

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.

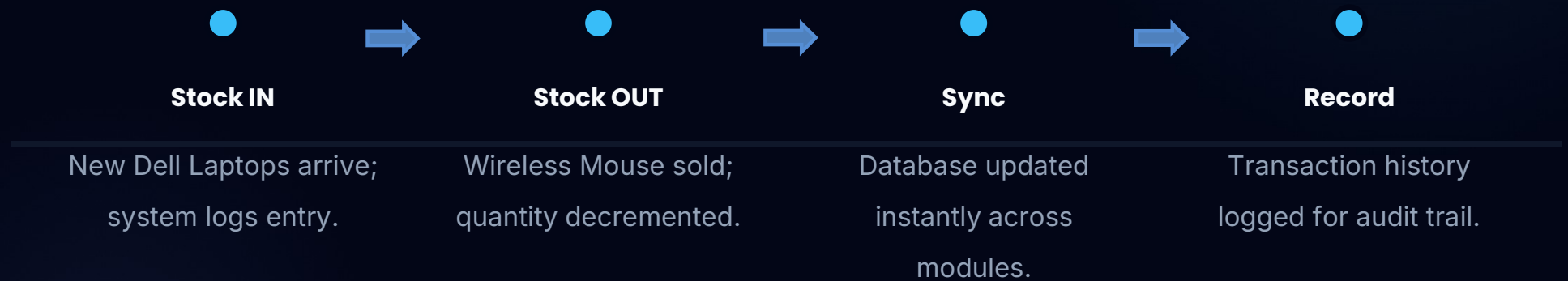
Dispute Resolution

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.



Representative product image for demonstration





TRANSACTION MANAGEMENT

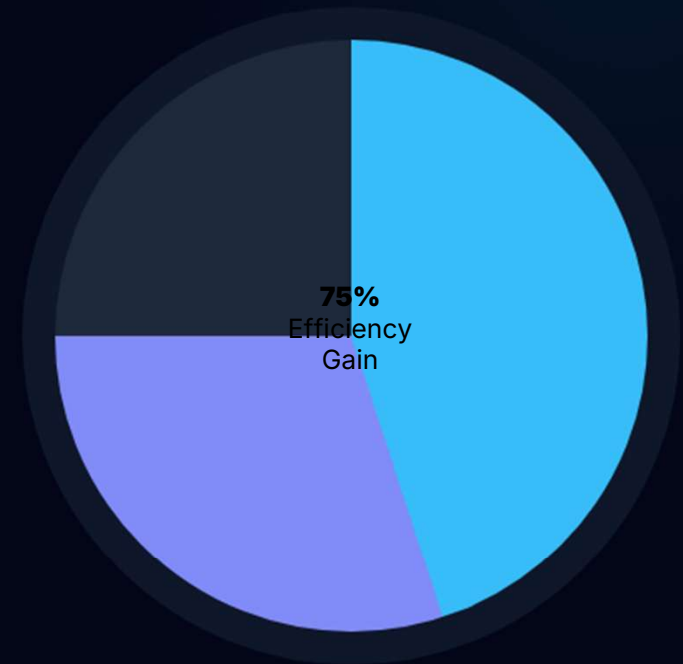
Timestamp	Product	User	Type	Quantity
2026-02-02 10:15	Dell XPS 15	Admin	STOCK_IN	+15
2026-02-02 11:30	Logitech Mouse	Staff_1	STOCK_OUT	-05
2026-02-02 14:45	Samsung SSD 1TB	Staff_2	STOCK_OUT	-02
2026-02-02 16:00	Laptop Charger	Admin	STOCK_IN	+50

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.

Thank You

Any Questions?

Project Developed by Team 2

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