MODEL DRIVEN SOFTWARE ENGINEERING

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DELIVERABLE: 2

DOMAIN ANALYSIS AND REQUIREMENTS

Submitted By:

Vivek Khatri 27292848

Dollar Kumar Bansal 27599188

Desai Parth Mukeshbhai 27397364

Jarin Manuvel Mathew 27168470

Manjot Singh Gill 27299699

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Project Domain Description – Inventory Management System

Inventory management is a very crucial part of many industries such as Retail Chains, Manufacturing Industries, Offices, Supply chain, restaurants etc. Inventory management, in general, is used from very small scale business such as operating a restaurant to high Level Corporation such as Walmart.

The essential function of inventory management software is to keep an account of stock in the warehouse so that the stock is always up to date and available when needed. In case of Retail management, which is the field chosen by us, our system needs to maintain an updated inventory of all the items in stock and in case of shortage of an item, the system should indicate the buyer to purchase for those items.

Using the inventory management system we can also track orders, sales and deliveries too. We also added the features of complaint tracking and report generations, which can be managed by the system. An inventory management system helps in managing the time efficiency of orders and should also reduce the cost of maintaining logistics. This system also handles the payment requests which includes tax calculations as per the government regulations.

Functional Requirements

There are several functional requirements that are considered for an inventory management system. The functional requirements are listed below:

Requirement 1

User Registration and authorization

Requirement 2

User should be able manage the Company's stock of various materials.

Requirement 3

User should be able to create, modify, update and delete the sales order.

Requirement 4

User should be able to track the delivery of the product to the client.

Requirement 5
User should be able to request for stock.

Requirement 6
User should be able to generate various reports about the company.

Non Functional Requirements

Usability
End user should feel the user interface is simple and user friendly. There shouldn't be any ambiguity in the processes that takes place in the user interface.

Reliability
Server should be active in order to respond to user requests. Maintenance must be allowed for two hours and it must be done once in a week during non-business hours. The server should also validate the user requests which ensures that the request is not malicious. For efficient maintenance of data, the normalization procedure will be in place.

Performance
Performance requirement is the major and very important part of the Inventory system. Performance requirements can be measured in different types of requirements that are described below:

1. The application should be able to handle the number of users.

2. Data access operation performed fast.

Security
The credentials provided by the user are encrypted to ensure that it is not misused. Payment operations are done through secure payment gateways. The information about customers are kept confidential.

Scalability
Inventory management application is more scalable and resilient because it handles large number of user requests at a time. Inventory management application dynamically adjusts the load on application and always provide on demand resources when it required.

