**Inventory Management System**

**Deliverable -2**

**Code Crafters**

**Group List**

1. Sameera Ellanki
2. Varsha Jampala
3. Nikhil Kuchipudi
4. Naga Shivani Pinnamaraju
5. Jaswanth Sai Donepudi
6. Manogna Reddy Anugu
7. Atluri Varun Chowdary
8. Naga Bindu Kondaveeti

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# Overall structure

The important components of the inventory management system handle how we monitor and manage orders and inventories. We go over each of these components' functions below:

## Dashboard

The Dashboard is a place where we show the profit loss margins and the graphs that shows the sales vs stock and other useful information among all the modules such as the pending sales orders or in transit purchase orders and so on. Dashboard is the most basic component in the inventory management system.

## Items

The most important part of the inventory management system is the Items section. It has a list of everything the company makes, buys, or sells. This part shows about each product's details like SKU numbers, costs, how many are there, when to get more, and what they are. It's important for knowing what products we got, deciding how much we need, and seeing how many items we have at glance. Basically, this is the main part of stock keeping.

## Customer

The Customer section looks after information about the company’s clients. This includes keeping all important details like contact info past orders, shipping and billing addresses, credit terms, and what the customer prefers. This is crucial for managing sales, improving support for clients, and carrying out targeted marketing strategies.

## Vendors

The Vendor's section is all about the businesses and people the company gets its products or services from. It holds information like how and when payments are made, details about the person or company that we get products form, how to contact them like there, and records of past purchases. This part is key to keeping the supply chain working well, handling buying things, talking over terms, and checking how well vendors are doing.

## Purchase Orders

The Purchase Orders section helps with making, following, and handling orders to buy products or services from suppliers. It deals with the whole process: making orders, getting them approved, sending them out, getting the items, and matching bills for payment. This section is important for managing our money and keep track of the orders that that inflowing to the warehouse.

## Sales Orders

The Sales Orders section takes care of everything from when a customer places an order until the product or service is delivered to them. It handles making orders, getting them approved, filling the orders, and keeping track of them. This part is needed to make sure orders are handled correctly, delivered quickly to customers, and to manage inventory well.

## Invoices

Invoicing clients for products sold or services rendered is the responsibility of the Invoices module. Besides keeping an eye on who is paid and who hasn't, this part is all about making, sending out, and keeping track of invoices. It's super important for figuring out our money situation, checking how cash moves in and out, and making sure we're making as much money as planned.

## Bills

The Bills part of our system as the place where we handle all the money related things, we owe to the vendor who give us things as per orders we placed, like products or services. When they send us a bill, we make sure we got what we paid for and then match the bill to our original order to check if everything is okay. These keeps us organized with the vendors.

## Warehouses

The Warehouses section keeps a record of items that are all the items in the warehouse. It's focused on managing the warehouse operations, keeping track of items that are in different locations we call those locations as bin locations, and make sure that everything is organized. This part is crucial for large operations to guarantee that goods are stored, located, and shipped out without any problems.

## Bin Locations

This part tells us where every item is kept in the warehouse. the bin locations helps the business owners to keep track of what item is in which location in the warehouse, this will also help the employees to get things faster like when an order arrives no need to search for the products they can just look them up in the system. This is important for using the space in the warehouse smartly, speeding up getting items, and making sure orders are right.

## Login/Logout

The module responsible for handling user authentication and session management in the inventory management system is the Login/Logout module. Only authorised users will be able to access the system and carry out tasks in accordance with their responsibilities and permissions thanks to this module.

## Database

The data base is where all the information from the various modules will be stored and accessed, every time when a set of data is created it will be stored in the database itself, this will support all the crud operations.

## System Structure Diagram

A diagram of a company

Description automatically generated

# Requirements

## Functional requirements

### 2.1.1 REQ-1 Inventory Management Requirements

* **REQ-1.1 Inventory Tracking**

The user shall get Real-time updates on inventory levels, as the stock updates it reflects everywhere, like warehouse, items, stock levels etc...

* **REQ-1.2 Product Management**

The system should allow handling of product information and categorization, this will typically do in items module.

* **REQ-1.3 Bin Location System**

The user can Precisely track of inventory locations within warehouses, we also should track the exact physical location where the product is within the warehouse.

* **REQ-1.4 Inventory Valuation**

The system should also calculate the valuation of all the unsold products and display it as a valuation on user demand, this is locked behind user demand because of the performance issues.

### 2.1.2 REQ-2 Warehouse Management Requirements

* **REQ-2.1 Warehouse Operations**

User should have the ability to manage and look at the items that are available in a particular warehouse is also the part of requirements.

* **REQ-2.2 Bin Location Management**

The system must Detailed management of bin locations for inventory organization, by entering a product into the system the ability to enter its corresponding bin location is a core part of this project.

* **REQ-2.3 Stock Movement**

Upon navigating to the warehouse module user should have the ability to take bulk actions to the target products like changing the sku and expiry dates.

### 2.1.3 REQ-3 Order Processing Requirements

* **REQ-3.1 Sales Order Processing**

The user shall have the ability to Manage the sales order lifecycle from creation to fulfilment, we will take the order as and take it through different stages of fulfilment.

