System Development Project Design

Innovation Nexus

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1. Introduction

1.1 Purpose

The purpose of this document is to provide a comprehensive design for the Bright Brightness Shop System, which is intended to streamline and enhance the business operations of the Best Brightness Pongola Shop. This system will address critical business needs, including inventory management, customer management, sales tracking, and e-commerce integration, through a robust web application built using ASP.NET.

1.2 Scope

The scope of this system design includes the following:

Included:

- Development of a web-based application for inventory management, customer management, and sales tracking.
- Integration of an e-commerce platform to enable online sales.
- Implementation of security measures to protect sensitive data.
- Design of a user-friendly interface for shop administrators and customers.

Excluded:

- Development of a mobile application.
- Integration with third-party accounting software.

1.3 Overview

This document outlines the system architecture, including hardware, software, and network components. It details the external interfaces, database design, user interface design, and application components. It also considers design aspects such as performance, scalability, security, usability, and dependability.

2. System Architecture

2.1 High-Level Overview

The system architecture of the Bright Brightness Shop System includes a three-tier architecture:

- ✓ **Presentation Layer:** The user interface (UI) components where users interact with the system.
- ✓ **Business Logic Layer**: Handles the core functionality, including business rules and operations.
- ✓ **Data Access Layer**: Manages interactions with the database, including CRUD operations.

2.2 Hardware Architecture

- User Devices: Desktop computers, laptops, tablets, and smartphones used by shop administrators and customers to access the system.

- System Devices: Servers hosting the web application, database, and e-commerce platform.

2.3 Software Architecture

User Applications:

- Web browsers on user devices for accessing the web application.

- System Applications:

- ASP.NET Core web application hosting the business logic and UI.
- SQL Server for managing the database.
- IIS (Internet Information Services) as the web server.

2.4 Network Architecture

- Network Infrastructure:

- The system components communicate over a secure HTTPS connection.
- The internal network uses Ethernet or Wi-Fi to connect servers and user devices.
- Internet access for remote users and online sales transactions.

- Network Protocols:

- HTTP/HTTPS for web communications.
- TCP/IP for internal networking.
- SSL/TLS for secure communications.

3. External Interfaces

3.1 Hardware Interfaces

- Interface with User Devices: Standard interfaces like USB, Ethernet, and Wi-Fi for connecting user devices to the network.
- Interface with System Devices: Servers connected via Ethernet to ensure fast and reliable communication.

3.2 Software Interfaces

- Web API: The web application may expose APIs for future integration with external systems.

- Database Interfaces: The application will interface with the SQL Server database using Entity Framework Core.

3.3 Communication Interfaces

1. Internal Communication: ASP.NET Core communicates with SQL Server using Entity Framework Core.
2. External Communication: The system communicates with user devices via HTTPS, ensuring data is encrypted during transmission.

3.4 System Security and Integrity Controls

1.1 User Authentication: ASP.NET Identity for managing user authentication and authorization.
1.2 Data Encryption: SSL/TLS for encrypting data in transit and AES for data at rest.
1.3 Input Validation: To prevent SQL injection and other security threats.

4. Database Design

4.1 Data Requirements

- Data Dictionary:

- Tables: Products, Sales, Customers, Users, Orders, Reviews, Stock Requests, Suppliers, Financial Reports.
- Fields: For Product – ProductId, ProductName, ProductCategory, QuantityInStore, QuantityInWarehouse, ProductPrice, ProductPrice, RestockLevel, SupplierId, DateAdded.

  For Sales – SaleId, ProductId, CustomerId, QuantitySold, TotalPrice, SaleDate, DiscountApplied, PaymentMethod, SaleType.

  For Customers – CustomerId, CustomerFirstName, CustomerLastName, CustomerEmail, CustomerPhoneNumber, CustomerAddress, CustomerLoyaltyPoints, AccountCreated.

  Users – UserId, UserName, UserPasswordHash, UserFirstname, UserLastName, UserEmail, UserRole, DateCreated, IsActive.

  Orders – OrderId, CustomerId, OrderDate, OrderStatus, OrderTotalAmount, OrderPaymentStatus, ShippingAddress.

  Reviews – ReviewId, ProductId, CustomerId, Rating, Comment, ReviewDate.

Stock Requests – RequestId, ProductId, RequestedBy, QuantityRequested, RequestDate, RequestStatus.

Suppliers – SupplierId, SupplierName, ContactPerson, SupplierPhoneNumber, SupplierEmail, SupplierAddress.

FinancialReport – ReportId, ReportType, ReportStartDate, ReportEndDate, ReportTotalSales, ReportTotalDiscounts, ReportNetProfit, GeneratedBy.

4.2 Database Schema

- Tables and Relationships:

- Products table with ProductId as the primary key.
- Sales table linked to Products and Users via foreign keys.
- Customers table with a one-to-many relationship with Sales.

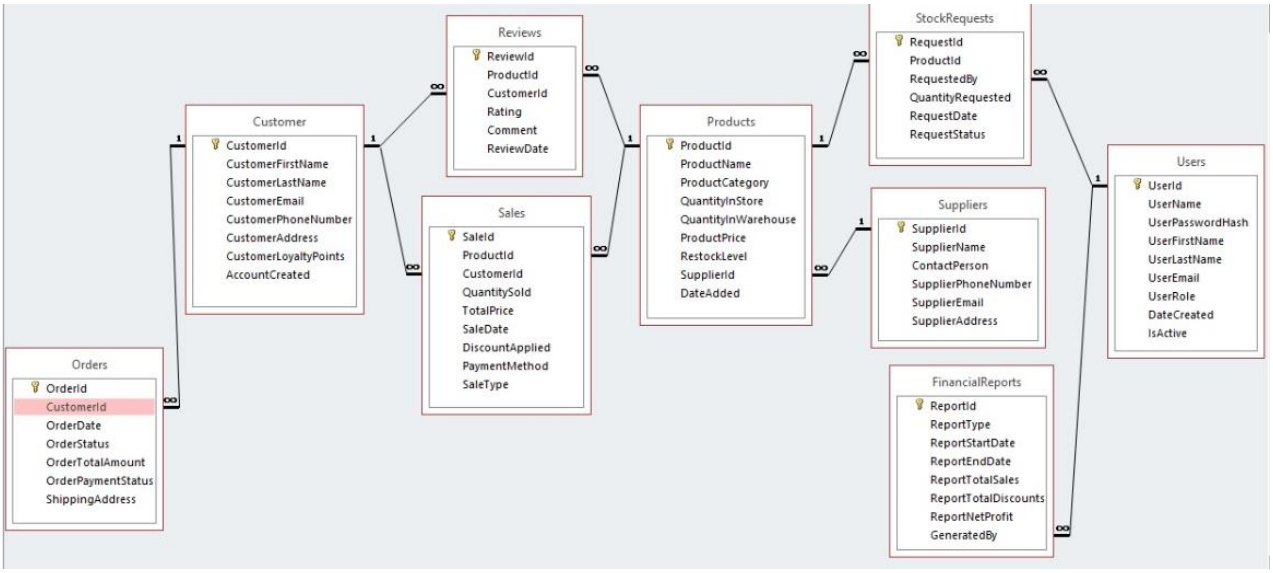
4.3 Database Physical Design

- Data Storage: SQL Server database hosted on a dedicated server.
- Storage Size: Adequate to accommodate the shop's growing data, including product details, sales records, and customer information.

4.4 Data Security

Security Measures:

