

# Infosys Springboard Virtual Internship 6.0 Completion Report

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## Team Details

Batch Number : 10

Start date :25-NOV-25

Names:

S.no	Name
1	Polepalli Keerthi
2	Prashant Kumar Pathak
3	Nagamani Mannempalli
4	Vaishnavi vankalas
5	Jerusha

Internship Duration: 8 Weeks

## 1. Project Title

INVENTRA INTELLIGENT INVENTORY MANAGEMENT SYSTEM

## 2. Project Objective

- **Securely authenticate users** with robust authentication and authorization mechanisms (including registration, login, JWT-based security, and password recovery workflows).
- **Manage inventory efficiently** by allowing users to **add, view, update, and delete products** and maintain their stock data in a backend database.
- **Monitor and track inventory levels**, including identifying and highlighting **low-stock items**, to support timely restocking and prevent stockouts.
- **Provide intuitive dashboards and reporting views** that enable users to visualize inventory data and trends through frontend pages.
- **Separate frontend presentation and backend logic** using RESTful APIs built with Spring Boot and MySQL, ensuring modularity and extensibility for future growth or real-world usage.

## 3. Project description in detail

The Inventra – Intelligent Inventory Management System is designed to modernize and streamline traditional inventory workflows that often suffer from manual errors, lack of real-time visibility, and inefficient stock tracking. By integrating secure authentication, structured product management, and automated inventory monitoring, the system provides organizations with a centralized platform to record, track, and manage their stock with accuracy and traceability. Unlike manual spreadsheets or isolated billing systems, Inventra maintains a persistent digital record of products, categories, suppliers, and quantity levels, enabling users to understand their operational inventory health at any point in time. Through defined modules—Authentication, Product Management, Inventory Alerts, and Reports—the system ensures that information access is role-based, data updates are validated, and stock levels are continuously observed for critical fluctuations

Inventra\_All\_Classes

Beyond product CRUD operations, Inventra's intelligent alerting and analytics capabilities serve as a strategic support tool for business decision-making and procurement planning. Low-stock detection prevents dangerous stockouts and operational delays, while reporting and analytical dashboards offer insights into stock movement, consumption patterns, and restocking requirements. The platform leverages a scalable backend supported by Spring Boot and MySQL, with a modular frontend designed for usability and clarity, making the system suitable for retail shops, warehouses, wholesalers, and institutional inventory environments. Through this combination of automation, structured data handling, and visual reporting, Inventra not only enhances day-to-day inventory operations but also transforms inventory management into a data-driven, proactive, and intelligent process aligned with modern business needs.

#### 4. Timeline Overview

<b>Week</b>	<b>Activities Planned</b>	<b>Activities Completed</b>
<b>Week 1</b>	Project kickoff, team introduction, defining problem statement, and researching existing customer feedback analysis systems.	Conducted project initiation meeting, finalized objectives and scope, and studied NLP-based sentiment and review analysis approaches.
<b>Week 2</b>	Data collection from review sources (e-commerce, app reviews, surveys) and identification of key product feedback datasets.	Collected customer reviews, grouped them by product/category, and validated data formats and sources.
<b>Week 3</b>	Data preprocessing – cleaning text, handling missing fields, and preparing labeled data for sentiment analysis.	Cleaned and normalized review text, performed tokenization and stop-word removal, and created sentiment-labeled datasets for model training.
<b>Week 4</b>	Exploratory Data Analysis (EDA), sentiment distribution analysis, and aspect/category identification from feedback.	Analyzed sentiment trends across products, identified common topics (price, quality, delivery, support), and finalized features for the model.
<b>Week 5</b>	Model development for sentiment analysis and product recommendation.	Trained initial sentiment model and implemented basic recommendation logic using user–product interactions plus sentiment scores.
<b>Week 6</b>	Model testing, evaluation, and fine-tuning of sentiment and recommendation models.	Evaluated models with accuracy/F1 and relevance metrics, tuned hyperparameters, and improved overall system performance.
<b>Week 7</b>	Dashboard and UI creation for user recommendations and product-owner insights (web app / Streamlit / BI tool).	Built an interactive dashboard showing sentiment summaries, top issues, recommended products, and improvement suggestions for product owners.
<b>Week 8</b>	Final documentation, presentation preparation, and submission/demo.	Completed full documentation, prepared presentation slides, and delivered final demo showing end-to-end system workflow from feedback to recommendations and insights.

