

YouShop Backend Implementation Plan

Technical Specification

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Contents

1	Phase 0: Foundations & DevOps (Continuous)	1
2	Phase 1: Identity & Display (Week 1)	1
2.1	Domain: Identity (Auth)	1
2.2	Domain: Display (Catalog)	2
3	Phase 2: Operations & Integrity (Week 2)	2
3.1	Domain: Storage (Inventory)	2
3.2	Domain: Workflow (Orders)	2
4	Phase 3: Quality & Deliverables	2

1 Phase 0: Foundations & DevOps (Continuous)

This phase establishes the project architecture and development environment.

- **Initialize NestJS Project:** Set up structured modules architecture.
- **Setup Docker Compose:** Configure PostgreSQL database and PGAdmin interface.
- **Setup Global Tools:**
 - *Winston*: Logging configuration.
 - *Helmet*: Security headers.
 - *Validation*: Setup `class-validator` and `class-transformer`.
- **Technical Focus:** Create a Generic API Response Wrapper (using TypeScript Generics).
- **Documentation:** Configure Swagger/OpenAPI.

2 Phase 1: Identity & Display (Week 1)

2.1 Domain: Identity (Auth)

- **Design User Entity:** Define fields (ID, Email, PasswordHash, Role).
- **Implement Auth Module:** Configure Passport (Local/JWT Strategies) and Bcrypt.
- **User Story (Sign Up):** Implement password hashing logic.
- **User Story (Login):** Implement JWT token issuance.
- **Security:** Implement RolesGuard to separate Admin and Client access.

2.2 Domain: Display (Catalog)

- **Design Entities:** Define Product and Category models.
- **User Story (Listing):** Public product listing with Pagination and Filters (Category/Price).
- **User Story (Detail):** Single product detail view.
- **User Story (Admin):** Product CRUD operations (Add, Edit, Hide).
- **Performance:** Implement Caching Interceptor for Catalog endpoints.

3 Phase 2: Operations & Integrity (Week 2)

3.1 Domain: Storage (Inventory)

- **Design Inventory Entity:** Define SKU, PhysicalStock, and ReservedStock.
- **User Story (Admin):** Manual stock update by SKU.
- **User Story (Alerts):** Low stock alerts view for Admins.
- **Logic:** Implement Stock Reservation Method (increment `ReservedStock`).

3.2 Domain: Workflow (Orders)

- **Design Order Entities:** Define Order, OrderItem, and StatusEnum.
- **Logic:** Implement Price Calculation Service (handling tax).
- **User Story (Transaction):** Order Creation Flow (Reserve Stock → Create Order).
- **User Story (History):** Client order history view.
- **Logic (Lifecycle):** Manage states (Pending → Paid → Cancelled).
- **Logic (Stock Release):** Mechanism to release stock on Order Cancel/Expire.

4 Phase 3: Quality & Deliverables

Focus on reliability and project handover.

- **Unit Tests:** Coverage for Price Calculation logic.
- **E2E Tests:** Coverage for the complete Order Flow.
- **Finalize Documentation:** Complete README and Architecture Diagrams.