**UNIVERSITY OF ECONOMICS AND LAW**

FACULTY OF INFORMATION SYSTEMS

# MID-TERM PROJECT

COURSE: DATABASE

***Topic:*** ***Design database for Tay Nguyen Food***

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Course number: 231IS9301

Group: 1

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# Chapter 1. Overview

## 1.1. Reasons for choosing the topic

In today's evolving Vietnamese society, there is a noticeable shift towards healthier living, leading to an increased demand for clean and nutritious food. High-fat and unhealthy food choices which have negative impacts on consumers' well-being have decreased over time. Instead, individuals are following "eat clean" lifestyle, advocating for fresh, minimally processed, and less spicy food options. This trend has enhanced the popularity of wholesome choices like brown rice, vegetable noodles, and cereals. Consumers not only see over time out these items more enthusiastically but also prioritize sourcing them from reputable suppliers.

Among plenty of brands claiming to offer "healthy food," finding one that is genuinely trustworthy and of high quality can be challenging. However, Tay Nguyen Food stands out as a company dedicated to producing and distributing genuinely healthy food. As per the information available on its website, Tay Nguyen Food - Vietnam was established with the desire to provide 100% natural, additive-free, and preservative-free foods of superior quality. These nutrition-packed offerings originate from traditional craft villages across the country, emphasizing the company's commitment to delivering the best in health care, fitness, beauty, and weight control to its customers. Considering these factors, Group 1 has selected Tay Nguyen Food as the focus of their database development. The company's business philosophy aligns with customer needs, emphasizing both quality and adherence to hygiene and safety standards set by food safety regulations and government requirements. Therefore, in addition to product development, the company recognizes the importance of implementing data science to enhance both internal and external business operations, fostering efficiency and transparency.

## 1.2. Objectives

Creating a database for Tay Nguyen Food helps in some big ways. First, it keeps track of what we have in stock, and when it expires, Tay Nguyen Food aims to cut down on waste and spend money wisely. It also helps the business figure out what people like the most to make more of those things and keep customers happy.

Second, this database helps Tay Nguyen Food work better. It keeps info about customers, so the company can give them offers they'll like and make sure their orders get to them quickly and correctly. This makes customers happy and helps us focus on making good food instead of spending too much time on paperwork.

Lastly, the database helps Tay Nguyen Food make smart decisions. By looking at what people are buying and what's popular, the company can plan. This means they can make new foods, set prices right, and even think about growing into new places. This info helps them stay competitive and do well in a changing market.

## 1.3. Expected outcomes

- Designing and managing a database for the e-commerce platform on the TAYNGUYENFOOD website.
- Build sale - distribution, and return - exchange processes for the Tay Nguyen Food application model.

# Chapter 2. Business survey

## 2.1. Company overview

Tay Nguyen Food, established in Vietnam and headquartered at G43 Le Thi Rieng Street, Thoi An ward, 12 district, Ho Chi Minh City, emerged as a response to the growing concern over the prevalence of untraceable and potentially harmful food products in the market. Recognizing the negative impact of such products on consumer health and wellness, Tay Nguyen Food was founded with a passionate commitment to providing clean, 100% natural food products. Their offerings are free from artificial colors, preservatives, and additives, ensuring the highest nutritional quality. These products are sourced directly from traditional villages across the country, preserving the essence of natural ingredients. The company positions itself as a vital ally in its customers' journey towards health, fitness, beauty, and weight management. Tay Nguyen Food prioritizes understanding and responding to the health desires of its customers, offering them the best choices for a healthy and clean daily diet. Since its inception in 2019, Tay Nguyen Food has earned a strong position in the clean eating and healthy food market in Vietnam. The company's vision extends beyond just selling products; it aspires to spread the benefits of natural and high-quality food while maintaining the purity and essence of nature's gifts. Tay Nguyen Food aims to be a companion to their customers, enhancing their clean eating experiences with delicious and nutritious meals.

## 2.2. Vision - Mission

### 2.2.1. Vision

Tay Nguyen Food, a prominent enterprise in Vietnam, is steadfastly committed to establishing itself as the foremost provider of 'eat clean' food within the country. This endeavor is underpinned by a strategic focus on securing customer preference and trust through the delivery of high-quality nutritional products and exemplary health services. The company's vision centers on integrating wellness and sustainability, ensuring that each offering not only supports a healthy lifestyle but also adheres to principles of environmental responsibility. This ambition is reflective of Tay Nguyen Food's dedication to excellence in both product and service, striving to set industry standards in the realm of healthy and sustainable food solutions.

### 2.2.2. Mission

Tay Nguyen Food, operating under the guiding principle of "Eat Clean - Live -Healthy" strives to provide its clientele with premium-quality “eat clean” foods, exclusively utilizing natural ingredients that ensure safety for all consumers. The organization's mission transcends mere product delivery; it embodies a commitment to fostering a community where selecting Tay Nguyen Food equates to opting for a lifestyle enriched by safe, unadulterated nourishment, conducive to both physical well-being and overall “nutritional” enrichment. Recognizing that the transition to a health-conscious and environmentally sustainable lifestyle represents a gradual, enduring journey, Tay Nguyen Food pledges unwavering support, respect, and belief in its customers' effort. This commitment is underpinned by an unyielding dedication to offering the finest products, thereby contributing significantly to the health and wellness of its consumer base.

### 2.2.3. Core value

- NATURAL: Eat clean foods from Tay Nguyen Food - Vietnam is 100% made from nature, no color, no chemicals, no preservatives, no additives. The product processing process is manual, hygienic, made in traditional craft villages or directly at home.

- NUTRITION: Tay Nguyen Food - Vietnam's products specialize in supporting fitness, beautifying body shape, weight control, and improving and nourishing health.

- PRESTIGE: The top principle of Tay Nguyen Food - Vietnam is the health and benefits of customers. Customer satisfaction is the joy, the guideline, and the vision and mission of the brand. We are committed to bringing the best value and nutritional products to customers.

## 2.3. Organization structure

The organization structure consists of several key divisions, each with distinct responsibilities and functions to facilitate efficient and seamless operations. These divisions include Human Resources, responsible for managing employee-related processes; Marketing, which focuses on promoting the company's products or services; Customer Management, responsible for receiving customer requests and managing customer relations; Sales Management, tasked with overseeing sales strategies and order management; Delivery Management, order delivery tracking and manage delivery schedule. Inventory Management, which handles the storage and distribution of goods; and the Financial and Accounting department, responsible for financial tracking and reporting. Each department plays a crucial role in the overall success of the company.

## 2.4. Business model

Business to Customer (B2C): The company provides organic food to customers via its website. Customers can choose products through the product list posts on the website, view product information, and prices, and order online. After booking is successful, the product will be delivered to the customer's home through.

## 2.5. Business functions and processes

### 2.5.1. Business functions

**- Customer Management**

+Manage customer data: This task involves maintaining a database of customer information, which may include contact details, order history, and preferences.

+Handle customer queries/requests/feedback: This task requires the business to respond to customer inquiries, process any requests they might have, and manage feedback, which can be used for improving services or products.

+Create return/exchange document: When customers want to return or exchange purchased items, this function is responsible for creating the necessary documentation to facilitate that process.

**- Sales Management**

+Update products' prices/discounts: This entails adjusting the pricing of products and setting discounts as part of sales strategies.

+Process order: This involves taking customer orders, ensuring their accuracy, and initiating the fulfillment process.

+Handle return/exchange: In the event of a customer wanting to return or exchange a product, this function manages the logistical and transactional aspects of that process.

**- Delivery Management**

+Coordinate with shipping unit: This requires organizing and communicating with the shipping department or external couriers to ensure that products are dispatched correctly.

+Create delivery order: For each customer order, a delivery order must be generated, detailing what needs to be delivered and where.

+Track delivery status: Monitoring the progress of deliveries is essential to ensure they are on time and to provide the system with updates on their status.

**- Finance and Accounting**

+Process invoice: This involves generating invoices for products or services sold and ensuring they are sent to customers for payment.

+Process payment/return payment: This task includes handling incoming payments and managing refunds where necessary.

+Financial record: Maintaining comprehensive financial records is crucial for the business's accounting practices. This includes recording all transactions, expenses, and income.

**- Inventory Management**

+Manage goods issues/goods receipts: This task involves keeping track of inventory as it is sold (goods issues) and received (goods receipts).

+Manage stock: This includes monitoring current stock levels, predicting future inventory needs, and ordering new stock as necessary.

+Update product information: quantity, status: Maintaining accurate records of inventory quantities and the status of products, such as whether they are available, low in stock, or need to be reordered.

*Table 2- 1 Business function to data entity matrix*

| Data entity types / Business functions | Customer | Order | Categories | Product | Discount | Employee | Department | Goods issue | Goods return document | Invoice | Delivery receipt | Shipping unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Customer management | x | x | | | | x | x | | | | | |
| Sales management | x | x | x | x | x | x | x | | x | x | | x |
| Delivery management | | | | x | | x | x | x | | | x | x |
| Finance and Accounting | | x | | x | x | x | x | | x | x | | |
| Inventory management | | x | x | x | | x | x | x | x | | | |

**2.5.2. Description of general business process**

**a. Sales and Distributions**

- *Product Search Process:* Customers are provided with product information through the Tay Nguyen Food website.

- *Order Placement Process:* To place an order, customers add desired products to their cart, modify the order, if necessary, fill in order details, choose a payment method (Cash or Bank Transfer), apply discount codes if available, and confirm the order. Upon confirmation, the Order Information transforms into Invoice Information. Customers receive an Order Confirmation Email detailing the Invoice and, if applicable, a Bank Transfer Information Email.

- *Payment Process:*

+ If choosing Cash Payment, the customer will pay cash after receiving the order.

+ If choosing Bank Transfer Payment, the customer will bank transfer to Tay Nguyen Food's bank account before the company starts to schedule delivery.

- *Order Modification Process:* To modify an order, customers directly contact the customer service hotline.

- *Order Processing:*

+ The Sales Department controls order information through the Order Database, and receives, and adjusts order details via customer service if needed.

+ The Warehouse Department matches the order and dispatches goods, recording this in Goods Issue Documents.

- *Delivery Process:* Tay Nguyen Food creates a Delivery Order along with goods packing for the delivery company. The delivery company receives it, performs the delivery, confirms, sends the Waybill Code, and updates the Order Status.

**b. Return - Exchange:**

- *At Delivery:* Customers can inspect the goods with the delivery personnel upon receipt. If discrepancies are found, they can contact customer service for support in returns or exchanges.

- *Handling Returns and Exchanges:*

+ Tay Nguyen Food reviews customer requests and processes returns or exchanges. The system receives information about unsuccessful deliveries from the Delivery Process and invoice data from the Invoice Database to cross-check returned items. Subsequently, return information is stored in the Returns Database.

+ For returns, the product is sent back to the company, and the customer receives a refund in their bank account.

+ For exchanges, Tay Nguyen Food replaces the item if it does not match the invoice.

