UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING, UTMJB

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PROJECT: PHASE 2

SECD2523: DATABASE

SECTION 10

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Table of contents

1.0 Introduction

The online shopping system stands as a sophisticated solution tailored to meet the evolving needs of consumers in an era where convenience is paramount, and digital transformation continually shapes the landscape of consumer experiences. Providing an easily navigable platform, this system enables users to seamlessly browse, select, and purchase a diverse array of products from the comfort of their homes, seamlessly merging technology and business dynamics.

To ensure a seamless consumer experience, the Digital Emporium incorporates an online shopping system that orchestrates a seamless interplay of procedures. Leveraging e-commerce principles, the system ensures efficiency, accuracy, and transparency across all stages of the process, starting from picking a product to delivering it to the doorstep. The extensive network connecting customers, the online shopping system, payment gateways, inventory management, and the shipping process is visually represented in a Data Flow Diagram (DFD), serving as a comprehensive roadmap.

This document breaks down how the system is supposed to work, illustrating how data flows seamlessly to synchronize numerous procedures, ensuring the successful fulfillment of product requests. A closer look at the customer's selection process within the DFD reveals the integration of secure payment methods, vigilant monitoring of inventory levels, and meticulous planning of shipping logistics. This advanced solution ensures the Digital Emporium operates with precision and agility, enhancing user experiences and optimizing backend operations.

