AUMC

INVENTORY MANAGEMENT SYSTEM

Prepared By :

Muhammad Maaz
Syed Muhammad Sarib
Muhammad Zain

Presented To :

Ms. Aatka Ali

+92 328 788 7571

233553@students.au.edu.pk

233505@students.au.edu.pk

Submitted on 26-12-2024

INVENTORY MANAGEMENT SYSTEM

Submitted By

Muhammad Maaz

Syed Muhmmad Sarib

Muhammad Zain

Instructor

Ms. Aatka Ali

DEPARTMENT OF COMPUTER SCIENCE

AIR UNIVERSITY MULTAN CAMPUS

DECEMEMBER 2024

AUTHOR'S DECLARATION

It is declared that we have developed a Inventory Management System.

Team Members

Student Name	Muhammad Maaz
Roll No	233553
Discipline	Computer Science
Year of Study	2024
Area of Study	Visual Programming
Proposed Project Title	Inventory Management System

Student Name	Syed Muhammad Sarib
Roll No	233505
Discipline	Computer Science
Year of Study	2024
Area of Study	Visual Programming

Student Name	Muhammad Zain
Roll No	233597
Discipline	Computer Science
Year of Study	2024
Area of Study	Visual Programming

Abstract

This project report details the design and implementation of an **Inventory Management System (IMS)** developed using **Windows Presentation Foundation (WPF)**. The system facilitates the management of inventory processes, including product management, supplier and customer management, purchase and sales order processing, stock tracking, and report generation. The objective of this project is to provide an efficient and user-friendly interface to streamline inventory operations while leveraging the features of WPF for an aesthetically pleasing and functional UI.

ACKNOWLEDGMENT

In the name of ALLAH, The Most Beneficent, The Most Merciful. Alhamdulillah, We are thankful to Allah for granting us the strength to complete this project. We would like to thanks our beloved parents. Last but not least, my deepest gratitude goes to my team members who played their role very well.

Thank you very much!

Table of Contents

Chapter No 1: Introduction

1.1 Introduction

The Inventory Management System (IMS) is designed to meet the needs of businesses for efficient inventory handling. The system aims to simplify the management of products, stock movements, supplier and customer details, and order processing. By using WPF, the system ensures an intuitive and interactive user experience with features such as real-time stock alerts, analytics, and detailed reporting.

1.2 Purpose

The purpose of the Inventory Management System (IMS) is to provide a comprehensive and efficient solution for managing inventory operations within a business. The system aims to streamline the processes of tracking stock levels, managing product information, handling supplier and customer data, and processing purchase and sales orders. By leveraging the capabilities of Windows Presentation Foundation (WPF), the IMS offers an intuitive user interface to ensure ease of use and enhanced productivity.

1.3 System Objectives

System objectives for developing Arithmetic Logic Unit.

- ✓ To provide an intuitive interface for managing inventory data.
- ✓ To ensure accuracy and real-time updates in stock levels.
- ✓ To streamline purchase and sales order processes.
- ✓ To generate meaningful insights through reports and analytics.
- ✓ To maintain an audit log for tracking user actions.

1.4 Tools

Some tools are used in developing ALU.

1.4.1 Hardware

- Laptop/PC

1.4.2 Software

1. **Development Tools**:
    - **IDE**: Visual Studio 2022 or later (Community Edition).
    - **Framework**: .NET Framework 6.0 or later.
2. **Operating System**:
    - Microsoft Windows 10 or later (64-bit recommended).
3. **Database Management System**:
    - **SQL Server**: SQL Server Express 2014 Edition.
4. **Libraries and Dependencies**:
    - WPF (Windows Presentation Foundation).
    - Entity Framework Core (for database operations).
5. **Version Control**:
    - GitHub or other version control platforms
6. **Reporting Tool**:
    - Microsoft Reporting Services or third-party reporting tools like Crystal Reports

Chapter No 2: Class Diagram

2.1 Class Diagram

2.1.1 Classes

- **Product**:

  Represents product details, including name, SKU, barcode, and stock quantity.

- **Supplier**:

  Manages supplier details for purchase orders.

- **Customer**:

  Handles customer information for sales orders.

- **PurchaseOrder and SalesOrder**:

  Represent order details with associated line items.

- **StockMovement**:

  Tracks stock inflow, outflow, and adjustments.