## 2.6. Business function diagram (BFD)

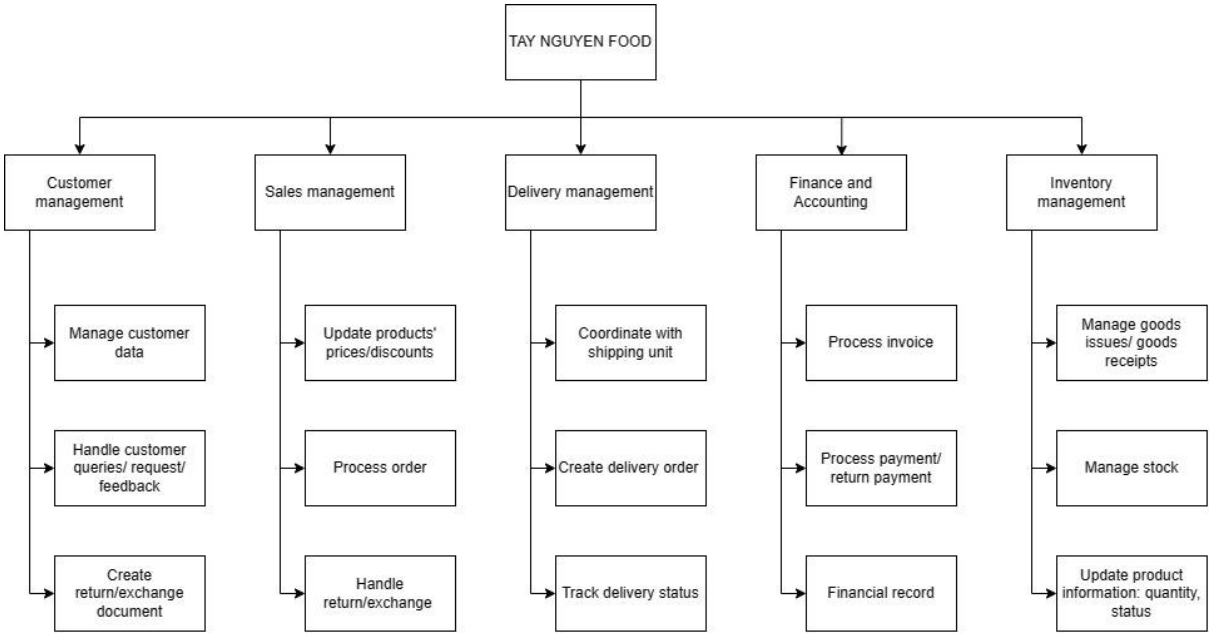



*Figure 2. 1 Business function diagram (BFD)*

## 2.7. Data flow diagram (DFD)

### 2.7.1. General

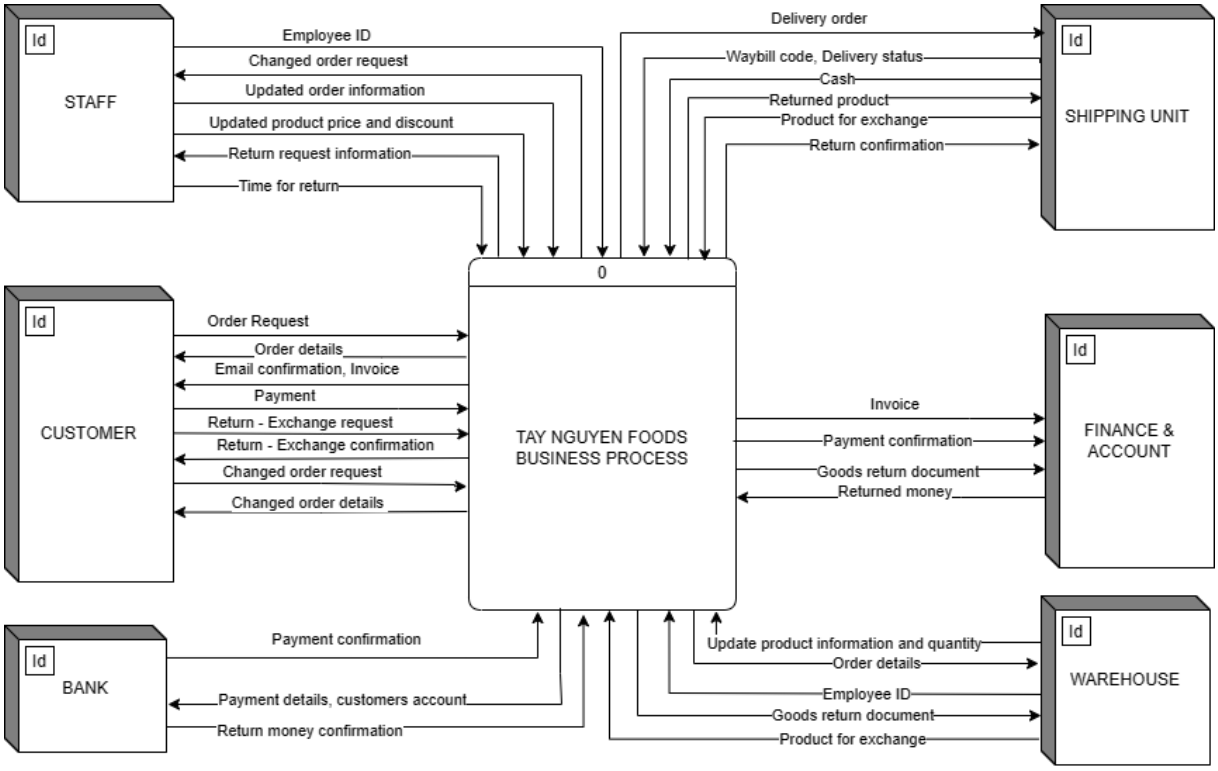



*Figure 2. 2 DFD context*

### 2.7.2. Sales and Distributions:

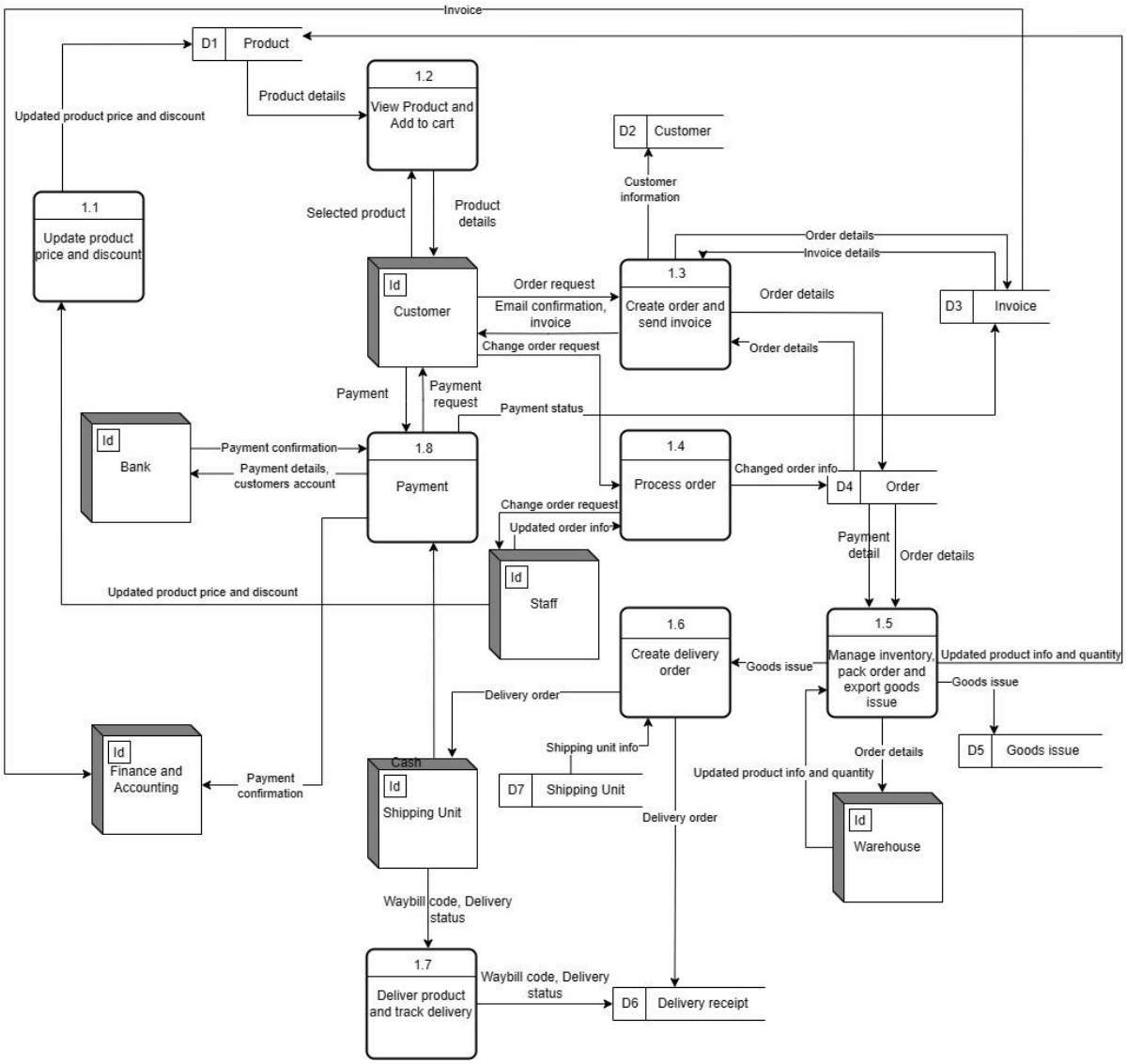



*Figure 2. 3 Sales and Distributions process DFD*

SD process is a significant process of Tay Nguyen Food operation. In this process, there are 6 entities (Customer, Shipping Unit, Warehouse, Staff, Finance and Accounting, Bank), 8 processes (Update product price and discount, View Product and Add to cart, Create order and send invoice, Process order, Manage inventory, pack order and export goods issue, Create delivery order, Deliver product and track delivery, Payment) and 7 data stores (Product, Customer, Invoice, Order, Good Issue, Delivery Receipt, Shipping Unit).

+Update product price and discount process: In this process, the entity Staff will update the product price and discount to the data store Product to display the most exact information for customer buying on the website.

+View Product and Add to cart process: This process occurs when customer want to view the product information provided by Tay Nguyen Food, and when they decide to purchase, they will add the product in the cart

+Create order and send invoice process: In this stage, the process will receive the order request from the entity customer, the order details then be saved in the data store Invoice. After that, the entity Invoice export invoice details and then, a confirmation email and invoice will

be sent to the customer and when they have confirmed the order, an order details will be saved to data store Order

+ Process order process: After receiving the confirmation email, if the customer wants to change the order, they will send a request. The entity Staff receives the request and updates the order information and order information will be saved in the data store Order. The order details will again be sent to the Create order and send invoice process and the confirmation email will be sent to the customer.

+Manage inventory, pack order and export goods issue process: After receiving the order detail, this process will send it to the entity Warehouse. And Warehouse will update the product information and quantity to data store Product. Then, the good issue document will be exported, which be saved in the data store Good issue, and will be sent to the Create delivery order process

+Create delivery order process: After receiving the Good issue document, the delivery order will be created and sent to the entity Shipping Unit, whose information is saved in the data store Shipping Unit, then, it will be saved to the data store Delivery receipt

+Deliver product and track delivery process: In this process, it receives the Waybill code and delivery status from the Shipping Unit entity and the Waybill code and delivery status will be saved in the data store Delivery receipt

+Payment Process: In this stage, if the customer chose the COD payment method, they will be asked to give cash to the Shipping Unit, whose role as intermediary now, and then their payment confirmation will be sent to the entity Finance and Accounting. If the customer chose the online payment method, an invoice details offering them to pay will be sent after the confirmation email. After that, the payment details and customer's account will be sent to the entity Bank, and the entity will return the payment confirmation when the payment is successful. Next, the payment status will be saved in the Invoice data store and the data store will export the invoice for the entity Finance and Accounting to record.

**2.7.3. Return – Exchange:**

"Returns" and "Exchanges" are pivotal processes designed to address customer-raised product concerns, spanning a range of issues from product defects to customers' desire to return unwanted items. In the return process, Tay Nguyen Food meticulously scrutinizes the issue and promptly initiates a refund to the customer. Conversely, in the exchange process, the company retrieves the original product from the customer and replaces it with a new one, ensuring seamless customer satisfaction.

This process is outlined in a Data Flow Diagram featuring seven distinct stages: Verify Return/Exchange Request, Check Product Condition, Return Money, Prepare Product, Pack Product for Exchange, Delivery of Returned Product, and Delivery and Exchange. It involves five key entities: Customer, Staff, Bank, Warehouse, and Delivery Unit, along with four data stores: Order, Returned Product Document, Product, and Inventory.

- Verify Return/Exchange Request: After receiving the customer's request and examining pertinent order and product condition details, a notification is generated, either accepting the exchange, refund, or declining based on the specific case. Information related to returns and exchanges is stored in the data store "Returned Product Document."

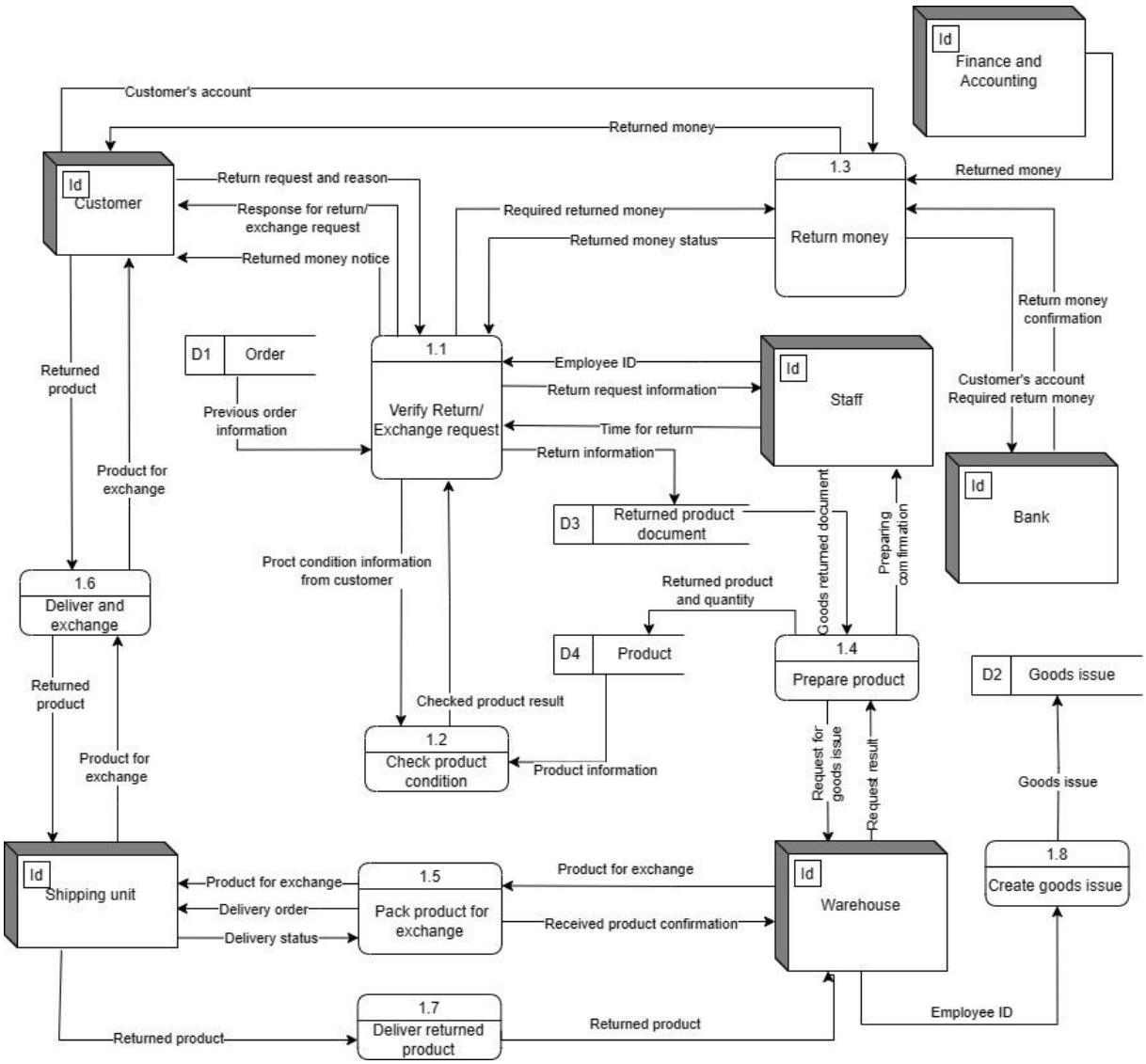



*Figure 2. 4 Return - Exchange process DFD*

- Check Product Condition: This stage involves assessing the status of the product received by the customer, comparing it with specified product specifications and characteristics, and delivering the verification result.

- Return Money: If the verification process warrants a refund for the customer, this process collects payment information and collaborates with the bank to refund the customer's money.

- Prepare Product: In cases where an exchange is approved, this process receives information about the product to be exchanged, confirms its readiness, and collaborates with the company's warehouse to retrieve the item. Information regarding the item to be exchanged is stored in the data store "Inventory".

- Pack Product for Exchange: After receiving the item from the warehouse, the next step involves packaging the product and handing it over to the transportation service provider for delivery to the customer.

- Delivery and Exchange: Upon receiving the product to be delivered from Tay Nguyen Food, the delivery unit delivers the new item to the customer and collects the old item to be exchanged.

- Delivery Returned Product: This process manages the transportation of returned or exchanged items from customers back to Tay Nguyen Food. Upon receiving the items, Tay Nguyen Food confirms the receipt to ensure successful delivery to the correct location.

# Chapter 3. Design entity-relationship model

## 3.1. Business Rules

**- Sale Management**

+When customers confirm an order, the system will automatically send the order details which include customer information, product information... to the database. Then, Customer ID and Order ID will be created. If the customer has ordered before, use an existing ID.

+One customer can have many orders.

+One order can have many order details that include information about a product.

+Every discount code is used by many orders and every order can only use one discount code.

+Each order has only one invoice and one good issue document.

+After successfully order, Tay Nguyen Food will verify order and send invoice to customer's email. If the customer chooses the online payment, they will receive another email with transfer instruction. Customers who choose online payment have to pay within 24 hours of receiving the invoice, then the packing and good issue document can be processed. If they do not make any payment within 24 hours, the order will be cancelled.

+The good return or exchange request must obey the Return Policy by Tay Nguyen Food to be approved. The product condition information sent by customers must be verified and confirmed.

**- Delivery management**

+Delivery Unit will conduct the delivery according to delivery receipts and request to receive money if the payment method chosen is COD

+One shipping unit can be assigned for many delivery receipts as well as goods issue documents. Every goods issue ID is included in the delivery receipt, which then be sent to the shipping unit.

**- Customer Management**

+Customers have the right to conduct a return or exchange request if the products were broken or wrong sent products. The cases that are approved for return are: outdated products, long delivery time, and products is not as described. The cases that are approved for exchange are outdated products, and wrong-sent products.

+Tay Nguyen Food will provide cost information for the customer; if there is any mistake Tay Nguyen Food will contact or inform that the order will be cancelled

+Customers can fill in a discount code if have one when sending the order request

+When login the website of Tay Nguyen Food, customers can choose 1 of 3 login types Google Account (include Google name), Facebook (include Facebook link, Facebook name), and Website account (include username and password)

- **Inventory Management**

+When an order is confirmed, the order details will be sent to the entity Warehouse and based on the Product ID, the number of products will be updated in the database.

+Warehouse will create the goods issue after receiving the order details. Goods issue will trigger the packing process.

+Each goods issue document has many goods issue document details that include information on one product.

+When receiving the return or exchange request, Tay Nguyen Food will verify the product conditions. Products approved in return will be returned to the warehouse. Exchanged products from the customers are also returned to inventory with the goods return document. After that, replace products with new good issues documents will be exported out of the inventory.

+One good issue is only taken charge of by one employee, but one employee can take charge of either many good issues or not. If having the return, one good issue document can only be used for one good return document.

+One good return document can have many good return details document that include information about a product returned.

+In terms of return and exchange, there are two types of exchange: goods exchange and payment return.

- **Finance & Accounting**

+Invoice will be issued after the customer places an order, and when customers make payment successfully, the payment status will be recorded in the invoice.

+Order revenue, payment return cost and inventory cost will be journalized and calculated by the accounting.

## 3.2. Actors

Customer, Delivery Unit, Warehouse, Bank, Staff, Finance & Accounting.

## 3.3. Identify and define entity attributes

**- Customer:** A person or an organization that has ordered products.

+*Attributes:* CustomerID, CustomerName, Phone, Email, Login Type

+*Primary key:* CustomerID

+*Single value attributes:* CustomerID, CustomerName, Phone, Email, Login Type

+*Not null attributes:* CustomerID, CustomerName, Phone, Email, Login Type

**- Product:** An item that may be ordered by customers.

+*Attributes:* ProductID, ProductName, CatergoryID, Price, ProductStatus, Barcode, Unit, Stock

+*Primary key:* ProductID

+*Foreign key attributes:* CatergoryID

+*Single value attributes:* ProductID, ProductName, CatergoryID, Barcode, Price, Unit, Stock, ProductStatus

+*Not null attributes:* ProductID, ProductName, CatergoryID, Barcode, Price, Unit, ProductStatus, Stock

**- Category:** Products are classified based on their characteristics.

+*Attributes:* CatergoryID, CatergoryName

+*Primary key:* CatergoryID

+*Single value attributes:* CatergoryID, CatergoryName

+*Not null attributes:* CatergoryID, CatergoryName

**- Order:** An order is a transaction associated with the sale of one or more products to a customer and Identified by an order ID.

+*Attributes:* OrderID, CustomerID, CusAddressNumber, TotalValue, TotalQuantity, DiscountID, OrderStatus, CreateDate, DeliveryReceiptID, Note

+*Primary key:* OrderID

+*Foreign key attributes:* CustomerID, DiscountID, DeliveryReceiptID

+*Composite attributes:* CusAddressNumber

+*Single value attributes:* OrderID, CustomerID, TotalValue, OrderStatus, CreateDate, TotalQuantity, DeliveryReceiptID, DiscountID, Note

+*Not null attributes:* OrderID, TotalValue, TotalQuantity, CustomerID, OrderStatus, CreateDate, DeliveryReceiptID, CusAddressNumber

**- Order detail:** An order detail represents a part of an order on a bill. An order detail can be made up of one item or multiples of an item.

+*Attributes:* OrderLineNumber, ProductID, OrderID, Quantity, Unit, SubTotalPrice

+*Primary key:* ProductID, OrderID

+*Single value attributes:* OrderLineNumber, ProductID, Quantity, SubTotalPrice, Unit, OrderID

+*Not null attributes:* OrderLineNumber, ProductID, OrderID, Quantity, SubTotalPrice, Unit

**- Invoice:** Keeps track of a transaction between a buyer and the seller. It is an essential component of accounting internal controls and audits.

+*Attributes:* InvoiceNumber, OrderID, InvoiceDate, TotalCost, PaymentMethod, PaymentStatus

+*Primary key:* InvoiceNumber

+*Foreign key attribute:* OrderID

+*Single value attributes:* InvoiceNumber, OrderID, TotalCost, InvoiceDate, PaymentMethod, PaymentStatus

+*Not null attributes:* InvoiceNumber, OrderID, InvoiceDate, TotalCost, PaymentMethod, PaymentStatus

**- Discount:** A reduction in the regular cost of orders, usually granted in exchange for early or advance payment or to a certain category of buyers.

+*Attributes:* DiscountID, DiscountPercent, DiscountLimit

+*Primary key:* DiscountID

+*Single value attributes:* DiscountID, DiscountPercent, DiscountLimit

+*Not null attributes:* DiscountID, DiscountPercent, DiscountLimit

**- Goods issue:** A good issue document is a form used to record warehouse delivery activities of each type of tool, instrument, raw material, production supply, product, and goods.