#### 5a. Key Milestones

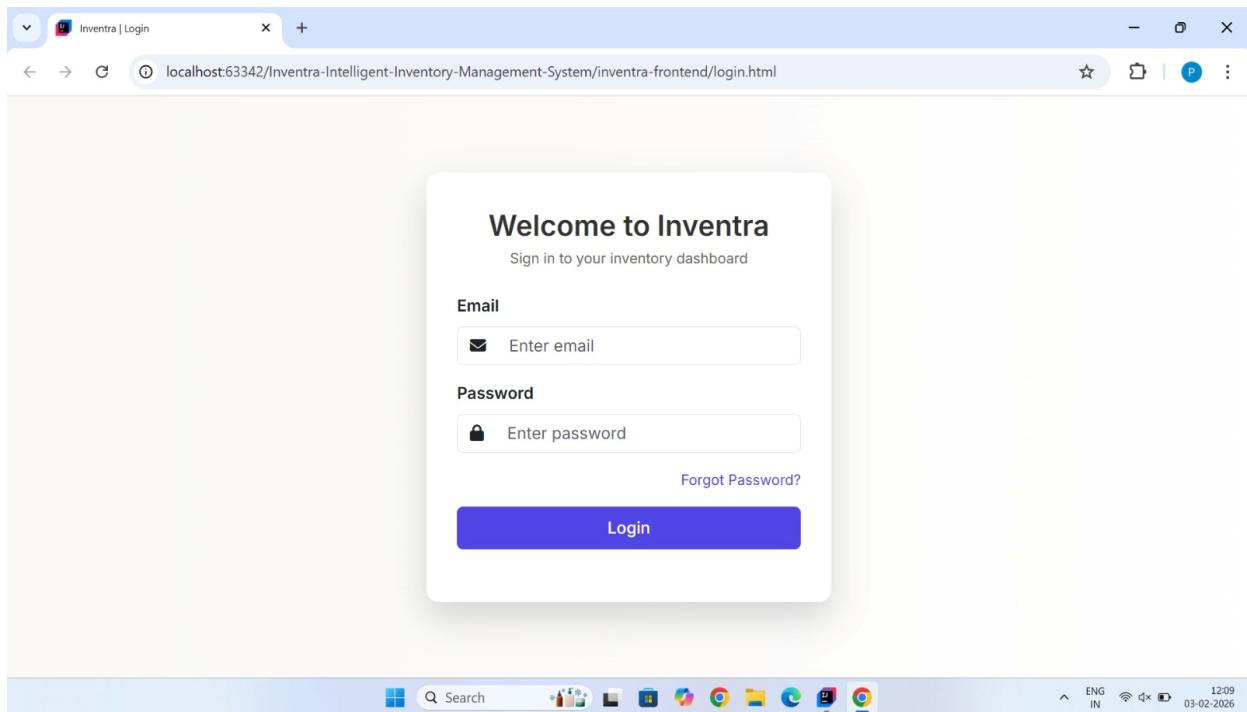
<b>Milestone</b>	<b>Description</b>	<b>Date Achieved</b>
Project Kickoff	Initial project briefing, team formation, objective finalization, and research on customer feedback and sentiment analysis techniques.	6-OCT-25

