COMP3030

INVENTORY MANAGEMENT SYSTEM

Group 6

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PROJECT CONTEXT & OBJECTIVES

Project: Inventory Management System

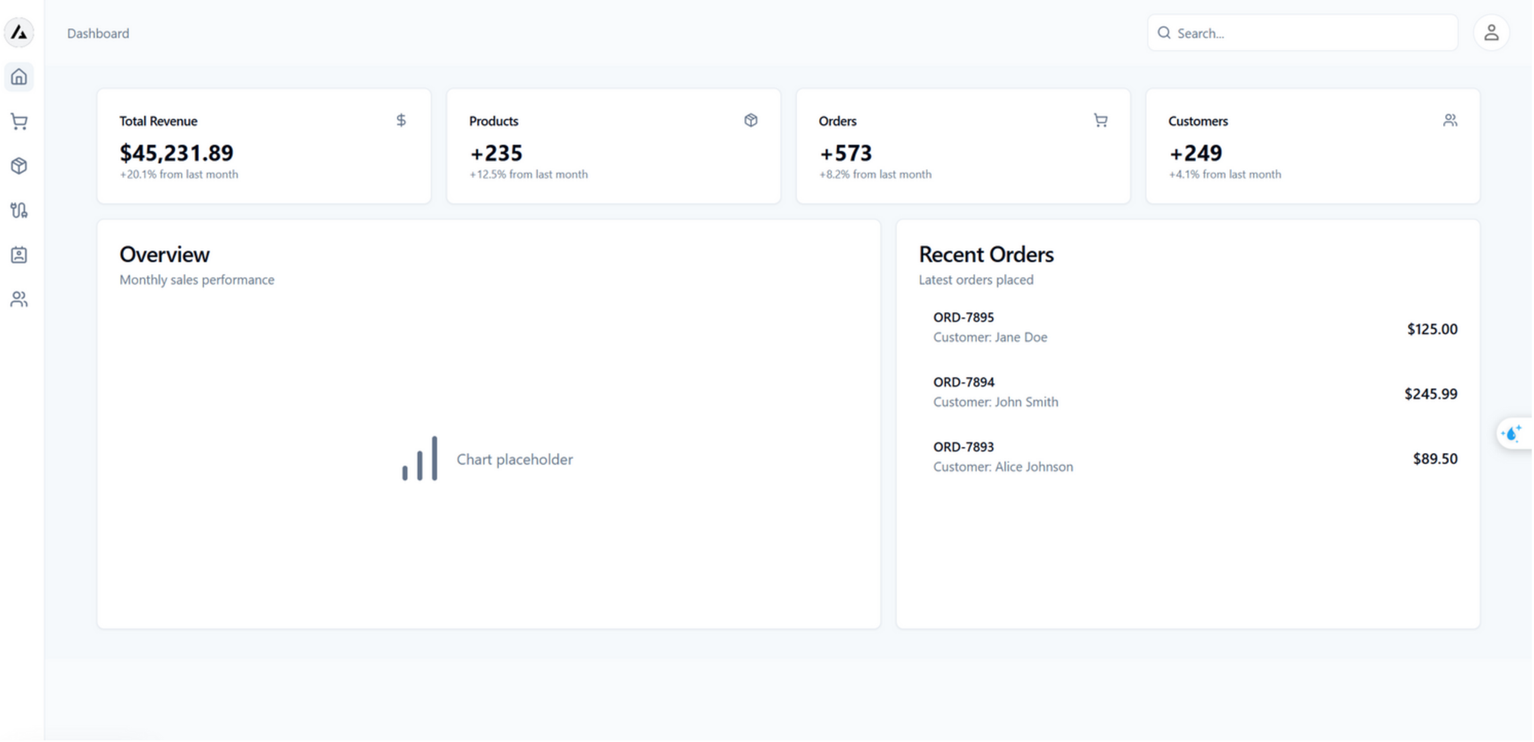
- Manages: Products, orders, users, and related entities.

Primary Goal:

