Infosys Springboard Virtual Internship 6.0 Completion Report

Team Details

Batch Number:10

Start date: 25-Nov-25

Names:

S.no	Name
1	Driti Sai
2	Rishwana
3	Naga Syamala
4	Hemanth Ravva
5	Tanoor Kiran

Internship Duration: 8 Weeks

Project Title

INVENTRA – Intelligent Inventory Management System

1. Project Objective

• Design and develop a centralized intelligent inventory management system to digitally monitor, control, and optimize stock handling processes

• Enable real-time inventory tracking to provide accurate visibility of stock availability, movement, and usage patterns

• Minimize human errors, stock mismatches, and data redundancy by replacing manual record-keeping with an automated digital solution

• Implement role-based authentication and authorization to ensure secure and controlled access for administrators, managers, and staff

• Develop a transaction management module to record item issuance, returns, and stock updates with complete traceability

2. Project description in detail

Inventra – Intelligent Inventory Management System is a smart digital platform developed to modernize and streamline traditional inventory handling processes. In many organizations, inventory is still managed using manual registers or basic spreadsheets, which often results in stock mismatches, delayed updates, data redundancy, and lack of real-time visibility. Inventra addresses these issues by providing a centralized, automated, and secure inventory management solution.

The system allows authorized users to manage inventory items with complete control over stock records. Each product entry includes detailed attributes such as item name, category, quantity, supplier information, and stock status. Through an intuitive interface, users can easily add new items, update stock levels, delete outdated records, and search for products, ensuring efficient day-to-day inventory operations.

Inventra incorporates a role-based authentication system to maintain data security and controlled access. Administrators can manage users and oversee the entire inventory, while staff members can perform permitted operations such as stock updates and transaction entries. This structure ensures both accountability and data protection within the system.

A core feature of Inventra is its transaction tracking module, which records all stock movements, including item issuance and returns. Every transaction is logged with timestamps and user details, enabling full traceability and reducing the risk of stock discrepancies or misuse. The system automatically updates inventory quantities after each transaction, ensuring that stock information remains accurate and up to date.

To enhance decision-making, Inventra provides an interactive dashboard with data visualization tools. The dashboard displays key insights such as total stock, low-stock items, frequently used products, and category-wise distribution. Visual elements like charts and summary cards help users quickly understand inventory trends and plan restocking efficiently.

Additionally, the system includes a smart alert mechanism that notifies users when stock levels fall below predefined thresholds. This helps prevent stockouts and ensures smooth operational flow. The system is designed with a scalable architecture, allowing it to be adapted for various environments such as educational institutions, warehouses, retail stores, and corporate offices.

4.Timeline Overview

Week	Activities Planned	Activities Completed
Week 1	Requirement analysis, problem identification, and system architecture design.	Conducted detailed study of existing inventory challenges, finalized system requirements, and designed overall system architecture and module breakdown
Week 2	Database schema design and backend setup	Designed normalized relational database schema for items, users, and transactions; configured backend development environment and API structure
Week 3	Authentication system and role-based access control	Implemented secure login system, user registration, password encryption, and role-based authorization for Admin and Staff users
Week 4	Inventory management module development	Developed core inventory features including item addition, stock updates, deletion, category classification, and search functionality
Week 5	Transaction management system	Implemented item issue and return tracking with automatic stock quantity adjustments and complete transaction history logging
Week 6	Dashboard development and data visualization	Built interactive dashboard displaying total stock, category-wise distribution, low-stock alerts, and item usage statistics using graphical charts
Week 7	System testing, debugging, and performance optimization	Performed unit testing and integration testing, resolved functional errors, optimized database queries, and improved system responsiveness
Week 8	Final system integration, documentation, and deployment	Integrated all modules, prepared technical documentation and user guide, conducted final system demo, and completed project submission

5a. Key Milestones

Milestone	Description	Date Achieved
Project Kickoff	Initial project briefing, requirement analysis, system planning, and technology stack finalization	6-OCT-25

Milestone	Description	Date Achieved
Database & Backend Setup Completed	Successful design of database schema and implementation of core backend structure with API connectivity	Week-1
Authentication Module Completed	Implementation of secure login system with role-based access control for Admin and Staff users	Week-2
Inventory Module Prototype Ready	Development of core inventory features including item management and stock updates	Week-3
Transaction Tracking System Completed	Implementation of issue/return logging with automatic stock adjustment and history tracking	Week-4
Dashboard & Analytics Integration	Deployment of interactive dashboard with stock insights, charts, and alert indicators	Week-5
System Testing & Optimization Completed	Completion of functional testing, bug fixes, and performance improvements	Week-6
Final System Deployment & Documentation	Full system integration, preparation of documentation, and successful project demonstration	Week-7

5b. Project execution details

The Inventra – Intelligent Inventory Management System was developed using a structured full-stack architecture to ensure scalability, security, and maintainability. The system was divided into key modules including authentication, inventory management, transaction tracking, and analytics dashboard.

