

Retail Management System

A comprehensive Python-based retail management solution featuring Tkinter GUI and SQLite3 database integration. Built for offline operations with complete inventory, employee, and billing management capabilities.



BIG BAZAAR

Challenges faced in Implementation

- Designing a user-friendly interface for both admin and staff
- Ensuring data accuracy in inventory and billing modules
- Handling database connectivity and queries efficiently
- Managing multiple modules integration (sales, stock, reporting)
- Limited time/resources for testing and adding advanced features
- Difficulty in simulating real-world retail scenarios in a small project setup
- Maintaining system security and preventing unauthorized access
- Ensuring scalability when handling larger databases or multiple users
- Providing proper documentation and training for end-users

Innovation & Uniqueness

Integrated Modular Approach

Combines inventory, billing, sales, and reporting in a single system, ensuring smooth data flow and reducing duplication.

Lightweight & Cost-Effective

Built with simple, widely available technologies to make it affordable and easily adaptable for small retailers.

Future-Ready Design

Scalable architecture with scope for upgrades like barcode integration, GST support, and multi-branch expansion.

The proposed solution is FRA Atlas

Automation & Accuracy

- Real-time inventory updates with every transaction
- Reduces manual errors & saves time
- Simple, user-friendly interface for easy use

Modular & Scalable Design

- Separate modules: inventory, billing, sales, reporting
- Central database for consistency across modules
- Cost-effective and lightweight for small retailers

Efficiency & Future Scope

- Automated report generation & analytics
- Helps in sales trend analysis & decision-making
- Future add-ons: barcode, GST, multi-branch support

Data Security & Reliability

- Controlled access for admins and staff
- Regular backups ensure data safety
- Reliable system for day-to-day operations

Better Decision Making

- Provides real-time sales & stock insights
- Identifies fast/slow-moving products
- Supports data-driven management strategies



_Core Features



Employee Management

Complete employee lifecycle management with add, edit, and remove capabilities plus secure login authentication system.



Inventory Control

Real-time stock tracking, product addition and modification, with automatic low-stock alerts and supplier management.



Billing System

Streamlined transaction processing, automatic bill generation, and comprehensive sales record maintenance with historical data access.

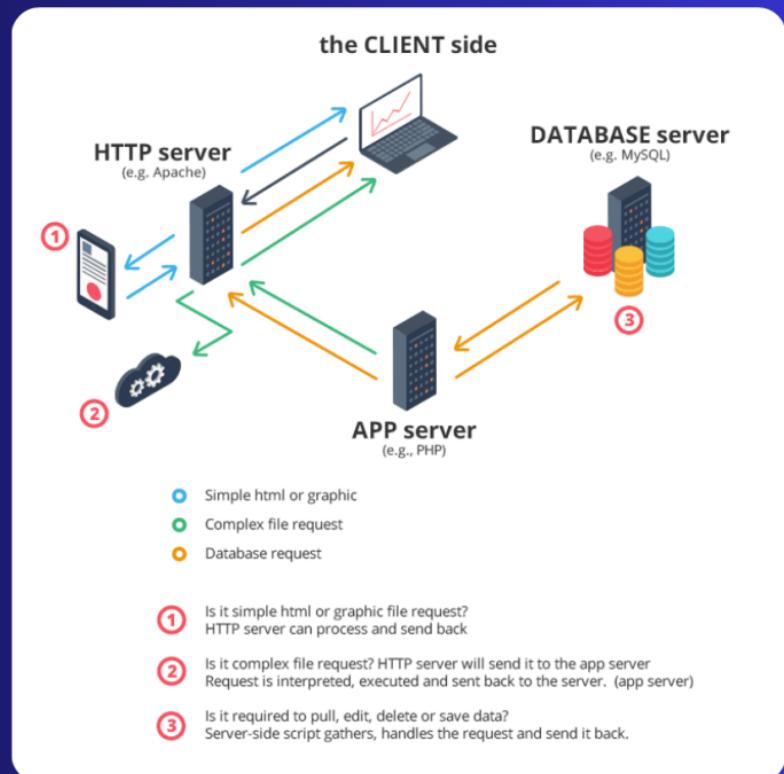
🛠️ Technology Stack

Programming & GUI

- **Python 3.x** - Core programming language
- **Tkinter** - Native GUI framework
- **Custom Fonts** - Enhanced visual design
- **24 PNG Icons** - Professional interface elements

Database & Storage

- **SQLite3** - Embedded database system
- **CSV Integration** - Initial data import capability
- **Local Storage** - Offline-first architecture
- **Data Persistence** - Reliable transaction logging



FEASIBILITY AND VIABILITY

Economic Feasibility



- Reduces operational costs
- Optimizes resource utilization

The Retail Management System is **cost-effective** as it uses widely available, open-source technologies, reducing software expenses. Minimal hardware requirements make it affordable for small and medium-sized retailers. By automating inventory, billing, and reporting, it saves labor costs and time. Overall, the system provides a high return on investment by improving operational efficiency without significant financial burden.