- Role-based access control to limit access to sensitive data.
- Regular backups to prevent data loss.
- Encryption of sensitive fields like passwords and payment information.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ReviewId
ProductId
CustomerId
Rating
Comment
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StockRequests
RequestId
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QuantityRequested
RequestDate
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Customer
CustomerId
CustomerFirstName
CustomerLastName
CustomerEmail
CustomerPhoneNumber
CustomerAddress
CustomerLoyaltyPoints
AccountCreated
Products
ProductId
ProductName
ProductCategory
QuantityInStore
QuantityInWarehouse
ProductPrice
RestockLevel
SupplierId
DateAdded
Users
UserId
UserName
UserPasswordHash
UserFirstName
UserLastName
UserEmail
UserRole
DateCreated
IsActive
Sales
SaleId
ProductId
CustomerId
QuantitySold
TotalPrice
SaleDate
DiscountApplied
PaymentMethod
SaleType
Suppliers
SupplierId
SupplierName
ContactPerson
SupplierPhoneNumber
SupplierEmail
SupplierAddress
Orders
OrderId
CustomerId
OrderDate
OrderStatus
OrderTotalAmount
OrderPaymentStatus
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ReportType
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ReportTotalSales
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ReportNetProfit
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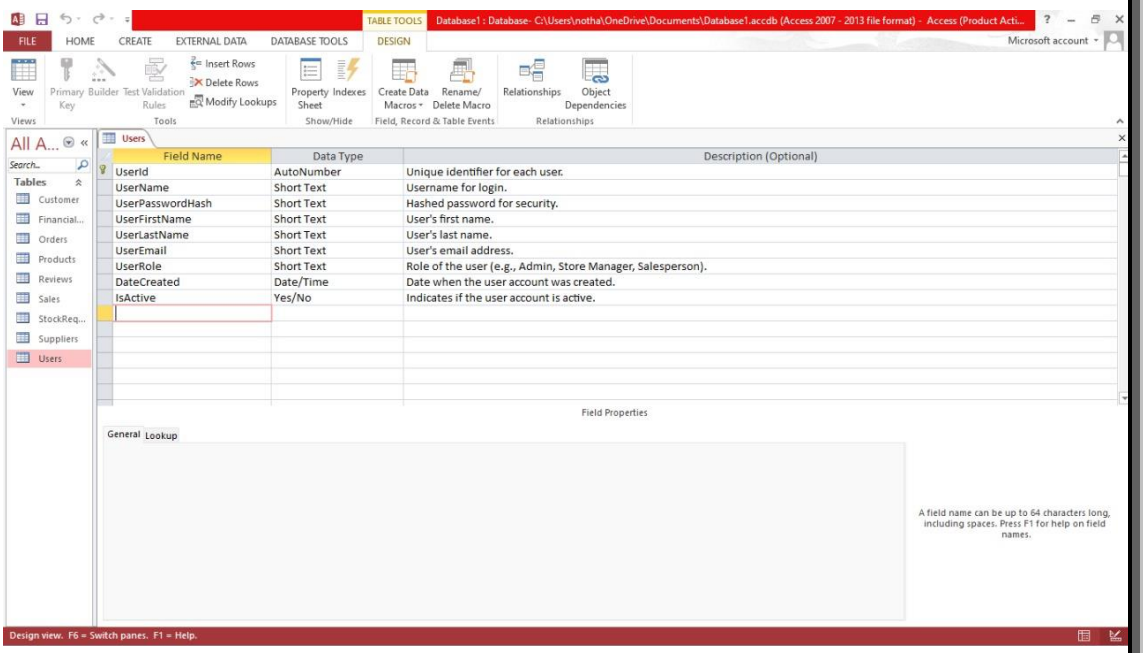
TABLE TOOLS
Database1 : Database- C:\Users\notha\OneDrive\Documents\Database1.accdb (Access 2007 - 2013 file format) - Access (Product Acti...
FILE
HOME
CREATE
EXTERNAL DATA
DATABASE TOOLS
DESIGN
Microsoft account
View
Primary Key
Builder
Test Validation Rules
Insert Rows
Delete Rows
Modify Lookups
Property Sheet
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Create Data Macros
Rename/ Delete Macro
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Field, Record & Table Events
Relationships
All A...
Search...
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Customer
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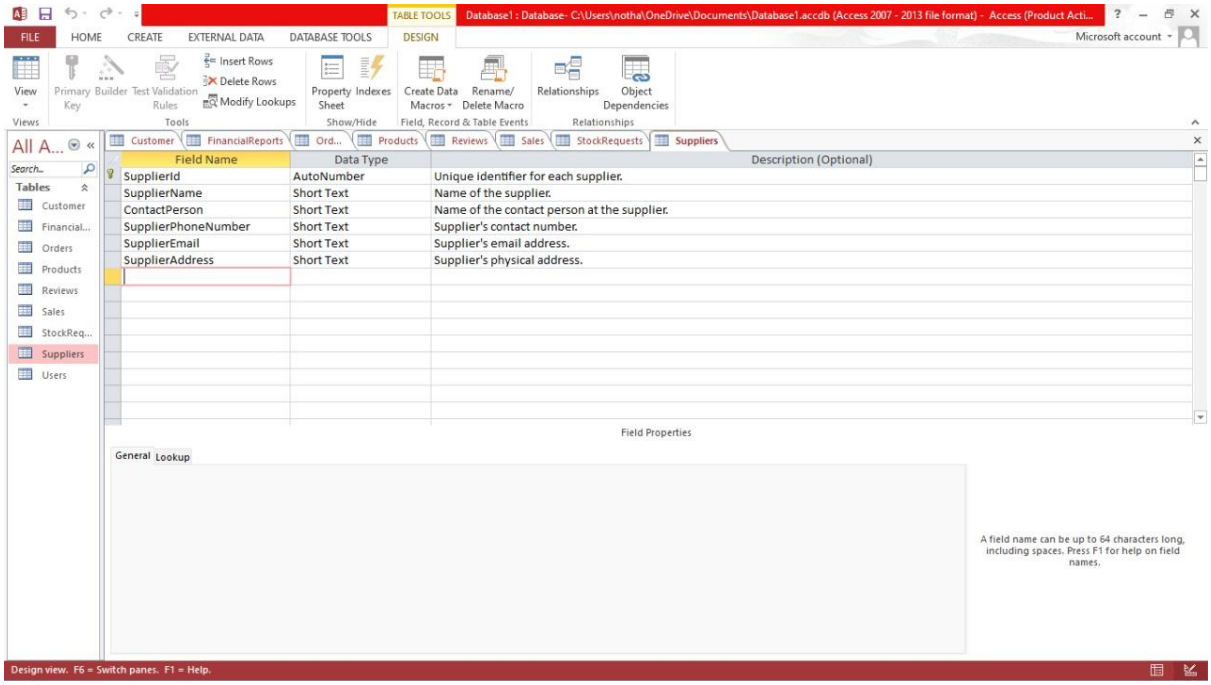
Orders
Products
Reviews
Sales
StockReq...
Suppliers
Users
Users
Field Name
Data Type
Description (Optional)
UserId
AutoNumber
Unique identifier for each user.
UserName
Short Text
Username for login.
UserPasswordHash
Short Text
Hashed password for security.
UserFirstName
Short Text
User's first name.
UserLastName
Short Text
User's last name.
UserEmail
Short Text
User's email address.
UserRole
Short Text
Role of the user (e.g., Admin, Store Manager, Salesperson).
DateCreated
Date/Time
Date when the user account was created.
IsActive
Yes/No
Indicates if the user account is active.
Field Properties
General
Lookup
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
Design view. F6 = Switch panes. F1 = Help.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Products
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StockRequests
Suppliers
Field Name
Data Type
Description (Optional)
SupplierId
AutoNumber
Unique identifier for each supplier.
SupplierName
Short Text
Name of the supplier.
ContactPerson
Short Text
Name of the contact person at the supplier.
SupplierPhoneNumber
Short Text
Supplier's contact number.
SupplierEmail
Short Text
Supplier's email address.
SupplierAddress
Short Text
Supplier's physical address.
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General
Lookup
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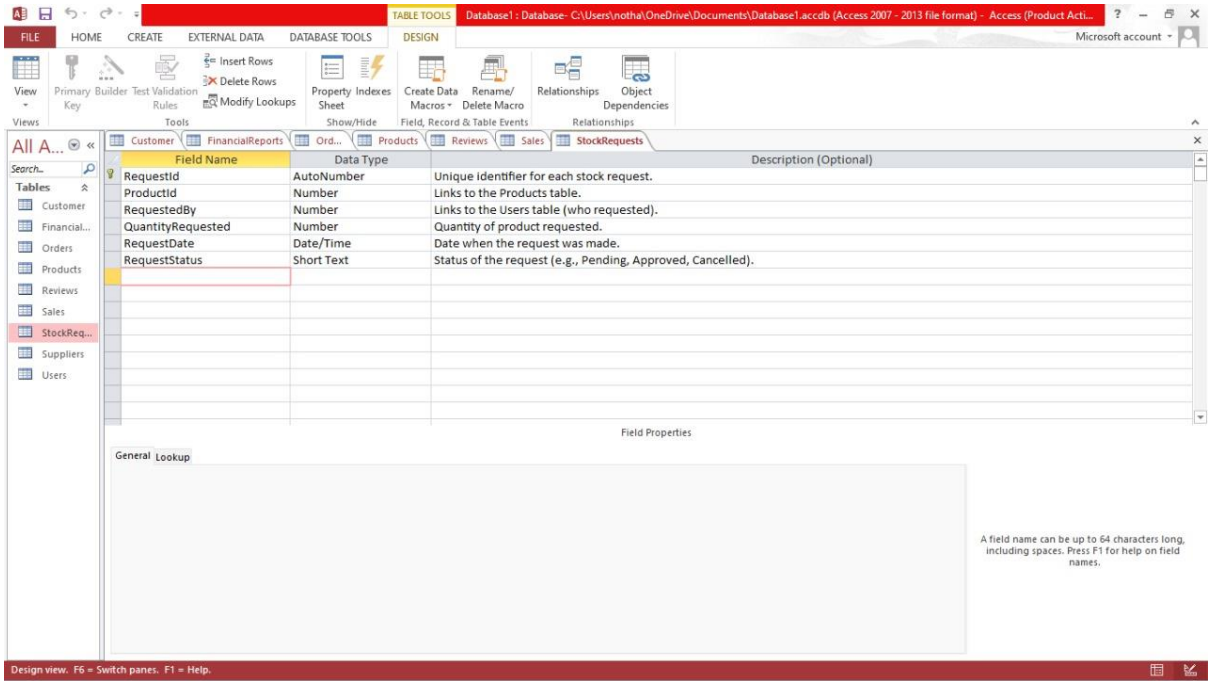
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StockRequests