The backend was implemented using Java (Spring Boot) to develop RESTful APIs that handle business logic, user requests, and database interactions. A MySQL relational database was used to store and manage system data, including user details, inventory records, product categories, and transaction logs. The database schema was designed using normalized tables with proper foreign key relationships to maintain data consistency and integrity.

A secure authentication and authorization system was implemented to protect system access. User credentials were securely stored with password encryption, and role-based access control (RBAC) was enforced to differentiate permissions between Admin and Staff users. Administrators have full control over inventory and user management, while staff members are restricted to operational tasks such as updating stock and recording transactions.

The inventory management module enables users to add new products, edit existing item details, manage stock quantities, assign categories, and perform item searches. Backend validation ensures that stock values remain consistent, and all changes are reflected in real time.

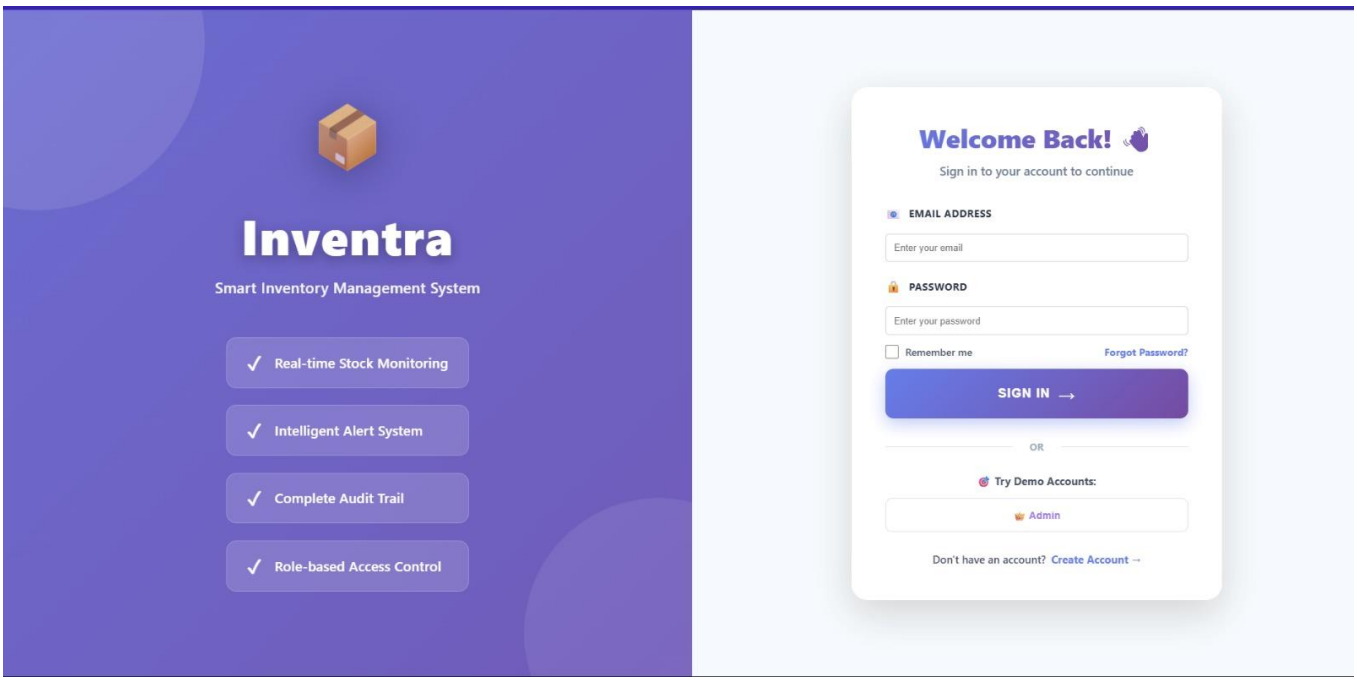
The transaction tracking module was developed to monitor item movement within the system. It records issuance and return operations with detailed information including item ID, quantity, user performing the action, and timestamp. The system automatically updates inventory levels after each transaction, ensuring accurate and up-to-date stock information.

