

ASSIGNMENT 1 FRONT SHEET

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Student declaration <p>I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.</p>			
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Grading grid

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Chapter 1 – Statements of user and system requirements

1.1. Overview about the Problem

- I am a Database Developer for a large IT consulting firm. Recently, FPT Shop, an expanding store chain, approached my company because of the increasing number of stores. At present, FPT Shop is having difficulty managing their database in a coordinated way across all of their stores.
- They decided to develop a new database in order to make registering with phone numbers as IDs, ordering and rating devices, and commenting on purchases more convenient for users. This data can then be accessed and used by store managers, director board members, and even the company itself.
- **Reasons for the project:** The company has been approached by a company called FPT Shop. This company is expanding because of the growth of the number of stores. FPT Shop is currently facing difficulties managing the database from all of the shops on over country. They have decided to develop a new database.
- **Requirements and Expectation:**
 - o Users must be able to access, manage, and update data with ease using the database system we are going to build.
 - o Ensure the security and integrity of the data.
 - o Data backup and restoration is simple.
 - o Making information management and retrieval simpler for enterprises

1.2. Requirements of the Application

- Customer:
 - o As a customer, I want to find products so that I can order products.
 - o As a customer, I want to see the details of the products so that I have more choices when buying.
 - o As a customer, I want to see what products I have added to my cart so that I can be sure I will buy them.
 - o As a customer, I want to register my information so that I can become a member.
 - o As a customer, I want to change my information so that I can keep it more secure.
- Staff:
 - o As a staff, I want to import new products so that I can manage the products.
 - o As a staff, I want to delete the products that are out of stock in the store so that I can easily manage the products.
 - o As a staff, I want to see the information of all customers so that I can assist customers to find their information when needed.
 - o As a staff, I want to modify products so that I can update the products.
 - o As a staff, I want to approve the order from customer so that the order can be shipped.
- Manager:
 - o As a manager, I want to check staff's attendance so that I can pay their salary.

- As a manager, I want to see the store's sales so that I can make the right adjustments.

Chapter 2 – Design the relational database system

1. Analyse the requirements

- As a Database Developer for a large IT consulting firm, I have some analysis of the following requirements:
 - On the customer side, they want to register their phone number as an ID, buy products, pay for products, ..
 - On the shop's side, they want to manage the shop's products, view customer information so that they can support customers when needed, view the products that customers have ordered, ...
 - On the management side, they want to capture all the information of the shop including employees, customers as well as products of the shop.
- For better management, FPT shop has improved its database-based management method, helping to improve management and rational use for employees, customers and managers.

2. Database design with explanations

Entity Relationship Diagram:

