E-Commerce API Case Study

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1. Introduction

Envato Elements is a popular online marketplace offering a wide range of digital assets, including graphics, templates and audio files. It enables users to browse, purchase and download digital products seamlessly.

Inspired by **Envato's** core functionality, this project implements a **RESTful E-commerce API** using **Laravel** (PHP) and MySQL. The API handles **product management** and **order processing**, ensuring data integrity and scalability.

2. Business Model

The system is built around two main entities:

- **Products**: Digital items with attributes:
  - Id, name, Price, stock
- **Orders**: Records of purchases:
  - Id,Product_id, Quantity,total_price

For simplicity, a fixed user is used in this implementation.

3. Key Features

Feature	Description
Product Management	Add new products and retrieve a list of all available products.

Order Placement	Place orders by specifying a product and quantity.
Order Listing	View all orders along with associated product details.
Stock Management	Automatically decrement product stock after successful order placement.

4. Workflow Diagram

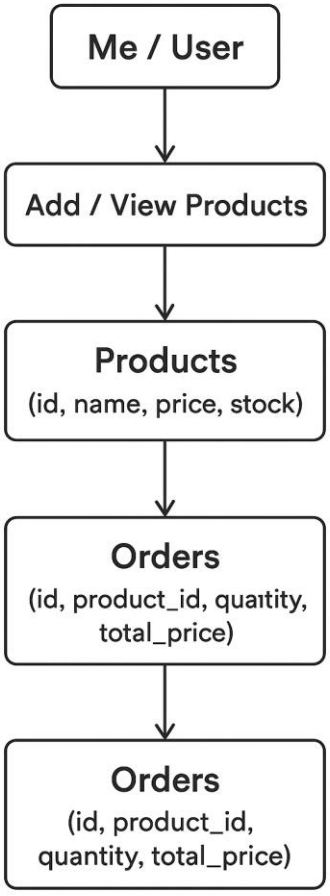

Figure 01: Workflow of the E-Commerce Site

5. Workflow Explanation

1. **User Actions**:
    - Add new products via API.
    - View all available products.
2. **Products Table**:
    - Stores product details: id, name, price, stock.
3. **Orders Table**:
    - Stores order details: id, product_id, quantity, total_price.
    - Linked to the products table via a foreign key (product_id).
4. **Placing an Order**:
    - User selects a product and specifies the quantity.
    - The system calculates the total price and creates an order record.
5. **Stock Management**:
    - After order placement, the product's stock is automatically reduced.

6. Technical Implementation

- **Backend Framework**: Laravel (PHP)
- **Database**: MySQL
- **Tables**:
    - products (id, name, price, stock)
    - orders (id, product_id, quantity, total_price)
- **Testing Tool**: Postman
- **Data Integrity**:
    - Foreign key constraints ensure orders reference valid products.
    - Automated stock updates maintain inventory accuracy.

7. Challenges & Solutions

- **Foreign Key Constraints**:
    - Initially faced migration errors due to incorrect table creation order.
    - **Solution**: Ensured the **products** table is created before **orders**.
- **Stock Management**:
    - Implemented atomic operations to prevent race conditions during order placement.

8. Conclusion

This project demonstrates the implementation of core e-commerce functionalities, including product catalog management, order processing and inventory tracking. The system ensures data consistency through foreign key constraints and automated stock updates.

By building this API, I **gained** hands-on experience with Laravel, MySQL, RESTful design and API testing skills essential for a Web Developer Intern at **NexGenix**.