Infosys Springboard Virtual Internship 6.0 Project Completion Report

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1. Internship Details

- **Internship Program:** Infosys Springboard Virtual Internship 6.0
- **Batch Number:** 10
- **Team Number:** Team 2
- **Internship Duration:** 8 Weeks
- **Start Date:** 26-NOV-2025

2. Team Details

S. No	Name
1	Christina J
2	Krishna Moorthy Anbalagan
3	Rajeshwari R
4	Shrisha Singha
5	Ganji Sudharsan Balaji

3. Project Title

Inventra – Intelligent Inventory Management System

4. Project Objective

- **Enable Intelligent Inventory Tracking** – Accurately monitor product quantities, stock movement, and availability in real time using a centralized database system.

- **Provide Efficient Product & Stock Management** – Support seamless addition, update, and deletion of product and inventory records to maintain accurate stock information.

- **Implement Automated Inventory Alerts** – Generate timely notifications for low-stock situations to prevent shortages and ensure uninterrupted operations.

- **Support Data-Driven Inventory Decisions** – Deliver clear insights through reports and analytics such as stock summaries, usage trends, and inventory status reports.

- **Ensure Secure and Scalable System Operation** – Protect user access through authentication mechanisms while maintaining a modular architecture that supports future scalability and enhancements.

5. Project Description

Inventra – Intelligent Inventory Management System is a **web-based application** designed to overcome the limitations of traditional inventory systems such as manual errors, lack of transparency, and inconsistent stock records.

The system follows a **layered architecture** using Spring Boot and REST APIs. It allows authenticated users to manage products, perform stock-in and stock-out operations, and automatically records each transaction. When inventory levels fall below a predefined threshold, the system generates alerts to notify responsible users.

The application ensures **data consistency, security, and accountability** using transaction management, JWT-based authentication, and role-based access control. Overall, the project provides a reliable and structured solution for inventory operations.

6. Technology Stack Used

- IntelliJ IDEA
- HTML, CSS, JavaScript
- Java
- Spring Boot
- REST API
- JWT
- BCrypt
- Role-Based Access Control
- MySQL
- Maven

7. Modules Implemented

Module 1: Authentication

- Secure login and registration
- JWT-based authentication
- Role-based access control

Module 2: Inventory Management

- Product management
- Stock-in and stock-out operations
- Duplicate product prevention

Module 3: Inventory Alerts

- Low-stock detection
- Automatic alert generation

Module 4: Transaction Management

- Recording stock movements
- Maintaining transaction history
- Supporting auditing and reporting

Module 5: Reports & Analytics

- Generating stock and transaction reports
- Applying basic filters

- Supporting decision making

8. Timeline Overview

Week	Activities Planned	Activities Completed
Week 1	Project kickoff, team introduction, understanding inventory management challenges, and defining problem statement and objectives.	Conducted project initiation meeting, finalized project scope and objectives, and studied existing inventory management systems and workflows.
Week 2	Requirement analysis and system design planning, including module identification and technology stack finalization.	Identified core modules (Authentication, Inventory Management, Alerts, Reports), finalized technology stack, and prepared system architecture and database design plan.
Week 3	Database schema design and authentication module planning.	Designed MySQL database schema, created entity relationships, and implemented JWT-based authentication with secure user login and role management.
Week 4	Development of Product and Inventory Management modules with backend APIs.	Implemented CRUD operations for products and inventory using Spring Boot REST APIs and integrated them with the MySQL database.
Week 5	Inventory alert mechanism and business logic implementation.	Developed stock threshold monitoring logic and implemented automated low-stock alert functionality.
Week 6	Reports and analytics module development and frontend integration planning.	Implemented inventory summary and product-wise reports and integrated backend APIs with frontend interfaces using HTML, CSS, and JavaScript.

Week 7	Frontend development, system integration, and testing.	Completed frontend screens, integrated all modules, and performed unit and integration testing for APIs, database operations, and alerts.
Week 8	Final testing, documentation, presentation preparation, and project demonstration.	Completed system documentation, prepared presentation slides, and delivered final demo showcasing end-to-end workflow from login to inventory tracking, alerts, and reports.

