

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>			
		Student's signature	

Grading grid

P1	M1	D1

⚙ **Summative Feedback:**⚙ **Resubmission Feedback:****Grade:****Assessor Signature:****Date:****Signature & Date:**

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Chapter 1 - Statements of user and system requirements

I. Overview about the Problem

Definition: A structured collection of data kept in a computer that, when accessed in a specific way, can be accessed in various way.

Scenario: You work for a sizable IT consulting firm as a database developer. FPT Shop, which is expanding as a result of the increase in the number of locations, has contacted the business. FPT Shop is currently having trouble handling the management of the database from all shops around the nation. It was planned to create a new database so that people could register using their phone numbers as IDs and order, rate, and comment on the devices they had purchased, shop managers could look after their businesses, and the director board could access all of the data from all of the shops.

II. Analysis of status, system evaluation, and solutions

I see that if FPT shop keeps records on paper, there will be a lot of troubles and problems, so we need a database to manage more easily.

- When purchasing a specific item, customers cannot verify the number of goods or the exact unit pricing. The buyer's address, phone number, and time are not clearly stored, and it is challenging to deliver to clients who live far away.
 - Employees struggle to access information, and management struggles to enter more data for the store. Additionally, the security has not been very strong and is readily breached, modifying information.
- I believe that the current system is not uniform. Customers should have access to additional details about the product we want to purchase. There are more base approaches and stronger security for management and workers. All of these issues have been improved, accepted as reflecting client preferences, and optimized for you.

III. User's requirements statements

- As a customer:

As a customer, I want to find products so that I can order that products.

As a customer, I want to view the detail of products so that I can select that products.

As a customer, I want to order products so that I can buy the products.

As a customer, I want to check my orders so that I am sure to buy what I want to buy.

As a customer, I want to register my information so that I can be a member.

As a customer, I want to track where my order has arrived so that I can schedule a time to receive it.

As a customer, I want to rate products so that I have purchased.

As a customer, I want to return a product so that I have purchased if it is damaged.

As a customer, I want to give feedback on a product I've used so that it can be improved.

- As a staff:

As a staff, I want to input products information so that I manage the products.

As a staff, I want to modify products information so that I can update the products.

As a staff, I want to approve the order from customer so that the orders can be shipped.

As a staff, I want to track whether the order is reaching the customer so that in case the product does not reach the customer there will be some solution.

As a staff, I want to see customer feedback on products and report to management about the products that customers have responded to so that management knows about those products.

- As a manager:

As the manager, I want to manage the staff so that I supervise the staff.

As the manager, I want to view products list so that I can manage the products.

As the manager, I want to view revenue by day/week/month/quarter/year so that I can manage the money of my shop.

As the manager, I want to check staff's attendance so that I can pay their salary.

As a manager, I want to check the sales of my employees so that at the end of the month I can reward the employees with the most sales.

As a manager, I want to see customer feedback on the product so that I can find solutions for defective products that are reported by customers.

- Identify the necessary tables:

1. Product (product code, name, price, quantity, ...)

2. Order (product code, customer's code, order date,)

3. Customer (customer's code, customer name, phone number, address,)

4. Staff (staff code, name, date of birth, phone number, address,)

- Requirements of the application:

- Present the requirements of FPT Shop about the database to be built:

- + Store data all stores.

- + Store goods, passengers, orders, etc.

- + Retrieve data when required.

- + Periodic data statistics.

- + Data backup.

Chapter 2 – Design the relational database system (P1)

I. Analyse the requirements

I will develop a database that meets the requirements of each user. The customer is the first and the database has to search for the product, display the product's information, order the product, check the order, know which staff will be in charge of his order and know which order. most bought. Second, HR and database departments must be able to enter product information, modify product information, confirm orders, and have access to customer information. Last but not least, is management. The database must manage its workers, display the list of items to manage them, display the monthly and yearly revenue list to manage money in the business, check the employee sales to have can pay them and finally show how many orders.