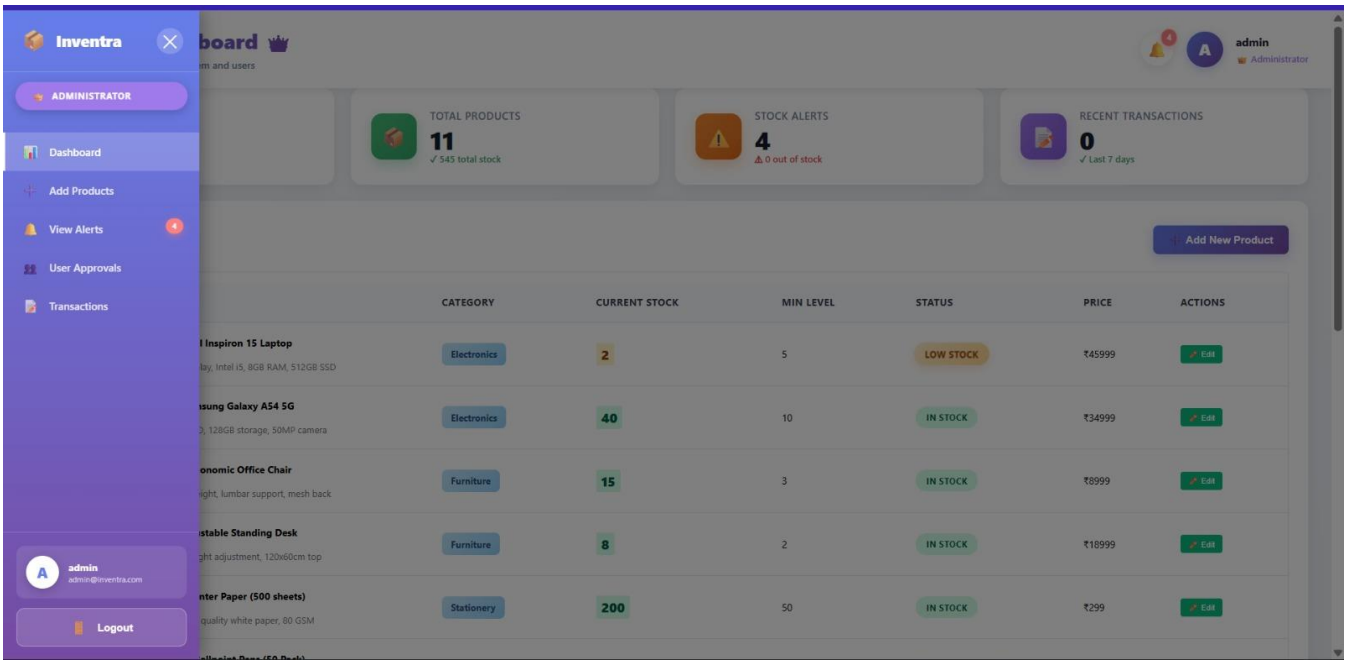
The frontend was developed using React.js, providing a responsive and user-friendly interface. The React application communicates with backend APIs to fetch and display inventory data dynamically. An interactive dashboard with charts and summary cards was created to visualize important insights such as total stock, low-stock items, category-wise distribution, and recent transactions.