2.0 DFD (To-Be)

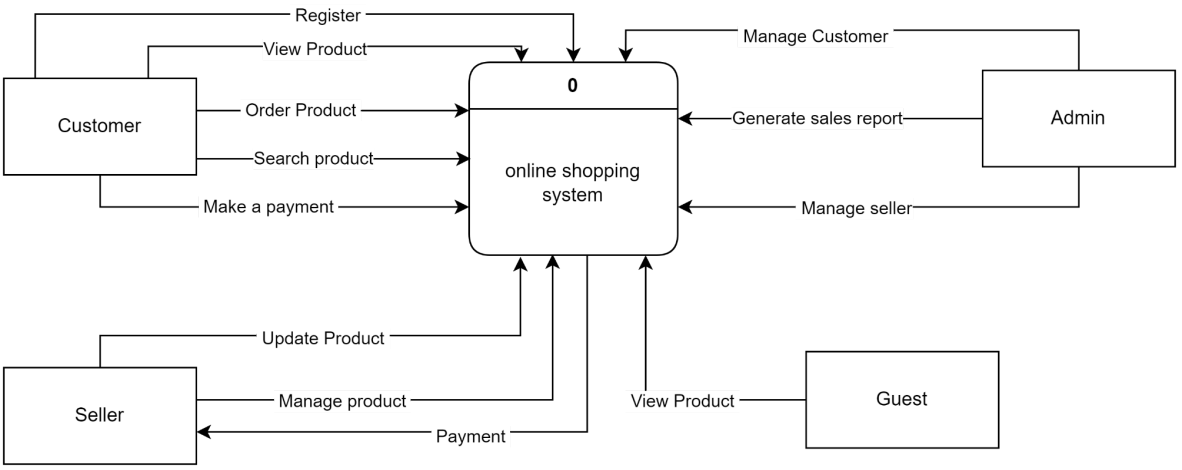

Figure 1.0: Context Diagram

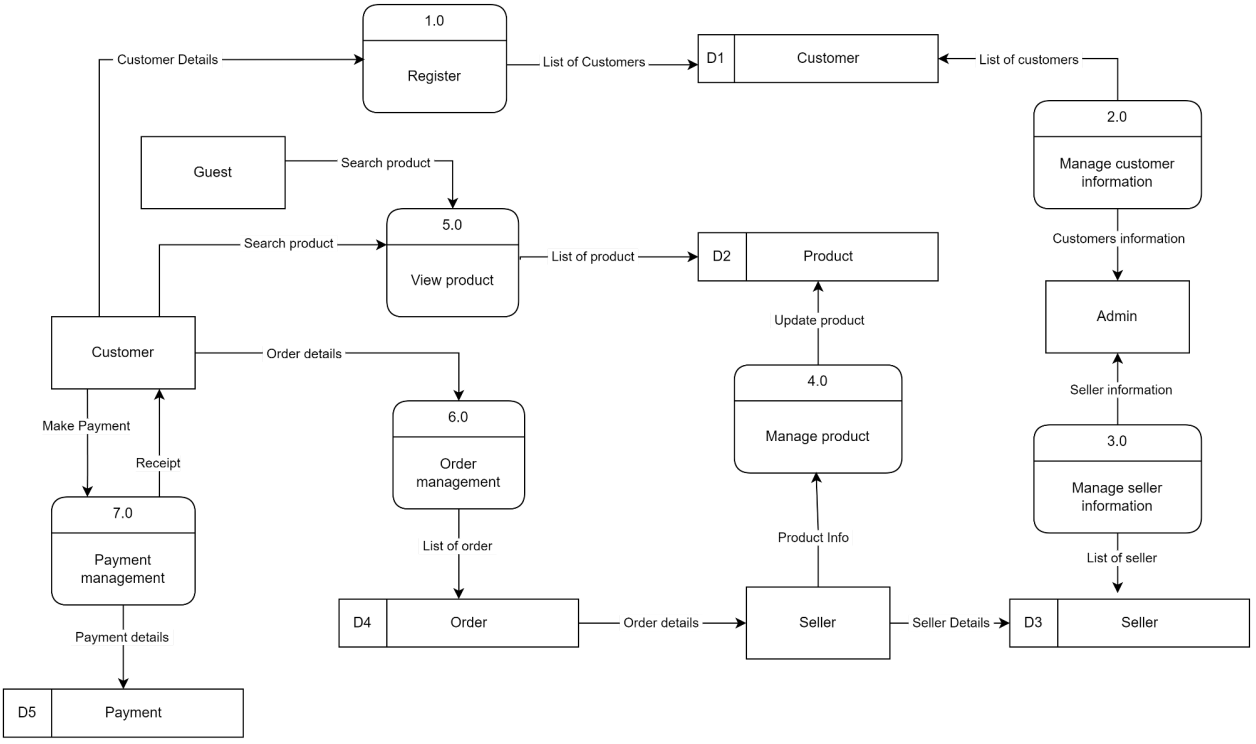

Figure 1.1: Diagram 0 online shopping system

Based on the diagram 0 Data Flow Diagram (DFD) above, comprises four main entities which are admin, seller, customer, and guest. Admins are responsible for managing both sellers and customers within the system, overseeing their accounts and information. Sellers have the authority to manage products and process orders, ensuring the accuracy and efficiency of their inventory. Next, for the Customers, are required to complete a registration process before they can proceed with placing orders and checking out their selected items. Registration helps maintain a secure and personalized experience for customers, enabling them to track their orders and manage their account details. Lastly, guests, representing unregistered users, are limited to viewing products without the ability to proceed to checkout. This hierarchical DFD outlines the primary interactions and responsibilities of each entity, emphasizing the different levels of access and functionality based on their roles within the online shopping system.

3.0 Data & Transaction requirement

3.1. Proposed business rule

Admin

- An admin can have multiple roles such as super admin, product manager, but each role is associated with only one admin.
- An admin can manage multiple sellers, but each seller is managed by only one admin.
- An admin can manage multiple customers, but each customer is managed by only one admin.

Seller

- A seller can manage multiple products, but each product is managed by only one seller.
- A seller can process multiple orders, but each order is processed by only one seller.

Customer

- Each customer must have a unique account, and each account is associated with only one customer.
- Customers must complete a registration process before placing orders.
- A customer can place multiple orders, but each order is placed by only one customer.
- Each order has a corresponding checkout process initiated by one customer.
- Each customer manages only their own account.
- A customer can have multiple receipts, while each receipt is associated with one and only one custome

