Dependent and Independent Modules

Modules That Can Be Developed Independently (in Parallel):

1. **Login and Authentication**

   o This can be developed early and independently, as it's a foundational user access system.

2. **Search and Filter Module**

   o Can be built using sample product data, it doesn't depend on other modules.

3. **Dynamic Pricing**

   o It can be developed independently with mock inventory and demand data.

4. **Reverse Image Search**

   o Image processing, CNN/KNN/Siamese logic, and frontend can be built separately.

5. **Chatbot**

   o It can be designed with placeholder backend endpoints and integrated later.

6. **Email Manager**

   o Auto-reply, spam filtering, and feedback analysis can function independently of user UI.

7. **Image Generator**

   o Based on text input using stable diffusion or GANs, it can be built without any dependency.

8. **Product Comparison Module**

   o Needs access to product data but not dependent on the user or admin system being complete.

Modules That Are Dependent (Should Be Developed After Certain Modules):

1. **User Profile and Order Module**

   o It depends on Login & Authentication and Cart & Checkout to fetch user-specific data and order history.

2. **Cart and Checkout Module**

   o   Requires Login & Authentication to associate orders with users and needs Product Module (via Admin Panel).

3. **Admin Panel Module**

   o   Depends on Authentication, and is needed to manage product listings, so ideally built before modules that need real product data (e.g., Search, Checkout).

4. **Loyalty Points/Reward Module**

   o   It depends on the User Profile and Order Module and Cart Module to calculate points and redeem them based on user activity.

Development Order (Logical Flow)

1. Login and Authentication

2. Admin Panel Module

3. Product Data Setup (under Admin Panel)

4. Parallel Work:

   o   Search and Filter

   o   Dynamic Pricing

   o   Reverse Image Search

   o   Chatbot

   o   Email Manager

   o   Image Generator

   o   Product Comparison

5. Cart and Checkout

6. User Profile and Order

7. Loyalty Points/Reward

Flow Chart:

Dependent:

1. Login and Authentication

    └──> 2. Admin Panel Module

        └──> 3. Product Data Setup

            └──> 4. User Profile and Order Module

                └──> 5. Loyalty Points / Reward Module

                    └──> 6. Cart and Checkout Module

Independent:

- Search and Filter Module
- Dynamic Pricing
- Reverse Image Search
- Chatbot
- Email Manager
- Image Generator
- Product Comparison Module