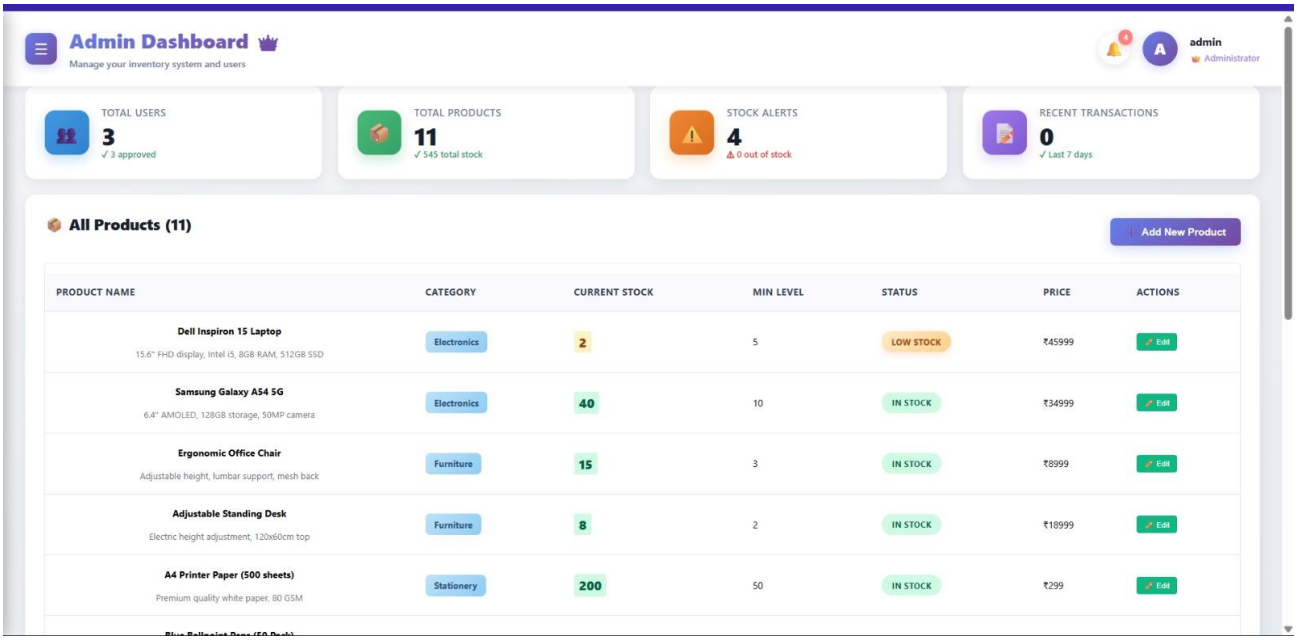
Testing was conducted at multiple levels, including backend API testing, frontend functionality testing, and integration testing between the React frontend and Java backend. Performance was optimized through efficient SQL queries, proper indexing, and API response handling.

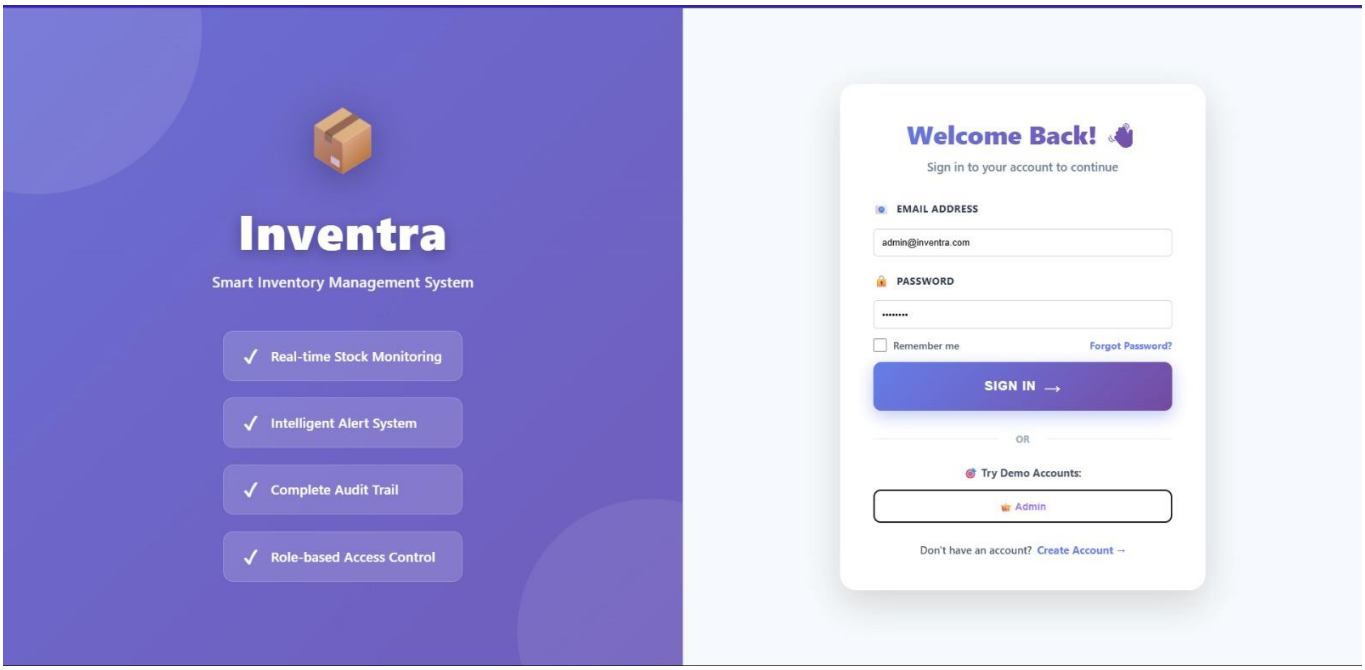
Finally, all modules were integrated and deployed in a test environment for demonstration. Comprehensive technical documentation and a user guide were prepared to ensure smooth system usage and future scalability.