**Goods issue:**

+*Attributes:* GoodsIssueID, OrderID, EmployeeID, DateIssue, ShippingUnitID

+*Primary key:* GoodsIssueID

+*Foreign key:* OrderID, ShippingUnitID, EmployeeID

+*Single value attributes:* GoodsIssueID, OrderID, EmployeeID, DateIssue, ShippingUnitID

+*Not null attributes:* GoodsIssueID, OrderID, EmployeeID, DateIssue, ShippingUnitID

**Goods issue details:**

+*Attributes:* GoodsIssueID, WarehouseName, ProductID, Quantity, Unit, SubTotalPrice

+*Primary key:* GoodsIssueID, ProductID

+*Single value attributes:* GoodsIssueID, ProductID, Quantity, Unit, SubTotalPrice, WarehouseName

+*Not null attributes:* GoodsIssueID, ProductID, Quantity, Unit, SubTotalPrice

**- Delivery receipt:** A document records the shipping information

+*Attributes:* DeliveryReceiptID, GoodIssueID, COD, ShippingUnitID, CreatedDate, DeliveryDate, Status

+*Primary key:* DeliveryReceiptID

+*Foreign key attribute:* ShippingUnitID, GoodsIssueID

+*Single value attributes:* DeliveryReceiptID, GoodsIssueID, COD, ShippingUnitID, CreatedDate, DeliveryDate, Status

+*Not null attributes:* DeliveryReceiptID, GoodsIssueID, COD, ShippingUnitID, CreatedDate, Status

**- ShippingUnit:** Information of shipping unit partners

+*Attributes:* ShippingUnitID, Name, Address, Email, Phone

+*Primary key:* ShippingUnitID

+*Single value attributes:* ShippingUnitID, Name, Address, Email, Phone

+*Not null attributes:* ShippingUnitID, Name, Address, Email, Phone

**- Good return:** Record return delivered products to the seller or entirely or partially reverse a purchase transaction for an item.

**Goods return:**

+*Attributes:* GoodsReturnID, GoodsIssueID, CustomerID, EmployeeID, CreateDate, ReturnStatus, ExchangeType

+*Primary key:* GoodsReturnID

+*Foreign key attribute:* GoodsIssueID, CustomerID, EmployeeID

+*Single value attributes:* GoodsReturnDocumentID, GoodsIssueID, EmployeeID, CustomerID, CreateDate, ReturnStatus, ExchangeType

+*Not null attributes:* GoodsReturnID, GoodsIssueID, EmployeeID, CustomerID, CreateDate, ReturnStatus, ExchangeType

**Goods return details:**

+*Attributes:* GoodsReturnID, ProductID, Quantity, Unit, SubTotalPrice, Reason

+*Primary key:* GoodsReturnID

+*Single value attributes:* GoodsReturnID, CustomerID, ProductID, Unit, Quantity, SubTotalPrice, Reason

+*Not null attributes:* GoodsReturnID, CustomerID, ProductID, Unit, Quantity, SubTotalPrice, Reason

**- Employees:** A person who works in the organization

+*Attributes:* EmployeeID, EmployeeName, DepartmentID, Phone, Email, EmpAddress, EmployeeType

+*Primary key:* EmployeeID

+*c* DepartmentID

+*Single value attributes:* EmployeeID, EmployeeName, DepartmentID, Phone, Email, EmployeeType

+*Composite attribute:* EmpAddress

+*Not null attributes:* EmployeeID, EmployeeName, DepartmentID, Phone, Email, Address, EmployeeType

**- Department:** A department is a part of an organization or business with specific tasks and responsibilities to contribute to the common goals of that organization.

+*Attributes:* DepartmentID, DepartmentName, ManagerID

+*Primary key:* DepartmentID

+*Not null attributes:* ManagerID

+*Single value attributes:* DepartmentID, Department Name, ManagerID

+*Not null attributes:* DepartmentID, Department Name, ManagerID

### 3.4. Define relationship between entities

*Table 3- 1 Description of relationship between entities*

| R | Relationship | | Description |
|---|---|---|---|
| R1 | Customer - Order | 1-N | 1 customer can have 1 or many orders.<br>1 order can only belong to 1 customer. |
| R2 | Order - OrderDetails | 1-N | 1 order can have 1 or many order details.<br>1 order detail belongs to only 1 order. |
| R3 | Product - OrderDetails | 1-N | 1 product can be in many order details or not.<br>1 order detail has only 1 product. |
| R4 | Order - Invoice | 1-1 | 1 order can only have 1 invoice.<br>1 invoice can only belong to 1 order. |
| R5 | Discount - Order | 1-N | 1 discount can be applied for many orders.<br>1 order can only use 1 discount. |
| R6 | Order - Goods_Issue | 1-1 | 1 order has only one goods issue.<br>1 goods issue belongs to only one order. |
| R7 | Goods_Issue - Goods_Issue_Details | 1-N | 1 goods issue has many goods issue details.<br>1 goods issue detail belong to only one goods issue. |
| R8 | Product - Goods_Issue_Details | 1-N | 1 product can be in many goods issue details or not.<br>1 goods issue detail has only one product. |
| R9 | Goods_Issue - DeliveryReceipt | 1-1 | 1 goods issue can only have 1 delivery receipt.<br>1 delivery receipt can only belong to 1 goods issue. |

| | | | |
|---|---|---|---|
| R10 | ShippingUnit - DeliveryReceipt | 1-N | 1 delivery receipt can only be delivered by 1 shipping unit.<br>1 shipping unit can deliver many deliveries receipt. |
| R11 | Employee (Manager) - Department | 1 - 1 | 1 manager can supervise only one department<br>1 department is supervised by only 1 manager. |
| R12 | Customer - Goods_Return | 1 - N | 1 customer can request many goods returned.<br>1 goods return can only be requested by 1 customer. |
| R13 | Goods_Return - Goods_Return_Details | 1 - N | 1 goods return has many goods return details.<br>1 goods return detail only belongs to 1 goods return. |
| R14 | Product - Goods_Return_Details | 1 - N | 1 product can belong to many goods return details<br>1 goods return detail can only have 1 product |
| R15 | Employee - Goods_Issue | 1- N | 1 employee can create many goods issues<br>1 goods issue can be only created by 1 employee |
| R16 | Department - Employee | 1 - N | 1 employee can belong to only 1 department<br>1 department can have more than 1 employee |
| R17 | Customer - Facebook | | Facebook is a subtype of Customer |
| R18 | Customer - Google | | Google is a subtype of Customer |
| R19 | Customer - Website Account | | Website Account is a subtype of Customer |
| R20 | Goods Return – Goods Exchange | | Goods Exchange is a subtype of Goods Return |
| R21 | Goods Return – Payment Return | | Payment Return is a subtype of Goods |
| R22 | Category - Product | 1-N | 1 product can belong to only 1 category<br>1 category can have more than 1 product |
| R23 | Shipping Unit - Goods Issue | 1-N | 1 goods issue can belong to only 1 shipping unit<br>1 shipping unit can have more than 1 goods issue |
| R24 | Employee- Good Return | 1-N | 1 goods return can be created by only 1 employee<br>1 employee can create more than 1 goods return |

## 3.5. EER diagram

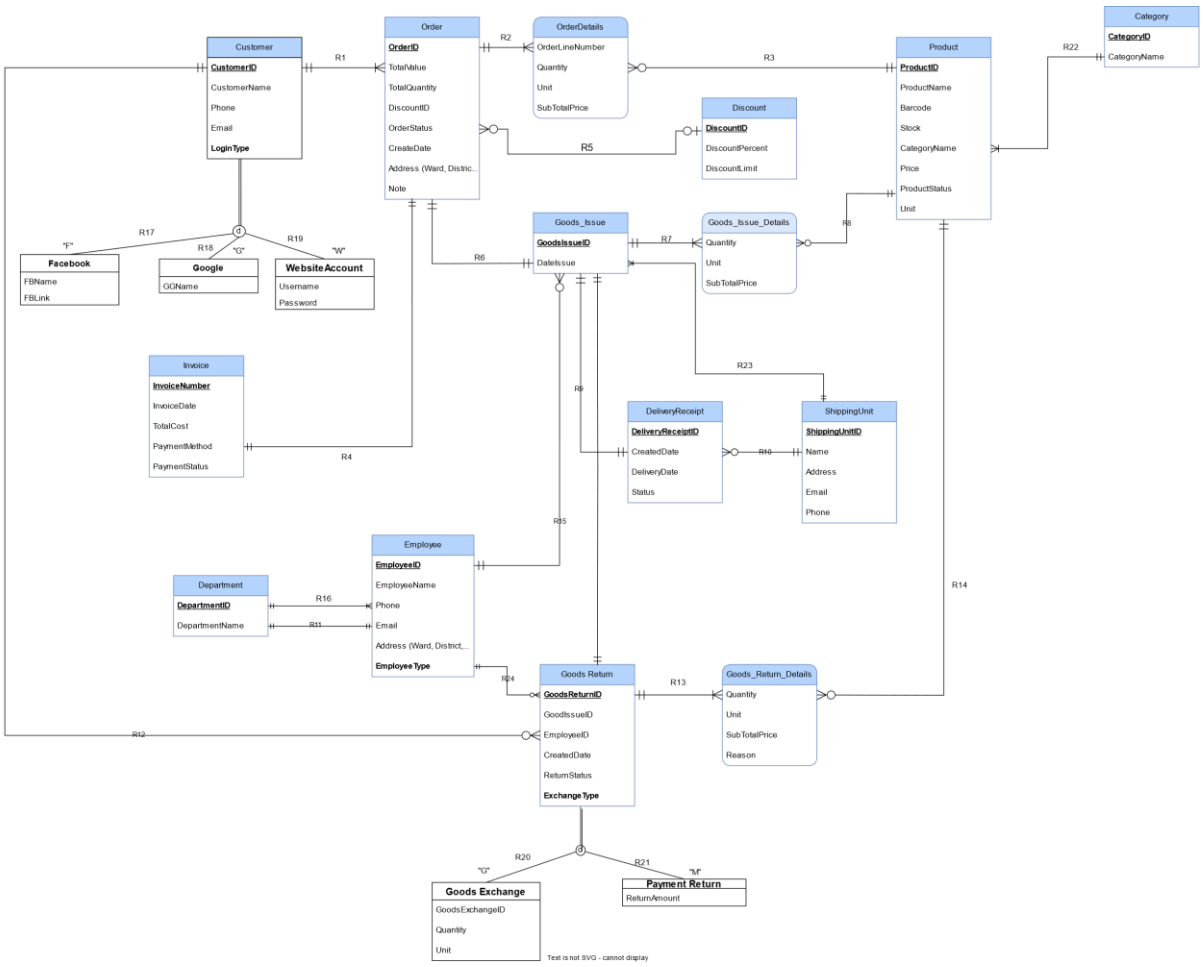
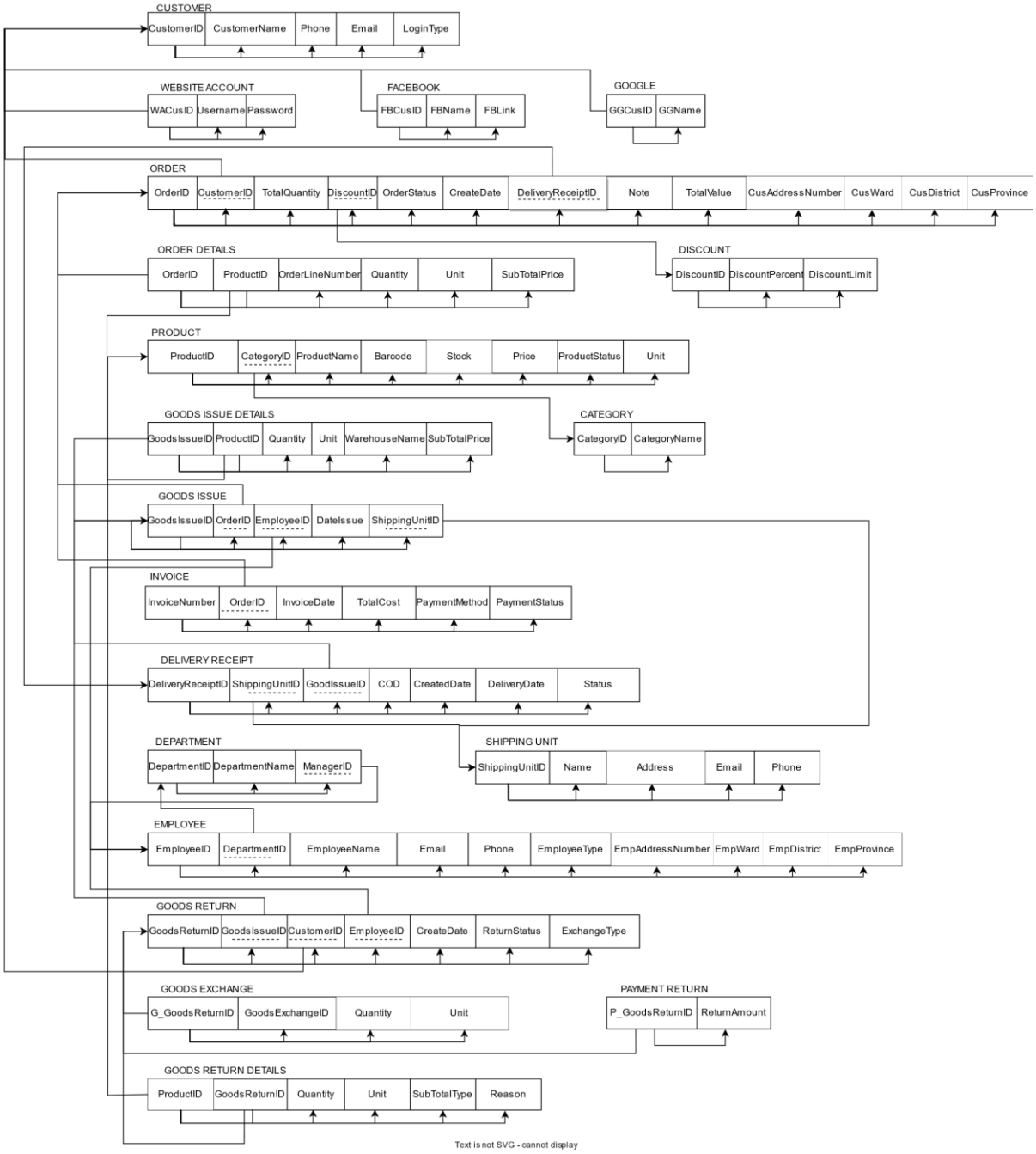



*Figure 3. 1 EER diagram*

https://drive.google.com/file/d/1UweELTjSIfWZMnD4d7TKnu6Vwak8c3oI/view?usp=sharing

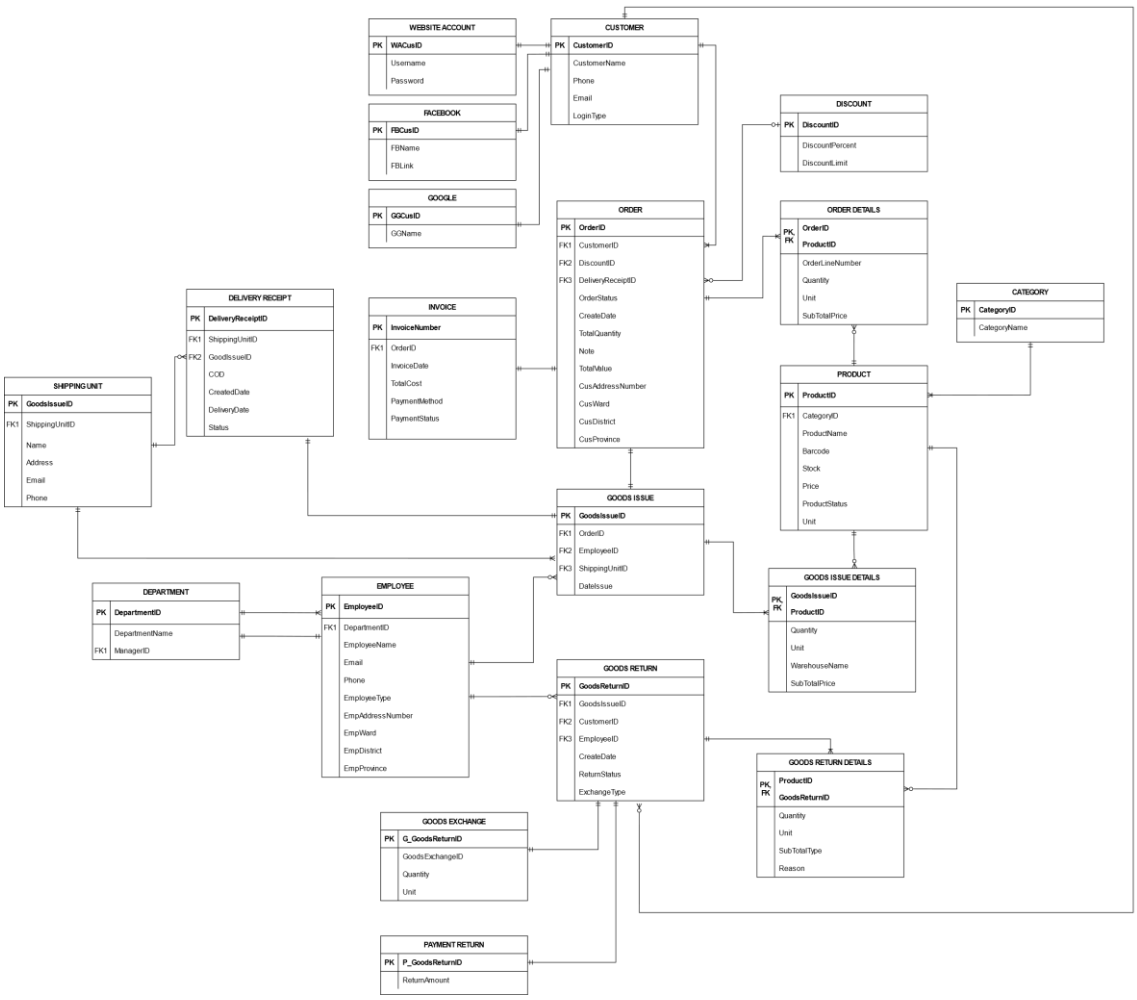
# Chapter 4. Logical database design

## 4.1. Relational Schema




https://drive.google.com/file/d/1RHjk-0VTpmFOcdYp0a5FrBG9NQC9Zo4E/view?usp=sharing