Use Cases

Inventory Management Use Case Diagram

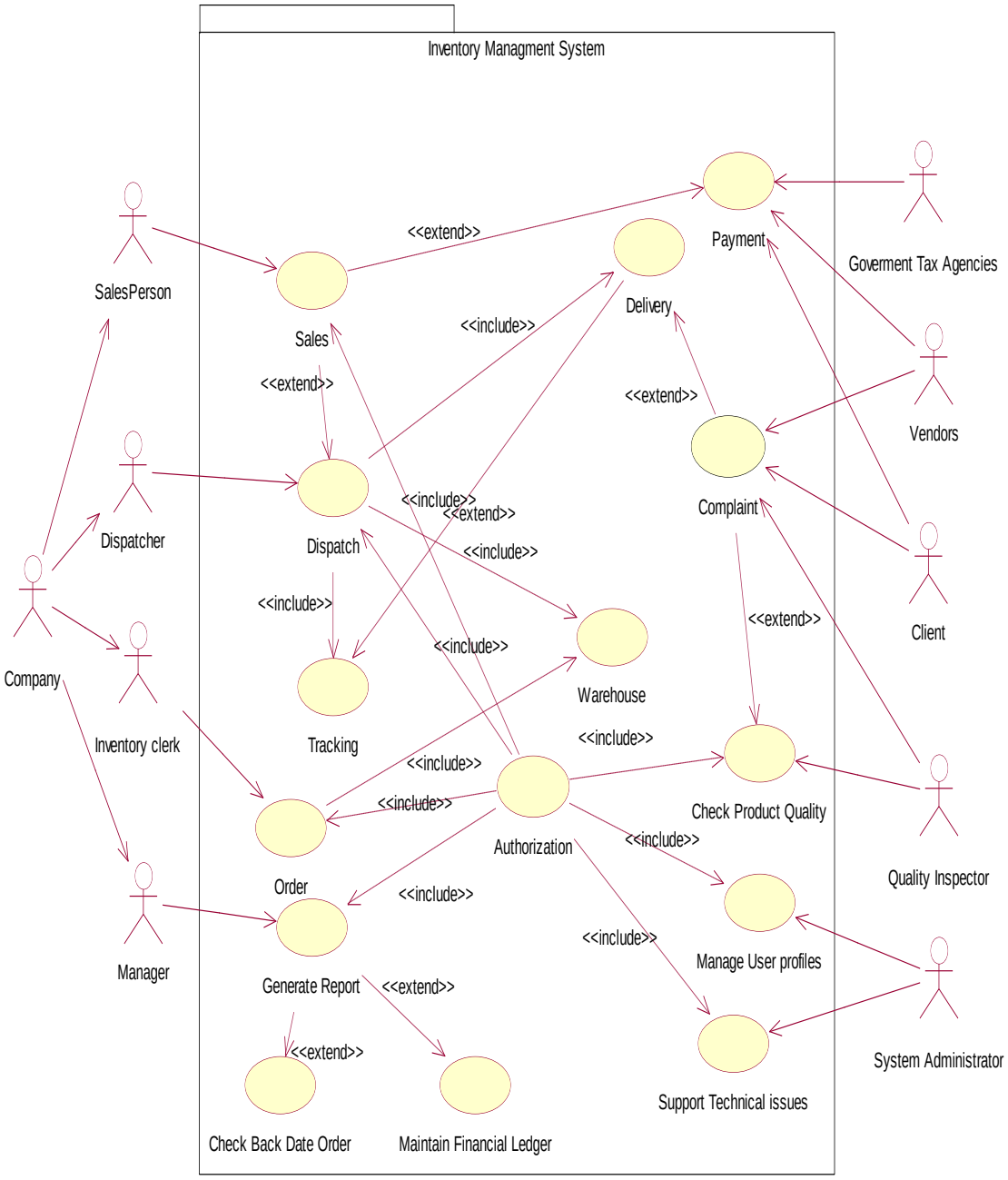

Figure 1: Use Case Diagram of the system

UC 1: User Authentication

Use Case Title	User Authentication
Brief Description	User Authentication is the process of authenticating the user id and his password in order to access the inventory management securely.
Primary Actors	Manager, Salesperson, Dispatcher
Stakeholders	Manager, Salesperson, Dispatcher, Company
Pre Conditions	User decides to login
Triggering events	User inputs username and password for log in
Main Flow	1. User inputs the username and password on the login page. 2. Username and password is verified with the database 3. If the username and password is valid the user is navigated to the next page. 4. If the username and password doesn't match then user is redirected back to login page.
Alternate Flow/ Extensions	*If user forgets his password 1. User selects the "forgot username/password" link in the login page. 2. User is redirected to password recovery page. 3. Once the user is authenticated with the security questions, the password is changed. 4. User is redirected to login page once the new password is set.
Post conditions	User is successfully logged in to the system where he can do the various functions like sales updates, dispatch updates, inventory update etc.

UC 2: Order

Use Case Title	Order
Brief Description	Order records the process of ordering the raw materials from different vendors in order to update the stocks in the warehouse.
Primary Actors	Inventory Clerk
Stakeholders	Manager, Vendors, Company, salesperson, Inventory Clerk
Pre Conditions	Stock of items is low
Triggering events	Stock of a particular item(s) is low in the inventory
Main Flow	1. Inventory clerk checks the inventory list. 2. If any item is missing or low in inventory then Inventory Clerk places the order with vendor. 3. Vendor quotes the price of the items. 4. Vendor asks for the payment. 5. Inventory Clerk makes the payment for the items. 6. All the items paid for are shipped by the vendor. 7. Inventory is updated.
Alternate Flow/ Extensions	*At any time system fails, 1. Inventory Clerk restarts system and requests recovery of prior state. 2. System Reconstructs prior state. 2. a. System detects the problem. 2. b. Inventory Clerk starts new order. 3. Inventory Clerk continues with the Order process. 5. Refer to payment use case.
Post conditions	Order is saved. Taxes are calculated correctly and accounting and inventory are updated. Order Receipt is generated and payment authorization approvals are recorded.