Field Name
Data Type
Description (Optional)
RequestId
AutoNumber
Unique identifier for each stock request.
ProductId
Number
Links to the Products table.
RequestedBy
Number
Links to the Users table (who requested).
QuantityRequested
Number
Quantity of product requested.
RequestDate
Date/Time
Date when the request was made.
RequestStatus
Short Text
Status of the request (e.g., Pending, Approved, Cancelled).
Field Properties
General
Lookup
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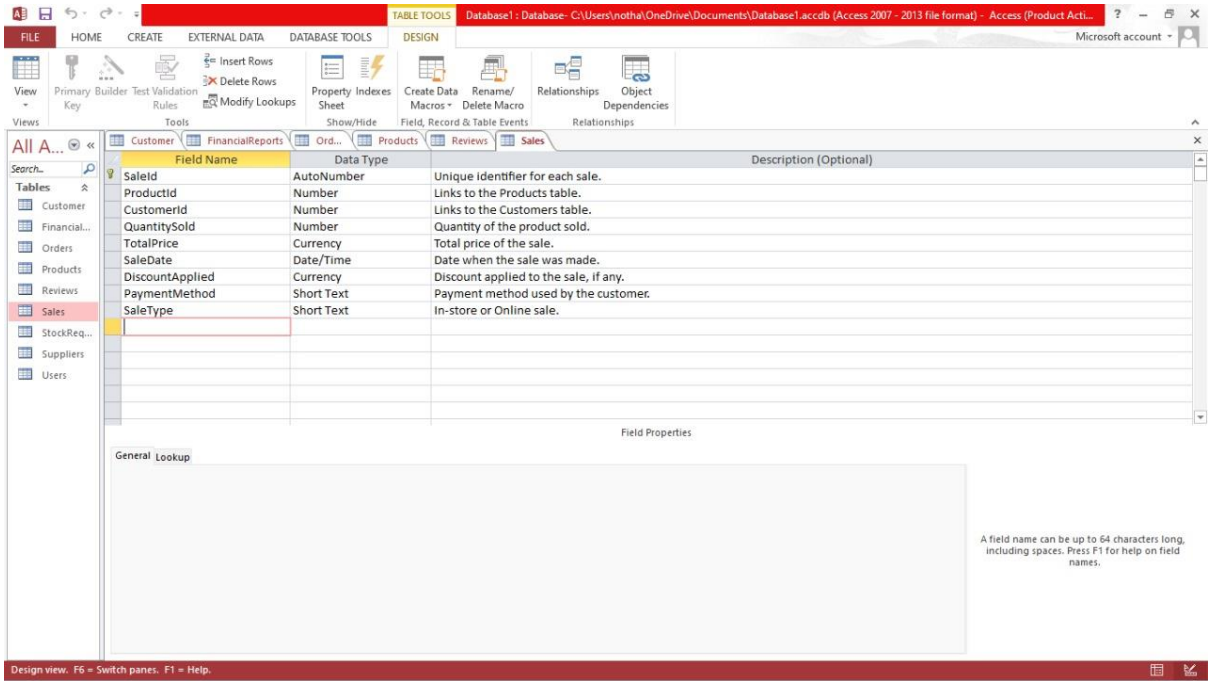
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FinancialReports
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Products
Reviews
Sales
Field Name
Data Type
Description (Optional)
SaleId
AutoNumber
Unique identifier for each sale.
ProductId
Number
Links to the Products table.
CustomerId
Number
Links to the Customers table.
QuantitySold
Number
Quantity of the product sold.
TotalPrice
Currency
Total price of the sale.
SaleDate
Date/Time
Date when the sale was made.
DiscountApplied
Currency
Discount applied to the sale, if any.
PaymentMethod
Short Text
Payment method used by the customer.
SaleType
Short Text
In-store or Online sale.
Field Properties
General
Lookup
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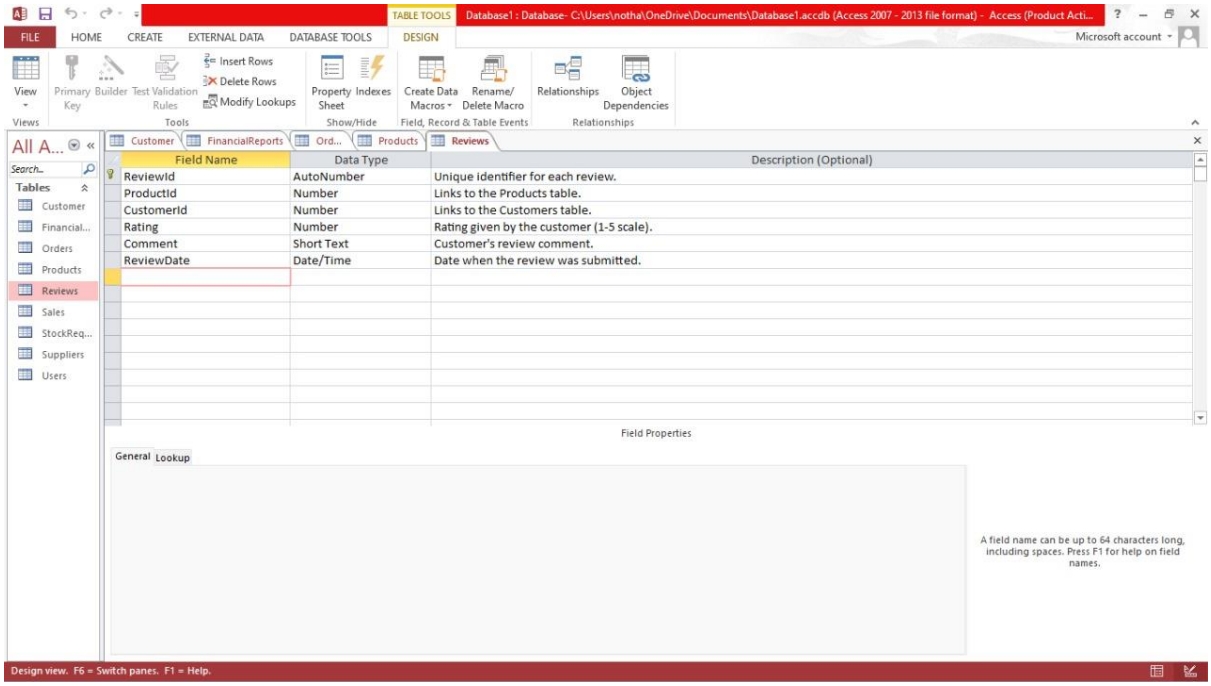
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Products
Reviews
Field Name
Data Type
Description (Optional)
ReviewId
AutoNumber
Unique identifier for each review.
ProductId
Number
Links to the Products table.
CustomerId
Number
Links to the Customers table.
Rating
Number
Rating given by the customer (1-5 scale).
Comment
Short Text
Customer's review comment.
ReviewDate
Date/Time
Date when the review was submitted.
Field Properties
General
Lookup
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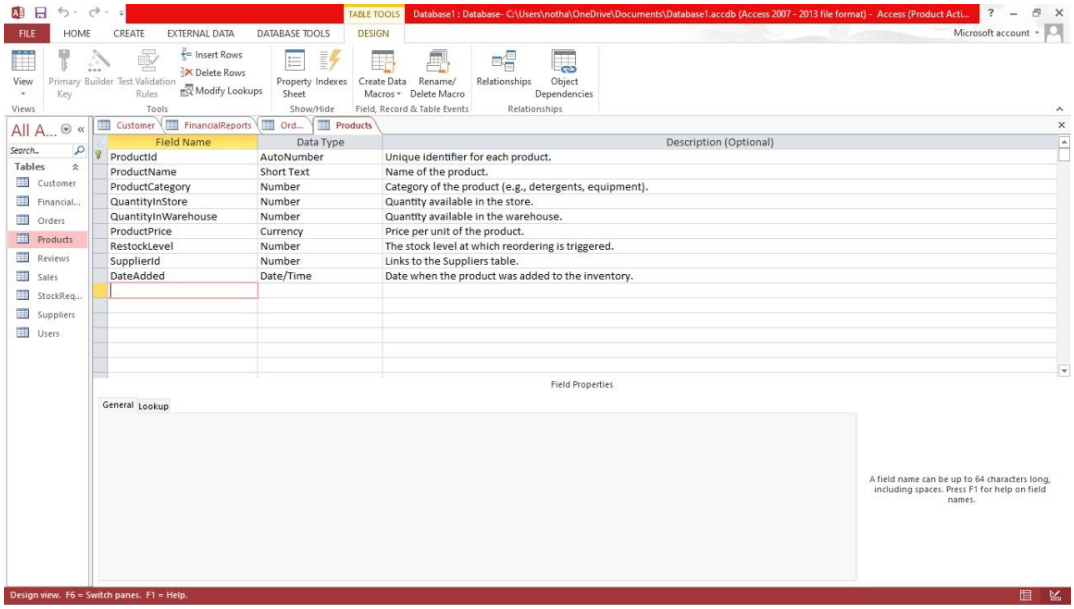
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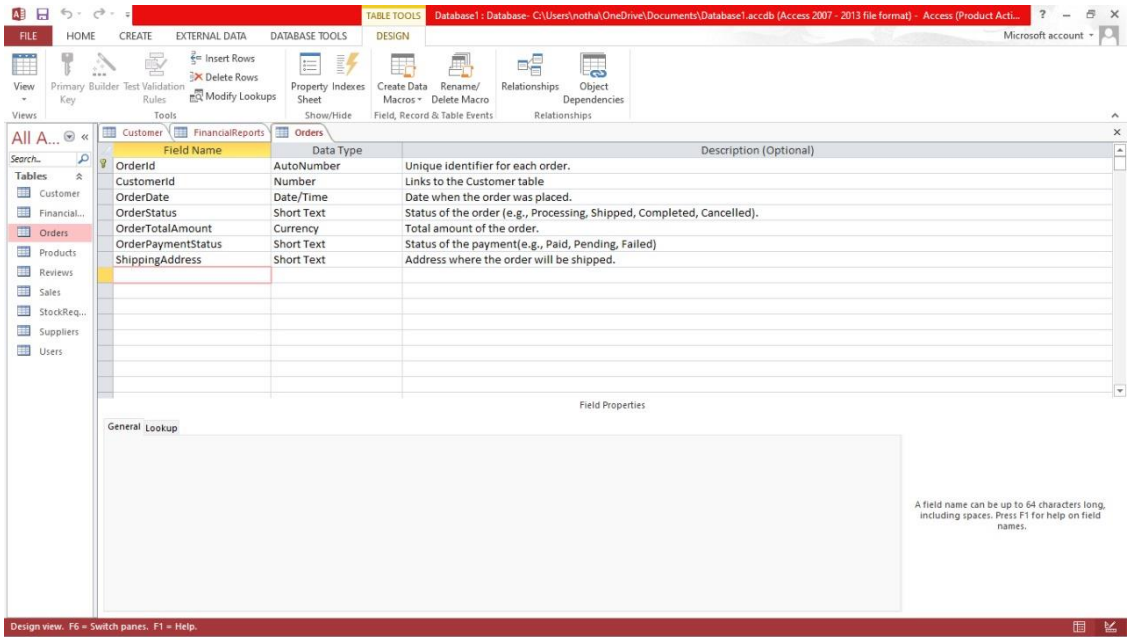
StockReq...
Suppliers
Users
Customer
FinancialReports
Ord...
Products
Field Name
Data Type
Description (Optional)
ProductId
AutoNumber
Unique identifier for each product.
ProductName
Short Text
Name of the product.
ProductCategory
Number
Category of the product (e.g., detergents, equipment).
QuantityInStore
Number
Quantity available in the store.
QuantityInWarehouse
Number
Quantity available in the warehouse.
ProductPrice
Currency
Price per unit of the product.
RestockLevel
Number
The stock level at which reordering is triggered.
SupplierId
Number
Links to the Suppliers table.
DateAdded
Date/Time
Date when the product was added to the inventory.
Field Properties
General
Lookup
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
Design view. F6 = Switch panes. F1 = Help.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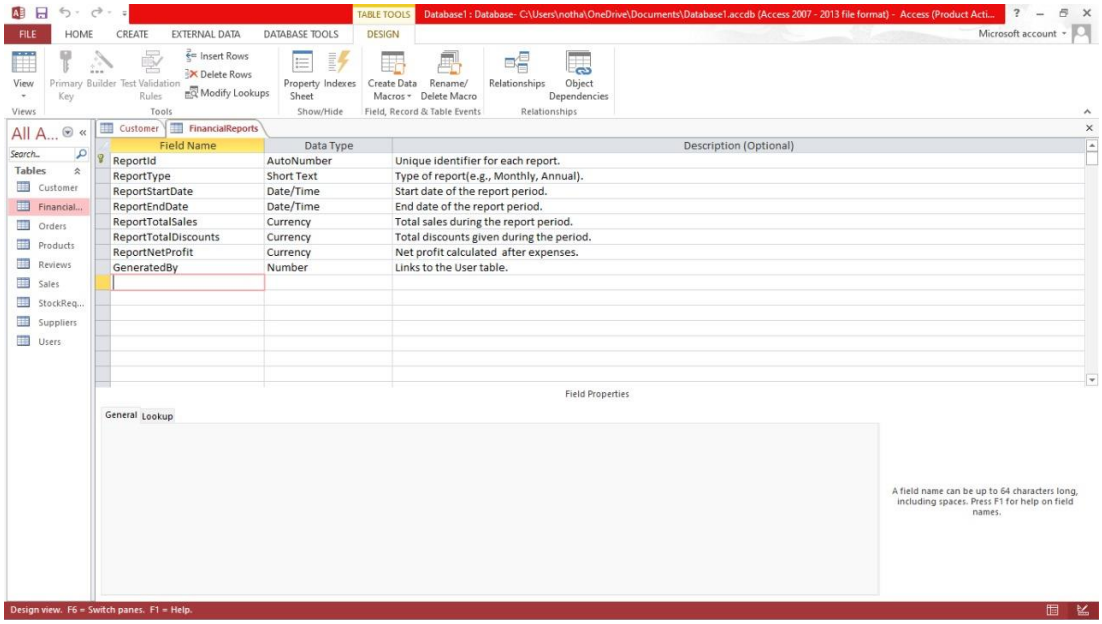
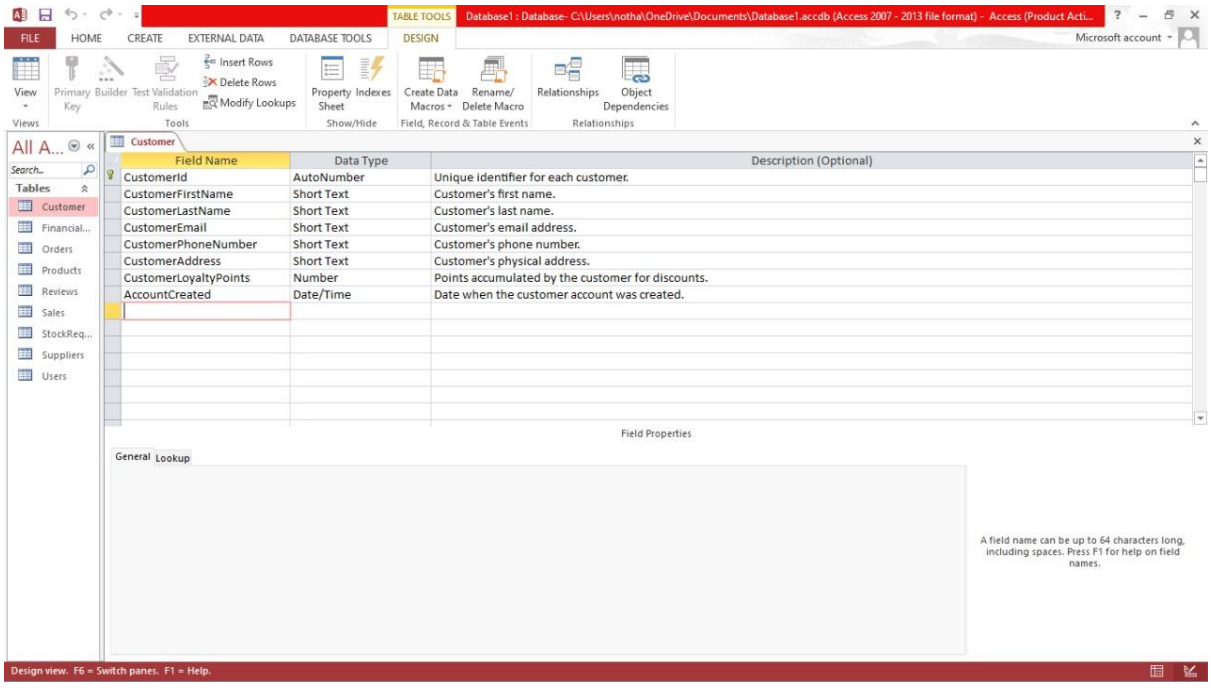
Users
Customer
FinancialReports
Orders
Field Name
Data Type
Description (Optional)
OrderId
AutoNumber
Unique identifier for each order.
CustomerId
Number
Links to the Customer table
OrderDate
Date/Time
Date when the order was placed.
OrderStatus
Short Text
Status of the order (e.g., Processing, Shipped, Completed, Cancelled).
OrderTotalAmount
Currency
Total amount of the order.
OrderPaymentStatus
Short Text
Status of the payment(e.g., Paid, Pending, Failed)
ShippingAddress
Short Text
Address where the order will be shipped.
Field Properties
General
Lookup
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.
Design view. F6 = Switch panes. F1 = Help.