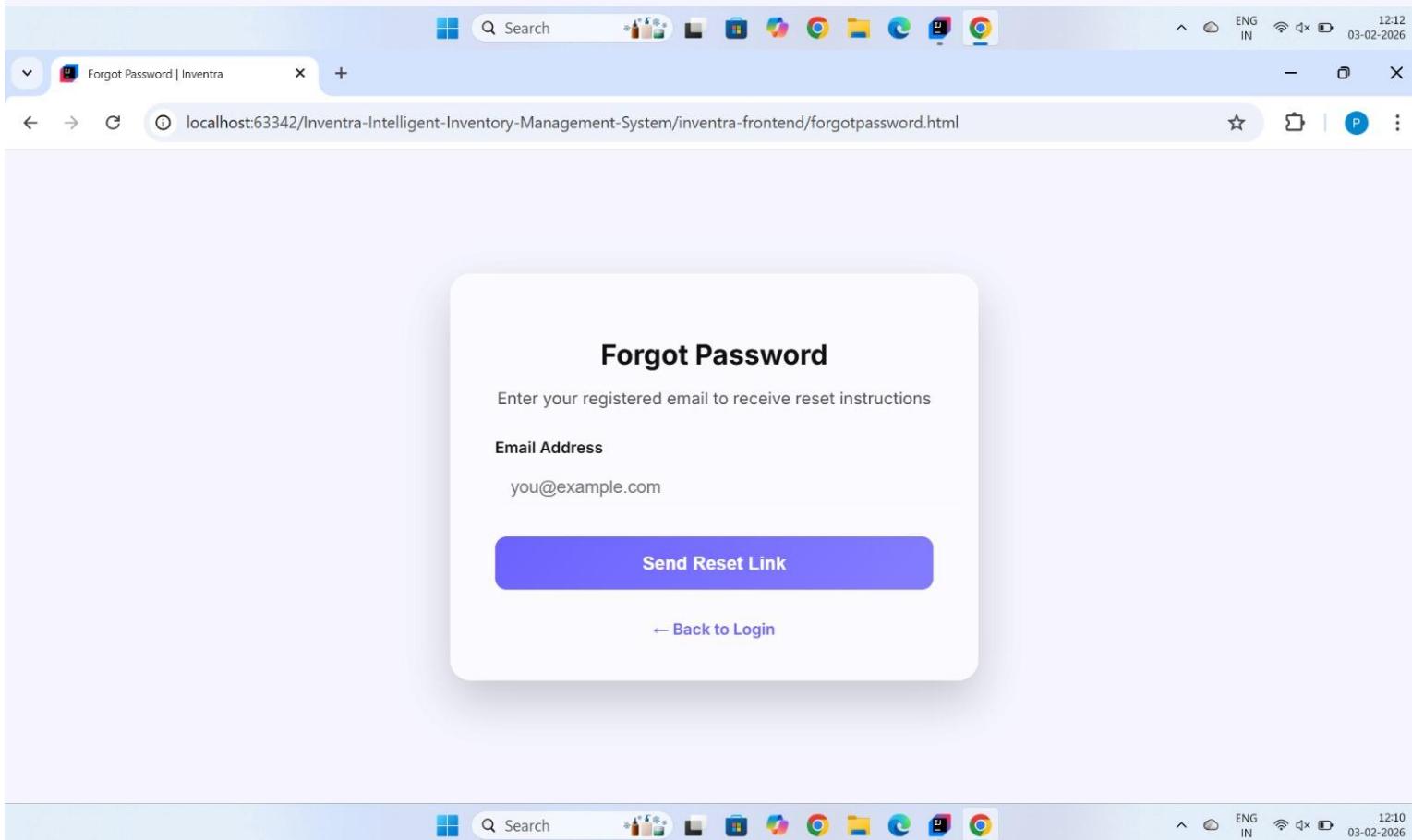
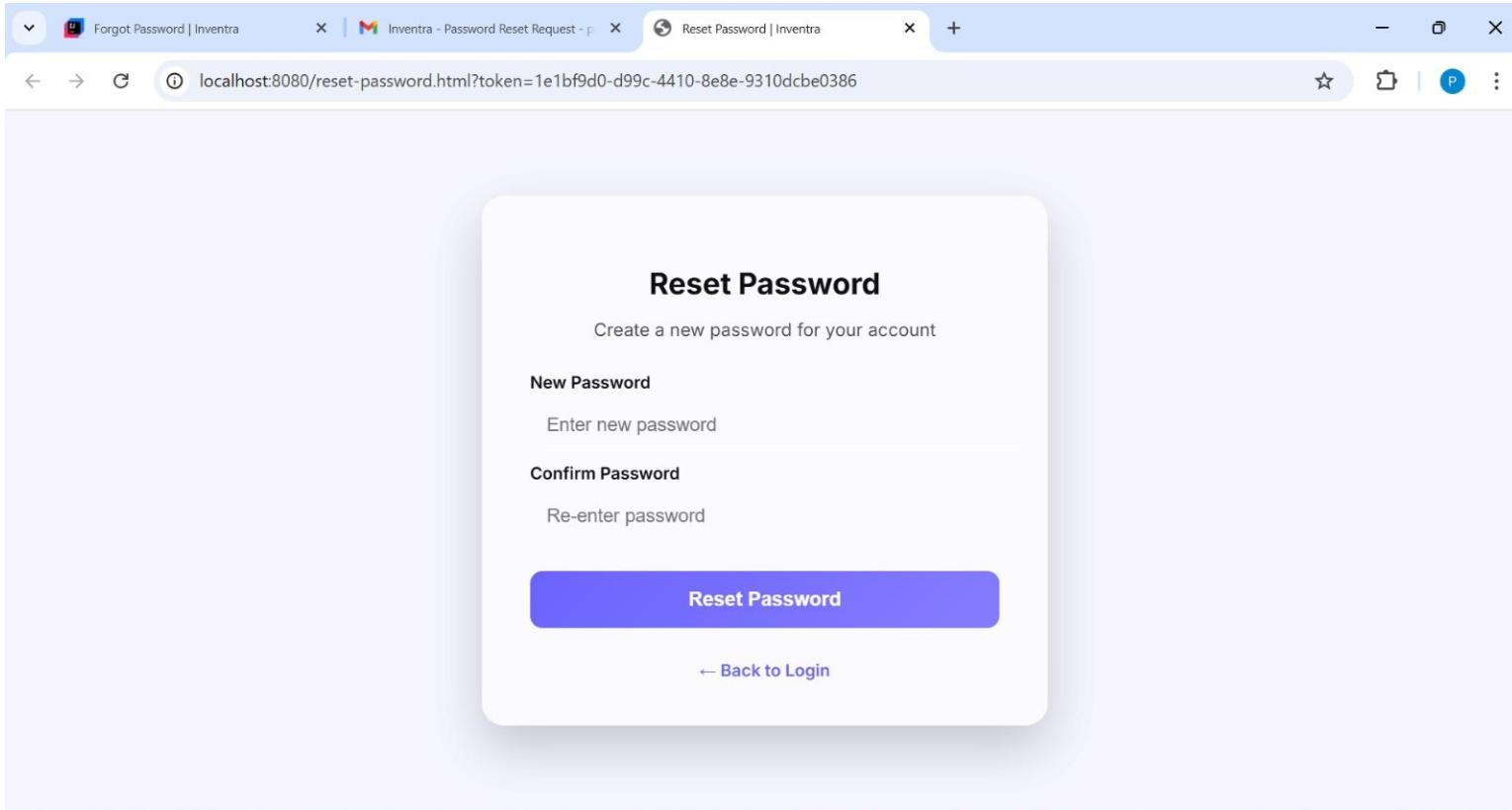
Milestone	Description	Date Achieved
Prototype / First Draft	Completion of data collection, preprocessing, and development of the initial sentiment analysis and recommendation model.	15-OCT-25
Mid-Term Review	Review of model performance, evaluation results, dashboard progress, and discussions on enhancements for the final system.	30-OCT-25
Final Submission	Completion of model training, dashboard/interface implementation, documentation, and system deployment for submission.	19-NOV-25
Presentation	Final demonstration of the project showing sentiment insights, recommendations, and full dashboard functionality.	01-DEC-25