## 4.2. Relational model




https://drive.google.com/file/d/17WT8LbS7JGvzxDufqLjUzLYM1VMcESKz/view?usp=sharing

# Chapter 5. Physical database design

## 5.1. Define data type

*Table 5- 1 Customer*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| CustomerID | int | Not allows null | | PK |
| CustomerName | nvarchar(50) | Not allows null | | |
| Phone | varchar(15) | Not allows null | | |
| Email | varchar(50) | Not allows null | | |
| LoginType | char(2) | Not allows null | WA: WebsiteAccount<br>FB: Facebook<br>GG: Google | |

*Table 5- 2 WebsiteAccount*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| WACusID | int | Not allows null | | PK |
| Username | nvarchar(50) | Not allows null | | |
| Password | nvarchar(20) | Not allows null | | |

*Table 5- 3 Facebook*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| FBCusID | int | Not allows null | | PK |
| FBName | nvarchar(50) | Not allows null | | |
| FBLink | varchar(60) | Not allows null | | |

*Table 5- 4 Google*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| GGCusID | int | Not allows null | | PK |
| GGName | nvarchar(50) | Not allows null | | |

*Table 5- 5 Department*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| DepartmentID | char(2) | Not allows null | | PK |
| DepartmentName | nvarchar(20) | Not allows null | | |
| ManagerID | int | Not allows null | | |

*Table 5- 6 Employee*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| EmployeeID | int | Not allows null | | PK |
| DepartmentID | char(2) | Not allows null | | FK |
| EmployeeName | nvarchar(50) | Not allows null | | |
| Email | varchar(50) | Not allows null | | |

| | | | | |
|---|---|---|---|---|
| Phone | varchar(15) | Not allows null | | |
| EmployeeType | varchar(15) | Not allows null | | |
| EmpAddressNumber | nvarchar(50) | Not allows null | | |
| EmpWard | nvarchar(30) | Not allows null | | |
| EmpDistrict | nvarchar(20) | Not allows null | | |
| EmpProvince | nvarchar(50) | Not allows null | | |

*Table 5- 7 ShippingUnit*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| ShippingUnitID | varchar(5) | Not allows null | | PK |
| Name | nvarchar(30) | Not allows null | | |
| Address | nvarchar(200) | Not allows null | | |
| Email | varchar(50) | Not allows null | | |
| Phone | varchar(15) | Not allows null | | |

*Table 5- 8 Category*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| CategoryID | char(2) | Not allows null | | PK |
| Category Name | nvarchar(30) | Not allows null | | |

*Table 5- 9 Product*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| ProductID | varchar(10) | Not allows null | | PK |
| CategoryID | char(2) | Not allows null | | FK |
| ProductName | nvarchar(50) | Not allows null | | |
| Barcode | bigint | Not allows null | | |
| Unit | nvarchar(10) | Not allows null | | |
| Price | int | Not allows null | | |
| Stock | int | Not allows null | | |

| | | | | |
|---|---|---|---|---|
| ProductStatus | varchar(10) | Not allows null | | |

*Table 5- 10 Discount*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| DiscountID | varchar(10) | Not allows null | | PK |
| DiscountPercent | tinyint | Not allows null | | |
| DiscountLimit | int | Not allows null | | |

*Table 5- 11 Order*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| OrderID | varchar(15) | Not allows null | | PK |
| CustomerID | int | Not allows null | | FK |
| TotalQuantity | int | Not allows null | | |
| TotalPrice | int | Not allows null | | |
| DiscountID | varchar(10) | | | FK |
| OrderStatus | char(3) | Not allows null | WA: Waiting<br>PC: Processing<br>PR1: Delivering (prepaid)<br>PR0: Delivering (COD)<br>CO: Delivered<br>RE: Returned | |
| CreateDate | date | Not allows null | | |
| CusAddressNumber | nvarchar(50) | Not allows null | | |
| CusWard | nvarchar(30) | Not allows null | | |
| CusDistrict | nvarchar(20) | Not allows null | | |
| CusProvince | nvarchar(50) | Not allows null | | |
| Note | nvarchar(100) | | | |

*Table 5- 12 OrderDetail*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| OrderID | varchar(15) | Not allows null | | PK |
| ProductID | varchar(10) | Not allows null | | PK |
| OrderlineNumber | int | Not allows null | | |
| Quantity | int | Not allows null | | |
| Price | int | Not allows null | | |
| Unit | nvarchar(10) | Not allows null | | |
| SubTotalPrice | int | Not allows null | | |

*Table 5- 13 Invoice*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| InvoiceNumber | varchar(15) | Not allows null | | PK |
| OrderID | varchar(15) | Not allows null | | FK |
| InvoiceDate | date | Not allows null | | |
| TotalCost | int | Not allows null | | |
| PaymentMethod | varchar(10) | Not allows null | Transfer<br>COD | |
| PaymentStatus | nvarchar(15) | Not allows null | | |

*Table 5- 14 GoodsIssue*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| GoodsIssueID | varchar(15) | Not allows null | | PK |
| OrderID | varchar(15) | Not allows null | | FK |
| EmployeeID | int | Not allows null | | FK |
| DateIssue | date | Not allows null | | |
| ShippingUnitID | varchar(5) | Not allows null | | FK |

*Table 5- 15 GoodsIssueDetails*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| GoodsIssueID | varchar(15) | Not allows null | | PK |
| ProductID | varchar(10) | Not allows null | | PK |
| Quantity | int | Not allows null | | |
| Unit | nvarchar(10) | Not allows null | | |
| SubTotalPrice | int | Not allows null | | |
| WarehouseName | nvarchar(20) | Not allows null | | |

*Table 5- 16 DeliveryReceipt*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| DeliveryReceiptID | varchar(15) | Not allows null | | PK |
| ShippingUnitID | varchar(5) | Not allows null | | FK |
| GoodsIssueID | varchar(15) | Not allows null | | FK |
| COD | int | Not allows null | | |
| CreateDate | date | Not allows null | | |
| DeliveryDate | date | | | |
| Status | nvarchar(10) | Not allows null | | |

*Table 5- 17 GoodsReturn*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| GoodsReturnID | varchar(15) | Not allows null | | PK |
| GoodsIssueID | varchar(15) | Not allows null | | FK |
| CustomerID | int | Not allows null | | FK |
| EmployeeID | int | Not allows null | | FK |
| CreateDate | date | Not allows null | | |
| ReturnStatus | nvarchar(15) | Not allows null | Đang xử lý<br>Hoàn thành | |
| ExchangeType | nvarchar(10) | Not allows null | GoodsExchange<br>PaymentReturn | |

*Table 5- 18 GoodsReturnDetails*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| GoodsReturnID | varchar(15) | Not allows null | | PK |
| ProductID | varchar(10) | Not allows null | | PK |
| Quantity | int | Not allows null | | |
| Unit | nvarchar(10) | Not allows null | | |
| SubTotalPrice | int | Not allows null | | |
| Reason | nvarchar(50) | Not allows null | | |

*Table 5- 19 GoodsExchange*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| G_GoodsReturnID | varchar(15) | Not allows null | | PK |
| GoodsExchangeID | varchar(10) | Not allows null | | FK |
| Unit | nvarchar(10) | Not allows null | | |
| Quantity | int | Not allows null | | |

*Table 5- 20 PaymentReturn*

| Attribute | Data type | Allows null | Note | Key |
|---|---|---|---|---|
| P_GoodsReturnID | varchar(15) | Not allows null | | PK |
| ReturnAmount | int | Not allows null | | |

# Chapter 6. Create Database

## 6.1. Create Database

```
CREATE DATABASE TAYNGUYENFOOD
GO
```

## 6.2. Create table and key constraints

```
/*Create CUSTOMER*/

CREATE TABLE [dbo].[CUSTOMER] (
    [CustomerID] INT            NOT NULL,
    [CustomerName] NVARCHAR (50) NOT NULL,
    [Phone] VARCHAR(15)        NOT NULL,
    [Email] VARCHAR(50)            NOT NULL,
    [LoginType] CHAR(2)            NOT NULL,
   CONSTRAINT [PK_CUSTOMER] PRIMARY KEY CLUSTERED ([CustomerID] ASC)
);
```

```sql
/*Create WEBSITE_ACCOUNT*/
CREATE TABLE [dbo].[WEBSITE_ACCOUNT] (
   [WACusID]  INT  NOT NULL,
   [Username] NVARCHAR (50) NOT NULL,
   [Password] NVARCHAR (20) NOT NULL,
   CONSTRAINT [PK_WEBSITE_ACCOUNT] PRIMARY KEY CLUSTERED ([WACusID]
ASC)
);
ALTER TABLE WEBSITE_ACCOUNT
  ADD CONSTRAINT FK_WEBSITE_ACCOUNT_CUSTOMER FOREIGN KEY (WACusID)
     REFERENCES CUSTOMER(CustomerID);

/*Create FACEBOOK*/
CREATE TABLE [dbo].[FACEBOOK] (
   [FBCusID] INT NOT NULL,
   [FBName]  NVARCHAR (50) NOT NULL,
   [FBLink]  VARCHAR (60)  NOT NULL,
   CONSTRAINT [PK_FACEBOOK] PRIMARY KEY CLUSTERED ([FBCusID] ASC)
);
ALTER TABLE FACEBOOK
  ADD CONSTRAINT FK_FACEBOOK_CUSTOMER FOREIGN KEY (FBCusID)
     REFERENCES CUSTOMER(CustomerID);

/*Create GOOGLE*/
CREATE TABLE [dbo].[GOOGLE] (
   [GGCusID] INT NOT NULL,
   [GGName]  NVARCHAR (50) NOT NULL,
   CONSTRAINT [PK_GOOGLE] PRIMARY KEY CLUSTERED ([GGCusID] ASC)
);
ALTER TABLE GOOGLE
  ADD CONSTRAINT FK_GOOGLE_CUSTOMER FOREIGN KEY (GGCusID)
     REFERENCES CUSTOMER(CustomerID)

/*Create DEPARTMENT*/
CREATE TABLE [dbo].[DEPARTMENT] (
   [DepartmentID]   CHAR (2)      NOT NULL,
   [DepartmentName] NVARCHAR (20) NOT NULL,
   [ManagerID]      INT          NOT NULL,
   CONSTRAINT [PK_DEPARTMENT] PRIMARY KEY CLUSTERED ([DepartmentID]
ASC)
);

/*Create EMPLOYEE*/
CREATE TABLE [dbo].[EMPLOYEE] (
   [EmployeeID]       INT       NOT NULL,
   [DepartmentID]       CHAR (2)      NOT NULL
   [EmployeeName]     NVARCHAR (50) NOT NULL,
   [Email]            VARCHAR (50)  NOT NULL,
```

```
   [Phone]            VARCHAR(15)   NOT NULL,
   [EmployeeType]     VARCHAR(15)   NOT NULL,
   [EmpAddressNumber] NVARCHAR (50) NOT NULL,
   [EmpWard]          NVARCHAR (30) NOT NULL,
   [EmpDistrict]      NVARCHAR (20) NOT NULL,
   [EmpProvince]      NVARCHAR (50) NOT NULL,
   CONSTRAINT [PK_EMPLOYEE] PRIMARY KEY CLUSTERED ([EmployeeID] ASC)
);
ALTER TABLE EMPLOYEE
  ADD CONSTRAINT FK_EMPLOYEE_DEPARTMENT FOREIGN KEY (DepartmentID)
     REFERENCES DEPARTMENT(DepartmentID)
/*Add more constraints in table DEPARTMENT*/
ALTER TABLE DEPARTMENT
  ADD CONSTRAINT FK_DEPARMENT_MANAGER FOREIGN KEY (ManagerID)
  REFERENCES EMPLOYEE (EmployeeID)

/*Create SHIPPING UNIT*/
CREATE TABLE [dbo].[SHIPPING_UNIT] (
   [ShippingUnitID] VARCHAR (5)    NOT NULL,
   [Name]           NVARCHAR (30)  NOT NULL,
   [Address]        NVARCHAR (200) NOT NULL,
   [Email]          VARCHAR(50)           NOT NULL,
   [Phone]          VARCHAR(15)           NOT NULL
   CONSTRAINT [PK_SHIPPING_UNIT] PRIMARY KEY CLUSTERED
([ShippingUnitID] ASC)
);

/*Create CATEGORY*/
CREATE TABLE [dbo].[CATEGORY] (
   [CategoryID]    CHAR (2) NOT NULL,
   [Category Name] NVARCHAR (30)   NOT NULL,
   CONSTRAINT [PK_CATEGORY] PRIMARY KEY CLUSTERED ([CategoryID] ASC)
);

/*Create PRODUCT*/
CREATE TABLE [dbo].[PRODUCT] (
   [ProductID]     VARCHAR (10)  NOT NULL,
   [CategoryID]   CHAR (2)  NOT NULL,
   [ProductName]   NVARCHAR (50) NOT NULL,
   [Barcode]      BIGINT       NOT NULL,
   [Unit]          NVARCHAR (10) NOT NULL,
   [Price]         INT           NOT NULL,
   [Stock]         INT       NOT NULL,
   [ProductStatus] VARCHAR(10)   NOT NULL,
   CONSTRAINT [PK_PRODUCT] PRIMARY KEY CLUSTERED ([ProductID] ASC)
);
ALTER TABLE PRODUCT
```

```sql
ADD CONSTRAINT FK_PRODUCT_CATEGORY FOREIGN KEY (CategoryID)
REFERENCES CATEGORY (CategoryID)

/*Create DISCOUNT*/
CREATE TABLE [dbo].[DISCOUNT] (
   [DiscountID]      VARCHAR(10) NOT NULL,
   [DiscountPercent] TINYINT NOT NULL,
   [DiscountLimit]   INT NOT NULL,
   CONSTRAINT [PK_DISCOUNT] PRIMARY KEY CLUSTERED ([DiscountID] ASC)
);

/*Create ORDER*/
CREATE TABLE [dbo].[ORDER] (
   [OrderID]           VARCHAR (15)   NOT NULL,
   [CustomerID]        INT            NOT NULL,
   [TotalQuantity]     INT        NOT NULL,
   [TotalPrice]        INT            NOT NULL,
   [DiscountID]        VARCHAR (10)   NULL,
   [OrderStatus]       CHAR (3)       NOT NULL,
   [CreateDate]        DATE      NOT NULL,
   [CusAddressNumber]  NVARCHAR (50)  NOT NULL,
   [CusWard]           NVARCHAR (30)  NOT NULL,
   [CusDistrict]       NVARCHAR (20)  NOT NULL,
   [CusProvince]       NVARCHAR (50)  NOT NULL,
   [Note]              NVARCHAR (100) NULL,
   CONSTRAINT [PK_ORDER] PRIMARY KEY CLUSTERED ([OrderID] ASC)
);
ALTER TABLE "ORDER"
  ADD CONSTRAINT FK_ORDER_CUSTOMER FOREIGN KEY (CustomerID)
     REFERENCES CUSTOMER(CustomerID)
ALTER TABLE "ORDER"
  ADD CONSTRAINT FK_ORDER_DISCOUNT FOREIGN KEY (DiscountID)
     REFERENCES DISCOUNT(DiscountID)

/*Create ORDER_DETAIL*/
CREATE TABLE [dbo].[ORDER_DETAIL] (
   [OrderID]         VARCHAR (15)  NOT NULL,
   [ProductID]       VARCHAR (10)  NOT NULL,
   [OrderlineNumber] INT           NOT NULL,
   [Quantity]        INT           NOT NULL,
   [Price]           INT           NOT NULL,
   [Unit]            NVARCHAR (10) NOT NULL,
   [SubTotalPrice]   INT           NOT NULL,
   CONSTRAINT [PK_ORDER_DETAIL] PRIMARY KEY CLUSTERED ([OrderID]
ASC,[ProductID] ASC)
);
ALTER TABLE ORDER_DETAIL
  ADD CONSTRAINT FK_ORDER_DETAIL_PRODUCT FOREIGN KEY (ProductID)
```

```
     REFERENCES PRODUCT(ProductID)
ALTER TABLE ORDER_DETAIL
  ADD CONSTRAINT FK_ORDER_DETAIL_ORDER FOREIGN KEY (OrderID)
     REFERENCES "ORDER"(OrderID)

/*Create INVOICE*/
CREATE TABLE [dbo].[INVOICE] (
   [InvoiceNumber] VARCHAR (15)  NOT NULL,
   [OrderID]       VARCHAR (15)  NOT NULL,
   [InvoiceDate]   DATE     NOT NULL,
   [TotalCost]     INT           NOT NULL,
   [PaymentMethod] VARCHAR(10)           NOT NULL,
   [PaymentStatus] NVARCHAR (15) NOT NULL,
   CONSTRAINT [PK_INVOICE] PRIMARY KEY CLUSTERED ([InvoiceNumber]
ASC)
);
ALTER TABLE INVOICE
  ADD CONSTRAINT FK_INVOICE_ORDER FOREIGN KEY (OrderID)
     REFERENCES "ORDER"(OrderID)

/*Create GOODS_ISSUE*/
CREATE TABLE [dbo].[GOODS_ISSUE] (
   [GoodsIssueID]    VARCHAR (15)  NOT NULL,
   [OrderID]        VARCHAR (15)  NOT NULL,
   [EmployeeID]     INT       NOT NULL,
   [DateIssue]      DATE      NOT NULL,
   [ShippingUnitID] VARCHAR (5)  NOT NULL,
   CONSTRAINT [PK_GOODS_ISSUE] PRIMARY KEY CLUSTERED ([GoodsIssueID]
ASC)
);
ALTER TABLE GOODS_ISSUE
  ADD CONSTRAINT FK_GOODS_ISSUE_SHIPPING_UNIT FOREIGN KEY
(ShippingUnitID)
     REFERENCES SHIPPING_UNIT(ShippingUnitID)
ALTER TABLE GOODS_ISSUE
  ADD CONSTRAINT FK_GOODS_ISSUE_EMPLOYEE FOREIGN KEY (EmployeeID)
     REFERENCES EMPLOYEE(EmployeeID)
ALTER TABLE GOODS_ISSUE
  ADD CONSTRAINT FK_GOODS_ISSUE_ORDER FOREIGN KEY (OrderID)
     REFERENCES "ORDER"(OrderID)

/*Create GOODS_ISSUE_DOC_DETAIL*/
CREATE TABLE [dbo].[GOODS_ISSUE_DETAIL] (
   [GoodsIssueID]   VARCHAR (15)  NOT NULL,
   [ProductID]      VARCHAR (10)  NOT NULL,
   [Quantity]       INT       NOT NULL,
   [Unit]           NVARCHAR (10) NOT NULL,
   [SubTotalPrice] INT           NOT NULL,
```

```
   [WarehouseName]  NVARCHAR (20) NOT NULL,
   CONSTRAINT [PK_GOODS_ISSUE_DOC_DETAIL] PRIMARY KEY CLUSTERED
([GoodsIssueID] ASC, [ProductID] ASC )
);

ALTER TABLE GOODS_ISSUE_DOC_DETAIL
  ADD CONSTRAINT FK_GOODS_ISSUE_DOC_DETAIL_PRODUCT FOREIGN KEY
(ProductID)
     REFERENCES PRODUCT(ProductID)
ALTER TABLE GOODS_ISSUE_DOC_DETAIL
  ADD CONSTRAINT FK_GOODS_ISSUE_DOC_DETAIL_GOOD_ISSUE FOREIGN KEY
(GoodsIssueID)
     REFERENCES GOODS_ISSUE(GoodsIssueID)

/*Create DELIVERY_RECEIPT*/
CREATE TABLE [dbo].[DELIVERY_RECEIPT] (
   [DeliveryReceiptID] VARCHAR (15) NOT NULL,
   [ShippingUnitID]    VARCHAR (5)  NOT NULL,
   [GoodsIssueID]       VARCHAR (15) NOT NULL,
   [COD]               INT          NOT NULL,
   [CreateDate]        DATE   NOT NULL,
   [DeliveryDate]      DATE    NULL,
   [Status]         NVARCHAR(10)       NOT NULL,
   CONSTRAINT [PK_DELIVERY_RECEIPT] PRIMARY KEY CLUSTERED
([DeliveryReceiptID] ASC)
);
ALTER TABLE DELIVERY_RECEIPT
  ADD CONSTRAINT FK_DELIVERY_RECEIPT_GOODS_ISSUE FOREIGN KEY
(GoodsIssueID)
     REFERENCES GOODS_ISSUE(GoodsIssueID)
ALTER TABLE DELIVERY_RECEIPT
  ADD CONSTRAINT FK_DELIVERY_RECEIPT_SHIPPING_UNIT FOREIGN KEY
(ShippingUnitID)
     REFERENCES SHIPPING_UNIT(ShippingUnitID)

/*Create GOODS_RETURN*/
CREATE TABLE [dbo].[GOODS_RETURN] (
   [GoodsReturnID] VARCHAR (15)  NOT NULL,
   [GoodsIssueID]  VARCHAR (15)  NOT NULL,
   [CustomerID]    INT           NOT NULL,
   [EmployeeID]    INT           NOT NULL,
   [CreateDate]    DATE          NOT NULL,
   [ReturnStatus]  NVARCHAR (15) NOT NULL,
   [ExchangeType]  NVARCHAR (10) NOT NULL,
   CONSTRAINT [PK_ GOODS_RETURN] PRIMARY KEY CLUSTERED
([GoodsReturnID] ASC)
);
ALTER TABLE GOODS_RETURN
```

```
  ADD CONSTRAINT FK_GOODS_RETURN_CUSTOMER FOREIGN KEY (CustomerID)
     REFERENCES CUSTOMER(CustomerID)
ALTER TABLE GOODS_RETURN
  ADD CONSTRAINT FK_GOODS_GOODS_ISSUE FOREIGN KEY (GoodsIssueID)
     REFERENCES GOODS_ISSUE(GoodsIssueID)
ALTER TABLE GOODS_RETURN
  ADD CONSTRAINT FK_GOODS_RETURN_EMPLOYEES FOREIGN KEY (EmployeeID)
     REFERENCES EMPLOYEE(EmployeeID)

/*Create GOODS_RETURN_DETAIL*/
CREATE TABLE [dbo].[GOODS_RETURN_DETAIL] (
   [GoodsReturnID] VARCHAR (15)   NOT NULL,
   [ProductID]     VARCHAR (10)   NOT NULL,
   [Quantity]      INT        NOT NULL,
   [Unit]          NVARCHAR (10) NOT NULL,
   [SubTotalPrice] INT            NOT NULL,
   [Reason]        NVARCHAR (50)  NOT NULL,
   CONSTRAINT [PK_GOODS_RETURN_DETAILS] PRIMARY KEY CLUSTERED
([GoodsReturnID] ASC, [ProductID] ASC)
);
ALTER TABLE GOODS_RETURN_DETAIL
  ADD CONSTRAINT FK_GOODS_RETURN_DETAIL_GOODS_RETURN FOREIGN KEY
(GoodsReturnID)
     REFERENCES GOODS_RETURN(GoodsReturnID)
ALTER TABLE GOODS_RETURN_DETAIL
  ADD CONSTRAINT FK_GOODS_RETURN_DETAIL_PRODUCT FOREIGN KEY
(ProductID)
     REFERENCES PRODUCT(ProductID)

/*Create GOODS_EXCHANGE*/
CREATE TABLE [dbo].[GOODS_EXCHANGE] (
   [G_GoodsReturnID] VARCHAR (15)  NOT NULL,
   [GoodsExchangeID] VARCHAR (10)  NOT NULL,
   [Unit]            NVARCHAR (10) NOT NULL,
   [Quantity]        INT       NOT NULL,
   CONSTRAINT [PK_GOODS_EXCHANGE] PRIMARY KEY CLUSTERED
([G_GoodsReturnID] ASC)
);
ALTER TABLE GOODS_EXCHANGE
   ADD CONSTRAINT FK_GOODS_EXCHANGE_GOODS_RETURN FOREIGN KEY
(G_GoodsReturnID)
   REFERENCES GOODS_RETURN (GoodsReturnID)
ALTER TABLE GOODS_EXCHANGE
    ADD CONSTRAINT FK_PRODUCT_GOODS_RETURN FOREIGN KEY
(GoodsExchangeID)
    REFERENCES PRODUCT(ProductID)

/*Create PAYMENT_RETURN*/
```

```sql
CREATE TABLE [dbo].[PAYMENT_RETURN] (
   [P_GoodsReturnID] VARCHAR (15)  NOT NULL,
   [ReturnAmount] INT  NOT NULL
   CONSTRAINT [PK_PAYMENT_STATUS] PRIMARY KEY CLUSTERED
([P_GoodsReturnID] ASC)
);
ALTER TABLE PAYMENT_RETURN
   ADD CONSTRAINT FK_PAYMENT_RETURN_GOODS_RETURN FOREIGN KEY
(P_GoodsReturnID)
   REFERENCES GOODS_RETURN (GoodsReturnID)
```