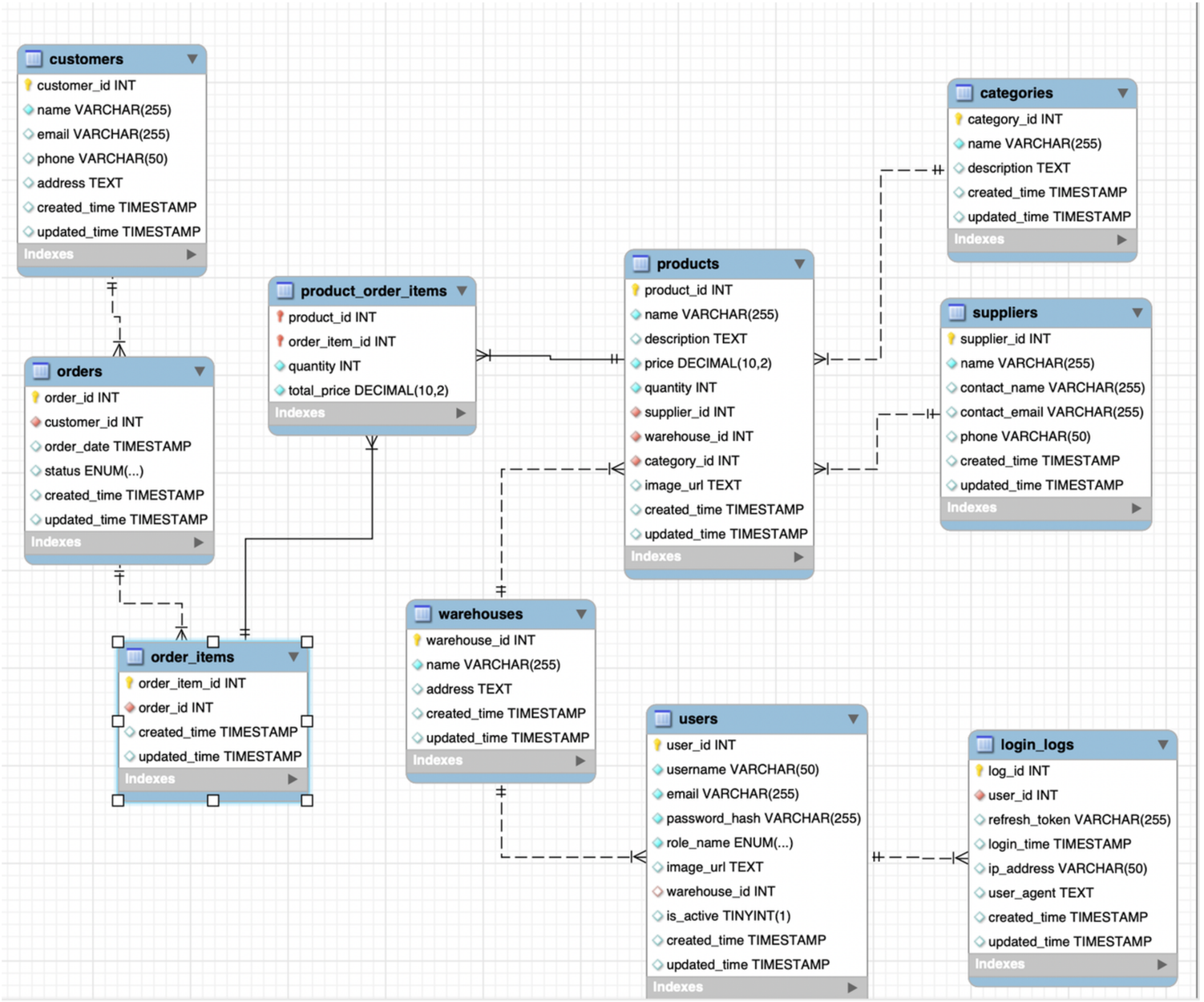
- Demonstrate a fully functional, performant, and secure system meeting all project requirements.

Core Technologies:

- MySQL (Database)
- Next.js (Web Interface)
- Redis (Caching)
- Docker (Deployment)]



SCHEMA IMPLEMENTATION



KEY PERFORMANCE OPTIMIZATIONS

Strategic Indexing:

- On Foreign Keys & frequent search columns (e.g., products.category_id, products.name).

```
-- Indexes
-- Users Email Index
-- Rationale: Speeds up login queries and email-based lookups
CREATE INDEX idx_users_email ON users(email);

-- Products Name Index
-- Rationale: Accelerates product searches by name
CREATE INDEX idx_products_name ON products(name);

-- Orders Date Index
-- Rationale: Optimizes queries filtering orders by date
CREATE INDEX idx_orders_date ON orders(order_date);
```

SECURITY CONFIGURATIONS

Access Control & Authorization:

- Roles: Admin (full) & Staff (activated by admin, assigned to specific warehouse_id for limited access).
- Token-Based: JWT & 64-char random string (Refresh Token).
- Middleware (login_required): Validates Access Token (signature, expiration, role, warehouse, cache blacklist).
- Secure Logout: Deletes Refresh Token from login_log, blacklists Access Token in cache (until 1hr expiry).

Secure Password Storage:

- Bcrypt hashing (application-level) with automatic salting & configurable work factor.
- Explicitly not using weaker MySQL hash functions (MD5/SHA1) due to lack of salt & vulnerabilities.

SQL Injection Prevention:

- Prepared statements with parameterized queries used for all database interactions.
- Separates SQL code from user data, preventing malicious input.

DEMO

Follow this link to see demo

https://drive.google.com/drive/folders/15tNFB8YszsEAHOrjKZ5pdEWL7hyN4C9P?usp=sharing

THANK YOU

- FOR YOUR NICE ATTENTION