### 5b. Project execution details

- The Inventra – Intelligent Inventory Management System was developed in planned stages using a full-stack web development approach. The project started by understanding the problem, collecting requirements, and dividing the work into four main parts: Authentication, Product Management, Inventory Alerts, and Reports. After this, the technology stack was finalized using Spring Boot for backend APIs, MySQL for data storage, Html, Css, Js for the user interface, and JWT tokens for secure access. The database was designed with tables for users, products, and inventory records. The backend work began with setting up user authentication and role-based access, ensuring that only registered users could manage or view inventory data.
- After completing authentication, the product and inventory modules were implemented and connected to the database. This allowed users to add, update, delete, and list products, while inventory levels were stored and tracked automatically. A low-stock alert mechanism was added to notify users when quantities fell below a specified limit. Once the backend was tested using Postman, the frontend dashboard was built to display products, inventory status, and alerts using REST API calls. The final stages included adding simple reporting features, testing all modules for correctness and usability, and preparing the project for demonstration. The completed system successfully showed the full flow from login → managing products → tracking inventory → seeing alerts → viewing reports, providing a practical and working inventory management solution.

## 6. Snapshots / Screenshots





Register User | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/register.html

ADMIN ☾ ⚙

Inventra

Dashboard

Products

Low Stock

Transactions

Reports

Categories

Suppliers

**Register User**

Logout

### Create New User

Username  
Enter username

Full Name  
Enter full name

Email  
Enter email

Contact Number  
Enter contact number

Password  
Enter password

Search bar and taskbar at the bottom.