II. Database design with explanations

1. ERD and explain relationships

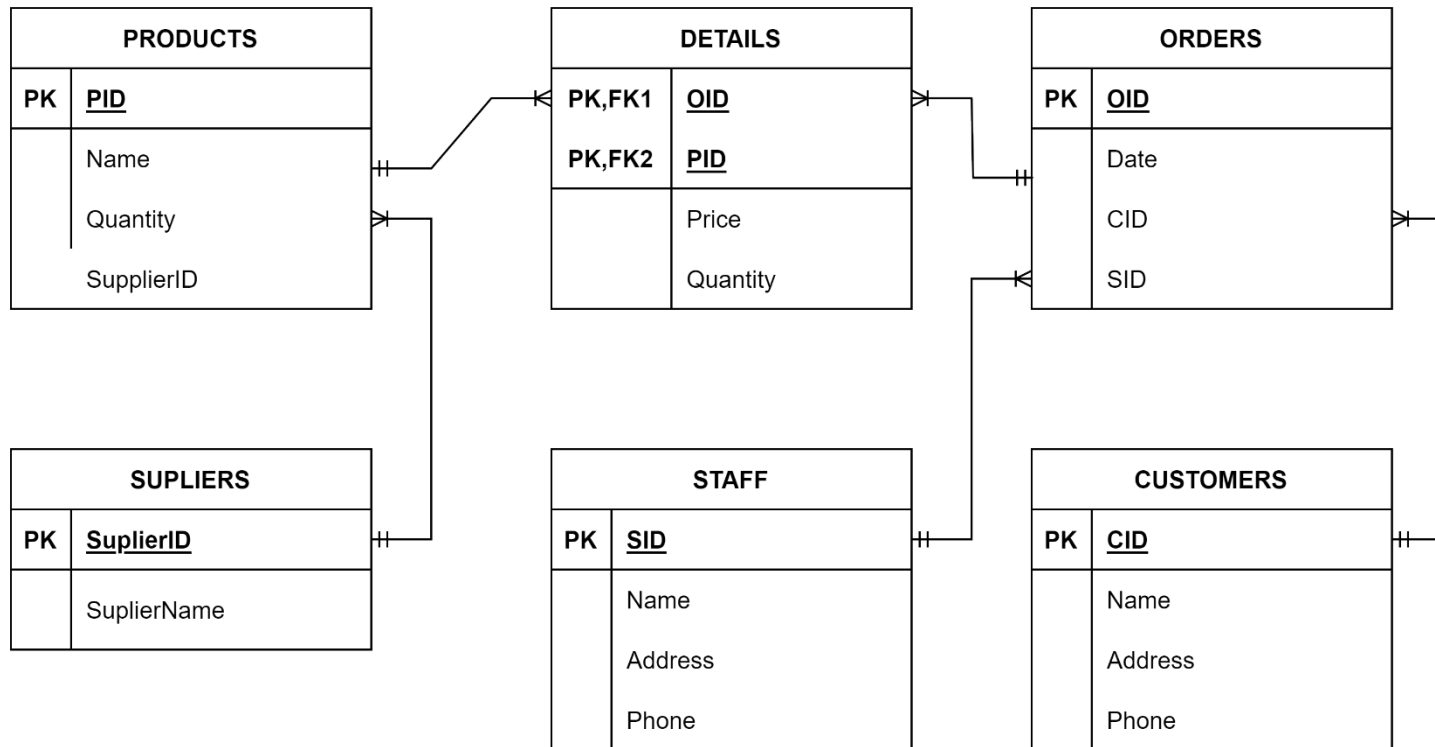


Figure 1: ERD chart

- **Explain relationship:** ERD image shows the relationship chart of the FPT Shop system. Through the ERD image, we see the following relationships.
 - The Supplier entity has a 1-to-many relationship with Products because 1 Supplier can fulfill many Products. Conversely, a particular Product has only one Supplier.
 - The Product entity has a 1-to-many relationship with the Details because 1 Product can fulfill many Details. In contrast, 1 specific Detail has only 1 Product.
 - The Order entity has a 1-to-many relationship with the Detail because 1 Order can fulfill many Details. In contrast, 1 specific Detail has only 1 Order.
 - The Staff entity has a 1-to-many relationship with Orders because 1 Staff can fulfill many Orders. In contrast, a particular Order has only 1 employee.
 - The Customer entity has a 1-to-many relationship with Orders because 1 Customer can fulfill many Orders. Conversely, a specific Order is placed by only one Customer.