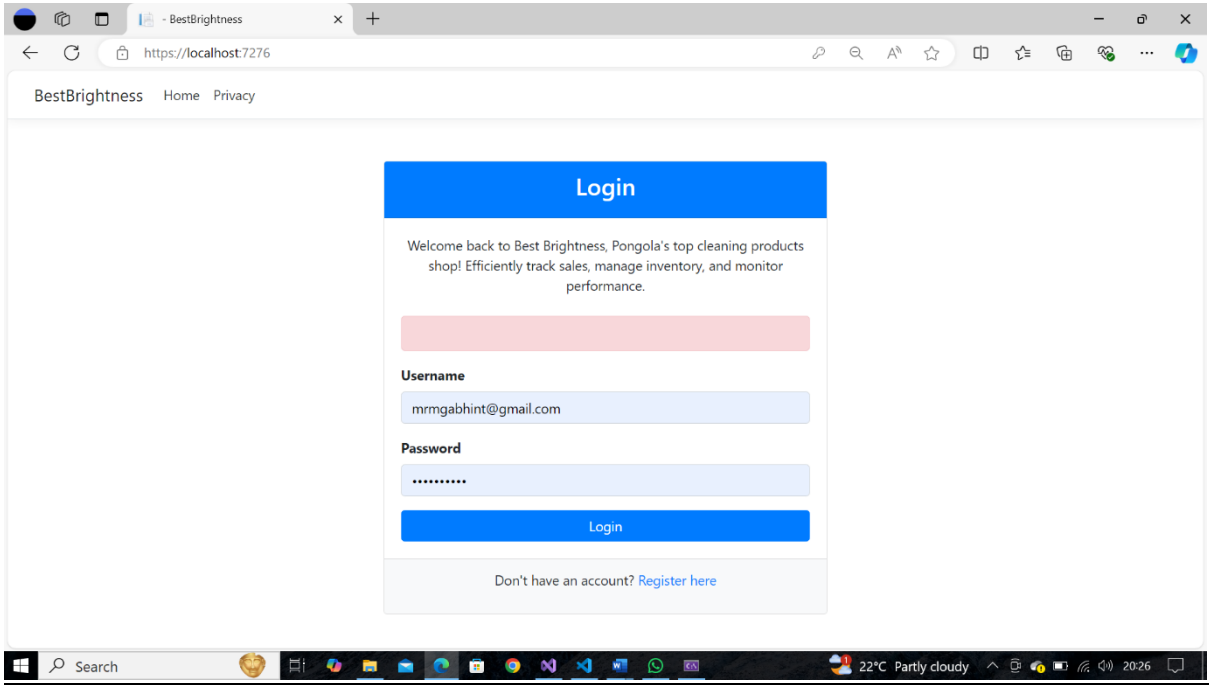


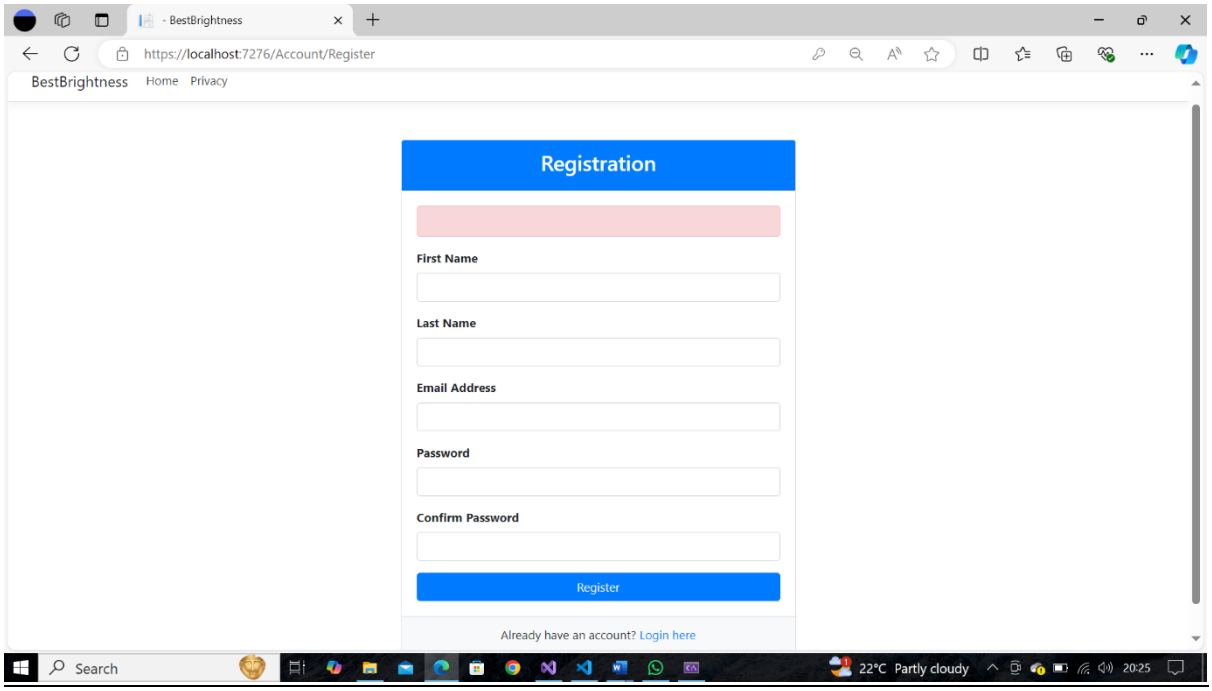


5. User Interface Design

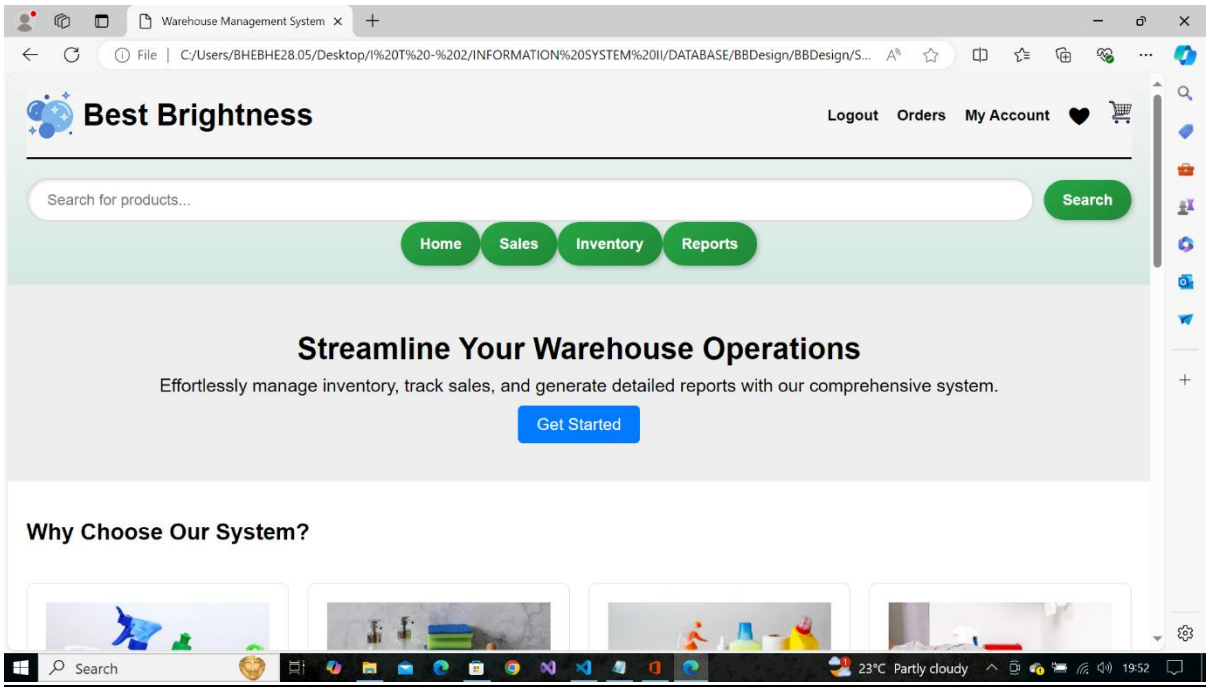
- Layouts and Mockups:
- Home Page: Welcome message, login/register buttons, and product overview.
- Dashboard: Features buttons for Record Sales, Manage Inventory, View Reports, with a clean and modern layout.
- Forms: Simplified and mobile-friendly forms for login, registration, and sales recording.

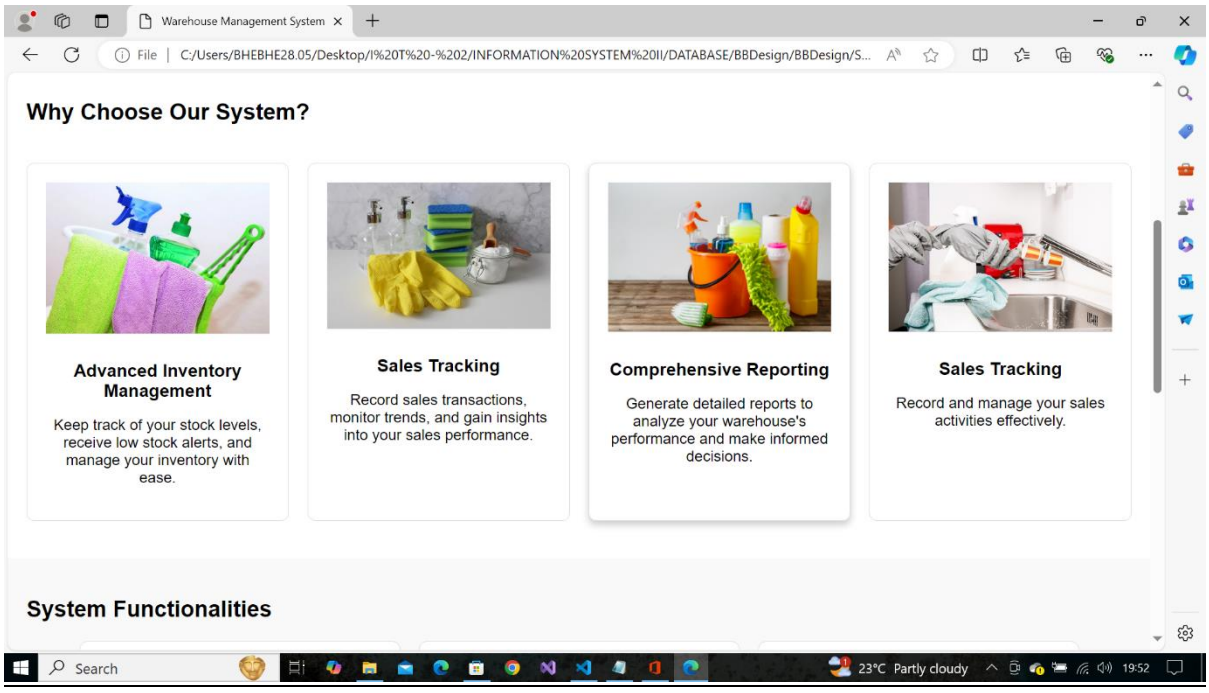
LOGIN AND REGISTRATION





SALES MENU


Warehouse Management System
File | C:/Users/BHEBHE28.05/Desktop/I%20T%20-%202/INFORMATION%20SYSTEM%20II/DATABASE/BBDesign/BBDesign/S...
Best Brightness
Logout
Orders
My Account
Search for products...
Search
Home
Sales
Inventory
Reports
Streamline Your Warehouse Operations
Effortlessly manage inventory, track sales, and generate detailed reports with our comprehensive system.
Get Started
Why Choose Our System?
Search
23°C Partly cloudy
19:52