* **REQ-3.2 Purchase Order Management**

The user should be allowed to handle the purchase orders, including creation, approval, and tracking, the same as the sales order we will take it through the series of fulfilment.

* **REQ-3.3 Returns Management**

The system shall process of returns from customers and to vendors, we will increase the stock and delete the corresponding sales order or purchase order.

### 2.1.4 REQ-4 Supplier and Customer Requirements

* **REQ-4.1 Supplier Management**

User shall have the ability to manage vendor information, including contact details and order history, payment info and so on, we can have different vendors for different products.

* **REQ-4.2 Customer Management**

User shall manage customer profiles and save the details of them, we will use the details while placing a sales order or rising an invoice.

### 2.1.5 REQ-5 Reporting and Analytics Requirements

* **REQ-5.1 Data Analysis**

The system shall automatically generate the reports on inventory, sales, and warehouse efficiency.

* **REQ-5.2 Performance Metrics**

The system should show Analytics on order fulfilment rates and supplier performance, these will be generating as a report list.

### 2.1.6 REQ-6 System Administration Requirements

* **REQ-6.1 User Access Control**

Particular user shall only the access of certain modules only like if a pos person can only have access to say returns and sales orders etc…

* **REQ-6.2 Security Management**

The system shall ensure data integrity and access security within the system.

### 2.1.7 REQ-7 User Interface Requirements

* **REQ-7.1 Dashboard**

User-friendly dashboard for real-time data display, like graphs for the number of sales we have done for a span of time and other useful information.

* **REQ 7.2 Navigation**

Navigation is a crucial part of the inventory management system; we will make it easier to navigate across different parts of the application.

### 2.1.8 REQ-8 Access Requirements

* **REQ-8.1 User Login/Sign Up**

The user can create a fresh organization and have their own inventory management or by using credentials for an existing organization and login as a user of a specific role.

* **REQ-8.2 User Logout**

The user can Log out the current session of the user those who are currently using a browser on a computer, so after logging out they must log back in to access the inventory.

### 2.1.9 REQ-9 Invoices and bills

* **REQ-9.1 Bills**

The user should be able to generate bills by using the bills module. It should have the access to the vendors and items data since every bill is assigned to a vendor.

* **REQ-9.2 Invoices**

The user should be able to generate invoices by using the invoice module. It should have the access to the customers and items data since every invoice is assigned to a customer.

## Non-Functional requirements

### 2.2.1 NF-1 Performance

* **NF-1.1 System Performance**

The system should handle multiple client requests without lagging response for any requests that are make at same time.

* **NF-1.2 Data Handlin**

The system should be Capable of managing large volumes of data without performance impact, this mostly depends on the hardware where the server was deployed.

### 2.2.2 NF-2 Scalability

* **NF-2.1 Managing the load**

The system should handle more number of users at the same time like generating sales orders, rising invoices etc…

* **NF-2.2 Scalable**

The system architecture should be able to accommodate the future growth of users without any issues.

### 2.2.3 NF-3 Reliability and Availability

* **NF-3.1 System Uptime**

The system should have as minimum downtime as possible, as it impacts the user experience.

* **NF-3.2 Data Backup**

Regular backups should be made at the database and in case of any data is lost we can easily rescue the data from the backup.

### 2.2.4 NF-4 Security

* **NF-4.1 Authentication**

Every user is authenticated and has a session management. This helps to protect the user data so that the data will not fall into wrong hands.

* **NF-4.2 User Access Control**

The system should make sure that users can only access what they are meant to access and all the other modules are locked until the owner gives the access.

### 2.2.5 NF-5 Usability

* **NF-5.1 Friendly UI UX**

The UI should be simple and organize all the features in a neatly fashioned so that the user can have a easy time to navigate.

* **NF-5.2 Accessibility**

The user should be able to use the application form any device so that it makes it easier for accessing.

### 2.2.6 NF-6 Maintenance

* **NF-6.1 Components**

Having the system as separate components makes it easier for maintenance and updates to the system.

* **NF-6.2 Updated Documentation**

The documentation should be kept up to date, down to the small features that could affect the system.

### 2.2.7 NF-7 Compliance and Standards

* **NF-7.1 Regulatory Compliance**

Ensure the system meets all relevant industry regulations and standards and maintain the data privacy standards.

## Interfaces

### User Interfaces

As the point of interaction between the user and the system, the user interface is an important part. It must be simple to use and intuitive. We're going to utilise a variety of interface elements for this project, including sections with information and outcomes, buttons to initiate actions, and fields for input. Everything is designed to make use the system's features and navigating around quite simple for you.

### Hardware Interfaces

This project is mostly about software but it will work with the hardware of the computers it runs on our project uses the computer's CPU RAM and storage to do things like manage data and keep it safe there’s an extra part that helps our project talk to the computer's parts making sure it works really well without wasting resources the system will be made to work on lots of different computers even if they have different kinds of hardware and specs.

### Software Interfaces

The way different software components and system layers communicate with one another is managed by the software interface. It will also be in charge of managing communications with the operating system and any external libraries or apps that the system makes use of.