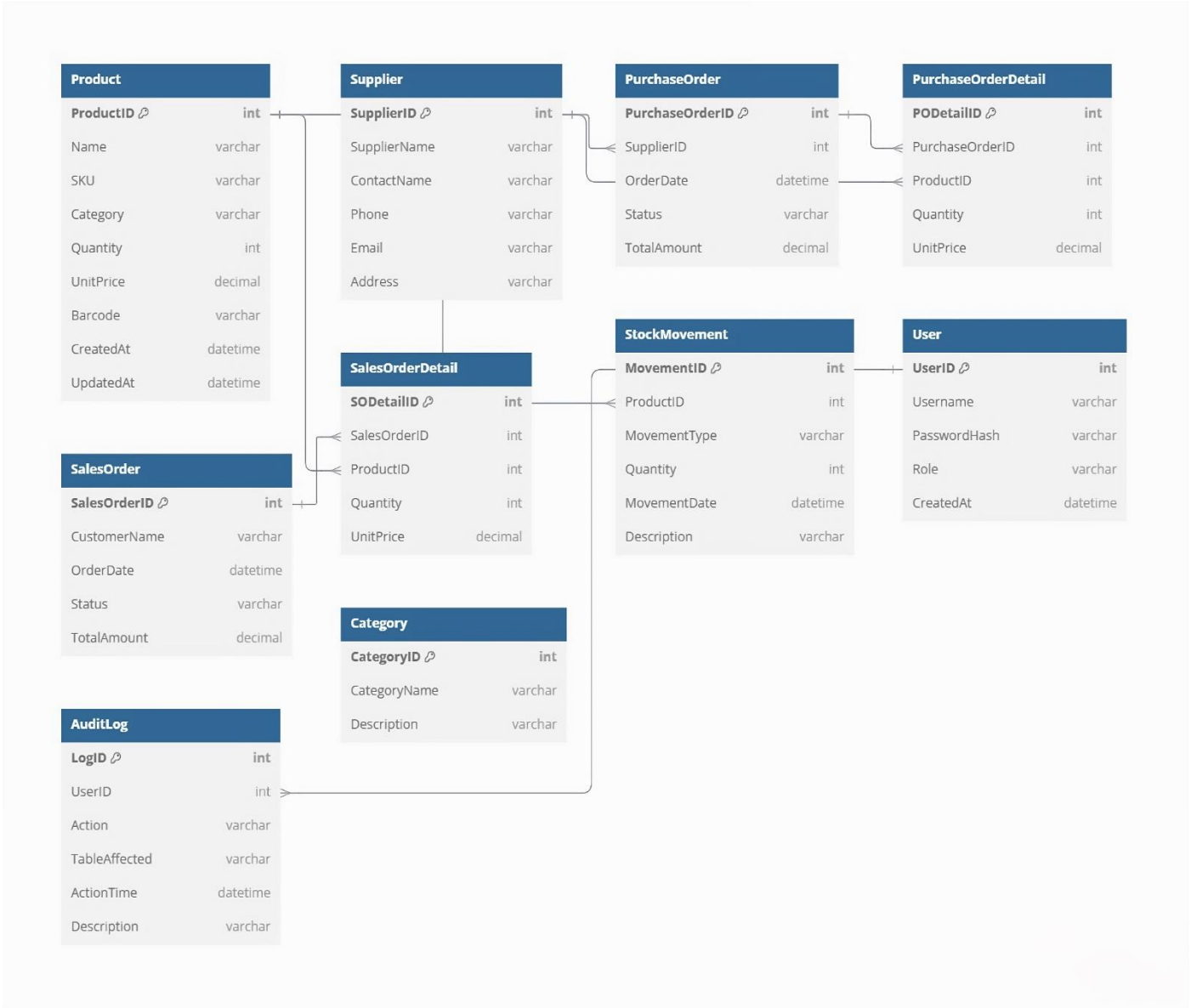
- **AuditLog**:

  Maintains a log of user actions for accountability.

- **Category**:

  Categorizes products for better organization.

2.1.2 UML Diagram



2.1.3 Relationships

Product and Category:

- **Relationship:** Many-to-One
- **Description:** Each product belongs to one category, but a category can have multiple products.

Product and StockMovement:

- **Relationship:** One-to-Many
- **Description:** Each product can have multiple stock movements (inflow, outflow, or adjustments).

Supplier and PurchaseOrder:

- **Relationship:** One-to-Many
- **Description:** Each supplier can be associated with multiple purchase orders.

PurchaseOrder and PurchaseOrderDetail:

- **Relationship:** One-to-Many
- **Description:** Each purchase order can have multiple line items, each representing a specific product and its quantity.