Warehouse Management System
File | C:/Users/BHEBHE28.05/Desktop/I%20T%20-%202/INFORMATION%20SYSTEM%20II/DATABASE/BBDesign/BBDesign/S...
Why Choose Our System?
Advanced Inventory Management
Keep track of your stock levels, receive low stock alerts, and manage your inventory with ease.
Sales Tracking
Record sales transactions, monitor trends, and gain insights into your sales performance.
Comprehensive Reporting
Generate detailed reports to analyze your warehouse's performance and make informed decisions.
Sales Tracking
Record and manage your sales activities effectively.
System Functionalities
Search
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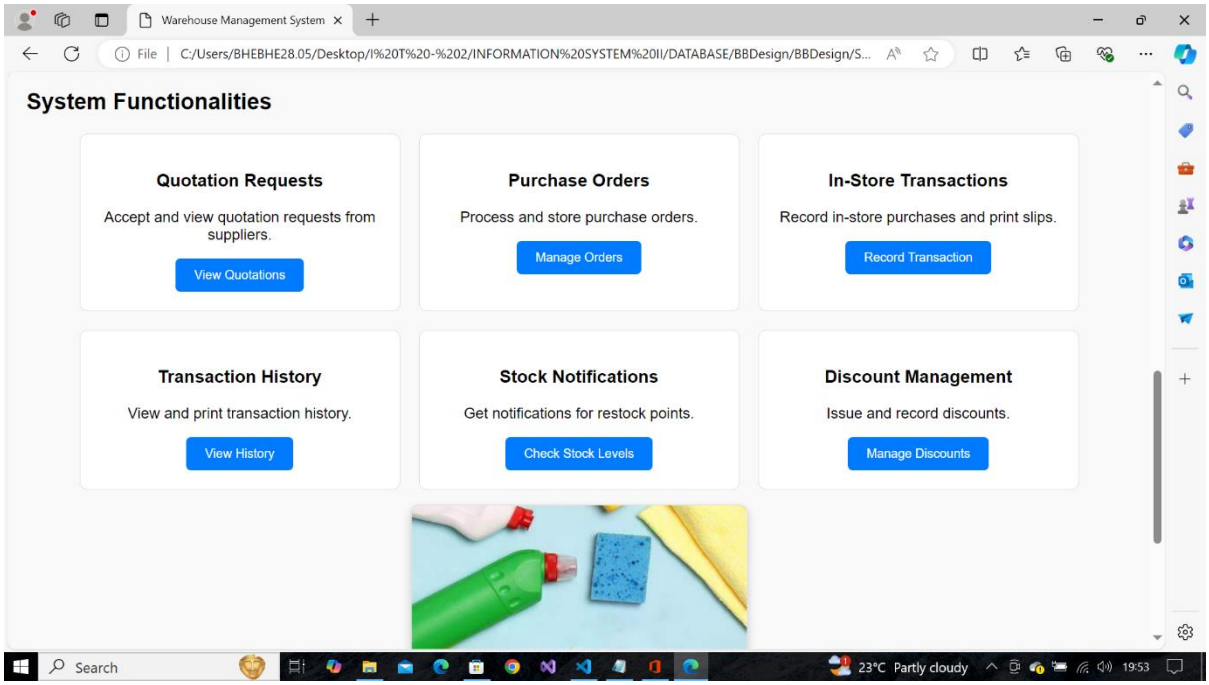
Warehouse Management System
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System Functionalities
Quotation Requests
Accept and view quotation requests from suppliers.
View Quotations
Purchase Orders
Process and store purchase orders.
Manage Orders
In-Store Transactions
Record in-store purchases and print slips.
Record Transaction
Transaction History
View and print transaction history.
View History
Stock Notifications
Get notifications for restock points.
Check Stock Levels
Discount Management
Issue and record discounts.
Manage Discounts
Search
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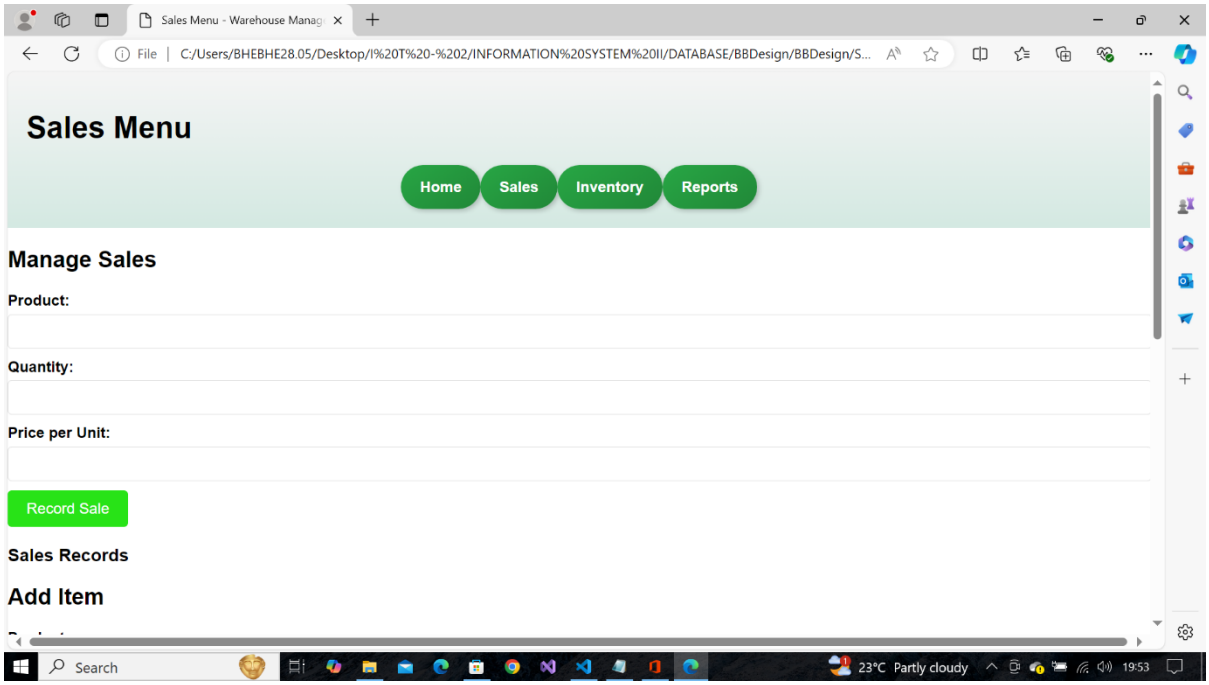
Sales Menu - Warehouse Manag
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Sales Menu
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Sales
Inventory
Reports
Manage Sales
Product:
Quantity:
Price per Unit:
Record Sale
Sales Records
Add Item
Search
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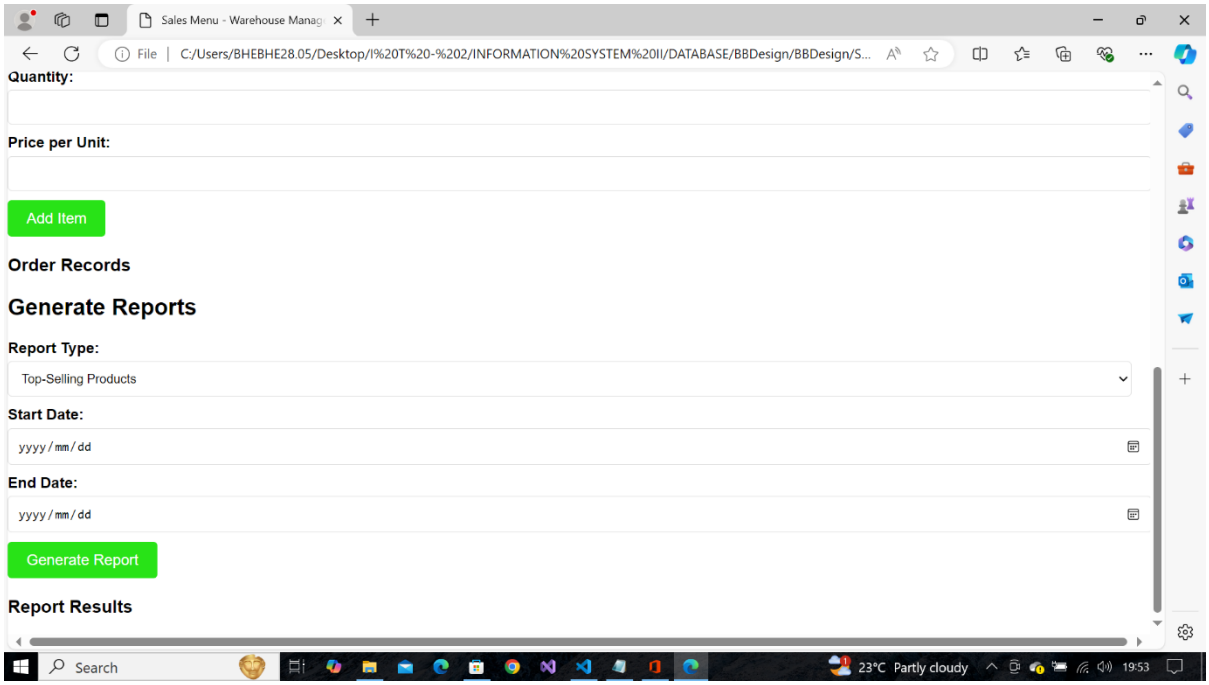
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Quantity:
Price per Unit:
Add Item
Order Records
Generate Reports
Report Type:
Top-Selling Products
Start Date:
yyyy / mm / dd
End Date:
yyyy / mm / dd
Generate Report
Report Results
Search
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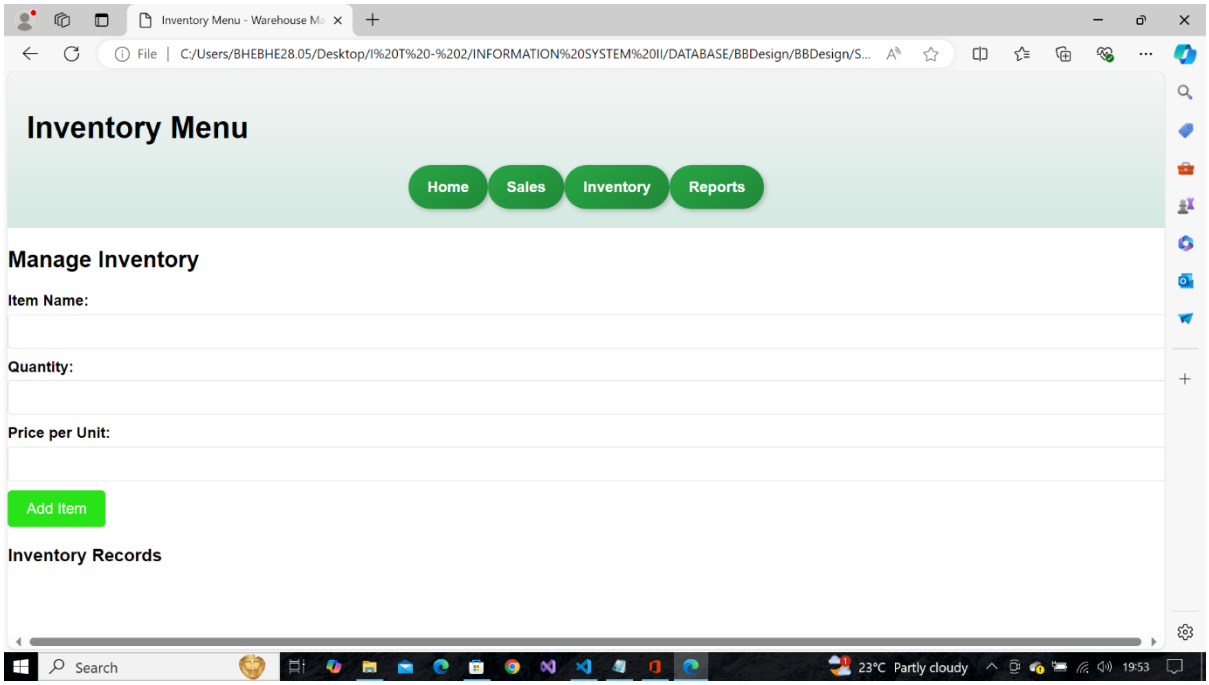
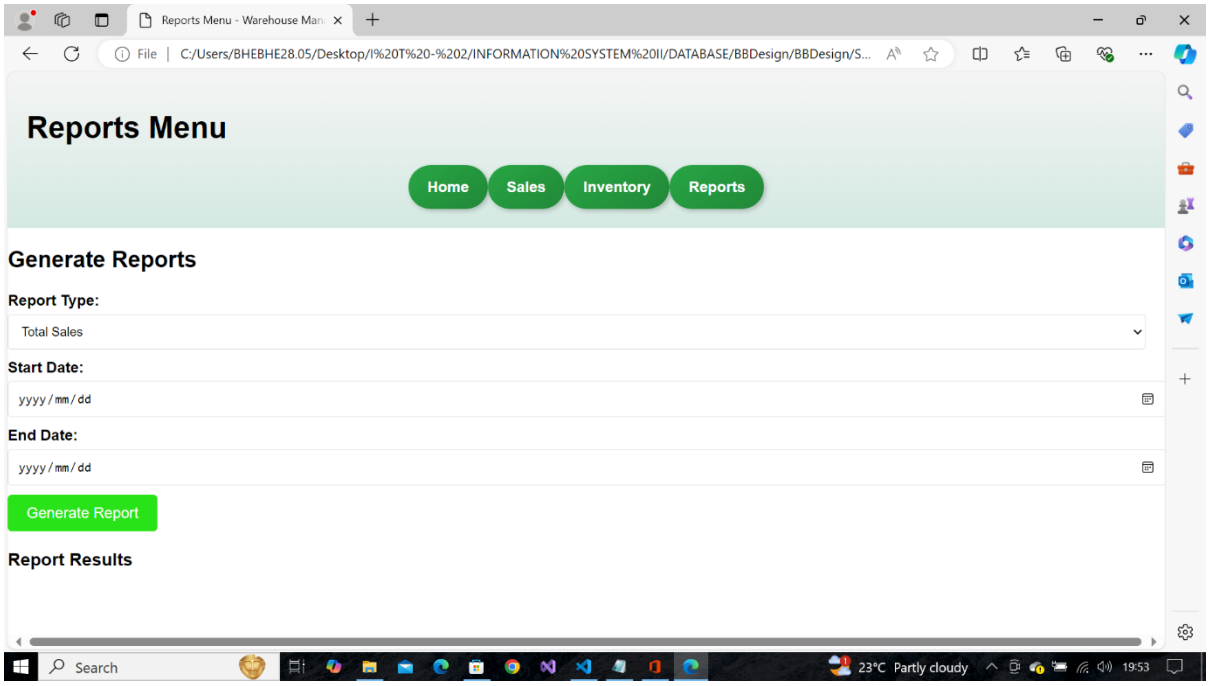
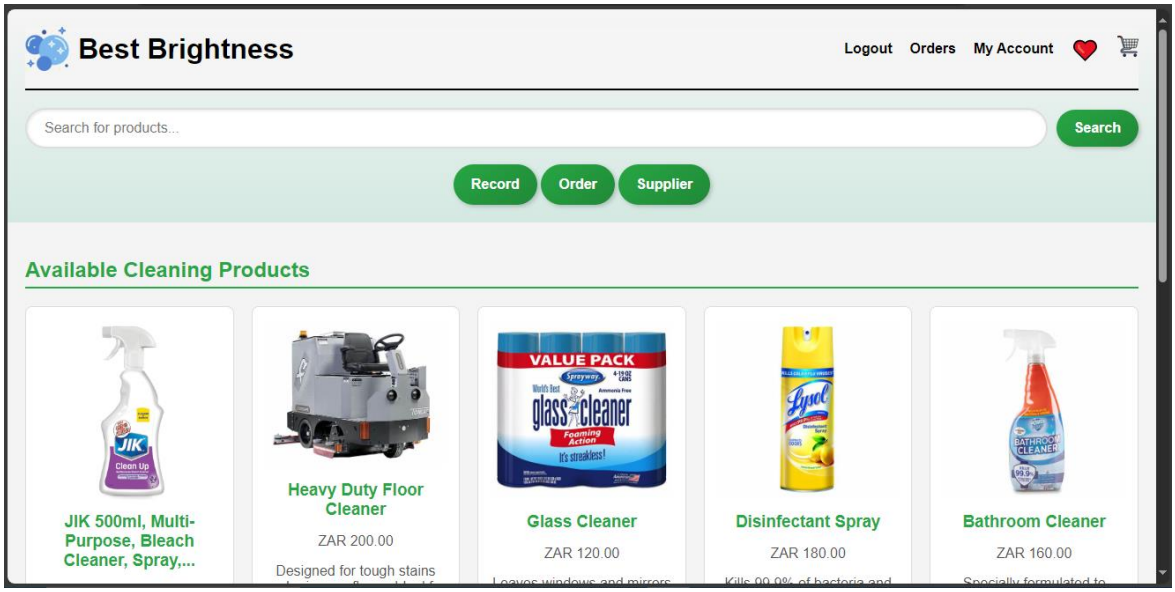
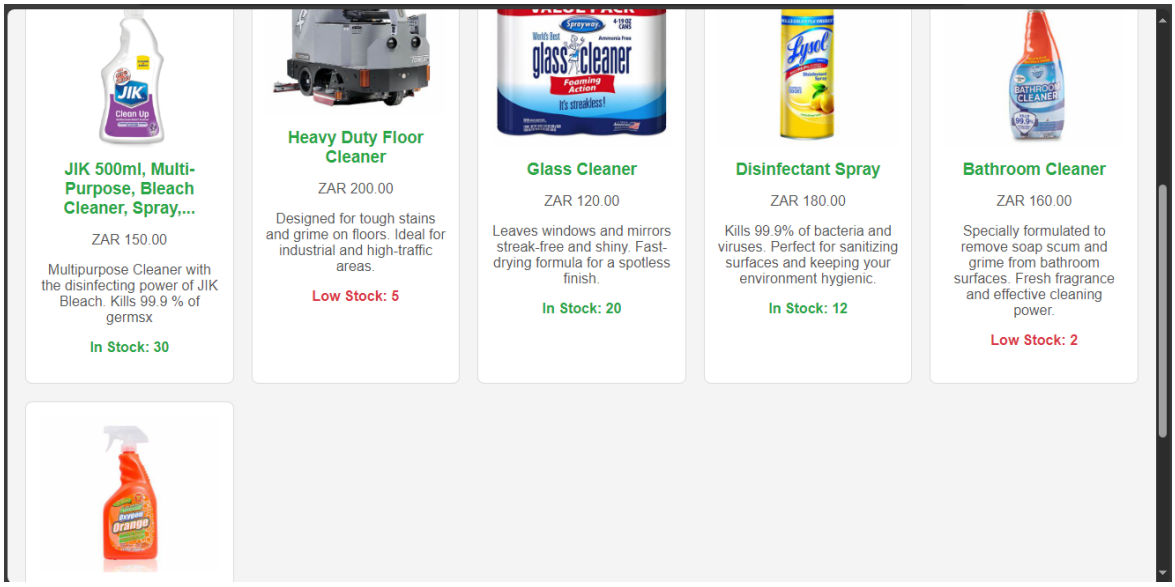
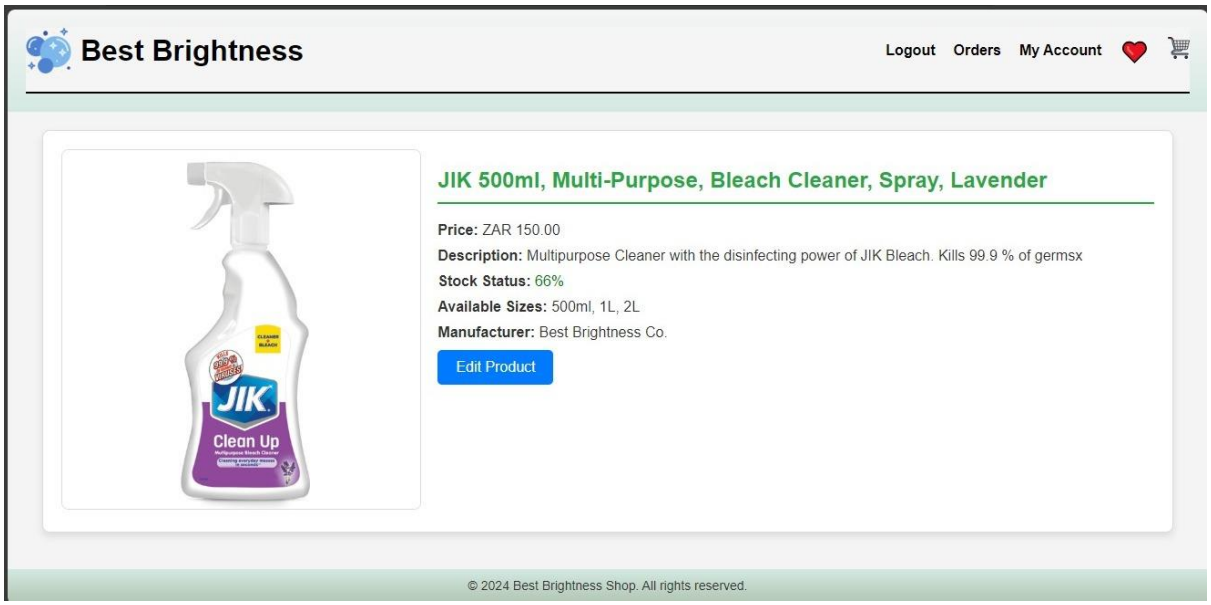