## 6.3. Database Diagram

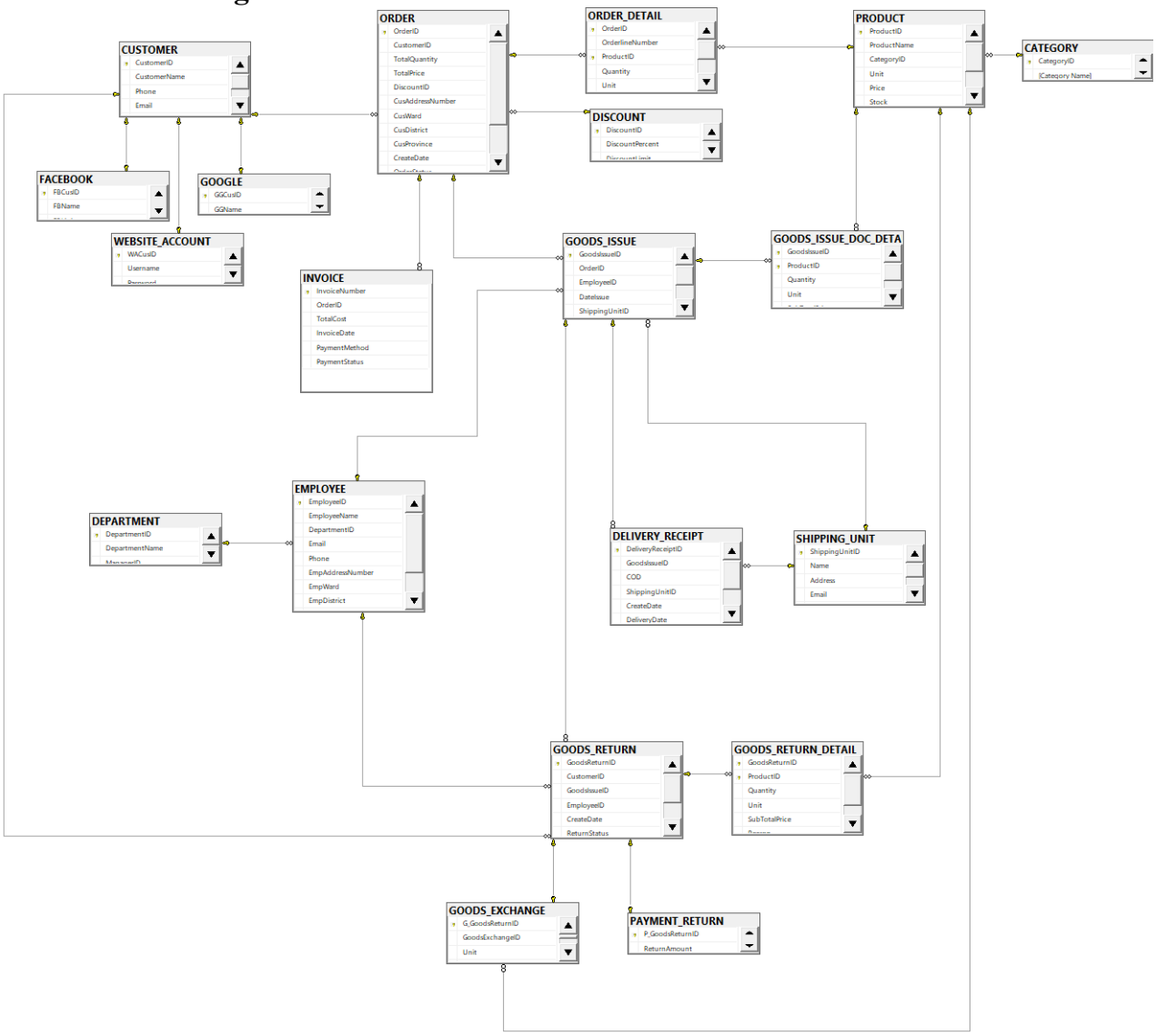



*Figure 6. 1 Database Diagram*

## 6.4. Input data

| | CustomerID | CustomerName | Phone | Email | LoginType |
|---|---|---|---|---|---|
| 1 | 10001 | Phạm Thuỳ Trang | 0336869819 | trangpt20402@st.uel.edu.vn | WA |
| 2 | 10002 | Nguyễn Thị Tuyết Ngân | 0902383796 | ngannt21405@st.uel.edu.vn | FB |
| 3 | 10003 | Nguyễn Doanh Doanh | 0971873382 | doanhnd19404a@st.uel.edu.vn | GG |
| 4 | 10004 | Lê Nhất Duyên | 0348718838 | duyenln214021c@st.uel.edu.vn | WA |
| 5 | 10005 | Nguyễn Thị Thanh Thương | 0326503532 | thuongntt20401@st.uel.edu.vn | FB |
| 6 | 10006 | Dụng Nữ Kim Oanh | 0947224683 | oanhdnk21404a@st.uel.edu.vn | GG |
| 7 | 10007 | Ngô Thị Mai Linh | 0948506607 | linhntm21408ca@st.uel.edu.vn | WA |
| 8 | 10008 | Lương Đặng Diễm Quỳnh | 0772730427 | quynhldd20408c@st.uel.edu.vn | FB |
| 9 | 10009 | Nguyễn Lê Hồng Loan | 0337691294 | loannlh20402@st.uel.edu.vn | GG |
| 10 | 10010 | Tiền Tiểu Vân | 0814224639 | vantt21410@st.uel.edu.vn | WA |
| 11 | 10011 | Nguyễn Thị Xuân Mai | 0898198462 | maintx20408@st.uel.edu.vn | FB |
| 12 | 10012 | Lê Nguyễn Phương Trâm | 0366155170 | tramlnp19404a@st.uel.edu.vn | GG |
| 13 | 10013 | Lưu Vũ Bảo | 0985640024 | baolv21401c@st.uel.edu.vn | WA |
| 14 | 10014 | Hoàng Trần Thế Phúc | 0974604472 | phuchtt21416c@st.uel.edu.vn | FB |
| 15 | 10015 | Bùi Thị Ái Vy | 0337011677 | vybta20402@st.uel.edu.vn | GG |
| 16 | 10016 | Đặng Nguyễn Tuyết Trân | 0562508233 | trandnt21406@st.uel.edu.vn | WA |
| 17 | 10017 | Nguyễn Kim Khôi Nguyên | 0946140758 | nguyennkk21502c@st.uel.edu.vn | FB |
| 18 | 10018 | Lê Ngọc Thuỳ Trâm | 0586193406 | tramlnt19403c@st.uel.edu.vn | GG |
| 19 | 10019 | Đào Ngọc Ánh | 0382058650 | anhdn20402@st.uel.edu.vn | WA |
| 20 | 10020 | Mai Thị Hồng Trinh | 0365249426 | trinhmth19404b@st.uel.edu.vn | FB |
| 21 | 10021 | Nguyễn Ngọc Minh Thanh | 0769822719 | thanhnnm19404a@st.uel.edu.vn | GG |

*Figure 6. 2 CUSTOMER table*

| | WACusID | Username | Password |
|---|---|---|---|
| 1 | 10001 | PhamThuyTrang23 | E%Vf?T6 |
| 2 | 10004 | LeNhatDuyen56 | UybyGcS> |
| 3 | 10007 | NgoThiMaiLinh734 | $>eS&S-k |
| 4 | 10010 | TienTieuVan567 | van567 |
| 5 | 10013 | LuuVuBao223 | U&&YUNd |
| 6 | 10016 | NguyenTuyetTran56 | Az9+yx=[ |
| 7 | 10019 | DaoNgocAnh43 | g}F<s%dq |
| 8 | 10022 | NguyenNhuQuynh89 | }6-z@*Bp |
| 9 | 10025 | NguyenDieuLinh56 | 02vRa`w |

*Figure 6. 3 WEBSITE_ACCOUNT table*

| | FBCusID | FBName | FBLink |
|---|---|---|---|
| 1 | 10002 | Nguyen Thi Tuyet Ngan | https://www.facebook.com/nguyenthituyetngan |
| 2 | 10005 | Nguyen Thi Thanh Thuong | https://www.facebook.com/nguyenthithanhthuong |
| 3 | 10008 | Luong Dang Diem Quynh | https://www.facebook.com/luongdangdiemquynh |
| 4 | 10011 | Nguyen Thi Xuan Mai | https://www.facebook.com/nguyenthixuanmai |
| 5 | 10014 | Hoang Tran The Phuc | https://www.facebook.com/hoangtranthephuc |
| 6 | 10017 | Nguyen Kim Khoi Nguyen | https://www.facebook.com/nguyenkimkhoinguyen |
| 7 | 10020 | Mai Thi Hong Trinh | https://www.facebook.com/maithihongtrinh |
| 8 | 10023 | Thuong Pham Uyen Thu | https://www.facebook.com/thuongphamuyenthu |

*Figure 6. 4 FACEBOOK table*

| | GGCusID | GGName |
|---|---|---|
| 1 | 10003 | Nguyễn Doanh Doanh |
| 2 | 10006 | Dụng Nữ Kim Oanh |
| 3 | 10009 | Nguyễn Lê Hồng Loan |
| 4 | 10012 | Lê Nguyễn Phương Trâm |
| 5 | 10015 | Bùi Thị Ái Vy |
| 6 | 10018 | Lê Ngọc Thuỳ Trâm |
| 7 | 10021 | Nguyễn Ngọc Minh Thanh |
| 8 | 10024 | Trần Tố Trân |

*Figure 6. 5 GOOGLE table*

| | DepartmentID | DepartmentName | ManagerID |
|---|---|---|---|
| 1 | CU | Quan hệ khách hàng | 15197 |
| 2 | DE | Phân phối | 23163 |
| 3 | FA | Kế toán – Tài chính | 10796 |
| 4 | HR | Nhân sự | 1028 |
| 5 | MA | Marketing | 15214 |
| 6 | SA | Kinh doanh | 1433 |
| 7 | WH | Quản lý kho | 2413 |