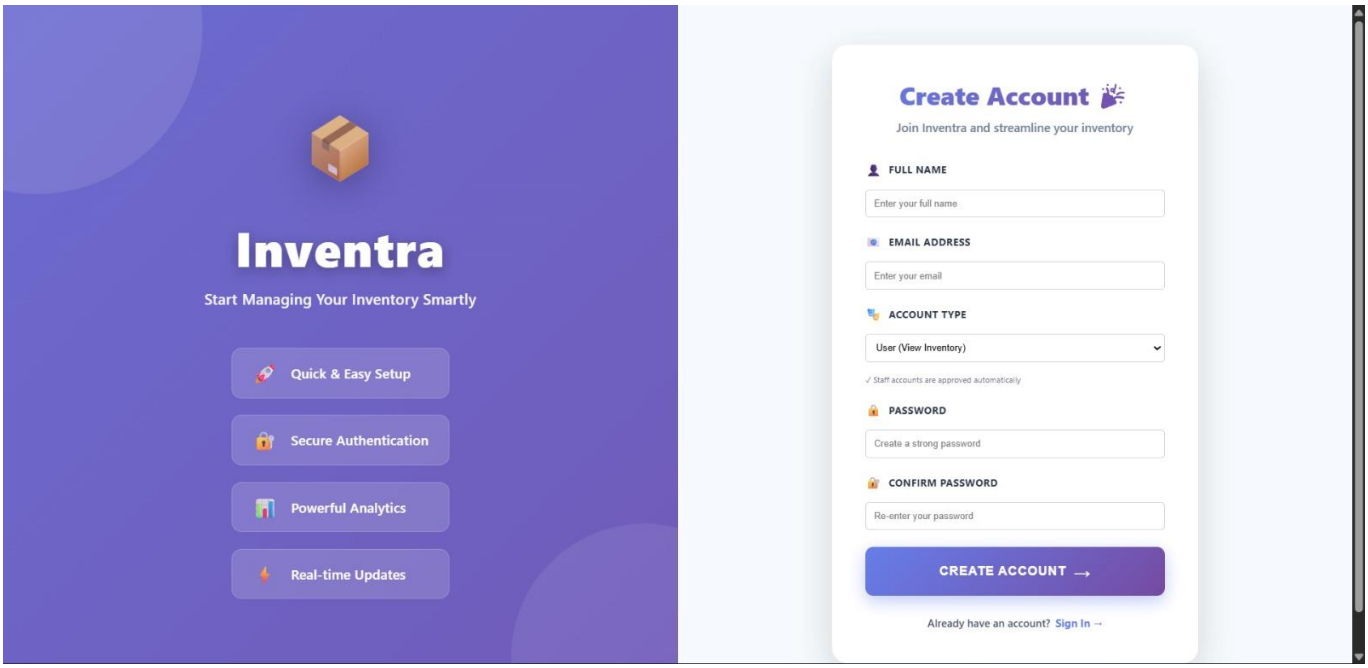
6. Snapshots / Screenshots

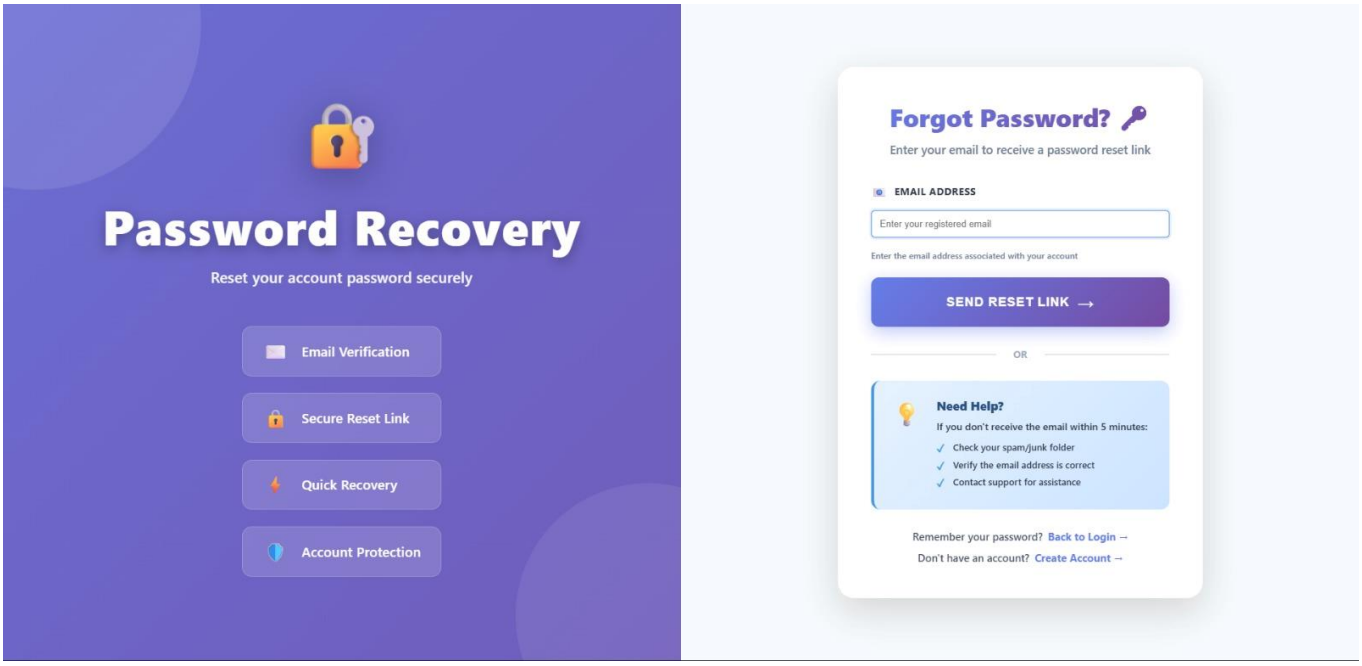


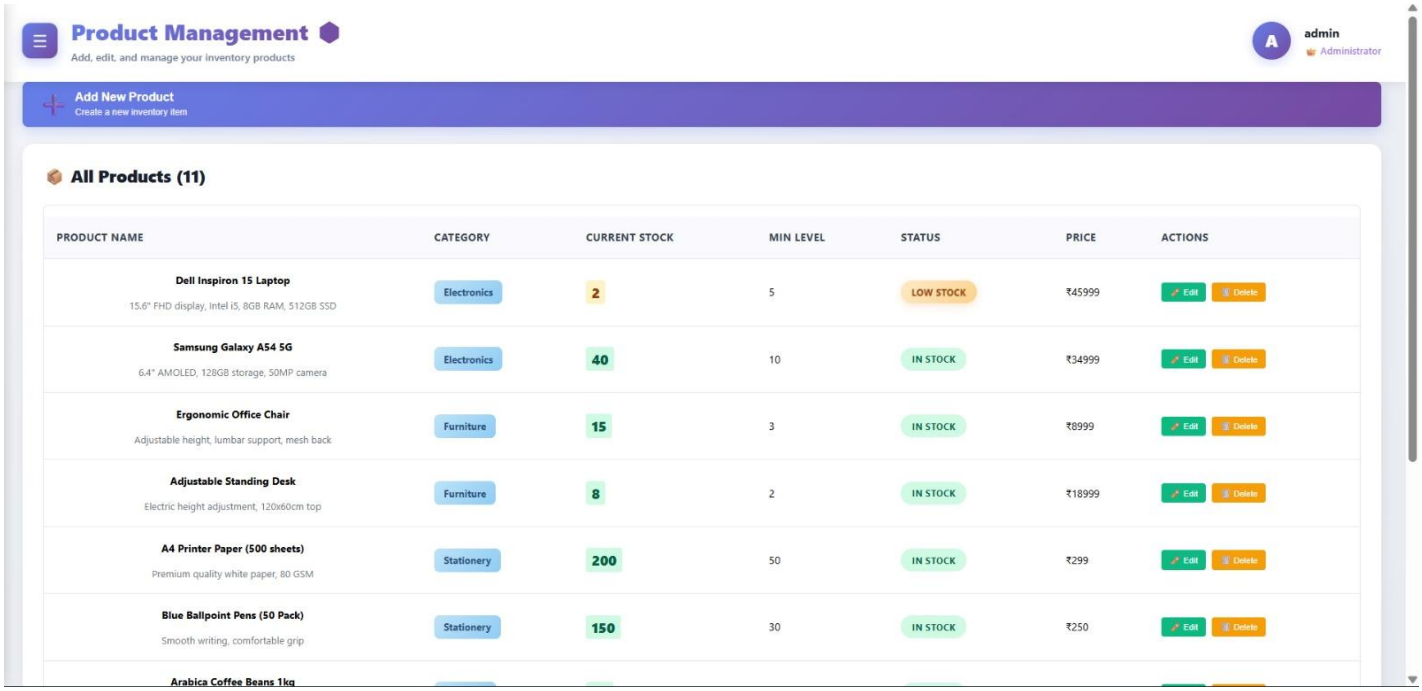



Admin Dashboard
Manage your inventory system and users
admin
Administrator
TOTAL USERS
3
✓ 3 approved
TOTAL PRODUCTS
11
✓ 545 total stock
STOCK ALERTS
4
⚠ 0 out of stock
RECENT TRANSACTIONS
0
✓ Last 7 days
All Products (11)
Add New Product
PRODUCT NAME
CATEGORY
CURRENT STOCK
MIN LEVEL
STATUS
PRICE
ACTIONS
Dell Inspiron 15 Laptop
15.6" FHD display, Intel i5, 8GB RAM, 512GB SSD
Electronics
2
5
LOW STOCK
₹45999
Edit
Samsung Galaxy A54 5G
6.4" AMOLED, 128GB storage, 50MP camera
Electronics
40
10
IN STOCK
₹34999
Edit
Ergonomic Office Chair
Adjustable height, lumbar support, mesh back
Furniture
15
3
IN STOCK
₹8999
Edit
