

# INVENTRA

Intelligent Inventory Management System

Domain: Electronic Gadgets Shop (Laptops, Computers, Accessories)

Infosys Springboard | Virtual Internship 6.0 | Team 2

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# CRITICALITY OF MANAGEMENT



## High-Value Items

Electronic gadgets are expensive assets that require precise tracking to prevent capital leakage.



## Fast-Moving Goods

Accessories like chargers and SSDs move rapidly; depletion leads to immediate revenue loss.



## Financial Integrity

Incorrect stock level detection directly causes financial discrepancies and budget misalignment.



## Peak Hour Efficiency

Manual tracking methods consistently fail during high-traffic hours, causing customer dissatisfaction.

# | SHOP INVENTORY ENVIRONMENT

- ☐ **Core Products:** Laptops, Keyboards, Mouse, Chargers, SSDs
- ☒ **Operational Flow:** Multiple staff members handling inventory daily
- ⟳ **Precision:** Real-time stock accuracy is non-negotiable
- ⌚ **Compliance:** Accountability is essential for all updates



# | IDENTIFIED CHALLENGES

-  **Duplicate Entries:** Redundant gadget records causing data clutter.
-  **Post-Sale Errors:** Mismatch in stock levels immediately after transactions.
-  **Zero Traceability:** No historical record of which staff member updated specific items.
-  **Late Detection:** Low-stock alerts for accessories are delayed or missed.
-  **Weak Access Control:** Vulnerable security protocols for inventory modification.

# THE INVENTRA SOLUTION



Dashboard shown is a conceptual representation of the planned system UI

- Centralized System:** One single source of truth for all branches.
- RBAC:** Secure role-based login for admin and staff.
- Live Updates:** Instantaneous stock adjustments.
- Automated Alerts:** Proactive notification for low-stock items.
- Audit Trail:** Complete transaction tracking for accountability.

# | TECHNOLOGICAL FOUNDATION



## Frontend

HTML5, CSS3, JavaScript for a responsive and intuitive interface.



## Backend

Java with Spring Boot framework for robust business logic processing.



## Middleware

REST API architecture for seamless communication between components.



## Security

JWT (JSON Web Tokens), BCrypt password hashing, and RBAC.



## Storage

MySQL relational database for structured and reliable data persistence.



## Development

IntelliJ IDEA as the primary Integrated Development Environment.

# | SYSTEM ARCHITECTURE

## Request Flow

Controller → Service → Repository →  
Database

## Controller Layer

Intercepts user requests and routes them to appropriate service handlers.

## Service Layer

Encapsulates core business logic, validation rules, and transaction boundaries.

## Repository Layer

Manages database interactions and data mapping via JPA/Hibernate.

# CORE MODULES



## Authentication

Security and identity management.



## Inventory

Stock management and cataloging.



## Monitoring

Real-time alerts and stock levels.



## Transactions

IN/OUT operation tracking.



## Reports & Analytics

Data-driven decision support and historical trends.

# AUTHENTICATION

-  Secure login for Admin and Staff.
-  Role-Based Access Control (RBAC).
-  Industry-standard BCrypt encryption.
-  Zero tolerance for unauthorized access.



# | Authentication – Business Impact

## **Admin Privileges**

Full control over high-value laptop catalogs and store-wide settings.

## **Staff Operations**

Restricted access to daily stock updates for accessories and sales entry.

## **Unique Identities**

Strict "no-shared-accounts" policy ensures complete individual accountability.

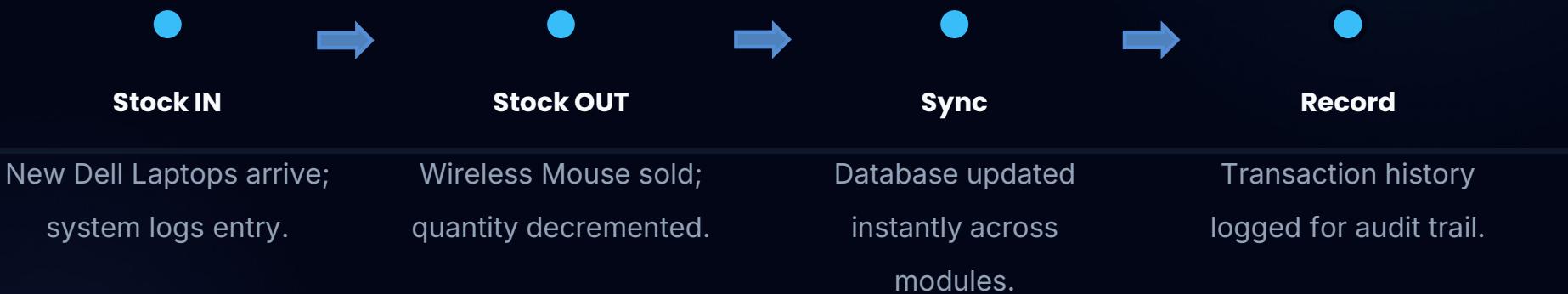
## **Dispute Resolution**

Clear audit logs allow management to resolve stock discrepancies instantly.