2. Detailed description of tables

- Supplier table: This table is used to store all information of the supplier. It has several columns such as supplier ID, supplier name. Among these, Supplier ID is primary key. Column supplier name must be not Null. The details of table supplier is shown as follows:

Column name	Data Type	Allow null	Constraint
SuplierID	Nvarchar(10)	No	PK
SuplierName	Nvarchar(50)	No	Unique

Table 1: Supplier Table

- Product table: This table is used to store all information of the product. It has several columns such as product ID, product name, price, quantity, supplier ID. Among these, Product ID is primary key and Suplier ID is foreign key. Column product name must be not Null. Column price and quantity must be greater than zero (>0). The detail of table products is shown as follow:

Column name	Data Type	Allow null	Constraint
ProductID	Nvarchar(10)	No	PK
ProductName	Nvarchar(100)	No	Unique
Price	int	Yes	Check (Price > 0)
Quantity	int	Yes	Check (Quantity > 0)
SupplierID	Nvarchar(10)	No	FK

Table 2: Product Table

- Staff table: This table is used to store all the staff information. It has several columns such as staff ID, staff name, address, salary, and phone number. Among these, staff ID is primary key. Column staff name, address and phone number must be not Null. Column salary must be greater than zero (> 0). The details of table staff is shown as follows:

Column name	Data Type	Allow null	Constraint
StaffID	Nvarchar(10)	No	PK
StaffName	Nvarchar(100)	No	Unique
Address	Nvarchar(150)	No	
Salary	int	Yes	Check (Salary > 0)
Phone	Nvarchar(11)	No	

Table 3: Staff Table

- Customer table: This table is used to store all the customer information. It has several columns such as customer ID, customer name, address and phone number. Among these, customer ID is primary key. Column customer name, address and phone number must be not Null. The details of table customer is shown as follows:

Column name	Data Type	Allow null	Constraint
CustomerID	Nvarchar(10)	No	PK
CustomerName	Nvarchar(100)	No	Unique
Address	Nvarchar(150)	No	
Phone	Nvarchar(11)	No	

Table 4: Customer Table

- Order table: This table is used to store all order information. It has several such as order ID, order date, customer, quantity, supplier ID. Among these, Order ID is primary key, Staff ID and Customer ID are foreign key. Column order date can be Null. The detail of table order is shown as follow:

Column name	Data Type	Allow null	Constraint
OrderID	Nvarchar(10)	No	PK
OrderDate	Date	Yes	
CustomerID	Nvarchar(10)	No	FK
StaffID	Nvarchar(10)	No	FK

Table 5: Order Table

- Detail table: This table is used to store all information of the detail. It has several columns such as Order ID, product ID, price and quantity. Among these, Order ID is foreign key and Product ID is foreign key. Column price and quantity must be greater than zero (>0). The detail of table products is shown as follow:

Column name	Data Type	Allow null	Constraint
OrderID	Nvarchar(10)	No	PK, FK
ProductID	Nvarchar(10)	No	PK, FK
Price	int	Yes	Check (Price > 0)
Quantity	int	Yes	Check (Quantity > 0)

Table 6: Detail Table

3. Create database

- Create SUPLIERS TABLE
- + Create SUPLIERS Table with Tools.


	Column Name	Data Type	Allow Nulls
	SuplierID	nvarchar(10)	<input type="checkbox"/>
	SuplierName	nvarchar(50)	<input type="checkbox"/>
			<input type="checkbox"/>

Figure 2: SUPLIERS Table with Tools

+ Create SUPLIERS Table with Code.

```
CREATE TABLE SUPLIERS (
  SuplierID NVARCHAR(10) PRIMARY KEY,
  SuplierName NVARCHAR(50) NOT NULL UNIQUE
)
```

Figure 3: SUPLIERS Table with Code

- Create PRODUCTS TABLE
- + Create PRODUCTS Table with Tools.


