

# Requirements Analysis

## Business Objectives

The implementation of *Inventra: A Web-Based Inventory Management System with AI-Driven Demand Forecasting for Café Pèdro* aims to achieve the following measurable objectives:

- **Improve Inventory Accuracy and Tracking**
  - Ensure real-time monitoring of stock levels to prevent both overstocking and understocking situations.
  - Implement a feature to automate restocking alerts, which will significantly minimize manual errors and guarantee the availability of popular products, leading to improved customer satisfaction
- **Minimize Waste and Financial Losses**
  - Reduce losses caused by expired or unsold products by aligning purchasing with sales trends.
  - Optimize supply chain efficiency by ensuring that procurement matches actual demand.
- **Enhance Data-Driven Decision Making**
  - Utilize AI-driven demand forecasting technology to accurately predict sales trends, enabling the management team to make more informed and strategic restocking decisions
  - Provide management with clear sales and inventory reports for improved business planning and resource allocation.

## User Requirements

The user requirements for Inventra are meticulously structured to cater to distinct roles within the café:

- **The System Administrator** shall manage user accounts in order to control access and ensure system security.
- **The Staff User** shall update inventory records in order to maintain accurate stock levels.
- **The Staff User** shall record daily sales in order to provide data for forecasting and reporting.
- **The System Administrator** shall access AI-driven demand forecasts in order to make informed purchasing decisions.
- **The Staff User** shall generate reports in order to review inventory performance and sales trends.
- **The System Administrator** shall configure system preferences in order to align the application with Café Pèdro's operational needs.

# Functional Requirements

## User Management

- **Creating New Users**
  - The System Administrator can create new accounts for staff members, requiring input such as:
    - Email
    - Password
    - Confirmed Password
    - Full Name
    - Role (Admin/Staff)
    - Date of Registration
  - The system is equipped to validate duplicate emails and enforce stringent password security measures, ensuring that each account is unique and secure.
- **Login for Users**
  - Authorized users can log in using registered credentials.
  - The system authenticates and determines the role (Admin or Staff).
  - Access is restricted based on role permissions.
- **Editing User Information**
  - Users can edit personal details such as email, contact number, and password.
  - Administrators will retain the ability to make further updates to staff details or reset credentials as required for operational efficiency.

## Inventory Management

- **Add/Update Items**
  - Staff users can add new products or update existing information, including the product's name, category, quantity, supplier details, and expiration date.
  - The system validates inputs to avoid incomplete or inconsistent records.
- **Stock Levels**
  - The system displays real-time stock counts with low-stock indicators.
  - Staff can filter inventory by product category or supplier.
- **Restocking Alerts**
  - The system automatically generates alerts when stock reaches a minimum threshold.
  - Administrators can adjust the threshold levels for each product based on historical sales data and expected demand.

## Sales Records

- **Daily Sales Recording**
  - Staff have the functionality to record daily sales transactions, detailing the products sold, the quantity, and the date of the transaction.
  - The system validates inputs and updates inventory automatically.
- **Monthly Sales Reports**
  - The system aggregates daily sales into monthly summaries.

- Administrators are able to filter these reports by product category, identify bestsellers, or analyze sales over specific time periods.

## **AI Forecasting**

- **Demand Forecasting**

- The system processes historical sales data using AI-driven time-series analysis.
- Forecasts provide predicted demand for the next weeks or months.
- Administrators can view forecast results as charts or tables.

## **Reports**

- **Inventory Reports**

- The system generates reports on stock movements, low-stock items, and restocking frequency.
- Reports can be exported in popular formats such as PDF or Excel for further analysis or presentation.

- **Sales Reports**

- The system generates detailed sales performance reports by product, category, and time period.
- Administrators can compare sales across different months to identify trends.

## **Utility Functions**

- **Search and Filter**

- Users can search inventory items by name, category, or supplier.
- Sales and reports can be filtered by date range or product.

- **Export Data**

- Users can export sales and inventory reports into CSV or PDF formats for record-keeping.

- **User Notifications**

- The system displays on-screen alerts for low-stock warnings, successful updates, and forecast availability.

## **Backup Functions**

- **Database Backup**

- The System Administrator can initiate a manual backup of the database.
- Backup files are stored securely on the server and can be downloaded locally.

- **Database Restore**

- The System Administrator can restore data from a backup file in case of system failure.
- The system validates the backup file before restoration.

## **Database Functions**

- **Centralized Database**

- The system maintains a centralized database to store inventory records, sales transactions, user accounts, and forecasts.

- **Data Validation**

- The system enforces constraints such as unique product IDs, required fields, and valid formats for dates and numbers.
- **Data Security**
  - The database encrypts user credentials (e.g., passwords) and restricts access based on roles.