# INVENTORY MANAGEMENT OPERATIONS

- + **Product Ingestion:** Seamlessly add new electronic products with detailed specs.
- ⇄ **Dynamic Adjustment:** Automatic stock updates after every single sale or purchase.
- ☰ **Quantity Tracking:** Real-time visibility of available shelf and warehouse stock.
- ⚠ **Validation:** Intelligent checks to prevent duplicate product entries and data corruption.

# OPERATIONAL WORKFLOW



## | ALERTS & MONITORING

# 24/7

Stock Vigilance

### **Automated Thresholds**

Continuous monitoring of accessory stock levels against minimum safety margins.

### **Zero Revenue Loss**

Instant alert generation prevents "Out of Stock" scenarios during peak demand.

# CASE STUDY: LOW-STOCK MITIGATION

Scenario: Charger stock drops below 10 units.

- ⓘ System detects breach of threshold.
- ✉ Alert generated for Admin dashboard.
- 🛒 Admin restocks before shortage impacts customers.



# TRANSACTION MANAGEMENT

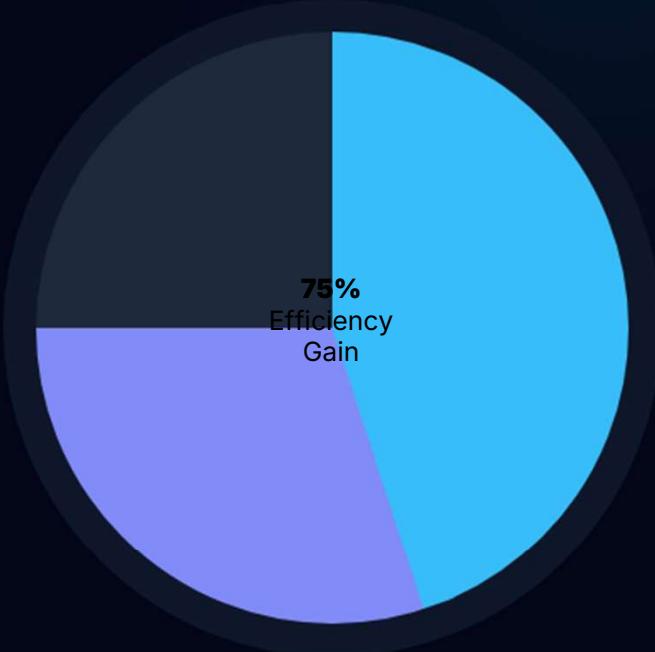
Timestamp	Product	User	Type	Quantity
2026-02-02 10:15	Dell XPS 15	Admin	STOCK_IN	+15
2026-02-02 11:30	Logitech Mouse	Staff_1	STOCK_OUT	-05
2026-02-02 14:45	Samsung SSD 1TB	Staff_2	STOCK_OUT	-02
2026-02-02 16:00	Laptop Charger	Admin	STOCK_IN	+50

## WHY TRANSACTION LOGS MATTER ?

*/// Transparency isn't just a feature; it's the foundation of trust. By identifying exactly who updated the laptop stock and when, we eliminate disputes and maintain a trusted operational record.*

# | REPORT & ANALYTICS

-  **Inventory Summaries:** Periodic snapshots of total asset value.
-  **Historical Trends:** Track stock movement over weeks or months.
-  **Granular Analysis:** Product-wise performance metrics.
-  **Strategic Support:** Data-driven insights for procurement.



## ACTIONABLE INSIGHTS



INVENTRA allows management to identify fast-selling accessories and plan laptop restocking with mathematical precision.

# THE INVENTRA ADVANTAGE



## Accuracy

Elimination of human error in stock counting.



## Security

Multi-layered RBAC and data encryption.



## Automation

Intelligent alerts and real-time syncing.



## Audit Trail

100% traceability for every transaction.



## Loss Prevention

Significant reduction in manual errors and shrinkage.

## | DOMAIN BENEFITS

- ◆ Better control of high-value electronic gadgets and fragile inventory.
- ◆ Avoid frequent accessory stock-outs during major tech releases.
- ◆ Faster decision-making for inventory procurement and pricing.
- ◆ Dramatically improved operational efficiency for retail staff.



# Conclusion

INVENTRA is a purpose-built solution for the modern electronic gadget ecosystem. By ensuring accuracy, security, and transparency, it not only reduces operational losses but also provides a scalable foundation for future business expansion.

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# Thank You

Any Questions?

Project Developed by Team 2

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