SCHOOL INVENTORY MANAGEMENT BACKEND SYSTEM

Project Presentation

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INTRODUCTION

- A robust backend system designed to streamline school inventory operations, including item tracking, collector assignments, and automated return reminders.

Goals & Objectives

- Build a robust backend for inventory management

- Enable seamless item tracking and collector assignments

- Automate return reminders for accountability

- Improve efficiency and reduce administrative burden

SYSTEM ARCHITECTURE

- Built with Spring Boot and PostgreSQL, providing RESTful APIs, secure authentication, and scalable design for integration with frontend and mobile platforms.

DATABASE DESIGN

- Normalized PostgreSQL schema ensuring data integrity and scalability. Includes Categories, Items, Collectors, Assignments, Reminders, and Users with UUID keys.

KEY FEATURES

- Item management with detailed status tracking
- Collector assignment with audit trails
- Automated email reminders for overdue items
- Role-based secure access control
- Real-time reporting and analytics

API ENDPOINTS

- Items, Categories, Collectors CRUD operations

- Assignments creation and return tracking

- Reminders automation and manual triggers

- Reports for inventory and assignment statistics

TECHNOLOGY STACK

- Spring Boot, Java, Maven
- PostgreSQL with JPA/Hibernate ORM
- Spring Security with BCrypt password hashing
- JavaMail for automated reminders
- Lombok for reduced boilerplate code

SECURITY & AUTHORIZATION

- Role-based access control (ADMIN, MANAGER)
- BCrypt password hashing for secure storage
- Endpoint-level authorization rules
- Session management for safe access

REMINDER AUTOMATION

- Scheduled tasks to detect overdue items
- Automated email notifications to collectors
- Manual triggers for urgent reminders
- Future integration with SMS and in-app alerts

FUTURE ENHANCEMENTS

- Frontend UI for improved usability

- Advanced reporting with visual dashboards

- Audit logging for compliance and troubleshooting

- Docker/Kubernetes deployment for scalability

- Internationalization support (multi-language)

CONCLUSION

- This backend system enhances inventory control, reduces losses, and improves accountability, providing a scalable, secure, and automated solution for schools.