3.2. Proposed data & transactional

3.2.1. Proposed data

- **Admin** (AdminID{PK}, AdminName, AdminEmail)
- **Customer** (CustID {PK}, CustName, CustEmail, CustPhoneNum, CustAddress)
- **Seller** (SellerID {PK}, SellerName, SellerEmail, SellerPhoneNum)
- **Product** (ProductID {PK}, SellerID, ProductName, Category, Description, Quantity, Price)
- **Orders** (OrderID {PK}, CustomerID, OrderDate, TotalPrice)
- **Payments** (PaymentID {PK}, OrderID, PaymentDate, PaymentMethod, Amount)
- **Receipt**(receiptID{PK}, orderID{PK), TotalPrice)

3.2.2. Proposed transactional

Entity	**Data**	**Data Entry**	**Data Update**	**Data Delete**	**Data Queries**
Admin	• Admin Id • Name • Email	add new sellers and customer to the system	update seller and customer information	Delete seller and customer informatio n	retrieve information about sellers, customers, and overall system statistics
Seller	• Seller ID • Seller Name • Email • Phone Number	add new products to the system	update product information and and modify order details	remove products from the system	retrieve information about their products and orders

Entity	Data	Data Entry	Data Update	Data Delete	Data Queries
Customer	• Cust ID • Cust Name • Email • Phone Number • Address	add products to their shopping cart and place new orders	update customer information	cannot perform data deletes on completed orders, but they can cancel pending orders.	retrieve information about their orders and account details
Product	• Product ID • ProductName • Category • Description • Price • Quantity	Add new product to system	Update new product stock	Delete expired item	List detail of the product and product stock
Order	• Order ID • Order date • Total price	Receive customer order and total price	Customer can add order	Customer can delete order	List customer order and the total price
Payment	• Payment ID • Payment Date • Payment method • Amount	Receive customer payment detail	Customer cannot update payment once the payment complete	Customer can delete payment but must contact with admin	List customer payment detail
Receipt	• Receipt ID • OrderID • TotalPrice	Receive record transaction	Modifying or changing existing information in the receipt	Removing or deleting information from the Receipt	List items purchased

4.0 Database conceptual design

4.1. Conceptual ERD

The ERD for our online shopping system provides a visual representation of the essential components that make up our e-commerce platform. In this diagram, we can see the relationships and interactions among various entities, such as customers, admins, sellers, products, orders, payments, categories, carts, and reviews. These entities work collaboratively to ensure the functionality and success of our online shopping system.