Suppliers | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/suppliers.html

ADMIN ☾ ⚙

Inventra

Supplier Management

### Suppliers

+ Add Supplier

NAME	EMAIL	PHONE	ACTION
ABC Traders	abctraders@inventra.com	9678451248	Delete
Global Supplies	globalsuppliers@inventra.com	9547812638	Delete
FreshMart	freshmart@inventra.com	9865741235	Delete
Local Distributors	localdistributors@gmail.com	7845129637	Delete

Dashboard

Products

Low Stock

Transactions

Reports

Categories

**Suppliers**

Register User

Logout

Search bar and taskbar at the bottom.

Reports & Analytics | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/reports.html

## Inventra Reports & Analytics

### Top 5 Products

- Whole Wheat Bread (sku-001) — 80 sold
- Chocolate Cupcakes (sku-003) — 27 sold
- Fresh Milk (1 L pouch) (sku-002) — 20 sold

The chart displays a single blue line representing Revenue. The y-axis ranges from 2,000 to 6,500 in increments of 500. The x-axis shows dates: 2026-01-31 and 2026-02-02. The line starts at approximately (2026-01-31, 2200) and ends at approximately (2026-02-02, 6500), indicating a steady upward trend.

Date	Revenue
2026-01-31	~2,200
2026-02-02	~6,500

ADMIN ☾ ⚙️

- Dashboard
- Products
- Low Stock
- Transactions
- Reports**
- Categories
- Suppliers
- Register User
- Logout

Reports & Analytics | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/reports.html

## Inventra Reports & Analytics

### Inventory Report

2026-01-31 2026-02-02

- Dashboard
- Products
- Low Stock
- Transactions
- Reports**
- Categories
- Suppliers
- Register User
- Logout

**Total Products** 5    **Stock Value** ₹8685.00    **Low Stock** 2

**Out of Stock** 0

#### Low Stock Products

Name	SKU	Qty	Reorder	Value
Whole Wheat Bread	sku-001	15	15	₹675.00
Paneer (200g pack)	sku-004	10	15	₹900.00

ADMIN ☾ ⚙️

### Inventra Stock Transactions

ADMIN

Date	Type	Quantity	Batch	Performed By
2026-01-31 17:46:33	STOCK_IN	5	BATCH-1769861792614	ADMIN
2026-01-31 17:47:17	STOCK_IN	20	BATCH-1769861836857	ADMIN
2026-01-31 17:47:21	STOCK_OUT	5	BATCH-1769861840946	ADMIN
2026-01-31 17:54:48	STOCK_IN	25	BATCH-1769862288095	ADMIN
2026-01-31 17:54:53	STOCK_OUT	5	BATCH-1769862292754	ADMIN
2026-01-31 17:54:57	STOCK_OUT	10	BATCH-1769862296563	ADMIN
2026-01-31 17:55:01	STOCK_OUT	15	BATCH-1769862300611	ADMIN
2026-02-01 23:03:41	STOCK_IN	20	BATCH-1769967220572	ADMIN
2026-02-01 23:15:53	STOCK_IN	5	BATCH-1769967952656	ADMIN

Enter Product ID  Load Transactions

Dashboard Products Low Stock Transactions Reports Categories Suppliers Register User Logout

Search ENG IN 12:09 03-02-2026

### Inventra Low Stock

ADMIN

<b>Whole Wheat Bread</b> SKU: sku-001 <b>15</b> Reorder: 15 Price: ₹45.00 LOW STOCK	<b>Paneer (200g pack)</b> SKU: sku-004 <b>10</b> Reorder: 15 Price: ₹90.00 LOW STOCK
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Dashboard Products Low Stock Transactions Reports Categories Suppliers Register User Logout

Search ENG IN 12:09 03-02-2026

### Inventra

#### Products

+ Add Product

	Name	SKU	Category	Supplier	Quantity	Reorder Level	Unit Price (₹)	Status	Actions
⚠ Low Stock	Whole Wheat Bread	sku-001	Bakery	ABC Traders	15	15	₹45	Low	<a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a> <a href="#">Batches</a>
↔ Transactions	Fresh Milk (1 L pouch)	sku-002	Dairy & Refrigerated	Global Supplies	40	20	₹65	In Stock	<a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a> <a href="#">Batches</a>
printStats	Chocolate Cupcakes	sku-003	Bakery	ABC Traders	23	10	₹120	In Stock	<a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a> <a href="#">Batches</a>