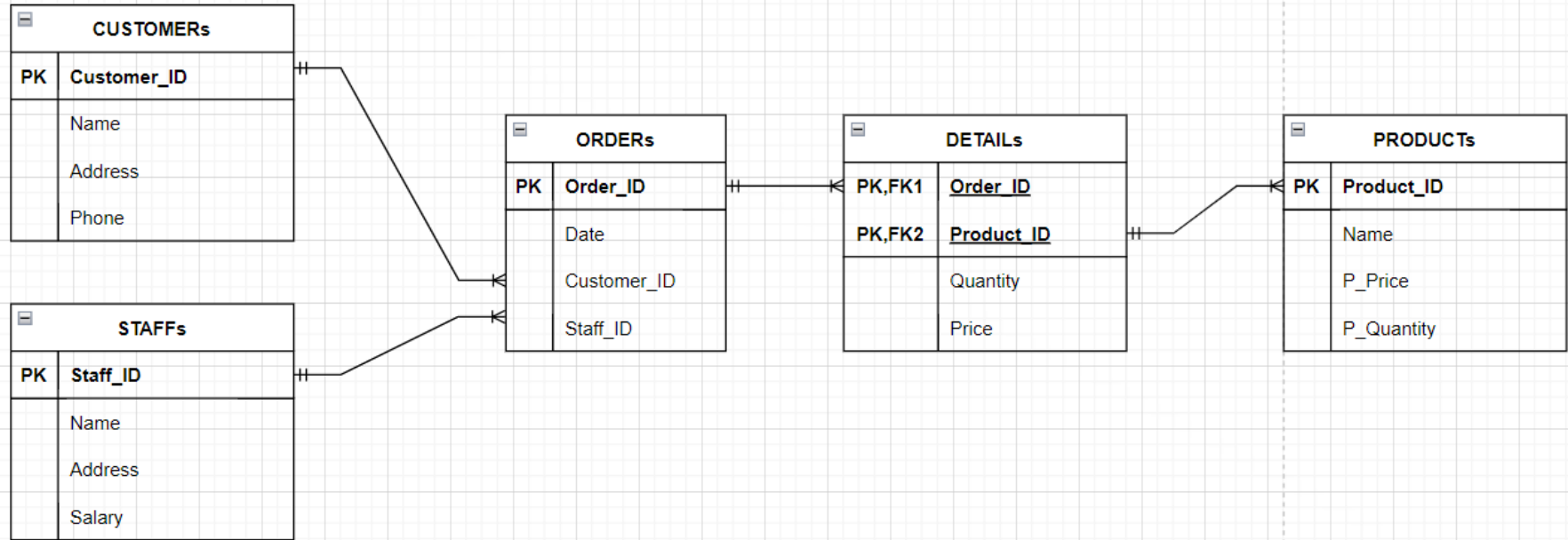


Figure 1: Entity Relationship Diagram

Explain for Entity Relationship Diagram:

This graphic has 5 tables, each of which contains a different attribute:

- 'CUSTOMERs' table: The 'CUSTOMERs' table contains the primary key: *Customer_ID*. Besides, the 'CUSTOMERs' table also has 3 attributes to collect customer information as *Customer_Name*, *Address*, *Phone*.

	Customer_ID	Customer_Name	Address	Phone
1	102	Nguyen Huu Nghia	Ha Noi	0414875617
2	123456	Le Tai Nhan	123 Nguyen Trai	0124611542
3	1234567	Le Tai Nhan	12 Nguyen Trai	0965412487
4	2442451	Pham Duc Viet	Hue	0154741244
5	45121	Le Nam	Can Tho	0415474124
6	5412	Bui Hai Anh	Bac Giang	0347841254
7	741244	Tran Thi Huong	Phu Tho	0547112644
8	7452445	Phan Duc Anh	Da Nang	0344841245
9	87452	Phan Duc Han	Le Quy Don, Dong Nai	0157845264

Figure 2: Illustration CUSTOMERs table

- ‘**STAFFs**’ table: The 'STAFFs' table contains the primary key: *Staff_ID*. Besides, the 'STAFFs' table also has 3 attributes to collect vaccine type information such as *Staff_Name*, *Address*, *Salary*.

	Staff_ID	Staff_Name	Address	salary
1	F001	Nguyen Thuy Linh	67 Dong Da	30000000
2	F002	Ngo Gia Tu	123 Ngo Tat To	30000000
3	F003	Nguyen Viet Dat	5 Le Duan	18500000
4	F004	Ta Xuan Kien	86 Nguyen Tat Thanh	20000000
5	F005	Le Xuan Loc	12 Pham Nhu Xuong	50000000

Figure 3: Illustration STAFFs table

- ‘**ORDERS**’ table: The 'ORDERS' table contains the primary key: *Order_id*. Besides, the 'ORDERS' table also has 3 attributes to collect customer information as *OrderDate*, *Cid*, *Staffid*.

	Order_Id	OrderDate	Cid	Staffid
1	1	2023-02-10	102	F005
2	2	2023-02-10	45121	F005
3	3	2023-02-10	1234567	F001
4	4	2023-02-09	741244	F003
5	5	2023-02-09	5412	F003
6	6	2023-02-09	2442451	F001
7	7	2023-02-08	7452445	F002

Figure 4: Illustration ORDERS table

- ‘**PRODUCTS**’ table: The ‘**PRODUCTS**’ table contains the primary key: **P_Id**. Besides, the ‘**PRODUCTS**’ table also has 3 attributes to collect customer information as **P_Name**, **Price**, **Quantity**.