	Column Name	Data Type	Allow Nulls
	PID	nvarchar(10)	<input type="checkbox"/>
	PName	nvarchar(100)	<input type="checkbox"/>
	Price	int	<input checked="" type="checkbox"/>
	Quantily	int	<input checked="" type="checkbox"/>
	SuplierID	nvarchar(10)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Figure 4: PRODUCTS Table with Tools

+ Create PRODUCTS Table with Code.

```
CREATE TABLE PRODUCTS (
  PID NVARCHAR(10) PRIMARY KEY,
  PName NVARCHAR(100) NOT NULL UNIQUE,
  Price int check(Price > 0),
  Quantily int check(Quantily > 0),
  SuplierID NVARCHAR(10) REFERENCES SUPLIERS(SuplierID)
)
```

Figure 5: PRODUCTS Table with Code

- Create STAFF TABLE
+ Create STAFF Table with Tools.

	Column Name	Data Type	Allow Nulls
▶	StaffID	nvarchar(10)	<input type="checkbox"/>
	SName	nvarchar(50)	<input type="checkbox"/>
	Addr	nvarchar(150)	<input type="checkbox"/>
	Salary	int	<input checked="" type="checkbox"/>
	Phone	int	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Figure 6: STAFF Table with Tools

- + Create STAFF Table with Code.

```
CREATE TABLE STAFF (
    StaffID NVARCHAR(10) PRIMARY KEY,
    SName NVARCHAR(50) NOT NULL UNIQUE,
    Addr NVARCHAR(150) NOT NULL,
    Salary int check(Salary > 0)
)
```

Figure 7: STAFF Table with Code

- Create CUSTOMERS TABLE
+ Create CUSTOMERS Table with Tools.

	Column Name	Data Type	Allow Nulls
▶	CustomersID	nvarchar(10)	<input type="checkbox"/>
	CustomersName	nvarchar(50)	<input type="checkbox"/>
	Addr	nvarchar(150)	<input type="checkbox"/>
	Phone	nvarchar(11)	<input type="checkbox"/>
			<input type="checkbox"/>

Figure 8: CUSTOMERS Table with Tools

+ Create CUSTOMERS Table with Code.

```
CREATE TABLE CUSTOMERS (
    CustomersID NVARCHAR(10) PRIMARY KEY,
    CustomersName NVARCHAR(50) NOT NULL UNIQUE,
    Addr NVARCHAR(150) NOT NULL,
    Phone NVARCHAR(11) NOT NULL
)
```

Figure 9: CUSTOMERS Table with Code

- Create ORDER TABLE
- + Create ORDER Table with Tools.


	Column Name	Data Type	Allow Nulls
	OrderID	nvarchar(10)	<input type="checkbox"/>
	OrderDate	date	<input checked="" type="checkbox"/>
	CustomersID	nvarchar(10)	<input checked="" type="checkbox"/>
	StaffID	nvarchar(10)	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Figure 10: ORDERS Table with Tools

+ Create ORDER Table with Code.

```
CREATE TABLE ORDERS (
    OrderID NVARCHAR(10) PRIMARY KEY,
    OrderDate DATE,
    CustomersID NVARCHAR(10) REFERENCES CUSTOMERS(CustomersID),
    StaffID NVARCHAR(10) REFERENCES Staff(StaffID)
)
```

Figure 11: ORDERS Table with Code

- Create DETAILS TABLE
+ Create DETAILS Table with Tools.



	Column Name	Data Type	Allow Nulls
	OID	nvarchar(10)	<input type="checkbox"/>
	PID	nvarchar(10)	<input type="checkbox"/>
	Price	int	<input checked="" type="checkbox"/>
	Quantily	int	<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Figure 12: DETAILS Table with Tools

- + Create DETAILS Table with Code.

```
CREATE TABLE DETAILS (
    OID NVARCHAR(10) REFERENCES ORDERS(OrderID),
    PID NVARCHAR(10) REFERENCES PRODUCTS(PID),
    Price int check(Price > 0),
    Quantily int check(Quantily > 0),
    Constraint pkDetail PRIMARY KEY (OID,PID)
)
```