Inventory Menu - Warehouse Ma
File | C:/Users/BHEBHE28.05/Desktop/I%20T%20-%202/INFORMATION%20SYSTEM%20II/DATABASE/BBDesign/BBDesign/S...
Inventory Menu
Home
Sales
Inventory
Reports
Manage Inventory
Item Name:
Quantity:
Price per Unit:
Add Item
Inventory Records
Search
23°C Partly cloudy
19:53



WAREHOUSE MENU




JIK
Clean Up
JIK 500ml, Multi-Purpose, Bleach Cleaner, Spray,...
ZAR 150.00
Multipurpose Cleaner with the disinfecting power of JIK Bleach. Kills 99.9 % of germsx
In Stock: 30
Heavy Duty Floor Cleaner
ZAR 200.00
Designed for tough stains and grime on floors. Ideal for industrial and high-traffic areas.
Low Stock: 5
glass Cleaner
Foaming Action
It's streakless!
Glass Cleaner
ZAR 120.00
Leaves windows and mirrors streak-free and shiny. Fast-drying formula for a spotless finish.
In Stock: 20
Lysol
Disinfectant Spray
ZAR 180.00
Kills 99.9% of bacteria and viruses. Perfect for sanitizing surfaces and keeping your environment hygienic.
In Stock: 12
BATHROOM CLEANER
Bathroom Cleaner
ZAR 160.00
Specially formulated to remove soap scum and grime from bathroom surfaces. Fresh fragrance and effective cleaning power.
Low Stock: 2
Orange


Best Brightness
Logout
Orders
My Account
JIK
Clean Up
JIK 500ml, Multi-Purpose, Bleach Cleaner, Spray, Lavender
Price: ZAR 150.00
Description: Multipurpose Cleaner with the disinfecting power of JIK Bleach. Kills 99.9 % of germsx
Stock Status: 66%
Available Sizes: 500ml, 1L, 2L
Manufacturer: Best Brightness Co.
Edit Product
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Record New Product

Product Name:

Category:

Select a category

Price:

Quantity:

Description:

Upload Image:

Choose File No file chosen

Record Product

Order Management

Create or Update Order

Action:

Create Order

Supplier:

Product:

Quantity:

Submit

Remove Stock

Product:

Quantity:

Remove Stock

Recorded Changes

Order ID: 12345 - **Action:** Created - **Supplier:** GreenClean Supplies - **Product:** UltraClean All-Purpose Cleaner - **Quantity:** 100 units - **Date:** August 20, 2024

Order ID: 12346 - **Action:** Updated - **Supplier:** EcoClean Partners - **Product:** UltraClean Window Cleaner - **New Quantity:** 50 units - **Date:** August 19, 2024

Order ID: 12347 - **Action:** Cancelled - **Supplier:** GreenClean Supplies - **Product:** UltraClean Bathroom Cleaner - **Quantity:** 200 units - **Date:** August 18, 2024

Stock Removal: - **Product:** UltraClean All-Purpose Cleaner - **Removed Quantity:** 10 units - **Date:** August 17, 2024

Pickup Slip ID: 56789 - **Action:** Generated - **Product:** UltraClean Floor Cleaner - **Quantity:** 30 units - **Date:** August 16, 2024 - Print

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Supplier Management

Create New Supplier

Supplier Name:

Contact Person:

Contact Email:

Contact Phone:

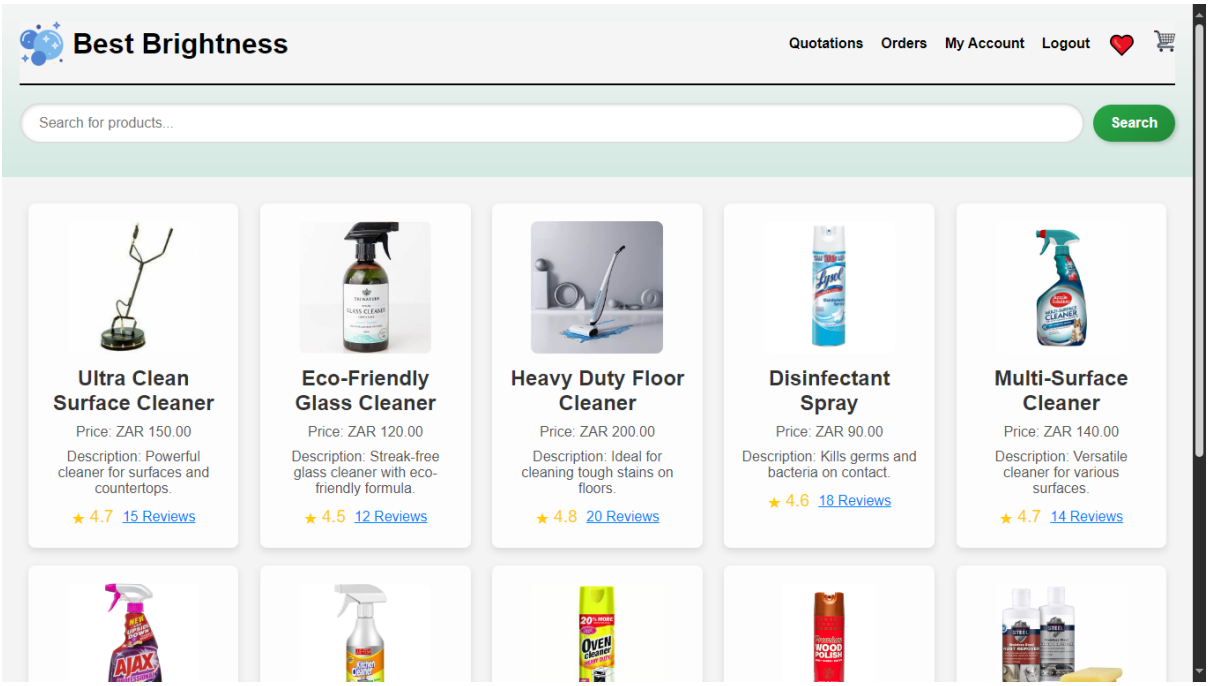
Address:

Add Supplier

Supplier List

Supplier Name	Contact Person	Email	Phone	Address	Actions
GreenClean Supplies	John Doe	john.doe@greenclean.com	(123) 456-7890	123 Greenway, Eco City	Edit Delete
EcoClean Partners	Jane Smith	jane.smith@ecoclean.com	(987) 654-3210	456 Eco Blvd, Green Town	Edit Delete
BioClean Inc.	Emily White	emily.white@bioclean.com	(555) 123-4567	789 Clean St, Fresh Valley	Edit Delete

CUSTOMER (ONLINE) MENU



Bathroom Cleaner

Price: ZAR 110.00

Description: Removes tough stains and soap scum from bathrooms.

★ 4.4 10 Reviews

Kitchen Degreaser

Price: ZAR 160.00

Description: Effectively removes grease and grime from kitchen surfaces.