9. Key Milestones

Milestone	**Description**	**Date Achieved**
Project Kickoff	Team formation, problem understanding, requirement analysis, and system architecture planning	26-NOV-25
Prototype / First Draft	Identification of core modules, technology stack finalization, and database schema design	04-DEC-25
Mid-Term Review	Implementation of authentication, product, and inventory management modules	19-DEC-25
Final Submission	Development of inventory alert mechanism and basic reporting features	08-JAN-26
Presentation	Frontend integration, testing, documentation, presentation, and final project demonstration	23-JAN-26

10. Project Execution Details

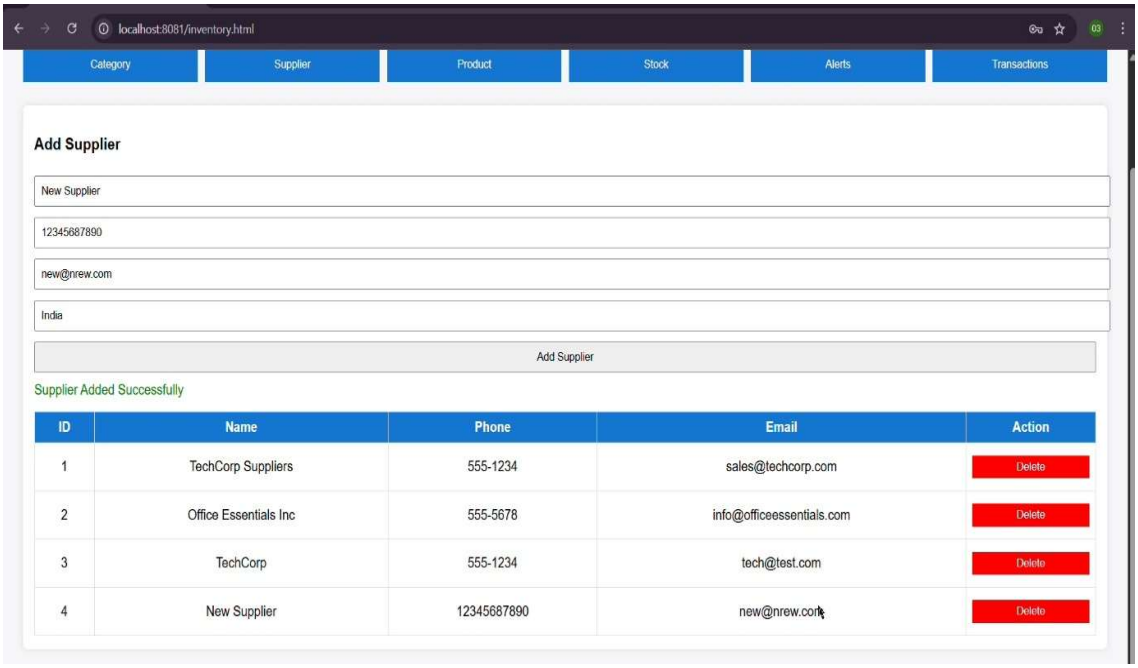
The Inventra – Intelligent Inventory Management System was developed over an 8-week internship period using a structured and modular approach. The project started with requirement analysis and system design, where key issues such as inaccurate stock handling, lack of transaction tracking, and security concerns were identified. Based on these requirements, a layered architecture consisting of Controller, Service, and Repository layers was designed.

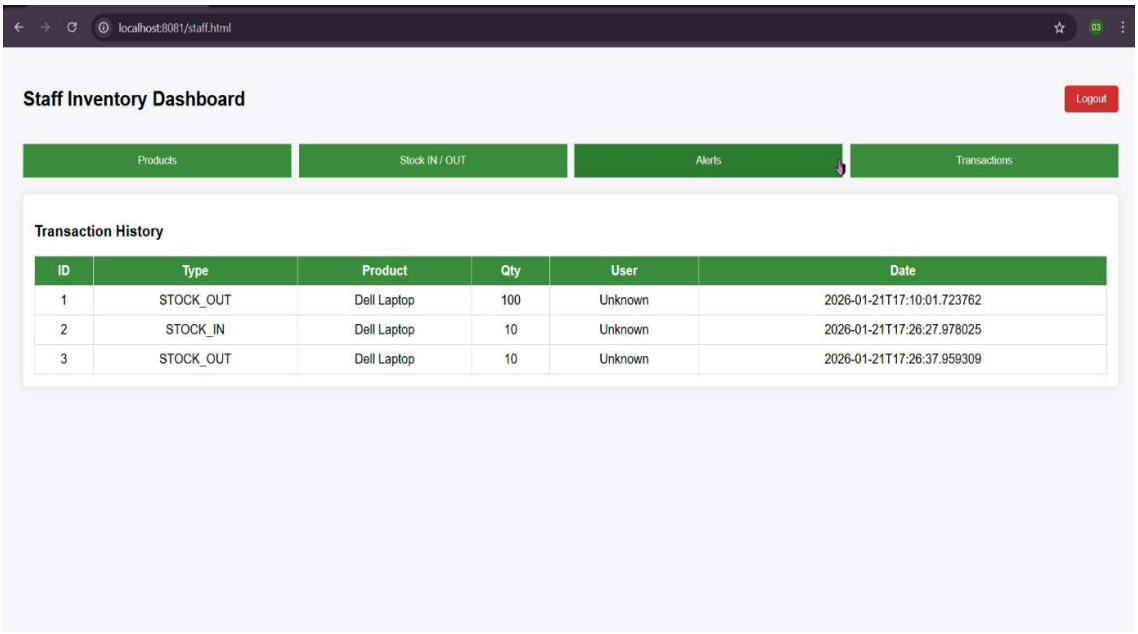
The Authentication module was implemented first using Spring Boot with JWT-based authentication and role-based access control to ensure secure access. Passwords were encrypted using BCrypt for improved security. Next, the Inventory Management module was developed to manage products and perform stock-in and stock-out operations with proper validations to prevent duplicate entries and negative stock values.