Figure 13: DETAILS Table with Code

4. Create Database Diagram

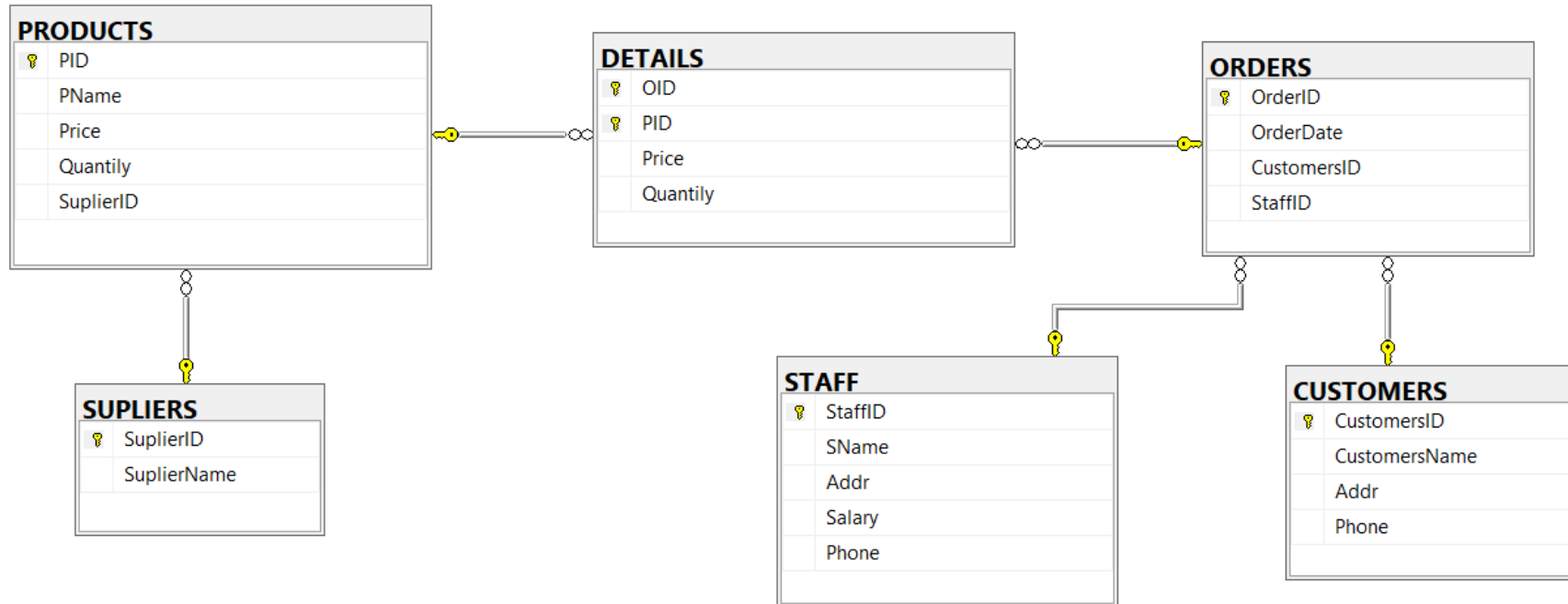


Figure 14: Database Diagram

5. Enter data for tables

- Enter data for Supplier Table

```
INSERT INTO SUPLIERS
VALUES ('Acer01', 'Acer'),
('Apple01', 'Apple'),
('Iphone01', 'Iphone'),
('Oppo01', 'Oppo'),
('Samsung01', 'Samsung')
```

	SuplierID	SuplierNa...
	Acer01	Acer
	Apple01	Apple
	Iphone01	Iphone
	Oppo01	Oppo
	Samsung01	Samsung
▶*	NULL	NULL

Figure 15: Enter data of Supplier Table with code

- Enter data for Product Table

```
INSERT INTO PRODUCTS
VALUES ('A1', 'OppoA52', '5000000', '10', 'Oppo01'),
('B1', 'Iphone11', '12000000', '20', 'Iphone01'),
('C1', 'Samsung Galaxy S22', '15000000', '30', 'Samsung01'),
('D1', 'Oppo Reno8', '8000000', '5', 'Oppo01'),
('E1', 'Acer Nitro Gaming 5', '24000000', '15', 'Acer01')
```