★ 4.9 25 Reviews

Oven Cleaner

Price: ZAR 180.00

Description: Heavy-duty cleaner for ovens and grills.

★ 4.6 16 Reviews

Wood Polish

Price: ZAR 130.00

Description: Enhances and protects wooden surfaces.

★ 4.8 22 Reviews

Stainless Steel Cleaner

Price: ZAR 170.00

Description: Cleans and shines stainless steel surfaces.

★ 4.7 19 Reviews

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+6

Hizero F500 Hard Floor Cleaner: Cordless 60Min Runtime, Advanced Cleaning

Be the first to write a review

In stock: **Get It Tomorrow!**

R 199

Eligible for next-day delivery or collection. Free Delivery Available. Hassle-Free Exchanges & Returns for 30 Days. 12-Month Limited Warranty.

+ Add to Cart

+ Add to List

eBucks eB1,990

Discovery MILES 1,990

Buy Now, Pay Later: Buy on credit for R 19 p/m × 12 months using Mobicred.

Description

The Hizero F500 Bionic Hard Floor Cleaner is a state-of-the-art device that revolutionizes the way you clean your floors. It's a cordless cleaner, ensuring mobility and ease of use, with a runtime of up to 60 minutes on a single charge. This makes it suitable for various home sizes.

The F500 features a unique dual-tank system that separates clean and dirty water, enhancing the efficiency of the cleaning process. It's also equipped with a polymer cleaning roller, adept at picking up dirt and debris, while being gentle on your floors.

Designed for user convenience, the F500 is easy to maintain. Its components are readily accessible for cleaning, ensuring long-term performance and reliability. The cleaner operates quietly, making it ideal for use in any domestic setting without causing disturbance.

Overall, the Hizero F500 Bionic Hard Floor Cleaner combines innovative cleaning technology with user-friendly design, making it an excellent choice for maintaining pristine hard floors with minimal effort.

What's in the Box

- 1x Hizero F500 Cleaner Unit
- 1x Charging Base
- 1x Power Adapter
- 1x User Manual
- 1x Cleaning Tools

Product Information

Categories	Home & Kitchen / Small Household Appliances / Vacuum & Steam Cleaners / Vacuums / Handheld Vacuums
Brand	HIZERO
Power	34.0 W
Warranty	Full (24 months)
Model	F500
Power Source	Built-In Rechargeable Battery

Vacuum Features	Cordless
What's in the box	1x Hizero F500 Cleaner Unit 1x Charging Base 1x Power Adapter 1x User Manual 1x Cleaning Tools
LED Display / Touch control	Yes
Household Appliance Type	Handheld Vacuum
Basic Colours	White
Barcode	6975052190020

Reviews

3 ★★★

1 Reviews

5★ 0
4★ 0
3★ 1
2★ 2 0
1★ 0

Write Review

Filter by Ratings

○ 5 ★
○ 4 ★
○ 3 ★
○ 2 ★
○ 1 ★

Take your time to clean

★★★★ Ri - 03 Aug 2024 (Reviewed a month after purchase)

It's a brilliant concept and a beautifully sleek design. For tiny- small apartments/houses and smooth surfaces it works fantastic. We have large porcelain tiles and it battles quite noisily

Your Shopping Cart

Multipurpose Cleaner

Price: ZAR 150.00

Quantity: 2

Total: ZAR 300.00

Remove

Heavy Duty Floor Cleaner

Price: ZAR 200.00

Quantity: 1

Total: ZAR 200.00

Remove

Cart Summary

Subtotal: ZAR 500.00

Tax: ZAR 50.00

Total: ZAR 550.00

Proceed to Checkout

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Search for products... Search

Payment Information

Name on Card:

Card Number:

Expiry Date:

MM/YY

CVV:

Billing Address:

Pay Now Cancel

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Order Review

Please review your order details below:

Product	Quantity	Price	Total
Multipurpose Cleaner	2	ZAR 150.00	ZAR 300.00
Heavy Duty Floor Cleaner	1	ZAR 200.00	ZAR 200.00
Subtotal			**ZAR 500.00**
Shipping			ZAR 50.00
Total			**ZAR 550.00**

Shipping Details

Shipping Method: Standard Shipping

Estimated Delivery Time: 5-7 Business Days

Shipping Address:

50 West Street, Durban Central, Durban 4001

Proceed to Payment Edit Order

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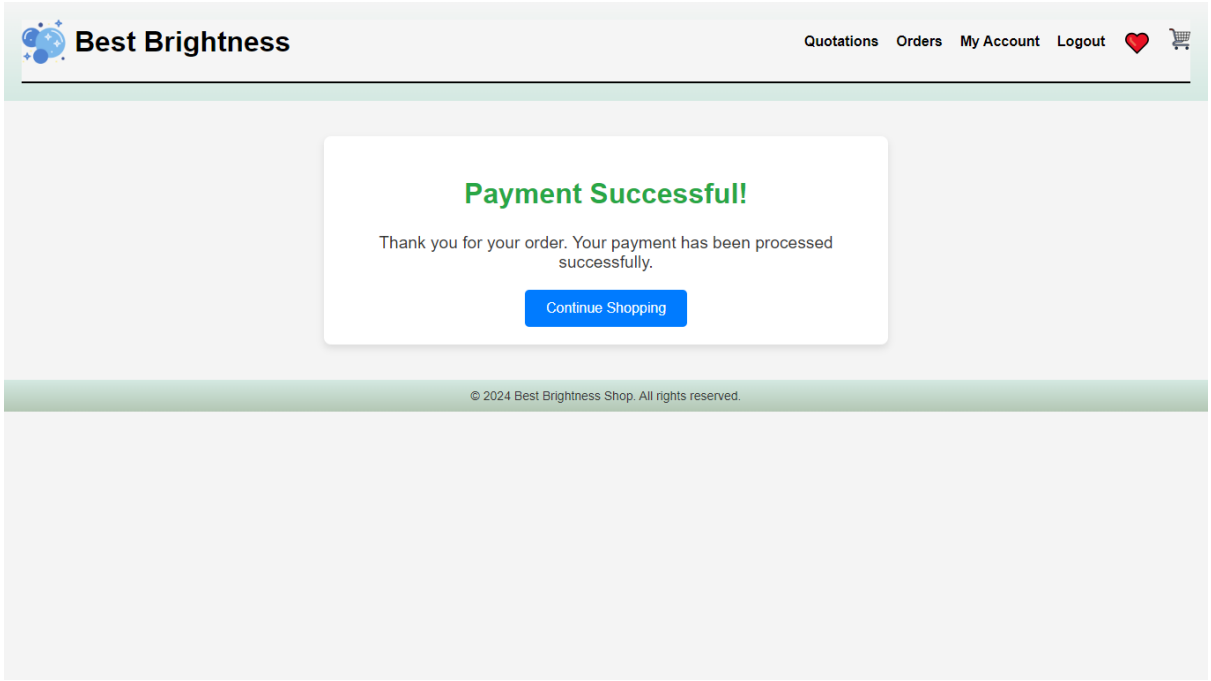
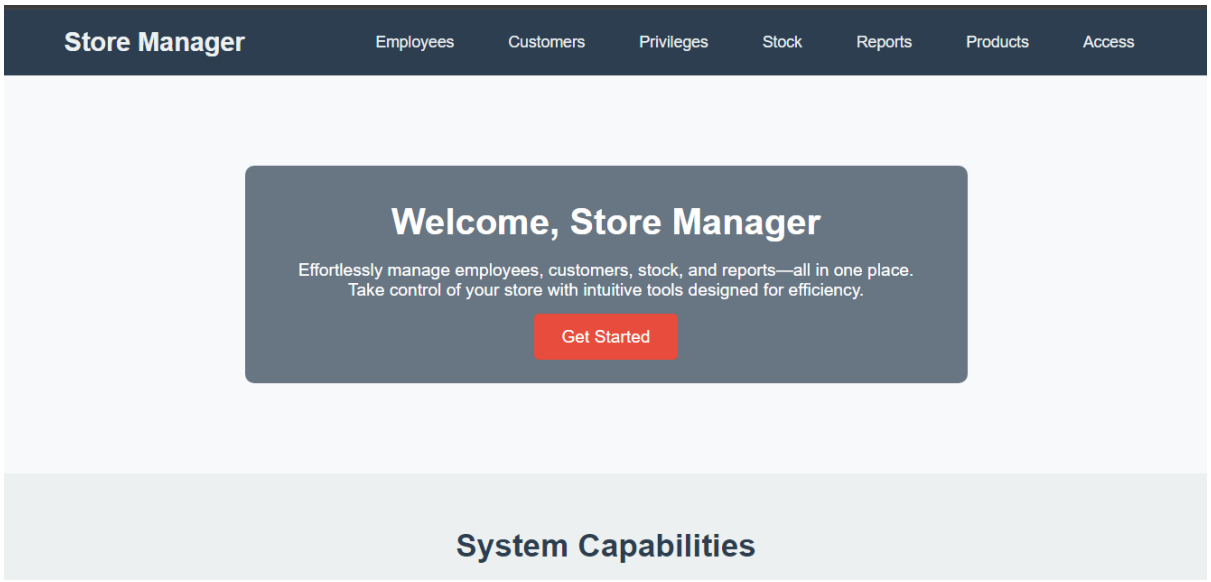
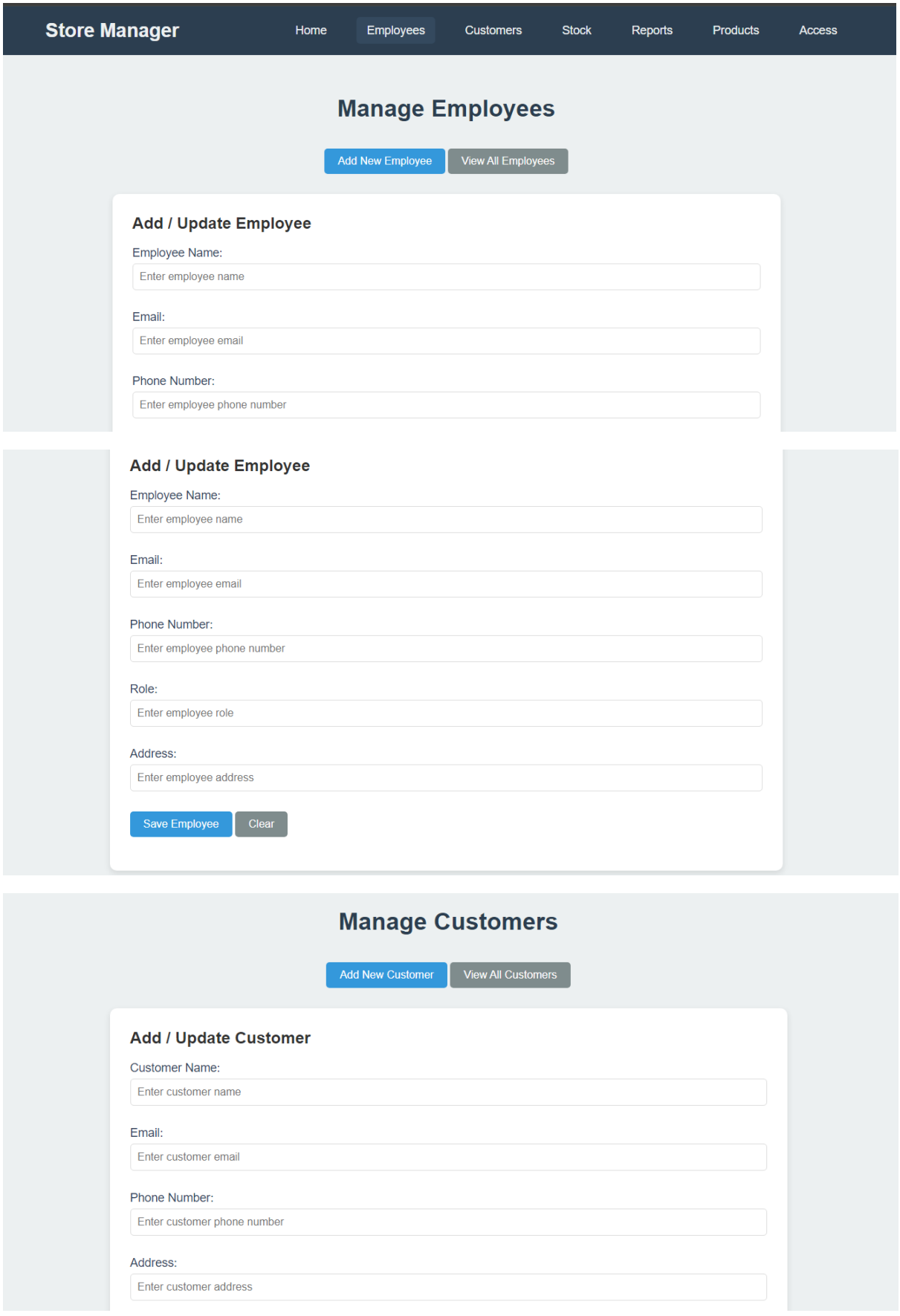