	P_ID	P_Name	Price	Quantity
1	AC001	Acer Predator Gaming Helios	40990000	20
2	AC002	Acer Swift 3	20290000	7
3	AP001	MacBook Pro 14" 2021 M1 Pro Ram 32GB	58990000	50
4	AP002	MacBook Pro 16" 2021 M1 Pro Ram 32GB	68990000	26
5	AS001	Asus TUF Gaming FX506LHB-HN188W i5	15950000	45
6	AS002	Asus TUF Gaming FA506IHRB-HN019W ...	16490000	32
7	AS003	Asus TUF Gaming FA507RC-HN051W R7	22090000	49
8	AS004	Asus Gaming TUF FX517ZM-HN480W i7	29490000	16
9	LG001	LG Gram 14Z90Q-G.AJ32A5 i3	25190000	10
10	LG002	Laptop LG Gram 16Z90Q-G.AH76A5 i7	45590000	18

Figure 5: Illustration PRODUCTS table

- **'DETAILS'** table: The **'DETAILS'** table contains two primary keys: *O_Id* and *P_Id*. Besides, the **'DETAILS'** table also has 2 attributes to collect customer information as *Price*, *Quantity*.

	O_Id	P_Id	Price	Quantity
1	1	AC003	24290000	1
2	1	AS002	16490000	1
3	4	LG001	25190000	2
4	5	AP001	58990000	1
5	5	AS001	15950000	1
6	5	LG002	45590000	2

Figure 6: Illustration DETAILS table

Explain the relationship between the tables:

- **The relationship between “CUSTOMERs” table and “ORDERs” table:** According to the entity relationship diagram above, the Customer entity has a one-to-many relationship with Orders, since one Customer can service many orders. Conversely, a particular order can only be placed by one of the customers.

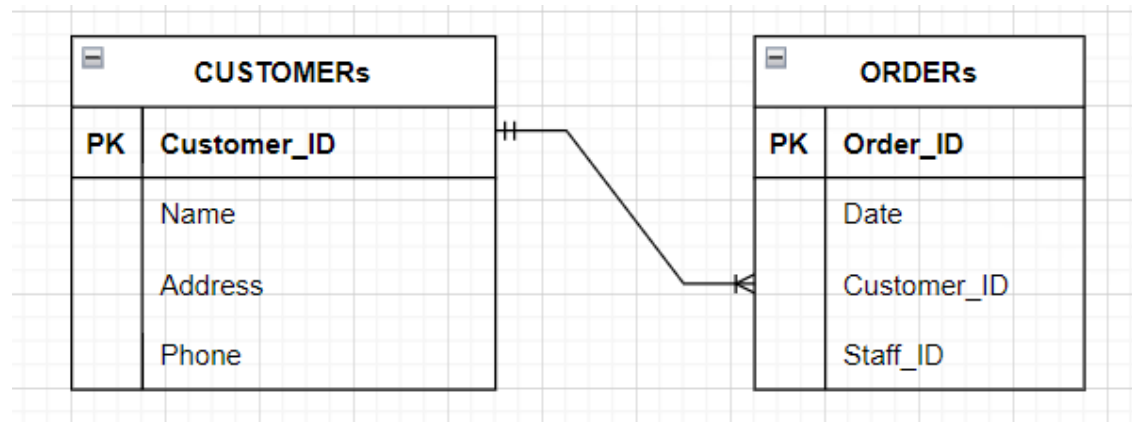


Figure 7: The relationship between “CUSTOMERs” table and “ORDERs” table

- **The relationship between “STAFFs” table and “ORDERS” table:** The Staff - Orders relationship is a one-to-many relationship. Each staff can manage multiple orders and maintain information about the orders, but only one specific staff is responsible for each order.