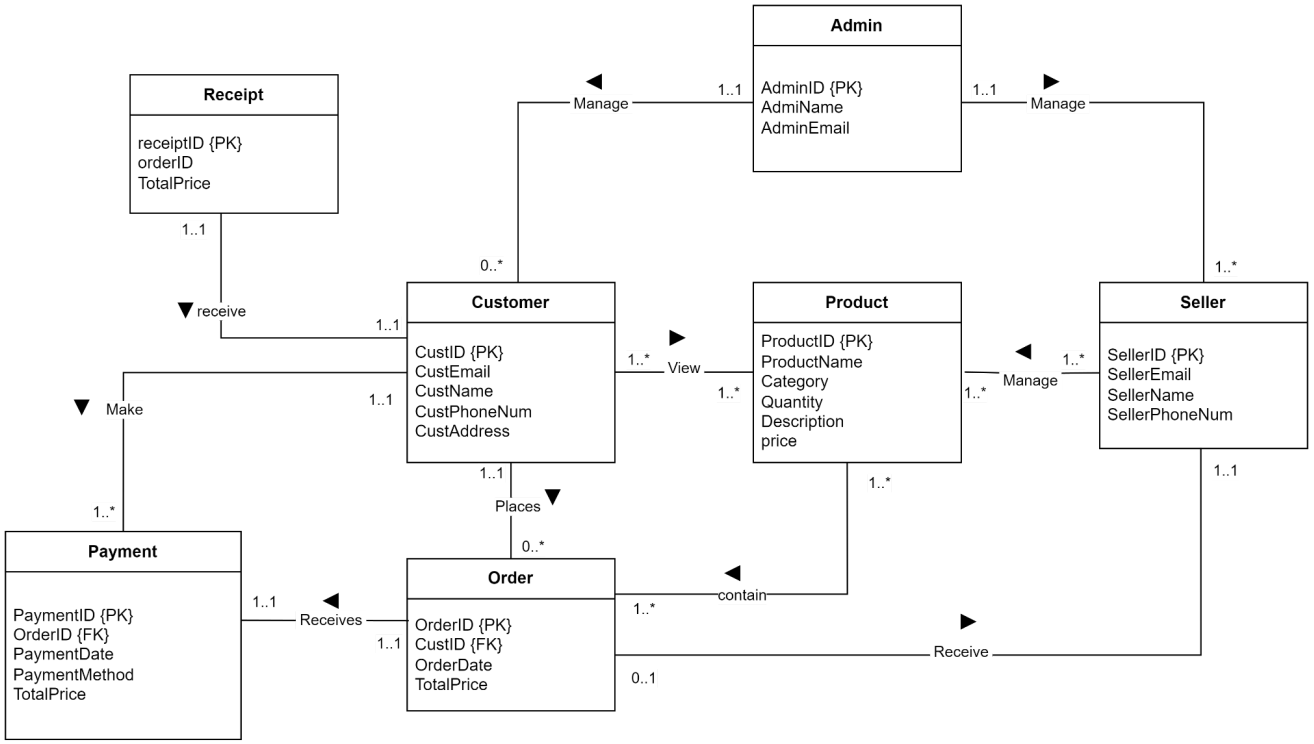

Figure 1.2: ERD diagram

4.2. Enhanced ERD (EERD)

In the Extended Entity-Relationship Diagram (EERD) for an online shopping system, the conceptual representation expands upon the Entity-Relationship Diagram (ERD). So that, we decided to enhance the "Payment" entity to accommodate various payment methods by introducing subclasses, creating a specialized categorization for payment types, including "Cash On Delivery" and "Online Banking.

