Low-Level Design for Flipkart

1.Introduction

Flipkart is an application which is one of the world's largest online retailers, offering a wide range of products and services to millions of customers worldwide. Users can browse, search for items, read product reviews and make purchases directly from their devices.

1.1Purpose

This low-level design document provides an overview of the design on the component level. Input is always the High-level design(HLD) in case of LLD for flipkart's e-commerce platform. Basically, it is component level process that follows a step by step refinement process.

1.2 Scope

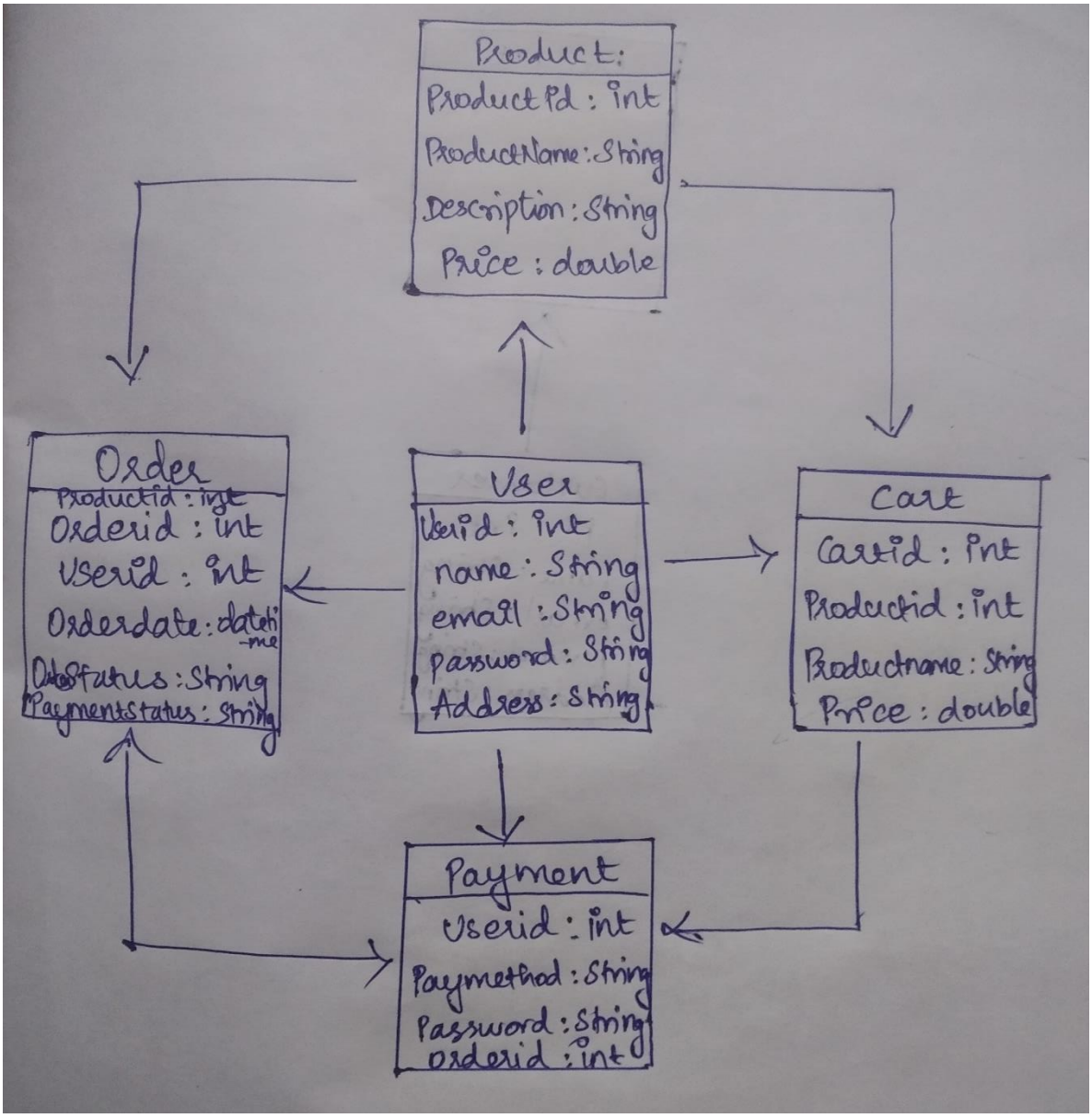
Low-Level Design describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer directly code the program from the document.

2.Low-Level Design

- Low-level design refers to the process of defining the detailed, functional design of a software system or component.
- It involves specifying the individual modules, data structures, algorithms, interfaces, and inputs/outputs of a system.
- The purpose of low-level design is to provide a clear and precise description of how the system should behave and how its different components will interact with each other.

2.1 Entity-relation Diagram

- The Entity Relational Model is a model for identifying entities to be represented in the database and representation of how those entities are related.
- The ER data model specifies enterprise schema that represents the overall logical structure of a database graphically.
- The Entity Relationship Diagram explains the relationship among the entities present in the database.



2.1.1 User Service:

The user component facilitates the user authentication, including login/logout functionality, password management, register new accounts including email verification. Allows users to view and update their profile information, such as name, email, address and preferences.

- **Trivial & Small:**

  It involves basic functionality like handling user registration , login/logout and email/password authentication mechanism and basic profile management.

- **Novel & Large :**
  If the functionality like advanced biometric authentication methods, or Multi-factor Authentication methods (MFA) includes ,then it needs the complex software and hardware which is difficult to implement.

2.1.2 Product Service:

The product service component facilitates managing product catalogue and searching and filtering functionality , displaying product details , and integrating with external suppliers or vendors to synchronize product data, price and availability.

- **Trivial & Small:**
  It involves basic and straightforward product management functionality by implementing basic crud operations for product listings and providing simple search and filtering capabilities.

- **Novel & Large:**
  If the functionality includes integration with blockchain technology for product authenticity verification, the high levels of security is needed for implementation.

2.1.3 Shopping Cart Service:

The shopping cart service facilitates the current summary of the items where users added from the product list , quantity adjusting functionality , integrates with checkout process for the order fulfilment process.

- **Trivial & Small:**
  It involves basic functionality and supports basic crud operations for cart items , and simple integration with the checkout process.

- **Novel & Large:**
  If the functionality includes voice recognition and natural language processing capabilities to enable users to add items to

their shopping cart , then its implementation through the voice commands through virtual assistants or smart speakers is difficult.

2.1.4 Payment Service

The payment service facilitates multiple payment methods, such as credit/debit cards, digital wallets (Google Pay, Phonepe), and the authentication & validation of payment transactions and integration with payment gateway.

- **Trivial & Small:**
  It involves functionality for handling a small number of payment methods (credit/debit cards) which makes implement easy by integrating with a single payment gateway provider.

- **Novel & Large:**
  If the functionality includes integration of biometric authentication methods such as fingerprint scanning, facial recognition which makes implement difficult.

2.1.5 Order Processing Service

The order processing service facilitates the secure capture and validation of customer information, including shipping addresses, payment details, and any special instructions, order history and status.

- **Trivial & Small:**
  It involves basic functionality and supports basic order history for viewing past orders and order details & order confirmation via email, including order confirmation and shipping notifications, which ease implementation.

- **Novel & Large:**
  If the functionality includes blockchain technology to create a transparent and immutable record of order transactions and shipment movements which makes the implement difficult.

3.Conclusion

In conclusion, low-level design is a critical phase in the software development process that translates the system architecture into a detailed design. It specifies how the system will be implemented, including the design of individual components, their interactions, and the data flows between them.