Technical Feasibility



- AI (OCR, NLP, CNN, U-Net) + GIS



- Cloud-ready, scalable & secure



- Automation: reduces manual effort, duplication & errors

Overall Viability



- Reduces costs of manual verification & claim tracking
- Minimizes resource wastage

Economic Feasibility

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Technical Feasibility

The system is technically feasible as it uses commonly available programming languages and database systems, ensuring easy development and maintenance. Its modular design allows seamless integration of different components like inventory, billing, and reporting. The software is lightweight and can run on standard computers without high-end specifications. Overall, the system is reliable, scalable, and can be implemented with minimal technical challenges.

Adaptability

The system can be easily customized for different retail environments. It supports modifications to meet specific business needs without major changes.

Scalability

Handles increasing data and user load efficiently. Can be expanded with additional modules like multi-branch support in the future.

FEATURES

• Inventory Management

Tracks all products in real-time and updates stock automatically with every sale or purchase, helping prevent overstocking or shortages.

• Billing System

Generates accurate bills instantly, reduces manual errors in calculations, and supports quick checkout for customers.

• Sales Management

Records all sales efficiently, provides insights into daily, weekly, and monthly sales, and helps analyze product performance trends.

• Report Generation

Automatically creates reports for stock and sales, allowing managers to monitor performance and export data for further analysis.

• User-Friendly Interface

Simple and intuitive layout for both admin and staff, minimizing training time and supporting smooth operation of all modules.

• Secure Database Handling

Centralized database ensures consistency across all modules, maintains data security, and supports backups to prevent data loss.

IMPACT AND BENEFITS

Key Benefits

CORE IMPACT

Operational Efficiency

Automates routine tasks like billing and inventory management. Reduces human errors and saves significant time.

Improves overall productivity of retail operations.

Faster Processing

Automated digitization and verification reduce delays in claim approvals and minimize manual workload

Promotes Sustainability & Decentralized Power

Incentivizes communities to protect forests, shifting control over resources from government bureaucracy to community-led Gram Sabhas.

Potential Challenges

1. Data Accuracy
2. System Integration
3. Data Security
4. User Adoption
5. Connectivity Gaps

Overcoming Strategies

- Maintain regular backups and security protocols
- Use modular design to simplify integration
- Implement OAuth2/OIDC & role-based access
- Provide simple, multilingual dashboards

Improved Accuracy:

- Automates billing and inventory updates.
- Reduces manual errors in records and calculations.
- Ensures reliable and consistent business data.

Time Efficiency:

- Speeds up daily retail operations.
- Minimizes repetitive manual tasks for staff.
- Allows managers to focus on decision-making.

Cost Effectiveness:

- Cuts down on labor and administrative costs.
- Uses affordable, widely available technologies.
- Provides high value at a low investment.

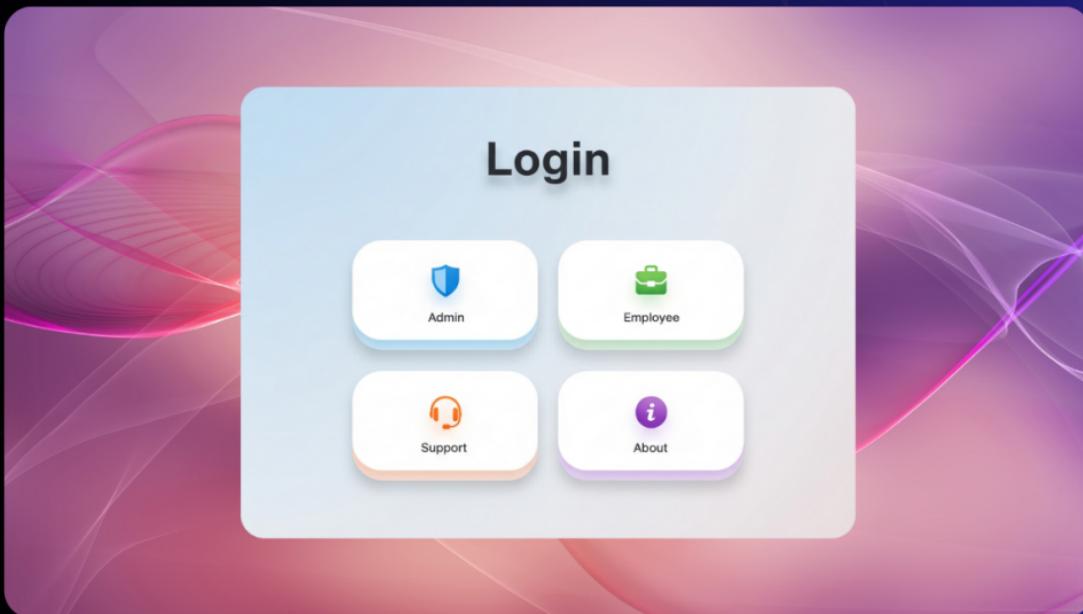
Better Management Insights:

- Generates reports for sales and stock analysis.
- Helps track product performance and trends.
- Supports data-driven strategic planning.



System Demonstration

Visual walkthrough of the Retail Management System's key interfaces and functionalities:



The interface demonstrates clean design principles with intuitive navigation, professional styling, and comprehensive functionality access.

Login

Username

Password

LOGIN



System Demonstration

Visual walkthrough of the Retail Management System's key interfaces and functionalities:

Billing System

Customer Details

Bill Number **Search** Customer Name Contact Number

Products

Select Category
Sub Category
Product
Quantity

Add To Cart **Remove** **Clear**

Bill Options

Total Generate Clear Exit

Bill Window

BIG BAZAAR (FUTURE RETAIL LTD)
BB-THANE-DAHISAR THAKUR MALL
THANE - 401104
TEL NO: 022-28204707
HELPLINE: 1800-200-255
GSTIN: 35AAC51429B1ZK valid 01.07.2017

Customer Name: Phone Number:
Bill Number: Date:

Product Name	Quantity(Qty)	Price

Update Employee

Employee Name Designation
Contact No. Address
Author No. Password

UPDATE **CLEAR**

ADMIN MODE

Logout

Inventory **Employees** **Invoices** **About Us**

Add Product

Product Name
Category Sub Category
Quantity Cost Price
Selling Price(Net) Vendor Phone No.

ADD **CLEAR**

⚙️ Installation Process

Clone the repository



```
git clone https://github.com/atharv-thakre/retail_management_system.git  
cd retail_management_system
```

Run the app



```
python main.py
```

Create virtual environment (optional but recommended)

- windows



```
python -m venv venv  
venv\Scripts\activate
```

- mac / linux



```
python -m venv venv  
source venv/bin/activate
```

```
C:\Users\LENOVO\OneDrive\Desktop\New folder>git clone https://github.com/atharv-thakre/retail_management_system.git  
Cloning into 'retail_management_system'...  
remote: Enumerating objects: 42, done.  
remote: Counting objects: 100% (42/42), done.  
remote: Compressing objects: 100% (39/39), done.  
remote: Total 42 (delta 7), reused 34 (delta 3), pack-reused 0 (from 0)  
Receiving objects: 100% (42/42), 1.92 MiB | 1.15 MiB/s, done.  
Resolving deltas: 100% (7/7), done.  
  
C:\Users\LENOVO\OneDrive\Desktop\New folder>cd retail_management_system  
  
C:\Users\LENOVO\OneDrive\Desktop\New folder\retail_management_system>dir  
Volume in drive C is Windows-SSD  
Volume Serial Number is B641-463A  
  
Directory of C:\Users\LENOVO\OneDrive\Desktop\New folder\retail_management_system  
  
26-09-2025 12.15 AM <DIR> .  
26-09-2025 12.15 AM <DIR> ..  
26-09-2025 12.15 AM 71,884 admin.py  
26-09-2025 12.15 AM <DIR> Database  
26-09-2025 12.15 AM 30,336 employee.py  
26-09-2025 12.15 AM <DIR> fonts  
26-09-2025 12.15 AM <DIR> images  
26-09-2025 12.15 AM 2,104 main.py  
26-09-2025 12.15 AM 2,528 README.md  
26-09-2025 12.15 AM 4 File(s) 106,852 bytes  
5 Dir(s) 80,897,736,704 bytes free  
  
C:\Users\LENOVO\OneDrive\Desktop\New folder\retail_management_system>
```

BTECH - CSE 3B
SEM : 3
SECTION : B

ATHARV THAKRE
ATISHAYA JAIN
DARH JAIN

109
111
129

THANK YOU