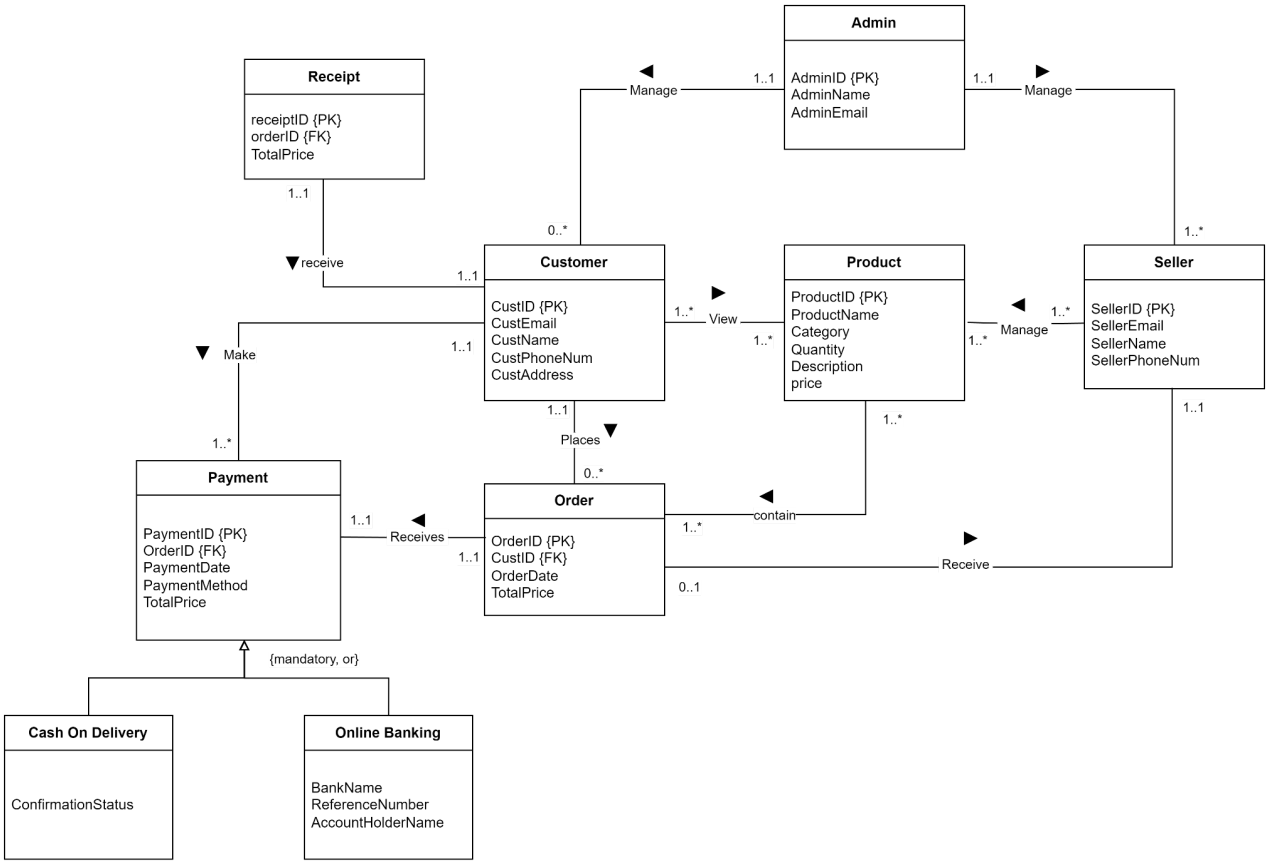

Figure1.3: EERD Online Shopping System

5.0 Data dictionary

Entity name	Attributes	Data type	Field Length	Nulls	Multivalued	Description
Admin	AdminID	VARCHAR2	15	NO	NO	Unique identifier for administrator
	AdminName	VARCHAR2	30	NO	NO	Name of the Admin
	Email	VARCHAR2	30	NO	NO	Admin email address
Seller	SellerID	VARCHAR2	15	NO	NO	Unique identifier for seller
	SellerName	VARCHAR2	30	NO	NO	Name of the seller
	SellerEmail	VARCHAR2	30	NO	NO	Seller email address
	SellerPhoneNum	INT	20	NO	NO	Seller phone number
Customer	CustID	VARCHAR2	15	NO	NO	Unique identifier for customer
	CustName	VARCHAR2	30	NO	NO	Name of the customer
	CustEmail	VARCHAR2	30	NO	NO	Customer email address
	CustPhoneNum	INT	20	NO	NO	customer phone number
	CustAddress	VARCHAR2	30	NO	NO	Customer Address

Entity name	Attributes	Data type	Field Length	Nulls	Multivalued	Description
Product	ProductID	VARCHAR2	15	NO	NO	Unique identifier for product
	ProductName	VARCHAR2	30	NO	NO	Name of the product
	Quantity	INT	5	NO	NO	Quantity of the product
	Category	VARCHAR2	20	NO	NO	Category of product
	Description	VARCHAR2	50	NO	NO	Description of the product
	Prices	FLOAT	20	NO	NO	Price of the product
Order	OrderID	VARCHAR2	15	NO	NO	Unique identifier for order
	OrderDate	DATE	10	NO	NO	Date of the order
	TotalPrice	FLOAT	20	NO	NO	Total price of the order
Payment	PaymentID	VARCHAR2	15	NO	NO	Unique identifier for payment
	PaymentDate	DATE	10	NO	NO	Date of the payment
	PaymentMethod	VARCHAR2	30	NO	NO	Method that used for payment
	Total Price	FLOAT	20	NO	NO	Total price of the produt

Entity name	Attributes	Data type	Field Length	Nulls	Multivalued	Description
Receipt	receiptID	VARCHAR2	15	NO	NO	Unique identifier for receipt
	orderID	VARCHAR2	15	NO	NO	Unique identifier for order
	TotalPrice	FLOAT	20	NO	NO	Total price of the produt

6.0 Summary

In this phase, our focus was on establishing a robust foundation for the online shopping system. We create a conceptual design to visually represent the key entities, relationships, and overall architecture, ensuring a clear understanding of the system's structure among stakeholders. This comprehensive overview serves as a foundational guide for subsequent development activities, offering a detailed roadmap for crafting an efficient and well-defined online shopping platform. This visual representation not only facilitates communication among team members but also acts as a guide for making decisions and solving problems throughout the whole development process. As we keep working on the project, the insights we get from the conceptual design help us make smart choices, work more efficiently, and, in the end, build a strong and user-friendly online shopping experience.