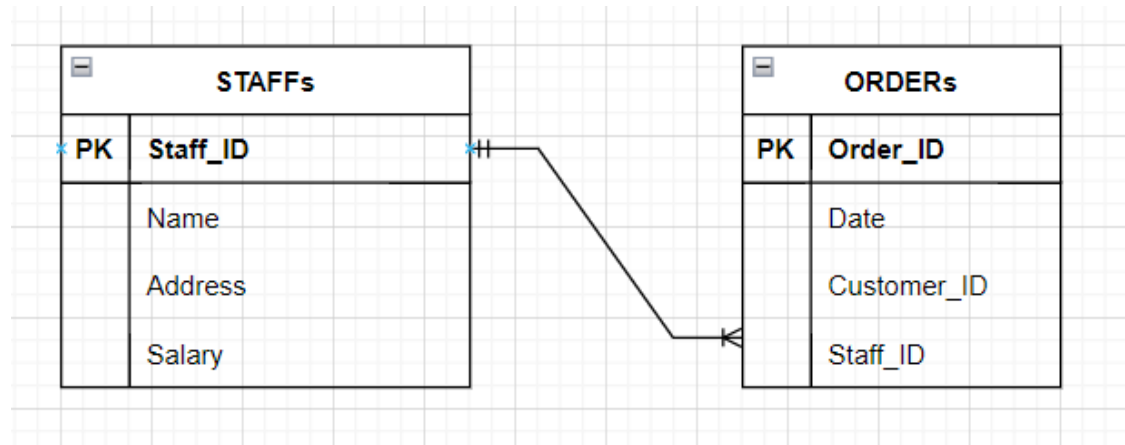


Figure 8: The relationship between “STAFFs” table and “ORDERS” table

- **The relationship between “ORDERS” table and “DETAILS” table:** The Orders entity has a one-to-many relationship with Details because an order should have many details such as quantity and price, but many details only have one order.

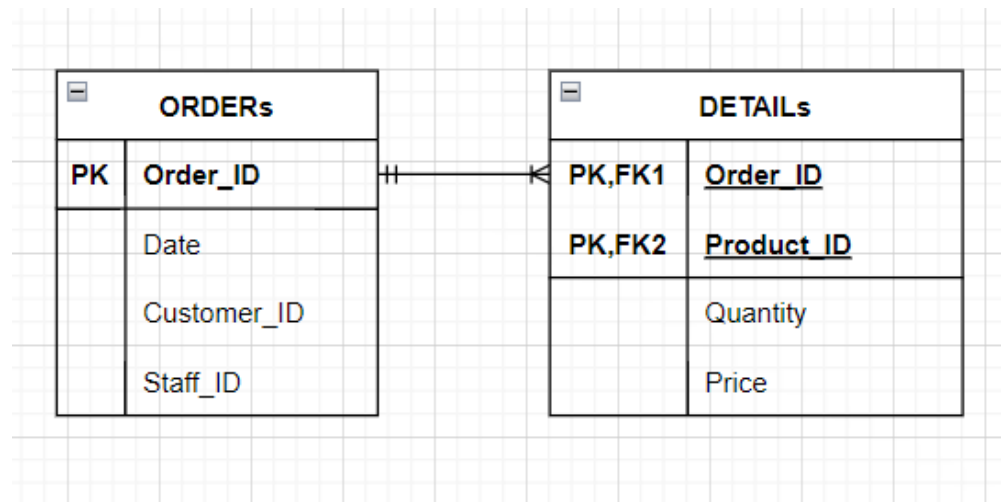


Figure 9: The relationship between “ORDERS” table and “DETAILS” table

- **The relationship between “DETAILS” table and “PRODUCTS” table:** The Product entity has a one-to-many relationship with one detail, since one product can implement multiple details. Meanwhile, details vary from product to product.