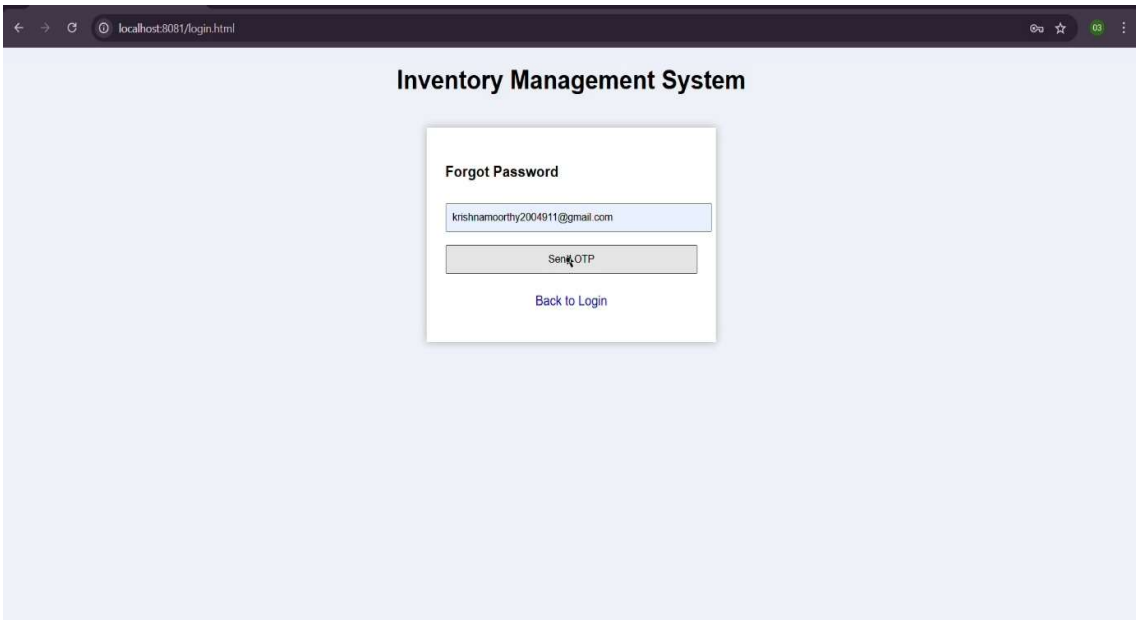
The Transaction Management module was integrated to record every inventory operation automatically. Transaction handling was implemented using Spring's @Transactional mechanism to ensure data consistency and rollback in case of failures. The Inventory Alerts module was then added to monitor stock levels and generate alerts whenever inventory fell below the minimum threshold.

Finally, the Reports & Analytics module was implemented by generating reports from existing inventory and transaction data using basic filters. The complete system was tested for functionality and security, followed by documentation and final submission.