*Figure 6. 6 DEPARTMENT table*

| | Emp… | D… | EmployeeName | Email | Phone | Empl… | EmpAd… | Emp… | EmpDistrict | EmpProvince |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1028 | HR | Lê Châu Anh | ngochab21409c@s… | 0355261479 | Quản lý | 28 Nguyễn… | Phường… | Quận 12 | Thành phố Hồ Chí Minh |
| 2 | 1235 | HR | Huỳnh Phương Nghi | nghihp194022c@s… | 0985640024 | Nhân vi… | 48 Nguyễn… | Phường… | Quận 2 | Thành phố Hồ Chí Minh |
| 3 | 1433 | SA | Phạm Thị Ánh Hồng | hongpta21405c@s… | 0948506607 | Quản lý | 43 Lê Lợi | Phường… | Quận 1 | Cần Thơ |
| 4 | 2025 | FA | Đỗ Tường Vy | vydt21408@st.ue… | 0325370506 | Nhân vi… | 21 Nguyễn… | Phường… | Quận 4 | Cần Thơ |
| 5 | 2278 | SA | Lưu Như Quỳnh | quynhln19402@st… | 0929592081 | Nhân vi… | 16 Nguyễn… | Phường… | Quận 4 | Hải Phòng |
| 6 | 2413 | WH | Nguyễn Hoàng Phư… | nghilt19411@st.… | 0942816071 | Quản lý | 39 Nguyễn… | Phường… | Quận 12 | Hà Nội |
| 7 | 3722 | FA | Nguyễn Trần Anh … | thunta21402@st.… | 0917104581 | Nhân vi… | 23 Lê Lợi | Phường… | Quận 9 | Đà Nẵng |
| 8 | 3891 | HR | Nguyễn Tiến Thành | thanhnt21401@st… | 0868325357 | Nhân vi… | 13 Nguyễn… | Phường… | Quận 3 | Hà Nội |
| 9 | 3901 | SA | Lê Thị Hồng Gấm | gamlth21408@st.… | 0916385612 | Nhân vi… | 9 Lê Lợi | Phường… | Quận 2 | Đà Nẵng |
| 1… | 4825 | FA | Phan Thị Ngọc Qu… | quynhptn194081c… | 0946799558 | Nhân vi… | 34 Nguyễn… | Phường… | Quận 4 | Thành phố Hồ Chí Minh |
| 1… | 4861 | MA | Đinh Thị Mỹ Hạnh | hanhdtm21408@st… | 0356410574 | Nhân vi… | 45 Lê Lợi | Phường… | Quận 9 | Đà Nẵng |
| 1… | 5504 | DE | Trần Ngọc Thức | thuctn204022c@s… | 0918338437 | Nhân vi… | 26 Nguyễn… | Phường… | Quận 6 | Cần Thơ |
| 1… | 5824 | DE | Lê Tấn Thành | thanhlt21408@st… | 0823956277 | Nhân vi… | 1 Nguyễn … | Phường… | Quận 4 | Đà Nẵng |
| 1… | 7596 | DE | Nguyễn Tiến Khoa | khoant21408@st.… | 0767480064 | Nhân vi… | 46 Nguyễn… | Phường… | Quận 5 | Đà Nẵng |
| 1… | 8049 | FA | Phạm Thị Mỹ Sương | suongptm20402@s… | 0772730427 | Nhân vi… | 23 Lê Lợi | Phường… | Quận 12 | Hà Nội |
| 1… | 9153 | WH | Tô Thị Hồng Nhung | nhungtth19408@s… | 0384079702 | Nhân vi… | 44 Lê Lợi | Phường… | Quận 1 | Thành phố Hồ Chí Minh |
| 1… | 9775 | CU | Nguyễn Trần Tiến | tiennt214082@st… | 0775112457 | Nhân vi… | 4 Lê Lợi | Phường… | Quận 7 | Hải Phòng |
| 1… | 10197 | DE | Phan Bá Việt | vietpb194022c@s… | 0814942339 | Nhân vi… | 28 Lê Lợi | Phường… | Quận 4 | Hà Nội |
| 1… | 10767 | WH | Trần Nguyễn Than… | Thutnt21405@st.… | 967799421 | Nhân vi… | 10 Lê Lợi | Phường… | Thủ Đức | Cần Thơ |
| 2… | 10796 | FA | Nguyễn Bảo An Nh… | thaontp21409c@s… | 0961744629 | Quản lý | 25 Nguyễn… | Phường… | Quận 10 | Hà Nội |
| 2… | 11141 | HR | Nguyễn Đoàn Vân … | quynhndv20409@s… | 0818391539 | Nhân vi… | 40 Lê Lợi | Phường… | Quận 8 | Hải Phòng |
| 2… | 12947 | MA | Lê Khánh Trình | trinhlk20408ca@… | 0937280522 | Nhân vi… | 21 Nguyễn… | Phường… | Quận 9 | Đà Nẵng |
| 2… | 12981 | HR | La Dĩ Khang | khangld21408@st… | 0796949743 | Nhân vi… | 18 Nguyễn… | Phường… | Thủ Đức | Cần Thơ |
| 2… | 14066 | FA | Vũ Anh Khôi | khoiva21408@st.… | 0961404419 | Nhân vi… | 26 Lê Lợi | Phường… | Bình Tân | Hải Phòng |
| 2… | 14404 | CU | Nguyễn Ngọc Huy | huynn21405@st.u… | 0339446162 | Nhân vi… | 25 Nguyễn… | Phường… | Quận 11 | Thành phố Hồ Chí Minh |
| 2… | 14638 | SA | Nguyễn Hồng Ánh | anhnh20408@st.u… | 0898198462 | Nhân vi… | 49 Lê Lợi | Phường… | Thủ Đức | Hà Nội |
| 2… | 15197 | CU | Phạm Thị Anh Thư | nhatpm19411@st.… | 0769822719 | Quản lý | 13 Nguyễn… | Phường… | Bình Tân | Cần Thơ |
| 2… | 15214 | MA | Phan Nguyễn Than… | hangpnt21405ca@… | 0971873382 | Quản lý | 37 Lê Lợi | Phường… | Quận 6 | Thành phố Hồ Chí Minh |
| 2… | 16808 | CU | Phạm Thị Quế Anh | anhptq21408@st.… | 0563238862 | Nhân vi… | 20 Nguyễn… | Phường… | Quận 12 | Thành phố Hồ Chí Minh |
| 3… | 17492 | DE | Ngô Lê Đại Phát | phatnld21401@st… | 0971119370 | Nhân vi… | 6 Nguyễn … | Phường… | Quận 10 | Hải Phòng |
| 3… | 17527 | FA | Nguyễn Thị Khánh… | linhntk21405@st… | 0345139211 | Nhân vi… | 5 Nguyễn … | Phường… | Quận 6 | Đà Nẵng |

*Figure 6. 7 EMPLOYEE table*

| | ShippingUnitID | Name | Address | Email | Phone |
|---|---|---|---|---|---|
| 1 | GHTK | Giao hàng tiết kiệm | Tòa nhà VTV số 8… | cskh.ghtk@gmail… | 19006092 |
| 2 | VNP | Bưu điện Việt Nam | Số 05 đường Phạm… | cskh.vnpost@gma… | 1900545481 |
| 3 | VP | Viettel Post | Toà nhà Viettel … | cskh.viettelpos… | 19008095 |

*Figure 6. 8 SHIPPING_UNIT table*

| | CategoryID | CategoryName |
|---|---|---|
| 1 | BU | Bún |
| 2 | GA | Gạo |
| 3 | HA | Các loại hạt |
| 4 | MY | Mỳ |
| 5 | SK | Thực phẩm sấy khô |

*Figure 6. 9 CATEGORY table*

| | DiscountID | DiscountPercent | DiscountLimit |
|---|---|---|---|
| 1 | BF01 | 20 | 20000 |
| 2 | BF02 | 30 | 40000 |
| 3 | BF03 | 50 | 40000 |
| 4 | S111101 | 10 | 20000 |
| 5 | S111102 | 20 | 40000 |
| 6 | TET01 | 15 | 40000 |
| 7 | TET02 | 20 | 20000 |

*Figure 6. 10 DISCOUNT table*

| | ProductID | CategoryID | ProductName | Barcode | Unit | Price | Stock | ProductSt… |
|---|---|---|---|---|---|---|---|---|
| 1 | BC024 | BU | Bún Cẩm | 4567890336 | Gói | 50000 | 55 | InStock |
| 2 | BCN021 | BU | Bún Chùm Ngây | 4567890305 | Gói | 50000 | 38 | InStock |
| 3 | BG018 | BU | Bún Gấc | 4567890275 | Gói | 40000 | 27 | InStock |
| 4 | BGD019 | BU | Bún Gạo Lứt Đỏ | 4567890282 | Gói | 50000 | 0 | Outstock |
| 5 | BGD020 | BU | Bún Gạo Lứt Đen | 4567890299 | Gói | 65000 | 30 | InStock |
| 6 | BHGL022 | BU | Bún Hoa Gạo Lứt | 4567890312 | Gói | 55000 | 40 | InStock |
| 7 | BKR009 | HA | Bánh Kẹp Rong Bi… | 4567890190 | Gói | 100000 | 25 | InStock |
| 8 | BN016 | BU | Bún Ngô | 4567890251 | Gói | 40000 | 10 | InStock |
| 9 | BRC017 | BU | Bún Rau Củ | 4567890268 | Gói | 40000 | 94 | InStock |
| 1… | BDB023 | BU | Bún Đậu Biếc | 4567890329 | Gói | 50000 | 70 | InStock |
| 1… | CDS007 | SK | Chanh Dây Sấy Dẻo | 4567890183 | Gói | 25000 | 50 | InStock |
| 1… | CS004 | SK | Cam Sấy Dẻo | 4567890152 | Gói | 25000 | 40 | InStock |
| 1… | DDS006 | SK | Dứa Sấy Dẻo | 4567890176 | Gói | 30000 | 60 | InStock |
| 1… | DS001 | SK | Dừa Sấy Giòn | 4567890121 | Gói | 30000 | 20 | InStock |
| 1… | GLDD030 | GA | Gạo Lứt Dẻo Điện… | 4567890398 | Gói | 90000 | 0 | Outstock |
| 1… | GLTT029 | GA | Gạo lứt tím than | 4567890381 | Gói | 80000 | 140 | InStock |
| 1… | GNC012 | HA | Granola Ngũ Cốc | 4567890220 | Gói | 130000 | 75 | InStock |
| 1… | HDD015 | HA | Hạt Dinh Dưỡng | 4567890244 | Gói | 200000 | 90 | InStock |
| 1… | HM010 | HA | Hạt Macca | 4567890206 | Gói | 250000 | 35 | InStock |
| 2… | HRB005 | HA | Hạnh Nhân Rang Bơ | 4567890169 | Lon | 150000 | 100 | InStock |
| 2… | MCG025 | MY | Mì Chũ Gạo Lứt | 4567890343 | Gói | 70000 | 30 | InStock |
| 2… | MCR3V026 | MY | Mì Chũ Rau Củ 3 … | 4567890350 | Gói | 70000 | 25 | InStock |
| 2… | MCR5&8027 | MY | Mì Chũ Rau Củ 5 … | 4567890367 | Gói | 70000 | 10 | InStock |
| 2… | MCR5V028 | MY | Mì Chũ Rau Củ 5 … | 4567890374 | Gói | 70000 | 200 | InStock |
| 2… | MS002 | SK | Mít Sấy Giòn | 4567890138 | Gói | 25000 | 90 | InStock |
| 2… | TGLCBRB011 | HA | Thanh Gạo Lứt Ch… | 4567890213 | Thanh | 100000 | 0 | Outstock |
| 2… | XS003 | SK | Xoài Sấy Dẻo | 4567890145 | Gói | 25000 | 50 | InStock |
| 2… | YMCM014 | HA | Yến Mạch Cán Mỏng | 4567890237 | Gói | 80000 | 100 | InStock |

*Figure 6. 11 PRODUCT table*

| | OrderID | Custo… | | TotalP… | Di… | O… | Create… | CusA… | CusW… | CusD… | CusProvin… | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2020-118983 | 10007 | 9 | 360000 | NULL | CO | 2020-12-14 | 19 Nguy… | Phường 5 | Quận 2 | Thành phố Hồ … | Đừng để mẹ em… |
| 2 | 2020-135545 | 10012 | 3 | 150000 | NULL | RE | 2020-04-18 | 11 Lê L… | Phường 2 | Quận 2 | Hà Nội | Giao hàng sau… |
| 3 | 2020-150630 | 10015 | 14 | 920000 | NULL | RE | 2020-10-13 | 29 Lê L… | Phường 8 | Bình Tân | Đà Nẵng | Nếu mưa, hãy … |
| 4 | 2020-164175 | 10013 | 1 | 30000 | NULL | CO | 2020-04-18 | 20 Nguy… | Phường 1 | Bình Tân | Thành phố Hồ … | Đừng để mẹ em… |
| 5 | 2021-101343 | 10020 | 2 | 50000 | NULL | CO | 2021-09-18 | 13 Lê L… | Phường 2 | Quận 5 | Hải Phòng | Giao hàng vào… |
| 6 | 2021-114440 | 10018 | 3 | 600000 | NULL | CO | 2021-06-17 | 4 Lê Lợi | Phường … | Quận 5 | Cần Thơ | Đừng để mẹ em… |
| 7 | 2021-139619 | 10021 | 2 | 200000 | NULL | CO | 2021-09-18 | 38 Nguy… | Phường … | Quận 2 | Hải Phòng | Đừng đặt hàng… |
| 8 | 2022-106376 | 10014 | 2 | 50000 | NULL | CO | 2022-12-11 | 40 Lê L… | Phường … | Quận 9 | Cần Thơ | NULL |
| 9 | 2022-107727 | 10016 | 13 | 2000000 | BF01 | CO | 2022-11-24 | 32 Nguy… | Phường … | Quận 6 | Thành phố Hồ … | Tránh giao hà… |
| 1… | 2022-111682 | 10011 | 5 | 200000 | NULL | RE | 2022-04-18 | 5 Nguyễ… | Phường … | Quận 11 | Đà Nẵng | Giao trước 10h |
| 1… | 2022-117415 | 10018 | 15 | 805000 | NULL | CO | 2022-09-05 | 19 Nguy… | Phường … | Quận 9 | Cần Thơ | Giao hàng vào… |
| 1… | 2022-117590 | 10017 | 9 | 360000 | NULL | RE | 2022-10-13 | 25 Nguy… | Phường … | Quận 4 | Hà Nội | Chỉ giao hàng… |
| 1… | 2022-121755 | 10014 | 2 | 50000 | NULL | CO | 2022-10-13 | 41 Lê L… | Phường … | Thủ Đức | Thành phố Hồ … | Yêu cầu xác n… |
| 1… | 2022-137330 | 10011 | 3 | 80000 | NULL | CO | 2022-06-26 | 12 Lê L… | Phường 8 | Bình Tân | Hải Phòng | Nhẹ nhàng đặt… |
| 1… | 2023-105816 | 10020 | 3 | 120000 | NULL | PR0 | 2023-10-18 | 24 Nguy… | Phường 4 | Bình Tân | Hà Nội | Giao cho mẹ em |
| 1… | 2023-105893 | 10008 | 15 | 805000 | NULL | CO | 2023-09-16 | 38 Lê L… | Phường 6 | Quận 8 | Hải Phòng | Giao hàng sau… |
| 1… | 2023-106075 | 10017 | 2 | 50000 | NULL | PR0 | 2023-10-13 | 31 Nguy… | Phường … | Quận 4 | Hải Phòng | Giao hàng sau… |
| 1… | 2023-106320 | 10013 | 1 | 30000 | NULL | RE | 2023-10-14 | 2 Nguyễ… | Phường 2 | Quận 12 | Cần Thơ | Yêu cầu giao … |
| 1… | 2023-108966 | 10003 | 1 | 30000 | NULL | PR1 | 2023-10-17 | 39 Nguy… | Phường 8 | Quận 6 | Hải Phòng | Giao hàng sau… |
| 2… | 2023-114412 | 10005 | 14 | 920000 | NULL | CO | 2023-03-25 | 18 Nguy… | Phường … | Quận 2 | Hải Phòng | NULL |
| 2… | 2023-115742 | 10025 | 6 | 240000 | NULL | PR1 | 2023-10-19 | 41 Nguy… | Phường … | Quận 4 | Đà Nẵng | Giao hàng sau… |
| 2… | 2023-115812 | 10004 | 2 | 50000 | NULL | PR0 | 2023-10-16 | 28 Nguy… | Phường 9 | Quận 3 | Đà Nẵng | Giao cho mẹ em |
| 2… | 2023-118255 | 10022 | 4 | 520000 | NULL | CO | 2023-05-15 | 43 Nguy… | Phường … | Quận 9 | Hà Nội | Hãy cẩn thận … |
| 2… | 2023-119823 | 10015 | 3 | 75000 | NULL | PR1 | 2023-10-12 | 41 Lê L… | Phường 9 | Quận 5 | Hải Phòng | Đừng gọi lúc … |
| 2… | 2023-120999 | 10019 | 12 | 635000 | NULL | CO | 2023-09-18 | 12 Nguy… | Phường 2 | Quận 6 | Hải Phòng | Giao hàng tại… |
| 2… | 2023-138688 | 10002 | 8 | 575000 | NULL | CO | 2023-06-05 | 34 Nguy… | Phường 9 | Quận 8 | Cần Thơ | Giao trước 10h |
| 2… | 2023-143336 | 10010 | 2 | 50000 | NULL | PR0 | 2023-10-17 | 29 Lê L… | Phường … | Quận 4 | Hải Phòng | Giao hàng sau… |
| 2… | 2023-146703 | 10023 | 5 | 400000 | NULL | WA | 2023-10-20 | 28 Lê L… | Phường 9 | Quận 10 | Đà Nẵng | NULL |
| 2… | 2023-152156 | 10001 | 3 | 80000 | TET01 | CO | 2023-01-15 | 50 Nguy… | Phường … | Quận 7 | Thành phố Hồ … | Giao trước 10h |
| 3… | 2023-156909 | 10012 | 8 | 575000 | NULL | RE | 2023-10-10 | 34 Nguy… | Phường 1 | Thủ Đức | Hải Phòng | Gọi tôi 15 ph… |
| 3… | 2023-161389 | 10006 | 13 | 2000000 | NULL | RE | 2023-10-10 | 33 Nguy… | Phường 9 | Quận 12 | Hải Phòng | NULL |