### Communications Interfaces

The part that lets the system talk to outside of the systems is called the communication interface its really important for letting computers and other parts of the system share data with each other in this project were going to make sure that when you send your info to the system it stays safe that means no one else can look at it or mess with it also were going to make sure all the parts of our project can talk to each other really well so everything works together just like a team working together to win a game.

### Application Programming Interfaces

By using API’s, the system communicates with each other share data functions and stay connected this is the main source that we update the data base. These are important for adding extra things and information from outside into our system. We'll do this by connecting with other services or using ready-made tools that other people have made like SQL in our case its SQLite. It is expected that the system will make its APIs available so that other services or systems may communicate with it, increasing and usefulness.

### Database Interfaces

The system can keep and get back the user data by using the database interface this part deals with talking to the database to help the system work with user data like it stores the bought and sold and any other important info. It will be set up to do lots of database operations like making reading changing and getting rid of data CRUD.

# Implementation Plan

## Development Phase 1: Foundation and Security

**Task1: Develop User Authentication System**

* Implement login and logout functionalities, making sure to secure access for authorized users only.
* Integrate security measures such as session management and basic authentication to safeguard the user data.
* **This task covers:**
  + REQ-8: REQ-8.1, REQ-8.2
  + NF-4: 4.1, 4.2
  + NF-6

**Task2: Implement Items Module**

* Items module have to be implemented with the added support for SKU numbers, descriptions, and stock levels, pricings etc...
* Inventory tracking and management have to be also developed to monitor how much stock is left and reorder levels.
* **This task covers:**
  + REQ-1: REQ-1.1, REQ-1.2, REQ-1.4
  + REQ-2: REQ2.1
  + NF-4: 4.1, 4.2
  + NF-5: NF-5.1

**Task3: Set Up Customer and Vendor Modules**

* Create profiles for customers and vendors with all necessary information including contact details and what items they sell etc...
* We also need to add support for editing these profiles because it’s a standard practice to able to edit previous information.
* **This task covers:**
  + REQ-4: REQ-4.1, REQ-4.2

**Deliverables:**

* Secure user authentication system.
* Items module for inventory management.
* Customer module
* Vendor module

## Development Phase 2: Transaction Management

**Task1: Develop Purchase Orders Module**

* Implement creation, tracking, and management of purchase orders, including vendor interactions and invoice matching.
* **This task covers:**
  + REQ-3: REQ-3.1, REQ-3.3

**Task2: Implement Sales Orders and Invoices Modules**

* Create functionalities for managing the sales process from order receipt to fulfilment and billing.
* Develop an Invoices module for generating and tracking customer billing and payments.
* **This task covers:**
  + REQ-3: REQ-3.2
  + REQ-9: REQ-9.2

**Task3: Set Up Bills Module**

* Develop features for managing and processing vendor bills, including payment tracking and financial reconciliation, which can calculate the profit loss as well.
* **This task covers:**
  + REQ-9: REQ-9.1

**Deliverables:**

* Fully functional Purchase Orders module.
* Sales Orders and Invoices modules.
* Bills module for vendor payments.

## Development Phase 3: Operational Efficiency

**Task1: Warehouses Module**

* Develop warehouse management functionalities to manage all the items stocks and their locations with the support of bins.
* **This task covers:**
  + REQ-2: REQ-2.1, REQ-2.2

**Task2: Implement Bin Locations Module**

* Bin locations must be saved and maintained for easy tracking of the products locations in a warehouse.
* **This task covers:**
  + REQ-1: REQ-1.3
  + REQ-2: REQ-2.2

**Task3: Dashboard**

* Implementing the dashboard for easier tracking of the statistics that will be generated by the application.
* **This task covers:**
  + REQ-7: REQ-7.1
  + NF-5: NF-5.1

**Task4: System Optimization and Testing**

* Making sure that the system operating well without any problems.
* Perform good amount of testing and if any bugs found then have to resolve them and make the system optimal for production.
* **This task covers:**
  + NF-1: NF-1.1, NF-1.2
  + NF-3: NF-3.1
  + NF-6: NF6.1

**Deliverables:**

* Warehouses module.
* Item Bin Locations module for precise inventory tracking.
* Dashboard
* An optimized, efficient, and fully tested system ready for operational use.

# Member Contribution Table

|  |  |  |
| --- | --- | --- |
| **Member Name** | **Contribution description** | **Overall Contribution (%)** |
| Sameera | Overall structure descriptions (1 to 8) | 12.5 |
| Varsha | Overall structure descriptions (9 to 11) and system structure diagram | 12.5 |
| Nikhil | Functional requirements (REQ-1 to REQ-4) | 12.5 |
| Jaswanth | Functional requirements (REQ-5 to REQ-9) | 12.5 |
| Varun | Non-Functional requirements (NF-1 to NF-6) | 12.5 |
| Shivani | Non-Functional requirements (NF-7) and Interfaces (1 - 4) | 12.5 |
| Bindu | Interfaces (5 - 6) and Development Phase 1 | 12.5 |
| Manogna | Development Phase 2 and 3 | 12.5 |