Adjustable Standing Desk
Electric height adjustment, 120x60cm top
Furniture
8
2
IN STOCK
₹18999
Edit
A4 Printer Paper (500 sheets)
Premium quality white paper, 80 GSM
Stationery
200
50
IN STOCK
₹299
Edit


Inventra
Smart Inventory Management System
✓ Real-time Stock Monitoring
✓ Intelligent Alert System
✓ Complete Audit Trail
✓ Role-based Access Control
Welcome Back!
Sign in to your account to continue
EMAIL ADDRESS
admin@inventra.com
PASSWORD
Remember me
Forgot Password?
SIGN IN →
OR
Try Demo Accounts:
Admin
Don't have an account? Create Account →


Inventra
Start Managing Your Inventory Smartly
Quick & Easy Setup
Secure Authentication
Powerful Analytics
Real-time Updates
Create Account
Join Inventra and streamline your inventory
FULL NAME
Enter your full name
EMAIL ADDRESS
Enter your email
ACCOUNT TYPE
User (View Inventory)
✓ Staff accounts are approved automatically
PASSWORD
Create a strong password
CONFIRM PASSWORD
Re-enter your password
CREATE ACCOUNT →
Already have an account? Sign In →


Password Recovery
Reset your account password securely
Email Verification
Secure Reset Link
Quick Recovery
Account Protection
Forgot Password?
Enter your email to receive a password reset link
EMAIL ADDRESS
Enter your registered email
Enter the email address associated with your account
SEND RESET LINK →
OR
Need Help?
If you don't receive the email within 5 minutes:
✓ Check your spam/junk folder
✓ Verify the email address is correct
✓ Contact support for assistance
Remember your password? Back to Login →
Don't have an account? Create Account →