Dashboard

Products

Low Stock

Transactions

Reports

Categories

Suppliers

Register User

Logout

Search

ENG IN 12:09 03-02-2026

### Inventra

#### Dashboard

Dashboard

Products

Low Stock

Transactions

Reports

Categories

Suppliers

Register User

Logout

Total Products: 5

Categories: 5

Suppliers: 4

Low Stock Items: 2

Critical Alerts: 0

Search

ENG IN 12:09 03-02-2026

## Inventra - Password Reset Request

Inbox ×

P

polepallikeerthi2005@gmail.com

to me ▾

Hello,

Click the link below to reset your password:

<http://localhost:8080/reset-password.html?token=1e1bf9d0-d99c-4410-8e8e-9310dcbe0386>

Regards,

Inventra Team

## Inventra - Password Reset Request

Inbox ×

P

polepallikeerthi2005@gmail.com

to me ▾

Hello,

Click the link below to reset your password:

<http://localhost:8080/reset-password.html?token=1e1bf9d0-d99c-4410-8e8e-9310dcbe0386>

Regards,

Inventra Team



# Critical Inventory Alert

Inbox ×

P

polepallikeerthi2005@gmail.com

to me, 22h51a6745 ▾

milk packet is LOW STOCK and NEAR EXPIRY

Quantity: 20

Reorder Level: 25

Batch: BATCH-1770032624342

Expires in: 2 day(s)

Categories | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/categories.html

### Category Management

ADMIN ☔️ 📞

**Categories**

- Dashboard
- Products
- Low Stock
- Transactions
- Reports
- Categories**
- Suppliers
- Register User
- Logout

+ Add Category

NAME	ACTION
Bakery	biscuits, cream rolls <button>Delete</button>
Dairy & Refrigerated	cheese, eggs, cold cuts and <button>Delete</button>
Grocery	rice, flour, ready mixes <button>Delete</button>
Stationery	paper, pens, art boxes, art materials <button>Delete</button>
Fruits & Vegetables	Fresh fruits, vegetables, greens, herbs and exotic produce <button>Delete</button>

Add Category

Category Name: Bakery  
e.g. Fruits & Vegetables

Description: Optional description

Cancel Save

Search 12:18 03-02-2026 ENG IN

**Inventra**

**Supplier Management**

**Suppliers**

**Add Supplier**

NAME	PHONE	ACTION
ABC Traders	9678451248	<b>Delete</b>
Global Supplies	9547812638	<b>Delete</b>
FreshMart	9865741235	<b>Delete</b>
Local Distributor	7845129637	<b>Delete</b>

**+ Add Supplier**

**Supplier Name \***

**Email**

**Phone**

**Address**

**Cancel** **Save**

**ADMIN**

**Dashboard** **Products** **Low Stock** **Transactions** **Reports** **Categories** **Suppliers** **Register User** **Logout**

Batch View | Inventra

localhost:63342/inventra-Intelligent-Inventory-Management-System/inventra-frontend/batches.html?productId=48

## Batch Details

Batch Number	Expiry Date	Quantity	Supplier	Status
TEST-BATCH-EXPIRED	2024-01-01	10	Manual Test Supplier	EXPIRED
BATCH-1770008965716	2026-02-03	0		OUT_OF_STOCK
BATCH-1770029808606	2026-02-11	5	ABC Traders	ACTIVE
BATCH-1770011613738	2026-02-13	0		OUT_OF_STOCK
BATCH-1770004955639	2026-02-15	0		OUT_OF_STOCK
BATCH-1769967220572	2026-03-10	0	ABC Traders	OUT_OF_STOCK

Products | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/products.html?\_ijt=38hju49t3h2sr5rh8j1p8rainl&\_ij\_rel...

## Inventra Products

+ Add Product

Name	Reorder Level	Unit Price (₹)	Status	Actions
Whole Wheat Bread	15	₹45	Low	<a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a> <a href="#">Batches</a>
Fresh Milk (1 L pouch)	0	₹65	In Stock	<a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a> <a href="#">Batches</a>
Chocolate Cupcakes	sku-003	Bakery	ABC Traders	23 10 ₹120 In Stock <a href="#">Edit</a> <a href="#">Del</a> <a href="#">+ In</a> <a href="#">Out</a>

**Edit Product**

Name: Whole Wheat Bread

Reorder Level: 15

Unit Price (₹): 45

Save Cancel

Stock In | Inventra

localhost:63342/Inventra-Intelligent-Inventory-Management-System/inventra-frontend/stock-in.html?productId=48

## Stock In

Quantity

Expiry Date

Supplier (optional)

Add Stock

Search

12:18 03-02-2026

## **7. Learnings & Skills Acquired**

**Full-Stack Development Workflow** – Understood how to plan, build, integrate, and test backend and frontend modules in stages.