UC 3: Sales

Use Case Title	Sales
Brief Description	Sales process completes the purchase with the client and creates the sales order with price quotation and updates the sales table
Primary Actors	Salesperson
Stakeholders	Manager, Client, Government tax agencies, Company, Payment authorization services, dispatcher
Pre Conditions	Salesperson is identified and authenticated
Triggering events	Client requests for products.
Main Flow	1. Client contacts salesperson to requests for goods to purchase. 2. Salesperson quotes the price of the goods. 3. If client agrees the quote, then salesperson enters the sales line items and creates sale order. 4. System calculates the price and total along with the taxes and is recorded. 5. Salesperson tells the client and asks for payment. 6. System handles the payment done by the client. 7. System logs completes sale, sends sale and payment information to external accounting system and inventory system. 8. System generates payment receipt. 9. Sales record is sent to dispatch department.
Alternate Flow/ Extensions	*At any time system fails, 4. Salesperson restarts system and requests recovery of prior state. 5. System Reconstructs prior state. 2. a. System detects the problem. 2. b. Salesperson starts new sale. 6. Salesperson continues with the sales process. 7. Refer to payment use case.

Post conditions	Sale is saved. Taxes are calculated correctly and accounting and inventory are updated. Sales Receipt is generated and payment authorization approvals are recorded.

UC 4: Dispatch

Use Case Title	Dispatch
Brief Description	Dispatch records the process of transportation of goods from the warehouse to customer and updates the inventory database.
Primary Actors	Dispatcher
Stakeholders	Manager, Client, Company, salesperson
Pre Conditions	Identify open sale order
Triggering events	Sales order is received from sales department
Main Flow	1. Dispatcher receives the sales order and verifies the stock. 2. Dispatcher collects all the items together and creates a package. 3. The system generates a tracking ID for the created package and updates the inventory. 4. The package is dispatched to the customer and the status of the package changes in the system. 5. Once, the package is successfully delivered to the customer, the status of the package changes to complete in the system.
Alternate Flow/ Extensions	1. a) The stock verification does not match. b) The Dispatcher sends the item list not found or damaged back to the salesperson. c) The salesperson informs the customer and starts a new sales process. 6. a) The customer is not satisfied with the delivered package. b) The status of the delivered package changes to dispute. c) The customer is then referred to the manager.

	d) If, there is a problem with some delivered goods, the manager creates a new sales, which is then sent to be dispatched.
Post conditions	All Items are delivered to customer. The inventory is updated. The customer is satisfied with the final delivered goods. The status of the tracking ID is changed to completed.

UC 5: Payment

Use Case Title	Payment
Brief Description	Payment is the process of transaction of money to vendor or from the clients as part of purchase and sale of goods.
Primary Actors	Vendor, Client, Company
Stakeholders	Manager, Salesperson, Dispatcher, Company, Vendor, Client
Pre Conditions	Client agrees to pay the amount or the company agrees to pay the vendor
Triggering events	Order is made or when a sale is done
Main Flow	1. When an order is made the vendor or Client requests for payment. 2. User is directed to payment details page where the user can enter the bank details. 3. User is redirected to payment gateway where the bank details are verified and the payment is done. 4. "Payment successful" message is displayed if the details entered by the user is correct else "Payment unsuccessful" message is displayed.
Alternate Flow/ Extensions	*When user enter wrong details: 1. Transaction is cancelled. 2. "Payment unsuccessful" message is displayed. 3. User is redirected to previous active page. *At any time system fails, 1. User restarts system and requests recovery of prior state.