Product Management
Add, edit, and manage your inventory products
admin
Administrator
Add New Product
Create a new inventory item
All Products (11)
PRODUCT NAME
CATEGORY
CURRENT STOCK
MIN LEVEL
STATUS
PRICE
ACTIONS
Dell Inspiron 15 Laptop
15.6" FHD display, Intel i5, 8GB RAM, 512GB SSD
Electronics
2
5
LOW STOCK
₹45999
Edit
Delete
Samsung Galaxy A54 5G
6.4" AMOLED, 128GB storage, 50MP camera
Electronics
40
10
IN STOCK
₹34999
Edit
Delete
Ergonomic Office Chair
Adjustable height, lumbar support, mesh back
Furniture
15
3
IN STOCK
₹8999
Edit
Delete
Adjustable Standing Desk
Electric height adjustment, 120x60cm top
Furniture
8
2
IN STOCK
₹18999
Edit
Delete
A4 Printer Paper (500 sheets)
Premium quality white paper, 80 GSM
Stationery
200
50
IN STOCK
₹299
Edit
Delete
Blue Ballpoint Pens (50 Pack)
Smooth writing, comfortable grip
Stationery
150
30
IN STOCK
₹250
Edit
Delete
Arabica Coffee Beans 1kg

7. Learnings & Skills Acquired

• Gained practical experience in designing and managing relational databases using MySQL

• Developed strong understanding of backend development using Java and Spring Boot for building RESTful APIs

• Learned to implement secure authentication and role-based authorization mechanisms

• Acquired skills in frontend development using React.js for building responsive and dynamic user interfaces

• Improved knowledge of API integration between frontend and backend systems

• Understood real-world implementation of inventory management logic and stock control systems

• Learned to design and display data visualizations and dashboards for better decision-making

• Enhanced ability in debugging, testing, and optimizing system performance

• Gained experience in full-stack application architecture and module integration

• Improved team collaboration, documentation, and project presentation skills

8. Challenges Face

Challenge 1: Designing an Efficient Database Structure

Problem: Managing relationships between users, inventory items, and transactions without data redundancy

Solution: Designed a normalized MySQL schema with proper foreign keys and indexing to maintain data integrity and improve query performance

Challenge 2: Maintaining Accurate Real-Time Stock Updates

Problem: Ensuring inventory quantities remain correct after every issue and return transaction

Solution: Implemented backend logic in Java to automatically update stock levels and validate quantity constraints

Challenge 3: Implementing Secure Role-Based Access Control

Problem: Preventing unauthorized users from accessing or modifying sensitive inventory data

Solution: Developed a role-based authentication system with encrypted passwords and controlled API access

Challenge 4: Integrating React Frontend with Java Backend

Problem: Handling smooth data exchange between frontend and backend services

Solution: Built RESTful APIs and implemented proper error handling and response management for seamless integration

9. Testimonials from team

Working on the Inventra project was a valuable learning experience for the entire team. Each member contributed to different modules such as backend development, frontend design, and database management, which helped us understand how a real-world full-stack system is built and integrated.

Regular discussions, planning sessions, and collaborative debugging helped us overcome technical challenges efficiently. The project improved our practical knowledge in Java, MySQL, and React, while also strengthening our problem-solving abilities.

This experience enhanced our teamwork, communication, and project documentation skills, making us more confident in handling industry-level software development projects.

10. Conclusion

The Inventra – Intelligent Inventory Management System successfully demonstrates how digital technology can transform traditional inventory handling into a smart, efficient, and data-driven process. By integrating a Java-based backend, a MySQL relational database, and a React frontend, the system delivers a complete full-stack solution for real-time inventory monitoring and control.

The project effectively addressed common challenges in manual inventory systems such as stock mismatches, lack of transparency, and delayed updates. Through features like role-based authentication, transaction tracking, automated stock updates, and visual dashboards, Inventra ensures accuracy, accountability, and ease of management.

Developing this system provided hands-on experience in backend API development, database design, frontend integration, and system testing. It also strengthened our understanding of how different components of a software system interact to create a reliable and scalable application.

Overall, Inventra stands as a practical and scalable solution that can be adapted for use in institutions, warehouses, retail stores, and other organizations requiring efficient inventory control. The project not only met its technical objectives but also enhanced our readiness to work on real-world software development challenges.

11. Acknowledgements

We would like to express our sincere gratitude to our project mentor and faculty members for their continuous guidance, encouragement, and valuable feedback throughout the development of the Inventra – Intelligent Inventory Management System. Their technical insights and support played a crucial role in helping us overcome challenges and improve the quality of our work.

We also thank our institution for providing the necessary resources and learning environment that enabled

us to successfully complete this project. The opportunity to work on a real-time, practical system has significantly enhanced our technical knowledge and confidence.

Finally, we appreciate the teamwork, dedication, and collaborative efforts of all team members, whose consistent contributions made the successful completion of this project possible.