# Question 3 (24 mark).

## Select three important processes from Level 0 DFD and provide their decomposition (Level 1 DFD).

### 1. Decomposition of Customer Interaction (Level 1 DFD):

Customer Interaction

Customer Account Management

View Offers

Make Payments

* Display available offers
* Filter offers based on criteria
* View offer detail
* Select payment method
* Enter payment details
* Confirm payment

#### Customer Account Management:

* This sub process manages customer accounts within the Doing Good Rewards Platform.
* Functionality includes:
* Creating new accounts.
* Updating account information.
* Managing account preferences.
* Deleting accounts.

#### View Offers:

* Allows customers to view available offers from participating merchants.
* Features include:
* Displaying available offers.
* Filtering offers based on criteria such as category or location.
* Viewing detailed information about specific offers.

#### Make Payments:

* Enables customers to make payments for products or services.
* Functionality includes:
* Selecting a payment method (e.g., credit card, bank transfer).
* Entering payment details such as card information or bank account details.
* Confirming the payment transaction.

The Customer Account Management sub process acts as the central hub for overseeing customer accounts within the Doing Good Rewards Platform, serving as the foundation for a smooth and efficient user experience. Its pivotal role encompasses a range of essential functionalities vital for customer interaction. These include creating new accounts, ensuring accurate and up-to-date account information, facilitating the management of account preferences to tailor the user experience, and overseeing account deletion processes when required. Through meticulous account management, the platform can maintain a high standard of user satisfaction and engagement, fostering long-term relationships with its customers.

### 2. Decomposition of Web Portal Management (Level 1 DFD):

Web Portal Management

Account Management

Invoice Mangement

Offer Mangement

* Upload new invoices
* Update invoice details
* Delete invoices
* Create new offers
* Edit existing offers
* Remove offers

#### Account Management:

* Manages merchant accounts within the web portal.
* Features include:
* Uploading new invoices for processing.
* Updating invoice details such as payment due dates or amounts.
* Deleting invoices that are no longer valid.

#### Invoice Management:

* Handles the management of invoices uploaded by merchants.
* Functionality includes:
* Uploading new invoices.
* Updating invoice details.
* Deleting invoices.

#### Offer Management:

* Manages offers and promotions available to customers within the platform.
* Features include:
* Creating new offers for products or services.
* Editing existing offers to adjust terms or conditions.
* Removing offers that are no longer available or valid.

Following the Customer Account Management sub process, the platform's operations extend into the intricate realm of Invoice and Payment Management. This multifaceted process is pivotal for maintaining a streamlined transactional flow between merchants and customers.

**Invoice Management** orchestrates the handling of invoices uploaded by merchants, ensuring accuracy and completeness in every transaction. Its functionalities encompass the uploading of new invoices, updates to invoice details, and the necessary protocols for removing outdated invoices, thereby maintaining a clean and organized database.

**Offer Management** complements these operations by curating a dynamic marketplace experience for customers. By enabling merchants to create, edit, and remove offers seamlessly, the platform fosters an environment where businesses can adapt their offerings in real-time to meet evolving consumer demands. This responsiveness not only enhances customer satisfaction but also promotes agility and innovation within the marketplace.

### 3. Decomposition of Invoice and Payment Processing (Level 1 DFD):

Invoice and Payment Processing

Payment Verification and Processing

Payment Verification

Payment Processing

* Verify payment authenticity
* Validate payment information
* Detect fraudulent activities
* Process credit card transaction
* Validate bank transfers
* Handle payment errors

Discount Calculation

Discount Allocation

* Calculate discounts
* Determine donation allocation
* Allocate discounts and donations
* Update transaction logs

#### Payment Verification and Processing:

* This main process verifies the authenticity of payments and processes them accordingly.
* It decomposes into two sub processes:
* Payment Verification: Verifies payment authenticity, validates payment information, and detects fraudulent activities.
* Payment Processing: Processes credit card transactions, validates bank transfers, and handles payment errors.

#### Payment Verification:

* Sub process responsible for verifying the authenticity of payments and ensuring they meet validation criteria.
* Tasks include verifying payment authenticity, validating payment information, and detecting fraudulent activities.

#### Payment Processing:

* Sub process responsible for processing verified payments and handling various payment methods.
* Tasks include processing credit card transactions, validating bank transfers, and managing payment errors.

#### Discount Calculation:

* Sub process responsible for calculating applicable discounts based on offer terms.
* Tasks include calculating discounts based on offer terms and determining donation allocation.

#### Discount Allocation:

* Sub process responsible for allocating discounts and donations to appropriate recipients.
* Tasks include allocating discounts and donations based on merchant preferences and updating transaction logs accordingly.

Following the meticulous handling of Payment Verification and Processing, the platform advances into Discount Calculation and Allocation, crucial for optimizing customer benefits and facilitating charitable contributions.

**Discount Calculation** process computes applicable discounts based on merchant terms, ensuring precise savings for customers. It also determines donation allocations, balancing benefits and charitable impact effectively.

**Discount Allocation** is Serving as a conduit between transactions and social impact, this process allocates discounts and donations according to merchant preferences. It updates transaction logs for transparency and accountability.

# Question 4 (20 mark).

## For the given case study, provide an Entity Relationship Diagram (ERD). Provide the logical model only!