*Figure 6. 12 ORDER table*

| | OrderID | ProductID | OrderlineN… | Quant… | Price | Unit | SubTotalPri… |
|---|---|---|---|---|---|---|---|
| 1 | 2020-118983 | BN016 | 1 | 6 | 40000 | Gói | 240000 |
| 2 | 2020-118983 | BRC017 | 2 | 3 | 40000 | Gói | 120000 |
| 3 | 2020-135545 | BGD019 | 1 | 3 | 50000 | Gói | 150000 |
| 4 | 2020-150630 | CS004 | 2 | 5 | 25000 | Gói | 125000 |
| 5 | 2020-150630 | GNC012 | 4 | 4 | 130000 | Gói | 520000 |
| 6 | 2020-150630 | TGLCBRB011 | 3 | 2 | 100000 | Thanh | 200000 |
| 7 | 2020-150630 | XS003 | 1 | 3 | 25000 | Gói | 75000 |
| 8 | 2020-164175 | DS001 | 1 | 1 | 30000 | Gói | 30000 |
| 9 | 2021-101343 | MS002 | 1 | 2 | 25000 | Gói | 50000 |
| 1… | 2021-114440 | HDD015 | 1 | 3 | 200000 | Hộp | 600000 |
| 1… | 2021-139619 | TGLCBRB011 | 1 | 2 | 100000 | Thanh | 200000 |
| 1… | 2022-106376 | MS002 | 1 | 2 | 25000 | Gói | 50000 |
| 1… | 2022-107727 | HDD015 | 2 | 8 | 200000 | Gói | 1600000 |
| 1… | 2022-107727 | YMCM014 | 1 | 5 | 80000 | Gói | 400000 |
| 1… | 2022-111682 | BG018 | 1 | 5 | 40000 | Gói | 200000 |
| 1… | 2022-117415 | BG018 | 1 | 5 | 40000 | Gói | 200000 |

*Figure 6. 13 ORDER_DETAIL table*

| | InvoiceNumb… | OrderID | InvoiceDate | TotalCost | PaymentMethod | PaymentStatus |
|---|---|---|---|---|---|---|
| 1 | INV-334259 | 2022-106376 | 2022-12-11 | 50000 | Transfer | Đã thanh toán |
| 2 | INV-342704 | 2020-164175 | 2020-04-18 | 30000 | Transfer | Đã thanh toán |
| 3 | INV-366944 | 2023-146703 | 2023-10-20 | 400000 | Transfer | Đã thanh toán |
| 4 | INV-368341 | 2023-118255 | 2023-05-15 | 520000 | COD | Đã thanh toán |
| 5 | INV-375072 | 2020-135545 | 2020-04-18 | 150000 | Transfer | Đã thanh toán |
| 6 | INV-492196 | 2023-105816 | 2023-10-18 | 120000 | COD | Chưa thanh toán |
| 7 | INV-644053 | 2022-111682 | 2022-04-18 | 200000 | Transfer | Đã thanh toán |
| 8 | INV-925509 | 2023-169194 | 2023-10-13 | 1600000 | COD | Đã thanh toán |
| 9 | INV-944251 | 2023-115742 | 2023-10-19 | 240000 | Transfer | Đã thanh toán |
| 1… | INV-987909 | 2023-152156 | 2023-01-15 | 68000 | COD | Đã thanh toán |
| 1… | IVN-102128 | 2023-105893 | 2023-09-16 | 805000 | COD | Đã thanh toán |
| 1… | IVN-273913 | 2022-117415 | 2022-09-05 | 805000 | Transfer | Đã thanh toán |
| 1… | IVN-316461 | 2023-156909 | 2023-10-10 | 575000 | Transfer | Đã thanh toán |
| 1… | IVN-325422 | 2023-115812 | 2023-10-16 | 50000 | COD | Chưa thanh toán |
| 1… | IVN-395789 | 2023-106320 | 2023-10-14 | 30000 | Transfer | Đã thanh toán |
| 1… | IVN-404386 | 2023-108966 | 2023-10-17 | 30000 | Transfer | Đã thanh toán |
| 1… | IVN-414837 | 2023-143336 | 2023-10-17 | 50000 | COD | Chưa thanh toán |
| 1… | IVN-427201 | 2023-161389 | 2023-01-19 | 2000000 | COD | Đã thanh toán |
| 1… | IVN-438322 | 2022-121755 | 2022-10-13 | 50000 | COD | Đã thanh toán |
| 2… | IVN-517860 | 2021-114440 | 2021-06-17 | 600000 | Transfer | Đã thanh toán |
| 2… | IVN-531497 | 2023-106075 | 2023-10-13 | 50000 | COD | Chưa thanh toán |

*Figure 6. 14 INVOICE table*

| | GoodsIs… | OrderID | EmployeeID | DateIssue | Sh… |
|---|---|---|---|---|---|
| 1 | GID-1000 | 2023-152156 | 9153 | 2023-01-16 | GHTK |
| 2 | GID-1001 | 2023-138688 | 17644 | 2023-06-05 | VP |
| 3 | GID-1002 | 2023-108966 | 23853 | 2023-10-17 | VNP |
| 4 | GID-1003 | 2023-115812 | 9153 | 2023-10-16 | GHTK |
| 5 | GID-1004 | 2023-114412 | 17644 | 2023-03-25 | VP |
| 6 | GID-1005 | 2023-161389 | 23853 | 2023-10-11 | VNP |
| 7 | GID-1006 | 2020-118983 | 18060 | 2020-12-14 | GHTK |
| 8 | GID-1007 | 2023-105893 | 20761 | 2023-09-16 | VP |
| 9 | GID-1008 | 2023-167164 | 10767 | 2023-10-16 | VNP |
| 1… | GID-1009 | 2023-143336 | 18060 | 2023-10-17 | VP |
| 1… | GID-1010 | 2022-137330 | 20761 | 2022-06-26 | VNP |
| 1… | GID-1011 | 2023-156909 | 10767 | 2023-10-10 | GHTK |
| 1… | GID-1012 | 2023-106320 | 9153 | 2023-10-15 | VP |
| 1… | GID-1013 | 2022-121755 | 9153 | 2022-10-14 | VNP |
| 1… | GID-1014 | 2020-150630 | 17644 | 2020-10-15 | GHTK |
| 1… | GID-1015 | 2022-107727 | 23853 | 2022-11-25 | VP |

*Figure 6. 15 GOODS_ISSUE table*

| | GoodsIssueID | ProductID | Quantity | Unit | SubTotalPrice | WarehouseName |
|---|---|---|---|---|---|---|
| 1 | GID-1000 | DS001 | 1 | Gói | 30000 | Tây Nguyên Food Q12 |
| 2 | GID-1000 | MS002 | 2 | Gói | 50000 | Tây Nguyên Food Q12 |
| 3 | GID-1001 | CS004 | 2 | Gói | 50000 | Tây Nguyên Food Q12 |
| 4 | GID-1001 | HRB005 | 3 | Hộp | 450000 | Tây Nguyên Food Q12 |
| 5 | GID-1001 | XS003 | 3 | Gói | 75000 | Tây Nguyên Food Q12 |
| 6 | GID-1002 | DS001 | 1 | Gói | 30000 | Tây Nguyên Food Q12 |
| 7 | GID-1003 | MS002 | 2 | Gói | 50000 | Tây Nguyên Food Q12 |
| 8 | GID-1004 | CS004 | 5 | Gói | 125000 | Tây Nguyên Food Q12 |
| 9 | GID-1004 | GNC012 | 4 | Gói | 520000 | Tây Nguyên Food Q12 |
| 1… | GID-1004 | TGLCBRB011 | 2 | Thanh | 200000 | Tây Nguyên Food Q12 |
| 1… | GID-1004 | XS003 | 3 | Gói | 75000 | Tây Nguyên Food Q12 |
| 1… | GID-1005 | HDD015 | 8 | Gói | 1600000 | Tây Nguyên Food Q12 |
| 1… | GID-1005 | YMCM014 | 5 | Gói | 400000 | Tây Nguyên Food Q12 |
| 1… | GID-1006 | BN016 | 6 | Gói | 240000 | Tây Nguyên Food Q12 |
| 1… | GID-1006 | BRC017 | 3 | Gói | 120000 | Tây Nguyên Food Q12 |
| 1… | GID-1007 | BG018 | 5 | Gói | 200000 | Tây Nguyên Food Q12 |
| 1… | GID-1007 | BGD019 | 3 | Gói | 150000 | Tây Nguyên Food Q12 |

*Figure 6. 16 GOODS_ISSUE_DETAIL table*

| | Deliver… | ShippingUn… | GoodsIssue… | COD | Cr… | DeliveryD… | Status |
|---|---|---|---|---|---|---|---|
| 1 | 10000193 | VNP | GID-1030 | 0 | 2023-… | NULL | Đang giao |
| 2 | 10000240 | VNP | GID-1002 | 0 | 2023-… | NULL | Đang giao |
| 3 | 10000246 | VP | GID-1021 | 520000 | 2023-… | 2023-05-20 | Đã giao |
| 4 | 10000454 | VP | GID-1001 | 0 | 2023-… | 2023-06-11 | Đã giao |
| 5 | 10000577 | GHTK | GID-1003 | 50000 | 2023-… | NULL | Đang giao |
| 6 | 10000760 | VP | GID-1004 | 920000 | 2023-… | 2023-03-28 | Đã giao |
| 7 | 10000940 | VP | GID-1018 | 0 | 2023-… | 2023-09-20 | Đã giao |
| 8 | 10000941 | VP | GID-1067 | 0 | 2023-… | 2023-09-22 | Đã giao |
| 9 | 10001149 | VP | GID-1012 | 0 | 2023-… | 2023-10-18 | Đã giao |
| 1… | 10001159 | VNP | GID-1027 | 0 | 2020-… | 2020-04-25 | Đã giao |
| 1… | 10001218 | VP | GID-1015 | 1980000 | 2022-… | 2022-11-28 | Đã giao |
| 1… | 10001487 | VNP | GID-1005 | 2000000 | 2023-… | 2023-10-13 | Đã giao |
| 1… | 10001539 | VNP | GID-1010 | 80000 | 2022-… | 2022-06-30 | Đã giao |
| 1… | 10001545 | VP | GID-1023 | 1600000 | 2023-… | 2023-10-15 | Đã giao |
| 1… | 10001631 | GHTK | GID-1025 | 0 | 2020-… | NULL | Đang giao |
| 1… | 10001706 | VNP | GID-1016 | 360000 | 2022-… | 2022-10-15 | Đã giao |

*Figure 6. 17 DELIVERY_RECEIPT table*

| | GoodsReturn… | GoodsIssue… | CustomerID | Employee… | CreateDate | ReturnStatus | ExchangeT… |
|---|---|---|---|---|---|---|---|
| 1 | GR2109 | GID-1032 | 10018 | 10767 | 2023-10-20 | Đang xử lý | Đổi hàng |
| 2 | GR2140 | GID-1014 | 10015 | 20902 | 2022-10-19 | Hoàn thành | Hoàn tiền |
| 3 | GR2430 | GID-1005 | 10006 | 23853 | 2023-10-14 | Đang xử lý | Đổi hàng |
| 4 | GR2448 | GID-1011 | 10012 | 19087 | 2023-10-15 | Hoàn thành | Đổi hàng |
| 5 | GR3145 | GID-1023 | 10024 | 20761 | 2023-10-15 | Hoàn thành | Đổi hàng |
| 6 | GR3457 | GID-1283 | 10025 | 23853 | 2023-10-14 | Hoàn thành | Hoàn tiền |
| 7 | GR3459 | GID-1012 | 10013 | 10767 | 2023-10-20 | Đang xử lý | Hoàn tiền |
| 8 | GR4773 | GID-1027 | 10012 | 23729 | 2020-04-26 | Hoàn thành | Hoàn tiền |
| 9 | GR5796 | GID-1016 | 10017 | 18060 | 2022-10-22 | Hoàn thành | Hoàn tiền |
| 1… | GR7585 | GID-1018 | 10019 | 9153 | 2021-09-20 | Hoàn thành | Đổi hàng |
| 1… | GR8647 | GID-1026 | 10011 | 23853 | 2022-04-18 | Hoàn thành | Hoàn tiền |

*Figure 6. 18 GOODS_RETURN table*

| | GoodsReturn… | ProductID | Quantity | Unit | SubTotalPrice | Reason |
|---|---|---|---|---|---|---|
| 1 | GR2109 | HRB005 | 1 | Hộp | 150000 | Giao nhầm hàng |
| 2 | GR2140 | TGLCBRB011 | 2 | Thanh | 200000 | Sản phẩm không đúng … |
| 3 | GR2430 | YMCM014 | 5 | Gói | 400000 | Hết hạn sử dụng |
| 4 | GR2448 | XS003 | 1 | Gói | 25000 | Hết hạn sử dụng |
| 5 | GR3145 | HDD015 | 8 | Gói | 1600000 | Giao nhầm hàng |
| 6 | GR3457 | BHGL022 | 1 | Gói | 55000 | Sản phẩm không đúng … |
| 7 | GR3459 | DS001 | 1 | Gói | 30000 | Thời gian giao hàng … |
| 8 | GR4773 | BGD019 | 3 | Gói | 150000 | Thời gian giao hàng … |
| 9 | GR5796 | BRC017 | 3 | Gói | 120000 | Sản phẩm không đúng … |
| 1… | GR7585 | BĐB023 | 1 | Gói | 50000 | Giao nhầm hàng |
| 1… | GR8647 | BG018 | 2 | Gói | 80000 | Hết hạn sử dụng |

*Figure 6. 19 GOODS_RETURN_DETAIL table*

| | G_GoodsRetu… | GoodsExcha… | Unit | Quantity |
|---|---|---|---|---|
| 1 | GR2109 | HDD015 | Hộp | 1 |
| 2 | GR2430 | YMCM014 | Gói | 5 |
| 3 | GR2448 | XS003 | Gói | 1 |
| 4 | GR3145 | HDD015 | Gói | 8 |
| 5 | GR7585 | MCG025 | Gói | 1 |

*Figure 6. 20 GOODS_EXCHANGE table*

| | P_GoodsRetu… | ReturnAmou… |
|---|---|---|
| 1 | GR2140 | 200000 |
| 2 | GR3457 | 55000 |
| 3 | GR3459 | 30000 |
| 4 | GR4773 | 150000 |
| 5 | GR5796 | 120000 |
| 6 | GR8647 | 80000 |

*Figure 6. 21 PAYMENT_RETURN table*

# Chapter 7. Query

## 7.1. Customer management

**<u>Query 1:</u> Display a list of customers and an order completion rate of 10%, display a "Consider" warning if the order completion rate is below 50%, and sort from high to low.**

```
WITH SUCCESSRATE AS
(
  SELECT
       CUSTOMER.CustomerID,
       (1.0 * (
           SELECT COUNT(*)
           FROM [ORDER]
           WHERE [ORDER].CustomerID = CUSTOMER.CustomerID AND
[ORDER].OrderStatus = 'CO'
       )) /
```

```
        (
            SELECT COUNT(*)
            FROM [ORDER]
            WHERE [ORDER].CustomerID = CUSTOMER.CustomerID
        ) * 100 AS Success_Rate
    FROM CUSTOMER
)
SELECT
    CustomerID,
    Success_Rate,
    CASE
        WHEN Success_Rate < 50 THEN 'Consider'
        ELSE 'Good'
    END AS 'Warning'
FROM SUCCESSRATE
WHERE Success_Rate >= 10
ORDER BY Success_Rate DESC;
```

| | CustomerID | Success_Rate | Warning |
|---|---|---|---|
| 1 | 10001 | 100.000000000000 | Good |
| 2 | 10002 | 100.000000000000 | Good |
| 3 | 10005 | 100.000000000000 | Good |
| 4 | 10007 | 100.000000000000 | Good |
| 5 | 10008 | 100.000000000000 | Good |
| 6 | 10014 | 100.000000000000 | Good |
| 7 | 10016 | 100.000000000000 | Good |
| 8 | 10019 | 100.000000000000 | Good |
| 9 | 10021 | 100.000000000000 | Good |
| 10 | 10022 | 100.000000000000 | Good |
| 11 | 10018 | 66.666666666600 | Good |
| 12 | 10011 | 50.000000000000 | Good |
| 13 | 10013 | 33.333333333300 | Consider |
| 14 | 10020 | 33.333333333300 | Consider |