STORE MANAGER MENU




Store Manager
Home
Employees
Customers
Stock
Reports
Products
Access
Manage Employees
Add New Employee
View All Employees
Add / Update Employee
Employee Name:
Enter employee name
Email:
Enter employee email
Phone Number:
Enter employee phone number
Add / Update Employee
Employee Name:
Enter employee name
Email:
Enter employee email
Phone Number:
Enter employee phone number
Role:
Enter employee role
Address:
Enter employee address
Save Employee
Clear
Manage Customers
Add New Customer
View All Customers
Add / Update Customer
Customer Name:
Enter customer name
Email:
Enter customer email
Phone Number:
Enter customer phone number
Address:
Enter customer address

Add / Update Customer

Customer Name:

Enter customer name

Email:

Enter customer email

Phone Number:

Enter customer phone number

Address:

Enter customer address

Save Customer | Clear

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Stock Requests

Create New Request | View All Requests

Create / Update Stock Request

Product Name:

Enter product name

Quantity:

Enter quantity

Warehouse Location:

Enter warehouse location

Request Date:

yyyy/mm/dd

Create / Update Stock Request

Product Name:

Enter product name

Quantity:

Enter quantity

Warehouse Location:

Enter warehouse location

Request Date:

yyyy/mm/dd

Submit Request | Clear

Financial Reports

Generate Monthly Report | Generate Annual Report | View All Reports

Generate Custom Financial Report

Start Date:

yyyy/mm/dd

End Date:

yyyy/mm/dd

Generate Report | Clear

Manage Products

Add New Product | View All Products

Add / Update Product

Product Name:

Enter product name

Price:

Enter product price

Category:

Enter product category

Description:

Enter product description

Price:

Enter product price

Category:

Enter product category

Description:

Enter product description

Stock Quantity:

Enter stock quantity

Save Product | Clear

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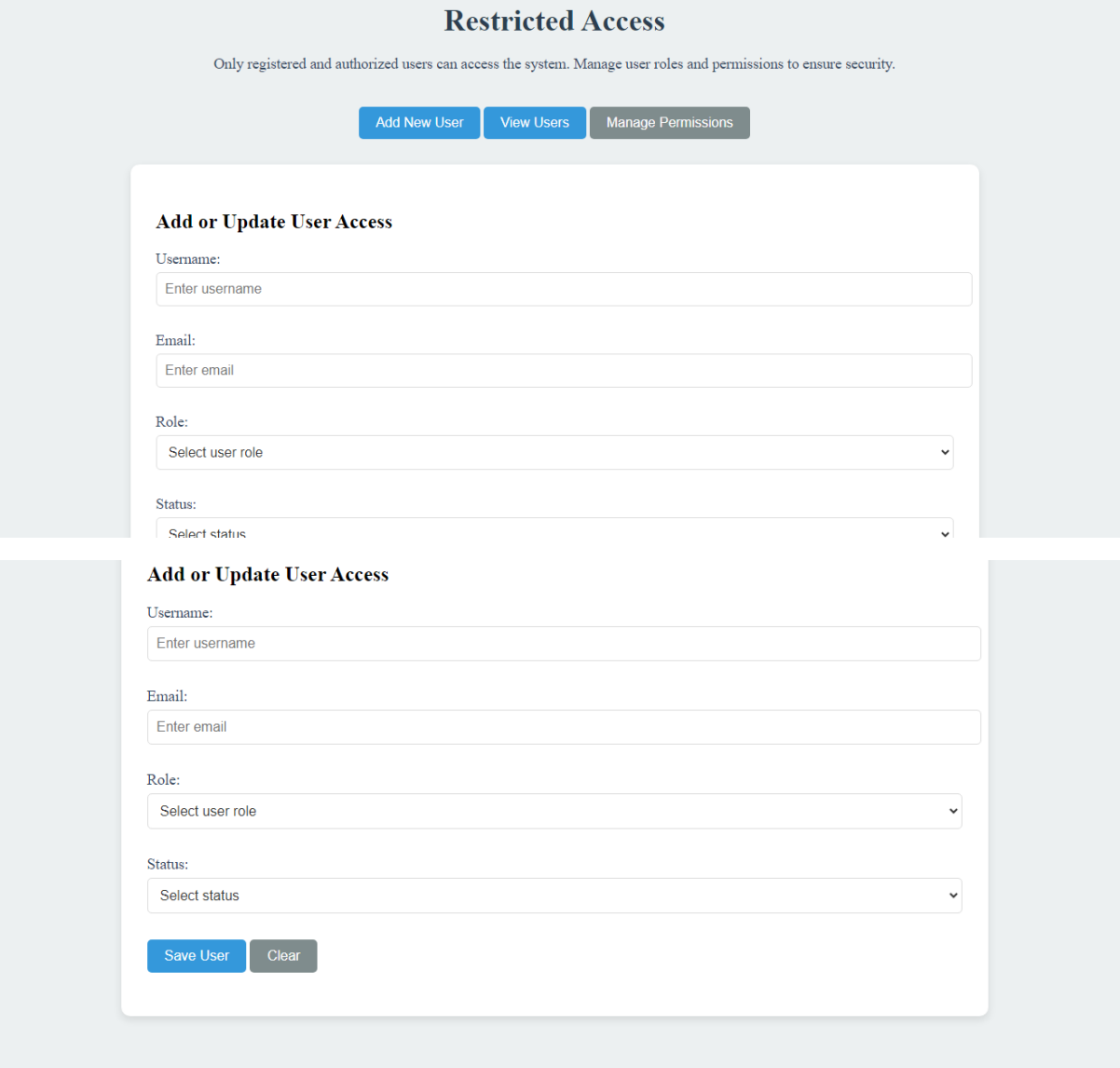

6. Application Components Design

6.1 Component Overview

Subsystems:

- Inventory Management: Tracks product stock levels, reordering, and adjustments.
- Sales Management: Manages sales transactions and records.
- Customer Management: Stores customer details and purchase history.
- E-commerce Integration: Facilitates online sales and order processing.

6.2 Detailed Component Design

- Purpose: Describe the purpose of the component.
- Data Structures: Describe any data structures used by the component.
- Interaction: Describe how the component interacts with other components.

7. Design Considerations

1. **Performance:**

- **Efficiency:** The system is designed to handle high volumes of transactions efficiently. ASP.NET Core's support for asynchronous programming ensures that the application remains responsive under load, minimizing wait times for users.
- **Caching:** To enhance performance, frequently accessed data such as product details and sales reports are cached using in-memory caching techniques. This reduces the load on the database and improves response times for users.
- **Load Balancing:** The system utilizes load balancing to distribute incoming requests evenly across multiple servers. This approach ensures high availability and optimizes resource utilization, preventing any single server from becoming a bottleneck.
- **Database Optimization:** Queries are optimized, and database indexing is implemented to speed up data retrieval. Regular maintenance tasks such as database deindexing and query optimization are scheduled to maintain performance levels.

2. **Scalability:**

- **Horizontal Scaling:** The system architecture supports horizontal scaling, allowing the addition of more servers to handle increased traffic. This ensures that the application can accommodate growth without compromising performance.
- **Modular Design:** The system is built with a modular architecture, allowing independent scaling of different components such as inventory management, sales tracking, and customer management. This modular approach facilitates targeted scaling based on specific needs.
- **Cloud Integration:** The application is designed to leverage cloud services for scalability. Cloud-based infrastructure allows for dynamic scaling of resources based on demand, ensuring the system can handle peak loads efficiently.

3. **Security:**

- **Authentication and Authorization:** ASP.NET Identity is used to manage user authentication and role-based authorization. This ensures that only authorized users have access to sensitive features and data within the system.

- **Data Encryption:** Data transmitted between users and the server is encrypted using SSL/TLS protocols. Additionally, sensitive data stored in the database, such as user credentials and financial information, is encrypted using AES encryption.
- **Input Validation and Sanitization:** The system implements strict input validation and sanitization to prevent common web vulnerabilities such as SQL injection and cross-site scripting (XSS). This helps protect the application from malicious attacks.
- **Security Audits:** Regular security audits and vulnerability assessments are conducted to identify and address potential security risks. This proactive approach ensures that the system remains secure against emerging threats.

4. **Usability:**

- **User-Friendly Interface:** The system features an intuitive and user-friendly interface designed to enhance the user experience. Consistent layouts, clear labeling, and responsive design elements contribute to ease of use across various devices.
- **Accessibility:** The application adheres to accessibility standards, ensuring that users with disabilities can navigate and interact with the system effectively. Features such as alternative text for images and keyboard navigation are included to support accessibility.
- **Feedback Mechanisms:** Users can provide feedback and report issues through built-in mechanisms within the application. This feedback is used to make continuous improvements to the user interface and overall usability.

5. **Dependability:**

- **Redundancy:** The system architecture includes redundancy at both hardware and software levels. Redundant servers, databases, and network components are implemented to minimize the impact of hardware failures and ensure continuous operation.
- **Backup and Recovery:** A comprehensive backup strategy is in place to protect against data loss. Regular backups are performed, and a well-defined recovery plan ensures that data can be restored quickly in the event of a failure.
- **Monitoring and Alerts:** The system includes monitoring tools to track performance, availability, and security. Alerts are configured to notify administrators of critical issues, enabling prompt response and resolution to maintain system dependability.

8. Appendices

A. Glossary of Terms

- ASP.NET Core: An open-source framework for building modern web applications and services. It is cross-platform and allows for building high-performance applications.
- Entity Framework Core (EF Core): An Object-Relational Mapper (ORM) that provides a higher-level abstraction to interact with databases using .NET objects.

- SQL Server: A relational database management system developed by Microsoft, used to store and manage the application's data.
- SSL/TLS: Protocols used to secure communication over a network by encrypting data transmitted between clients and servers.
- Load Balancer: A device or software application that distributes network or application traffic across multiple servers to ensure no single server becomes overwhelmed.

B. Acronyms

- UI: User Interface
- CRUD: Create, Read, Update, Delete
- HTTPS: Hypertext Transfer Protocol Secure
- AES: Advanced Encryption Standard
- HTTP: Hypertext Transfer Protocol
- TCP/IP: Transmission Control Protocol/Internet Protocol

C. System Requirements

- Hardware Requirements:
    - Server: Minimum 4 CPUs, 16 GB RAM, and 500 GB SSD for hosting the application and database.
    - Client: Desktop or laptop with a modern web browser (Chrome, Firefox, Edge) and internet access.
- Software Requirements:
    - Server: Windows Server 2019 or later, .NET Core Runtime, SQL Server 2019 or later.
    - Client: Latest version of web browsers (Chrome, Firefox, Edge) for optimal performance.

D. Design Diagrams

- Architecture Diagram: Illustrates the three-tier architecture including presentation layer, business logic layer, and data access layer.
- Database Schema Diagram: Shows the tables and their relationships in the SQL Server database.
- User Interface Mockups: Provides visual representations of key user interfaces such as the home page, dashboard, and various forms.

E. Implementation Plan

- Phase 1: Requirements Gathering and Analysis
    - Duration: 2 weeks

    - Activities: Gather detailed requirements, analyze business needs, and document functional and non-functional requirements.
- Phase 2: System Design
    - Duration: 3 weeks
    - Activities: Create design documents, develop architecture diagrams, and finalize database schema.
- Phase 3: Development
    - Duration: 8 weeks
    - Activities: Develop application components, implement user interfaces, and integrate with the database.
- Phase 4: Testing
    - Duration: 4 weeks
    - Activities: Conduct unit tests, integration tests, and user acceptance tests.
- Phase 5: Deployment
    - Duration: 2 weeks
    - Activities: Deploy the application to the production environment, perform final validation, and provide user training.
- Phase 6: Maintenance
    - Duration: Ongoing
    - Activities: Monitor system performance, apply updates and patches, and address user feedback and issues.

F. Contact Information

- Project Manager: Mbekezeli Sibusiso Mthethwa, Email: mbekezelimthethwa@gmail.com, Phone: +27 71 832 7848

9. References

- ASP.NET Core Documentation: https://docs.microsoft.com/aspnet/core
- Available at [10,000+ Free Cleaning Products & Cleaning Images - Pixabay]
- Entity Framework Core Documentation: https://docs.microsoft.com/ef/core
- SQL Server Documentation: https://docs.microsoft.com/sql/sql-server
- OWASP (Open Web Application Security Project): https://owasp.org - For security best practices and guidelines.