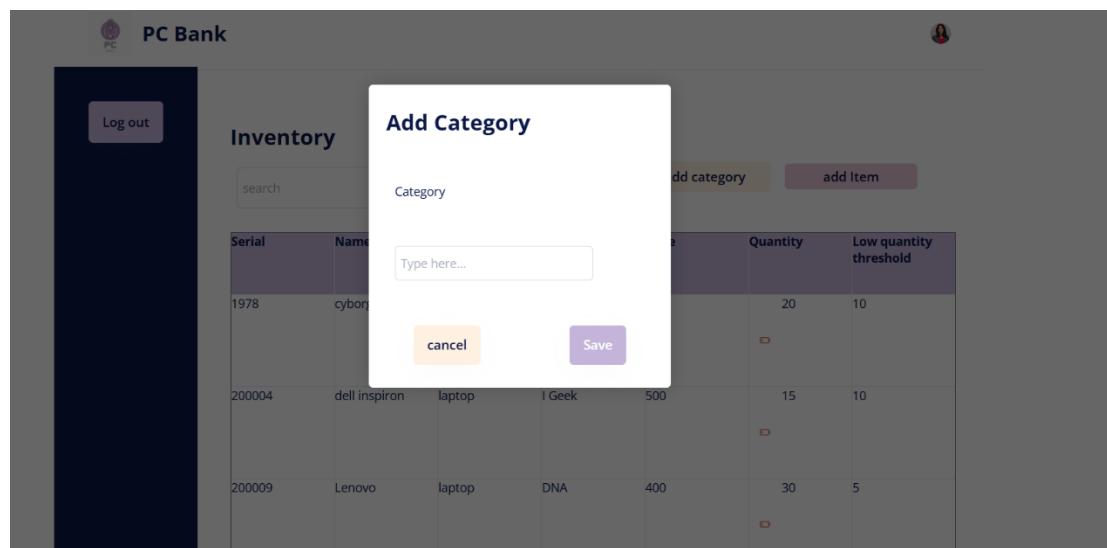


Figure 9

PC Bank

Log out

Inventory

search

Serial	Name	Price	Quantity	Low quantity threshold
1978	cyborg15	800	20	10
200004	dell inspiron	500	15	10
200009	Lenovo laptop	400	30	5

Add item

Serial Number
Type here...

Supplier
Type here...

Name
Type here...

Price
Type here...

Warranty
Type here...

Category
Type here...

cancel Save

Figure 10

add category add Item

	Price	Quantity	Low quantity threshold
	800	20	10
	500	15	10
	400	30	5

Figure 11

Order
#000

Item #	Current Quantity	Order quantity	Supplier	Cost	Action
1978	10	20	I Geek	20	
2009	8	18	I Geek	400	
2004	1	20	I Geek	1500	

payment method

Choose an option...

Total cost : 20, 400, 1500, 5000

Figure 12

3.4.a Use the icon to edit the order

3.4.b Use the icon to delete the order

4. Suppliers

PC Bank Hello Khaled!

Suppliers											
		Search <input type="text"/>									
		Add Supplier									
	Dashboard		Dell	Email	TAHA@EMAIL.COM	Phone	0123456	Address	USA		
	Orders		DNA computers	Email	KENAN@GMAIL.COM	Phone	0788977	Address	USA		
	Inventory		GTS	Email	LANA010@YAHOO.COM	Phone	011125547	Address	AUSTRALIA		