*Figure 7. 1 Customer Management Result Query 1*

**<u>Query 2:</u> Display loyal customers based on total order value, purchase frequency by year, then rank loyalty by gold, silver, bronze.**

```
WITH customer_orders AS (
 SELECT
   CustomerID,
   SUM(TotalPrice) AS total_order_value,
   COUNT(*) AS order_frequency
 FROM "ORDER"
 WHERE
   YEAR(CreateDate) = 2023
 GROUP BY
   CustomerID
```

```sql
),
customer_ranks AS (
 SELECT
   CustomerID,
   total_order_value,
   order_frequency,
   CASE
     WHEN total_order_value > 1000000 THEN 'gold'
     WHEN total_order_value > 500000 THEN 'silver'
     ELSE 'bronze'
   END AS loyalty_rank
 FROM
   customer_orders
)
SELECT
 c.CustomerName,
 co.total_order_value,
 co.order_frequency,
 co.loyalty_rank
FROM
 CUSTOMER c
JOIN
 customer_ranks co
ON
 c.CustomerID = co.CustomerID
ORDER BY
 co.total_order_value DESC,
 co.order_frequency DESC;
```

| | CustomerName | total_order_value | order_frequency | loyalty_rank |
|---|---|---|---|---|
| 1 | Dụng Nữ Kim Oanh | 2000000 | 1 | gold |
| 2 | Lê Ngọc Thuỳ Trâm | 1600000 | 1 | gold |
| 3 | Trần Tố Trân | 1600000 | 1 | gold |
| 4 | Nguyễn Thị Thanh Thương | 920000 | 1 | silver |
| 5 | Lương Đặng Diễm Quỳnh | 805000 | 1 | silver |
| 6 | Nguyễn Kim Khôi Nguyên | 770000 | 3 | silver |
| 7 | Đào Ngọc Ánh | 635000 | 1 | silver |
| 8 | Nguyễn Lê Hồng Loan | 615000 | 1 | silver |
| 9 | Nguyễn Thị Tuyết Ngân | 575000 | 1 | silver |
| 10 | Lê Nguyễn Phương Trâm | 575000 | 1 | silver |
| 11 | Mai Thị Hồng Trinh | 520000 | 2 | silver |
| 12 | Nguyễn Như Quỳnh | 520000 | 1 | silver |
| 13 | Nguyễn Diệu Linh | 445000 | 2 | bronze |
| 14 | Thượng Phạm Uyên Thư | 400000 | 1 | bronze |
| 15 | Lưu Vũ Bảo | 80000 | 2 | bronze |
| 16 | Phạm Thuỳ Trang | 80000 | 1 | bronze |
| 17 | Bùi Thị Ái Vy | 75000 | 1 | bronze |
| 18 | Lê Nhất Duyên | 50000 | 1 | bronze |
| 19 | Tiền Tiểu Vân | 50000 | 1 | bronze |
| 20 | Nguyễn Doanh Doanh | 30000 | 1 | bronze |

*Figure 7. 2 Customer Management Result Query 2*

## 7.2. Sales management

**<u>Query 1:</u> Write a SQL query to find Issued Order information including OrderID, CreateDate, TotalPrice in order of TotalPrice from high to low and employees being responsible for these orders.**

```sql
SELECT
   o.OrderID,
   o.CreateDate,
   o.TotalPrice,
   e.EmployeeID,
   e.EmployeeName
FROM
   "ORDER" o
JOIN
   GOODS_ISSUE g ON o.OrderID = g.OrderID
JOIN
   EMPLOYEE e ON g.EmployeeID = e.EmployeeID
ORDER BY
   o.TotalPrice DESC
```

| | OrderID | CreateDate | TotalPrice | EmployeeID | EmployeeName |
|---|---|---|---|---|---|
| 1 | 2023-161389 | 2023-10-10 | 2000000 | 23853 | Lê Phương Trang |
| 2 | 2022-107727 | 2022-11-24 | 2000000 | 23853 | Lê Phương Trang |
| 3 | 2023-161389 | 2023-10-10 | 2000000 | 17644 | Phan Nguyễn Da Thảo |
| 4 | 2023-169194 | 2023-10-13 | 1600000 | 20761 | Huỳnh Mỹ Tâm |
| 5 | 2023-169194 | 2023-10-13 | 1600000 | 20761 | Huỳnh Mỹ Tâm |
| 6 | 2020-150630 | 2020-10-13 | 920000 | 17644 | Phan Nguyễn Da Thảo |
| 7 | 2023-114412 | 2023-03-25 | 920000 | 17644 | Phan Nguyễn Da Thảo |
| 8 | 2023-105893 | 2023-09-16 | 805000 | 20761 | Huỳnh Mỹ Tâm |
| 9 | 2022-117415 | 2022-09-05 | 805000 | 20761 | Huỳnh Mỹ Tâm |
| 10 | 2023-120999 | 2023-09-18 | 635000 | 10767 | Trần Nguyễn Thanh Thư |
| 11 | 2023-120999 | 2023-09-18 | 635000 | 10767 | Trần Nguyễn Thanh Thư |
| 12 | 2023-167164 | 2023-10-16 | 615000 | 10767 | Trần Nguyễn Thanh Thư |
| 13 | 2021-114440 | 2021-06-17 | 600000 | 17644 | Phan Nguyễn Da Thảo |
| 14 | 2023-156909 | 2023-10-10 | 575000 | 10767 | Trần Nguyễn Thanh Thư |
| 15 | 2023-138688 | 2023-06-05 | 575000 | 17644 | Phan Nguyễn Da Thảo |
| 16 | 2023-156909 | 2023-10-10 | 575000 | 10767 | Trần Nguyễn Thanh Thư |
| 17 | 2023-118255 | 2023-05-15 | 520000 | 23853 | Lê Phương Trang |
| 18 | 2022-117590 | 2022-10-13 | 360000 | 18060 | Nguyễn Đình Bảo Lâm |
| 19 | 2020-118983 | 2020-12-14 | 360000 | 18060 | Nguyễn Đình Bảo Lâm |
| 20 | 2023-115742 | 2023-10-19 | 240000 | 10767 | Trần Nguyễn Thanh Thư |
| 21 | 2023-173927 | 2023-10-10 | 205000 | 17644 | Phan Nguyễn Da Thảo |
| 22 | 2022-111682 | 2022-04-18 | 200000 | 17644 | Phan Nguyễn Da Thảo |
| 23 | 2021-139619 | 2021-09-18 | 200000 | 17644 | Phan Nguyễn Da Thảo |
| 24 | 2020-135545 | 2020-04-18 | 150000 | 23853 | Lê Phương Trang |
| 25 | 2023-105816 | 2023-10-18 | 120000 | 9153 | Tô Thị Hồng Nhung |
| 26 | 2023-152156 | 2023-01-15 | 80000 | 9153 | Tô Thị Hồng Nhung |
| 27 | 2022-137330 | 2022-06-26 | 80000 | 20761 | Huỳnh Mỹ Tâm |
| 28 | 2023-119823 | 2023-10-12 | 75000 | 10767 | Trần Nguyễn Thanh Thư |
| 29 | 2023-106075 | 2023-10-13 | 50000 | 9153 | Tô Thị Hồng Nhung |
| 30 | 2022-106376 | 2022-12-11 | 50000 | 20761 | Huỳnh Mỹ Tâm |
| 31 | 2021-101343 | 2021-09-18 | 50000 | 9153 | Tô Thi Hồng Nhung |

*Figure 7. 3 Sale Management Result Query 1*

**<u>Query 2:</u> Write a SQL query to find the OrderID, CreateDate, and TotalPrice for orders within the recent three months and sort the results by OrderID within each month**

```sql
SELECT
   OrderID,
   CreateDate,
   TotalPrice
FROM
   "ORDER"
WHERE
   CreateDate >= DATEADD(MONTH, -3, '2023-10-20')
ORDER BY
   YEAR(CreateDate),
   MONTH(CreateDate),
   DAY(CreateDate)
```

| | OrderID | CreateDate | TotalPrice |
|---|---|---|---|
| 1 | 2023-180183 | 2023-09-15 | 400000 |
| 2 | 2023-180184 | 2023-09-15 | 1600000 |
| 3 | 2023-105893 | 2023-09-16 | 805000 |
| 4 | 2023-120999 | 2023-09-18 | 635000 |
| 5 | 2023-156909 | 2023-10-10 | 575000 |
| 6 | 2023-161389 | 2023-10-10 | 2000000 |
| 7 | 2023-173927 | 2023-10-10 | 205000 |
| 8 | 2023-119823 | 2023-10-12 | 75000 |
| 9 | 2023-169194 | 2023-10-13 | 1600000 |
| 10 | 2023-106075 | 2023-10-13 | 50000 |
| 11 | 2023-106320 | 2023-10-14 | 30000 |
| 12 | 2023-115812 | 2023-10-16 | 50000 |
| 13 | 2023-167164 | 2023-10-16 | 615000 |
| 14 | 2023-143336 | 2023-10-17 | 50000 |
| 15 | 2023-108966 | 2023-10-17 | 30000 |
| 16 | 2023-105816 | 2023-10-18 | 120000 |
| 17 | 2023-115742 | 2023-10-19 | 240000 |
| 18 | 2023-146703 | 2023-10-20 | 400000 |
| 19 | 2023-180180 | 2023-10-20 | 50000 |
| 20 | 2023-180181 | 2023-10-20 | 200000 |
| 21 | 2023-180182 | 2023-10-20 | 520000 |

*Figure 7. 4 Sale Management Result Query 2*

**<u>Query 3:</u> Write a SQL query to find ProductID, Product name, and Total Sold Quantity of the products and sorted out them by total sales volume from high to low.**

```sql
SELECT
   od.ProductID,
   p.ProductName,
   SUM(od.Quantity) AS 'Total Sold Quantity'
FROM
   ORDER_DETAIL od
JOIN
   PRODUCT p  ON od.ProductID = p.ProductID
GROUP BY
   od.ProductID, p.ProductName
ORDER BY SUM(od.Quantity) DESC
```

| | ProductID | ProductName | Total Sold Quantity |
|---|---|---|---|
| 1 | HDD015 | Hạt Dinh Dưỡng | 35 |
| 2 | YMCM014 | Yến Mạch Cán Mỏng | 20 |
| 3 | BN016 | Bún Ngô | 18 |
| 4 | CS004 | Cam Sấy Dẻo | 16 |
| 5 | BCN021 | Bún Chùm Ngây | 16 |
| 6 | GNC012 | Granola Ngũ Cốc | 16 |
| 7 | MS002 | Mít Sấy Giòn | 16 |
| 8 | XS003 | Xoài Sấy Dẻo | 15 |
| 9 | BG018 | Bún Gấc | 15 |
| 10 | BGD020 | Bún Gạo Lứt Đen | 14 |
| 11 | BGD019 | Bún Gạo Lứt Đỏ | 9 |
| 12 | BRC017 | Bún Rau Củ | 9 |
| 13 | TGLCBRB011 | Thanh Gạo Lứt Chà Bông Rong Biển | 8 |
| 14 | HRB005 | Hạnh Nhân Rang Bơ | 7 |
| 15 | BHGL022 | Bún Hoa Gạo Lứt | 7 |
| 16 | DS001 | Dừa Sấy Giòn | 5 |
| 17 | BĐB023 | Bún Đậu Biếc | 1 |
| 18 | MCG025 | Mì Chũ Gạo Lứt | 1 |

*Figure 7. 5 Sale Management Result Query 3*

## 7.3. Delivery management

**<u>Query 1:</u> Compare average delivery times of shipping partners**

```
    SELECT
        su.ShippingUnitID,
        su.Name,
        AVG(DATEDIFF(DAY, dr.CreateDate, dr.DeliveryDate)) AS
AverageDeliveryDay
    FROM
        DELIVERY_RECEIPT dr
    JOIN
        SHIPPING_UNIT su ON dr.ShippingUnitID = su.ShippingUnitID
    GROUP BY
        su.ShippingUnitID, su.Name
    ORDER BY
        AverageDeliveryDay ASC;
```

| | ShippingUnitID | Name | AverageDeliveryD… |
|---|---|---|---|
| 1 | GHTK | Giao hàng tiế… | 2 |
| 2 | VNP | Bưu điện Việt… | 3 |
| 3 | VP | Viettel Post | 3 |

*Figure 7. 6 Delivery Management Result Query 1*

**<u>Query 2:</u> Classified times of delivery for each completed order**

```
    SELECT
    o.OrderID,
    DATEDIFF(DAY, dr.CreateDate, dr.DeliveryDate) AS DeliveryTime,
    CASE
```

```
        WHEN DATEDIFF(DAY, dr.CreateDate, dr.DeliveryDate) <= 2 THEN
'Fast'
        WHEN DATEDIFF(DAY, dr.CreateDate, dr.DeliveryDate) BETWEEN 3
AND 5 THEN 'On time'
        ELSE 'Late'
    END AS DeliveryStatus
FROM
  "ORDER" o
JOIN
    GOODS_ISSUE gi ON o.OrderID = gi.OrderID
JOIN
    DELIVERY_RECEIPT dr ON gi.ShippingUnitID = dr.ShippingUnitID
WHERE
    dr.DeliveryDate <> ' '
```

| | OrderID | DeliveryTime | DeliveryStatus |
|---|---|---|---|
| 1 | 2023-152156 | 2 | Fast |
| 2 | 2023-152156 | 3 | On time |
| 3 | 2023-152156 | 2 | Fast |
| 4 | 2023-152156 | 3 | On time |
| 5 | 2023-152156 | 2 | Fast |
| 6 | 2023-152156 | 3 | On time |
| 7 | 2023-152156 | 3 | On time |
| 8 | 2023-152156 | 2 | Fast |
| 9 | 2023-152156 | 2 | Fast |
| 10 | 2023-138688 | 3 | On time |

*Figure 7. 7 Delivery Management Result Query 2*

## 7.4. Inventory management

**<u>Query 1:</u> Show barcodes of products that have the MCR prefix**

```
SELECT PRODUCTID, PRODUCTNAME, BARCODE
FROM PRODUCT
WHERE PRODUCTID LIKE 'MCR%'
```

| | PRODUCTID | PRODUCTNAME | BARCODE |
|---|---|---|---|
| 1 | MCR3V026 | Mì Chũ Rau Củ 3 Vị | 4567890350 |
| 2 | MCR5&8027 | Mì Chũ Rau Củ 5 & 8 Vị | 4567890367 |
| 3 | MCR5V028 | Mì Chũ Rau Củ 5 Vị | 4567890374 |

*Figure 7. 8 Inventory Management Result Query 1*

**<u>Query 2:</u> Suppose that need to check the inventory status of products. Showing products with quantity over 200 is Overstock, from 50 to 200 is Normal, from 1 to 49 is Need to Restock, else Out of stock**

```
Select ProductID, ProductName, Stock,
Case
When Stock > 200 then 'Overstock'
```

```
When Stock Between 50 and 200 then 'Normal'
When Stock Between 1 and 49 then 'Need to Restock'
ELSE 'Out of Stock'
END AS 'Status'
From PRODUCT
Order by Stock ASC
```

| | ProductID | ProductName | Stock | Status |
|---|---|---|---|---|
| 1 | BGD019 | Bún Gạo Lứt Đỏ | 0 | Out of Stock |
| 2 | GLDD030 | Gạo Lứt Dẻo Điện Biên | 0 | Out of Stock |
| 3 | TGLCBRB011 | Thanh Gạo Lứt Chà Bông Rong Biển | 0 | Out of Stock |
| 4 | MCR5&8027 | Mì Chũ Rau Củ 5 & 8 Vị | 10 | Need to Restock |
| 5 | BN016 | Bún Ngô | 10 | Need to Restock |
| 6 | DS001 | Dừa Sấy Giòn | 20 | Need to Restock |
| 7 | MCR3V026 | Mì Chũ Rau Củ 3 Vị | 25 | Need to Restock |
| 8 | BKR009 | Bánh Kẹp Rong Biển | 25 | Need to Restock |
| 9 | BG018 | Bún Gấc | 27 | Need to Restock |
| 10 | BGD020 | Bún Gạo Lứt Đen | 30 | Need to Restock |
| 11 | MCG025 | Mì Chũ Gạo Lứt | 30 | Need to Restock |

*Figure 7. 9 Inventory Management Result Query 2*

**<u>Query 3:</u> Find out the total quantity of the product shipped the most in 2023**

```
SELECT g.ProductID, SUM(g.Quantity) AS Total_Quantity_Issue
FROM GOODS_ISSUE_DETAIL g
JOIN GOODS_ISSUE d on g.GoodsIssueID = d.GoodsIssueID
WHERE YEAR(d.DateIssue) = 2023
GROUP BY g.ProductID
ORDER BY SUM(g.Quantity) DESC
```

| | ProductID | Total_Quantity_Issue |
|---|---|---|
| 1 | HDD015 | 24 |
| 2 | BCN021 | 16 |
| 3 | XS003 | 13 |
| 4 | CS004 | 11 |
| 5 | YMCM014 | 10 |
| 6 | GNC012 | 8 |

*Figure 7. 10 Inventory Management Result Query 3*

## 7.5. Finance and accounting

**<u>Query 1:</u> Average order quantity per Transaction**

```
SELECT AVG(TotalQuantity) AS Avg_Quantity
```

```
FROM "ORDER";
```

| | Avg_Quantity |
|---|---|
| 1 | 5 |

*Figure 7. 11 Finance and Accounting Result Query 1*

**<u>Query 2:</u> Show the successful transaction invoices/order of the business:**

```
SELECT i.InvoiceNumber, i.TotalCost, i.InvoiceDate, o.OrderID
FROM INVOICE i
JOIN "ORDER" o
ON i.OrderID = o.OrderID AND o.OrderStatus NOT IN ('WA', 'CA')
```

| | InvoiceNumber | TotalCost | InvoiceDate | OrderID |
|---|---|---|---|---|
| 1 | INV-334259 | 50000 | 2022-12-11 | 2022-106376 |
| 2 | INV-342704 | 30000 | 2020-04-18 | 2020-164175 |
| 3 | INV-368341 | 520000 | 2023-05-15 | 2023-118255 |
| 4 | INV-375072 | 150000 | 2020-04-18 | 2020-135545 |
| 5 | INV-492196 | 120000 | 2023-10-18 | 2023-105816 |
| 6 | INV-644053 | 200000 | 2022-04-18 | 2022-111682 |
| 7 | INV-925509 | 1600000 | 2023-10-13 | 2023-169194 |
| 8 | INV-944251 | 240000 | 2023-10-19 | 2023-115742 |
| 9 | INV-987909 | 68000 | 2023-01-15 | 2023-152156 |
| 10 | INV-102128 | 805000 | 2023-09-16 | 2023-105893 |

*Figure 7. 12 Finance and Accounting Result Query 2*