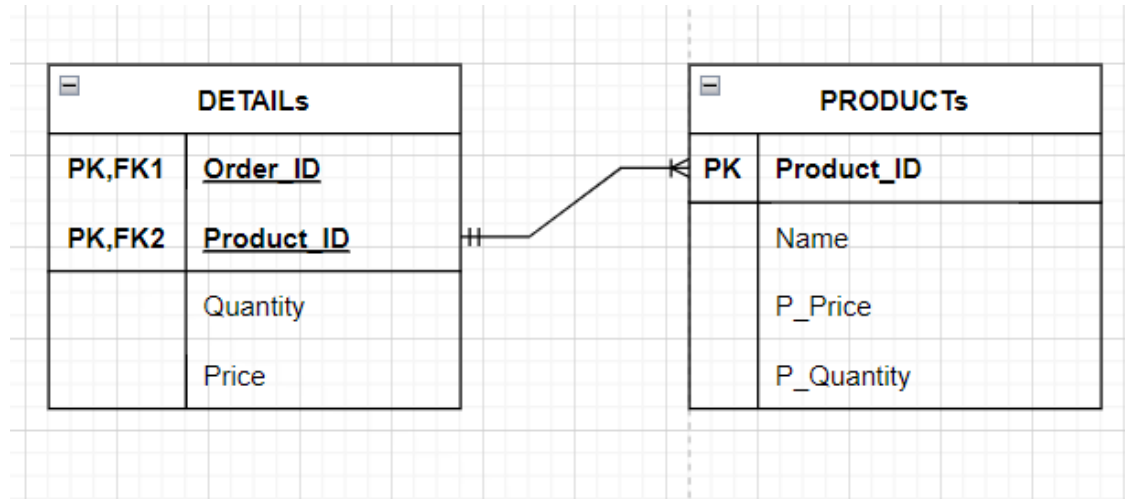


Figure 10: The relationship between “DETAILS” table and “PRODUCTS” table

Data Types:

- “CUSTOMERS” table:


	Column Name	Data Type	Allow Nulls
	Customer_ID	nvarchar(10)	<input type="checkbox"/>
	Customer_Name	nvarchar(50)	<input type="checkbox"/>
	Address	nvarchar(150)	<input type="checkbox"/>
	Phone	nvarchar(11)	<input checked="" type="checkbox"/>

Figure 11: Data type for table “CUSTOMERS”

- “STAFFs” table:

	Column Name	Data Type	Allow Nulls
▶	Staff_ID	nvarchar(10)	<input type="checkbox"/>
	Staff_Name	nvarchar(50)	<input type="checkbox"/>
	Address	nvarchar(150)	<input type="checkbox"/>
	salary	int	<input checked="" type="checkbox"/>

Figure 12: Data type for table "STAFFs"

- "ORDERS" table:

	Column Name	Data Type	Allow Nulls
▶	Order_Id	nvarchar(10)	<input type="checkbox"/>
	OrderDate	date	<input checked="" type="checkbox"/>
	Cid	nvarchar(10)	<input checked="" type="checkbox"/>
	Staffid	nvarchar(10)	<input checked="" type="checkbox"/>

Figure 13: Data type for table "ORDERS"

- "DETAILS" table:

	Column Name	Data Type	Allow Nulls
▶	O_Id	nvarchar(10)	<input type="checkbox"/>
▶	P_Id	nvarchar(10)	<input type="checkbox"/>
	Price	int	<input checked="" type="checkbox"/>
	Quantity	int	<input checked="" type="checkbox"/>

Figure 14: Data type for table "DETAILS"

- “PRODUCTs” table:


	Column Name	Data Type	Allow Nulls
	P_ID	nvarchar(10)	<input type="checkbox"/>
	P_Name	nvarchar(50)	<input type="checkbox"/>
	Price	int	<input checked="" type="checkbox"/>
	Quantity	int	<input checked="" type="checkbox"/>

Figure 15: Data type for table "PRODUCTs"