Figure 13

4.1 Track and manage supplier information on the Suppliers page

4.2 To add a new supplier **click add supplier button** (see figure 14)

4.3 Use the icon to update the supplier details (see figure 15)

4.4 Use the icon to remove the supplier

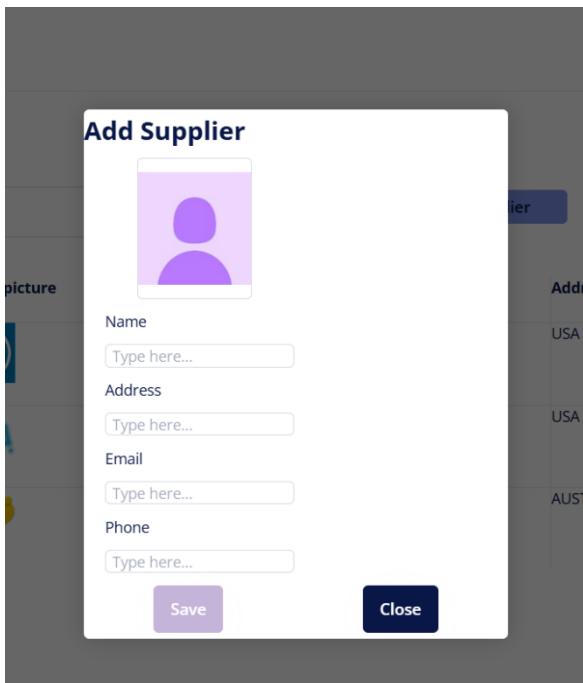


Figure 14

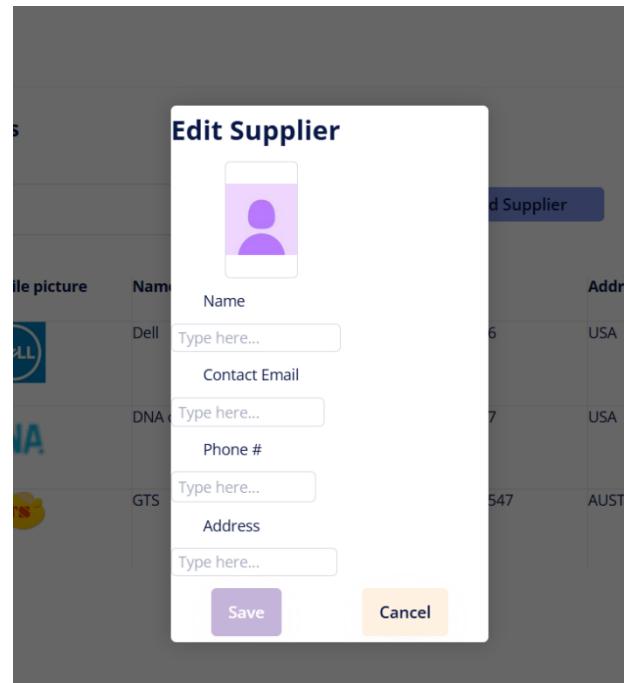


Figure 15

5. Employee

Profile picture	User name	Name	Phone	Role	Action
	Khaled	Khaled	77777777	Manager	
	Mohammad	Mohammad	778888888	Maintenance	
	khader	khader	77898989	Staff	

Figure 16

5.1 Manage employee details and permissions on the Employees page

5.2 To add a new employee **click add employee button** (see figure 17)

5.3 Use the icon to update info (see figure 18)

5.4 Use the icon to remove the employee

Add Employee

Username	<input type="text" value="Type here..."/>
Password	<input type="password" value="*****"/>
First name	<input type="text" value="Type here..."/>
Last name	<input type="text" value="Type here..."/>
Email	<input type="text" value="Type here..."/>
Phone	<input type="text" value="Type here..."/>
Role	<input type="text" value="Choose an option..."/>
Permission options	
<input type="button" value="Save"/>	<input type="button" value="Close"/>

Figure 17

Edit Employee

Username	<input type="text" value="Type here..."/>
First name	<input type="text" value="Type here..."/>
Last name	<input type="text" value="Type here..."/>
Phone number	<input type="text" value="Type here..."/>
Role	<input type="text" value="Choose an option..."/>
<input type="button" value="Save"/>	<input type="button" value="Cancel"/>

Figure 18

5.2.a To set permissions click permission options button in figure 17 (see figure 19)

Permission

	create	update	view	delete
member	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
item	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
category	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
seller	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 19

6.Maintenance

The screenshot shows the 'Maintenance' section of the PC Bank application. On the left is a sidebar with icons for Dashboard, Orders, Inventory, Supplier, Employees, and Maintenance, with Maintenance being the active tab. A 'Log out' button is at the bottom. The main area has a header 'Maintenance' with a '+ add' button. Below is a table with columns: Serial, Waranty, Parts used quantity, Cost, Time started, Time end, Duration, Status, Customer number, Reported issue, and Total cost. The table is currently empty.

Serial	Waranty	Parts used quantity	Cost	Time started	Time end	Duration	Status	Customer number	Reported issue	Total cost

Figure 20

6.1 Maintenance Track items sent for maintenance and their statuses

6.2 To include a new maintenance item **click on add button** (see figure 21)

The screenshot shows the 'Add new Maintenance' form. It has sections for 'Device Details' (Serial, Model), 'Customer Information' (Name, Number), 'Report Issue' (issue), and 'Repair Start Date' (Date). At the bottom are 'Add' and 'Cancel' buttons.

Device Details	
Serial	#
Model	Model
Customer Information	
Name	Name
Number	Num
Report Issue	issue
Repair Start Date	Date

Add Cancel

Figure 21

7.Sales

Serial	Name	Category	Supplier	Price	Quantity	Sell date	Warranty end	Warranty status
197888	Inspiron	Laptop	DNA	600	10	Jan 1, 2025 2:38 pm	Jan 1, 2026 2:38 pm	
2004004	Studio	headphone	Igeek	90	3	Feb 1, 2025 3:44 pm		
300304	LG	Mouse	GTS	30	22	Mar 1, 2025 1:09 pm	Mar 1, 2026 1:09 pm	

Figure 22

7.1 Review all sold items and their details on the Sales page

8.Logging out

Revenue
8530

Profit
3010

Calendar

January 2025

Best Seller

Serial Number	Name	Quantity
197888	Inspiron	10
2004004	Studio	3
300304	LG	22

Figure 23

8.1 To log out from the application click **log out button** at the bottom of the side bar

7.0 References

1. Software engineering Ian Sommerville
2. Bubble.io
3. Jira
4. StarUML