	PID	PName	Price	Quantily	SuplierID
▶	A1	OppoA52	5000000	10	Oppo01
	B1	Iphone11	12000000	20	Iphone01
	C1	Samsung G...	15000000	30	Samsung01
	D1	Oppo Reno8	8000000	5	Oppo01
	E1	Acer Nitro ...	24000000	15	Acer01
*	NULL	NULL	NULL	NULL	NULL

Figure 16: Enter data of Product Table with code

- Enter data for Staff Table

```
INSERT INTO STAFF
VALUES ('A110', 'Nguyen Phi Hung', 'Ngo Quyen', '5000000', '0968123990'),
('A1104', 'Tang Nhat Tue', 'Song Hong', '5000000', '0353497480'),
('B234', 'Huynh Tran Thanh', 'Vo Thi Sau', '10000000', '0234921453'),
('B332', 'Le Thi Nho', 'Le Trong Bat', '3000000', '0343973540'),
('C117', 'Nguyen Hoang Nam', 'Ly Thuong Kiet', '6000000', '0987499641')
```

	StaffID	SName	Addr	Salary	Phone
►	A110	Nguyen Phi ...	Ngo Quyen	5000000	0968123990
	A1104	Tang Nhat T...	Song Hong	5000000	0353497480
	B234	Huynh Tran ...	Vo Thi Sau	10000000	0234921453
	B332	Le Thi Nho	Le Trong Bat	3000000	0343973540
	C117	Nguyen Ho...	Ly Thuong K...	6000000	0987499641
*	NULL	NULL	NULL	NULL	NULL

Figure 17: Enter data of Staff Table with code

- Enter data for Customer Table

```
INSERT INTO CUSTOMERS
VALUES
('01', 'Ho Quang Minh', '43 Le Trong Bat', '0787739048'),
('02', 'Lai Van Manh', '', ''),
('03', 'Nguyen Dang Minh Quan', '', ''),
('04', 'Nguyen Nhat Hieu', '', ''),
('05', 'Ho Quang Man', '650 Ngo Quyen', '0924340080')
```

	CustomersID	CustomersName	Addr	Phone
	01	Ho Quang Minh	43 Le Trong Bat	0787739048
	02	Lai Van Manh	642 Ngo Quyen	0912962805
	03	Nguyen Dang Minh Quan	643 Ngo Quyen	01208142859
	04	Nguyen Nhat Hieu	538 Ngo Quyen	0935296842
	05	Ho Quang Man	650 Ngo Quyen	0924340080
►*	NULL	NULL	NULL	NULL

Figure 18: Enter data of Customer Table with code

- Enter data for Order Table

INSERT INTO ORDERS

VALUES ('A112', '2022-03-02', '01', 'A1104'),
 ('A2978', '2020-01-02', '02', 'A110'),
 ('B156', '2019-05-18', '03', 'B332'),
 ('B923', '2022-12-05', '04', 'B234'),
 ('C472', '2016-06-15', '05', 'C117')

	OrderID	OrderDate	CustomersID	StaffID
▶	A112	2022-03-02	01	A1104
	A2978	2020-01-02	02	A110
	B156	2019-05-18	03	B332
	B923	2022-12-05	04	B234
	C472	2016-06-15	05	C117
*	NULL	NULL	NULL	NULL

Figure 19: Enter data of Order Table with code

- Enter data for Detail Table

INSERT INTO DETAILS

VALUES ('A112', 'A1', '5000000', '2'),
 ('A112', 'C1', '15000000', '5'),
 ('C472', 'E1', '24000000', '10'),
 ('B923', 'B1', '12000000', '6'),
 ('B156', 'A1', '5000000', '4')

	OID	PID	Price	Quantily
▶	A112	A1	5000000	2
	A112	C1	15000000	5
	B156	A1	5000000	4
	B923	B1	12000000	6
	C472	E1	24000000	10
*	NULL	NULL	NULL	NULL

Figure 20: Enter data of Detail Table with code

References

Lich, N. K., 2016. [Online]

Available at: <https://aita.gov.vn/tong-quan-ve-khai-niem-co-so-du-lieu-phan-loai-co-so-du-lieu-va-thao-luan-ve-co-so-du-lieu-trong-co-quan-nha-nuoc-phan-1>