SalesOrder and SalesOrderDetail:

- **Relationship:** One-to-Many
- **Description:** Each sales order can have multiple line items, each representing a specific product and its quantity.

Product and SalesOrderDetail:

- **Relationship:** One-to-Many
- **Description:** A product can appear in multiple sales order details.

Product and PurchaseOrderDetail:

- **Relationship:** One-to-Many

- **Description:** A product can appear in multiple purchase order details.

User and AuditLog:

- **Relationship:** One-to-Many
- **Description:** Each user can have multiple entries in the audit log, representing their actions in the system.

AuditLog and Other Tables:

- **Implicit Relationship:** The AuditLog table references actions performed on various other tables, but there's no direct foreign key relationship.

Chapter No 3: Functionalities

3.1 Functionalities

3.1.1 Inventory Tracking

Feature Name	Description	Database Tables
Real-Time Stock Updates	Automatically update stock levels during sales, purchases, or adjustments.	Products, StockMovements
Multi-location Support	Track inventory across multiple warehouses or store locations.	Products, StockMovements
Batch and Serial Tracking	Manage products by batch, lot, or unique serial numbers.	Products, StockMovements
Stock Movement History	Maintain a log of all stock movements (inflow, outflow, adjustments).	StockMovements

3.1.2 Product Management

Feature Name	Description	Database Tables
Product Registration	Add, update, or remove products with details like SKU, category, and price.	Products
Barcode Integration	Generate and scan barcodes for quick product identification.	Products
Categorization	Organize products into categories or groups for easier management.	Categories, Products
Unit of Measure Support	Manage inventory in various units (e.g., boxes, pieces, kg).	Products

3.1.3 Order Management

Feature Name	Description	Database Tables
Purchase Order Management	Create, track, and manage purchase orders from suppliers.	PurchaseOrders, PurchaseOrderDetails
Sales Order Management	Process customer sales orders and link them to inventory.	SalesOrders, SalesOrderDetails
Reorder Point Alerts	Receive alerts when stock levels drop below a defined threshold.	Products, StockMovements
Supplier and Vendor Management	Maintain supplier details and purchase history.	Suppliers, PurchaseOrders

3.1.4 Stock Control

Feature Name	Description	Database Tables
Stock In/Out Transactions	Record inventory inflows (purchases) and outflows (sales).	StockMovements
Stock Transfers	Move stock between different locations or warehouses.	StockMovements
Stock Adjustment	Adjust stock levels due to shrinkage, damage, or other factors.	StockMovements

3.1.5 Reporting and Analytics

Feature Name	Description	Database Tables
Inventory Valuation	Generate real-time reports on the total value of inventory.	Products
Stock Movement Reports	Track historical data on stock inflow/outflow and adjustments.	StockMovements
Sales and Purchase Reports	Analyze sales trends, purchase history, and supplier performance.	SalesOrders, PurchaseOrders
Demand Forecasting	Predict future inventory needs based on historical data.	SalesOrders, StockMovements

3.1.6 User Management

Feature Name	Description	Database Tables
Role-Based Access Control	Define user roles (Admin, Manager, Staff) with specific permissions.	Users
User Authentication	Secure login with password encryption.	Users
Audit Logs	Track and log user actions for accountability.	AuditLogs, Users

3.1.7 Integration and Automation

Feature Name	Description	Database Tables
Accounting Integration	Sync inventory data with accounting systems like QuickBooks or Xero.	Integration handled outside DB
E-commerce Integration	Integrate with platforms like Shopify or WooCommerce for real-time updates.	Integration handled outside DB
Email and Notifications	Send alerts and updates via email or in-app notifications.	No direct table, notifications can use a NotificationLogs table if needed.

3.1.8 Security and Compliance

Feature Name	Description	Database Tables
Data Encryption	Protect sensitive data with encryption during storage and transmission.	Users, AuditLogs
Backup and Recovery	Implement automated backups and disaster recovery plans.	Backup handled outside DB
Compliance Support	Ensure compliance with industry regulations (e.g., GDPR, ISO).	Policies handled outside DB

3.1.8 Expense Management

Feature Name	Description	Database Tables
Expense Tracking	Add, update, and delete expense records with details like date, amount, and category.	Expenses
Categorization	Organize expenses into categories for better analysis and tracking.	Expenses, Categories
Expense Reports	Generate reports to analyze expense trends over a specific period.	Expenses

Report Ended

We hope that this report will conclude all the requirements and describe our project very well.