	2. System Reconstructs prior state. 2. a. System detects the problem. 2. b. User starts new request. * If the user wants to pay by Cheque or Cash, 1. The Salesperson enters the details of payment manually when It is received.
Post conditions	Payment information is updated to the database.

UC 6: Generate Report

Use Case Title	Generate Report
Brief Description	Generate Report process generates the reports requested by the manager
Primary Actors	Manager
Stakeholders	Manager, Company, Salesperson, Inventory Clerk
Pre Conditions	Manager wishes to check the reports
Triggering events	Manager Requests for reports
Main Flow	1. Manager Log in with his credentials 2. Manager selects the option to generate report. 3. Manager selects the report type. 4. Report is generated and displayed in the screen.
Alternate Flow/ Extensions	None
Post conditions	Requested report is generated and displayed in the screen.

UC 7: Manage User Profile

Use Case Title	Manage User Profile
Brief Description	Manage User Profile process is used for the managing the profiles created by various users so as to authenticate the access to the website to each user.
Primary Actors	System Administrator
Stakeholders	System Administrator, Manager, Salesperson, Inventory Clerk, Dispatcher
Pre Conditions	
Triggering events	New employee is hired
Main Flow	1. System Administrator creates the user account. 2. System Administrator provides authentication to perform his/her tasks. 3. System Administrator can view user's activity and keep system safe from anonymous activities. 4. System Administrator can deactivate the account.
Alternate Flow/ Extensions	*If user wishes to change the password/account is blocked 1. System Administrator gets the request from user to change the password/unblock the account. 2. System administrator approves the request and changes the password/ unblocks the account.
Post conditions	User profile table is updated with the username and password

UC 8: Check Product Quality

Use Case Title	Check Product Quality
Brief Description	Check Product Quality is the process of quality check of the products by the quality inspector
Primary Actors	Quality Inspector

Stakeholders	Quality Inspector, Manager, Salesperson, Inventory Clerk, Dispatcher
Pre Conditions	Maintaining of stock quality
Triggering events	Quality check process is initiated
Main Flow	1. Locating the product from the inventory. 2. Pick a sample product which is used for quality inspection. 3. Inspect the product according to the company guidelines. 4. If the product passes the quality check, update the quality status in the system for the product batch.
Alternate Flow/ Extensions	*If the product quality check fails. 1. Update the quality status in the system. 2. Inventory clerk returns the particular stock to the vendor. 3. Inventory clerk updates the inventory database with the new count.
Post conditions	Quality Status is updated in the database and if the quality check is failed then stock quantity is reduced in the database.

UC 9: Complaint

Use Case Title	Complaint
Brief Description	In this process client registers complaint about the product
Primary Actors	Client
Stakeholders	Client, Manager, Vendor, Salesperson, Inventory Clerk
Pre Conditions	Client receives a faulty product
Triggering events	Client discovers the fault in the product
Main Flow	1. Client receives a faulty product. 2. Client discovers the fault. 3. Client lodges the complaint. 4. Manager is notified about the complaint. 5. Manager takes necessary actions to resolve the complaint.

Alternate Flow/ Extensions	None
Post conditions	Product is either replaced or fixed

UC 10: Manage Technical Issues

Use Case Title	Manage Technical Issues
Brief Description	In this process technical issues faced by different users are resolved.
Primary Actors	System Administrator
Stakeholders	System Administrator, Manager, Vendor, Salesperson, Inventory Clerk
Pre Conditions	System user has some issues with the system
Triggering events	System User reports the issue in the system
Main Flow	1. System administrator receives a ticket for the issue reported by the user. 2. The status of the ticket changes to “In progress”, when the administrator picks up the ticket on his/her name. 3. When the issue is resolved by the administrator, the ticket is handed over to the user. 4. If the user is satisfied by the resolution, He/she changes the status of the ticket to complete. 5. The ticket is then closed.
Alternate Flow/ Extensions	4* In case the user is not satisfied by the resolution a) The user reopens the ticket and reports it back to the system administrator
Post conditions	The technical issues faced by the system user is resolved, The ticket status is updated to complete, and ticket is closed.