**Backend Development with Spring Boot** – Learned to create REST APIs, service layers, and repositories using Spring Boot and Java.

**JWT Authentication & Security** – Gained experience in implementing login, token-based authentication, and secure access control.

**Database Design & MySQL Integration** – Designed tables, managed relationships, wrote queries, and integrated backend with MySQL using JPA/Hibernate.

**REST API Usage & Testing** – Practiced working with REST endpoints, sending requests, and validating API responses using tools like Postman.

**Frontend Development with HTML, CSS, JS** – Built interactive UI screens for login, product listings, alerts, and reports using components and API calls.

**Inventory & Product Management Logic** – Learned to handle CRUD operations, track stock levels, update quantities, and manage product attributes.

**Alert & Notification Mechanisms** – Implemented logic to detect low-stock items and trigger alerts for timely restocking.

**Reporting & Dashboard Visualization** – Created dashboard pages to display inventory summaries, product counts, and analytics for decision-making.

**Testing & Debugging Skills** – Improved debugging abilities for both frontend and backend, and tested different user workflows for correctness.

**Project Documentation & Presentation** – Enhanced skills in writing documentation, explaining modules, and presenting end-to-end project flow.

**Team Collaboration & Communication** – Improved coordination, presentation skills, and project documentation habits through weekly milestone reviews.

## 7. Challenges Face

### Challenge 1: Securing User Access

**Problem:** Implementing authentication so that only valid users can access and manage inventory was difficult at the start.

**Solution:** Used JWT token-based authentication and role-based access control to secure APIs and prevent unauthorized usage.

### Challenge 2: Managing Product & Inventory Data

**Problem:** Handling multiple data fields (product name, category, supplier, quantity, etc.) and maintaining consistency during updates was tricky.

**Solution:** Designed a proper relational database schema in MySQL and used Spring Data JPA for clean CRUD operations and data integrity.

### Challenge 3: Stock Level Monitoring & Alerts

**Problem:** Detecting low-stock items dynamically and keeping the UI updated with alert notifications required additional logic.

**Solution:** Added threshold fields for products, created backend alert conditions, and displayed alerts on the frontend for quick action.

### Challenge 4: Frontend–Backend Communication

**Problem:** Sending requests from HTML/JS to the backend and handling JSON responses caused CORS errors and format issues.

**Solution:** Enabled CORS in Spring Boot, used fetch() for AJAX calls in JavaScript, and validated response formats for smooth communication.

### Challenge 5: Error Handling & Debugging

**Problem:** JWT errors, database exceptions, and CORS issues made debugging time-consuming.

**Solution:** Implemented exception handlers in Spring Boot, used browser console logs for frontend debugging, and validated tokens properly.

## 8. Testimonials from team

As part of the internship journey, our team experienced a realistic software development workflow. We explored new technologies, learned how to connect frontend and backend modules, and improved our understanding of secure inventory control. Despite academic schedules and challenges during coding, the team communicated well, divided tasks properly, and helped each other during debugging. Regular discussions, documentation sharing, and testing sessions made the progress smooth and productive.

## 9. Conclusion

The Inventra – Intelligent Inventory Management System provided a complete learning experience across the major stages of full-stack development including requirement analysis, database design, backend implementation, frontend integration, authentication setup, testing, and documentation. By building this system, we gained hands-on experience in Spring Boot APIs, MySQL integration, JWT-based security, and UI development with HTML, CSS,

and JavaScript. The final system demonstrates secure login, product management, inventory tracking, low-stock alerts, and reporting features, making it a practical solution for managing small or medium-scale business inventories. Overall, this project significantly improved both technical confidence and industry readiness in web application development.

## **10.Acknowledgements**

We would like to express our sincere gratitude to our mentor for the continuous support, encouragement, and valuable feedback throughout this project. Your guidance helped us understand backend development, database handling, and security techniques in a more practical way. We also thank Infosys Springboard for providing a structured virtual internship environment, learning resources, and motivation to successfully complete this project. This experience has played an important role in expanding our technical skills and preparing us for real-world software development challenge