11. Snapshots / Screenshots



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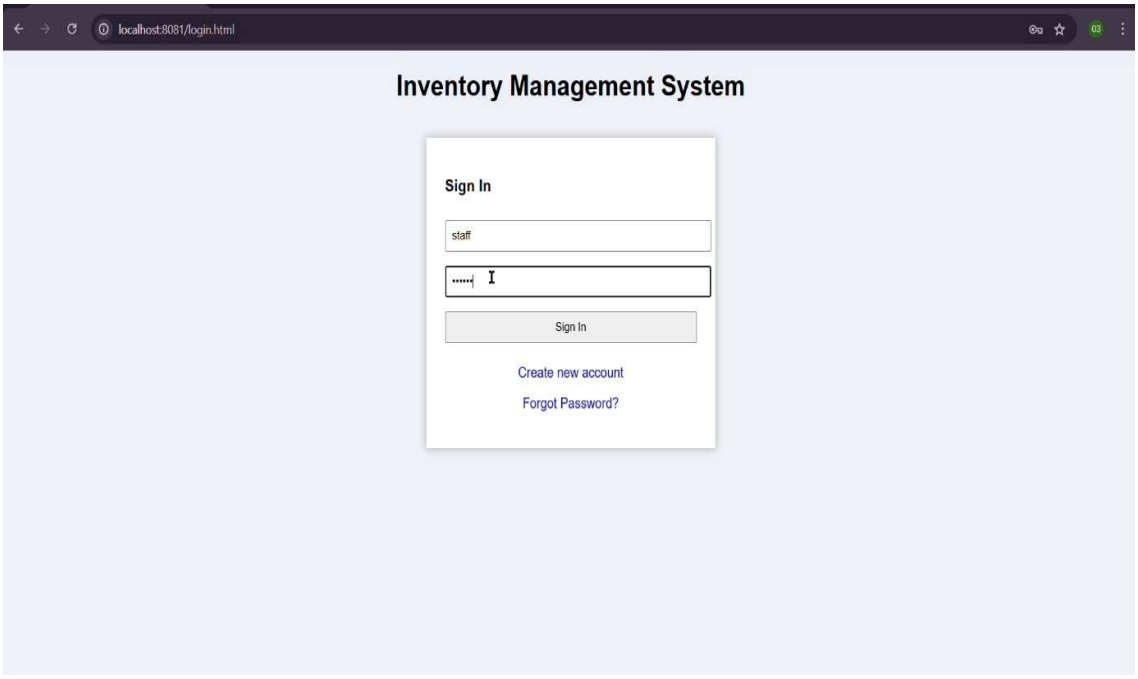
Inventory Management System
Forgot Password
krishnamoorthy2004911@gmail.com
Send OTP
Back to Login


localhost:8081/login.html
Inventory Management System
Sign In
staff
Sign In
Create new account
Forgot Password?

12. Key Learnings & Skills Acquired

- Gained understanding of inventory management workflows and system requirements.
- Developed backend applications using Java and Spring Boot with RESTful APIs.
- Learned secure authentication using JWT, BCrypt, and Role-Based Access Control (RBAC).
- Built frontend interfaces using HTML, CSS, and JavaScript.
- Designed and managed MySQL databases with CRUD operations and data integrity.
- Implemented inventory alert mechanisms and business logic.
- Generated inventory reports to support data-driven decisions.
- Improved testing, debugging, teamwork, and project documentation skills.

- Learned to write unit/integration tests and optimize system latency, model accuracy, and API performance.

- Improved coordination, presentation skills, and project documentation habits through weekly milestone reviews.

13. Challenges Faced

- Challenge 1: Database Design for Inventory Management

Problem: Designing a database schema that efficiently handles products, inventory levels, users, and alerts without data redundancy.

Solution: Implemented a well-structured MySQL relational schema with proper normalization and foreign key relationships to ensure data integrity and scalability

- Challenge 2: Secure Authentication and Authorization

Problem: Ensuring secure access while managing different user roles within the system.

Solution: Implemented JWT-based authentication with BCrypt password encryption and Role-Based Access Control (RBAC) to manage permissions securely.

- Challenge 3: Real-Time Inventory Accuracy

Problem: Maintaining accurate stock levels during frequent inventory updates and transactions.

Solution: Centralized inventory update logic in the Spring Boot service layer and ensured synchronized database operations through validated API workflows.

- Challenge 4: Frontend–Backend Integration

Problem: Ensuring seamless data exchange between frontend interfaces and backend REST APIs.

Solution: Standardized API responses and thoroughly tested endpoints to ensure smooth integration and consistent data rendering.

14. Testimonials from team

Working on the Inventra project helped us gain practical exposure to real-world inventory management systems and strengthened our backend development skills.
The project improved our understanding of Spring Boot, REST APIs, and database integration while enhancing our teamwork and coordination.
Mentor guidance and collaborative problem-solving played a key role in successfully implementing secure authentication and inventory alert mechanisms.
This project enhanced our confidence in building scalable, secure, and industry-relevant applications.

15. Conclusion

The Inventra – Intelligent Inventory Management System successfully demonstrates the implementation of a **secure, modular, and scalable inventory solution**. The project provided hands-on experience in backend development, database design, security implementation, and team collaboration. This internship significantly enhanced our understanding of real-world software development practices and industry-level application design.

16. Acknowledgement

We sincerely thank **Infosys Springboard** and our mentor for providing guidance, resources, and continuous support throughout the internship. Their encouragement and feedback helped us successfully complete this project and gain valuable practical experience.
