Phase 3 of the DBMS Project

❖ *Modifications that have been made to the EER diagram which was submitted in Phase 2:*

- As advised by the professor, ternary relationship has been established among 'CUSTOMER', 'E-COMMERCE PORTALS' and 'PRODUCTS' entities.

- Relations 'BUY' and 'RETURNS' between entities 'CUSTOMER' and 'PRODUCTS' has been merged into one relation 'BUY/RETURN'. Additional attribute 'Status' has been added to distinguish between Buy and Return of the Product by a Customer.

```
CUSTOMER ——————— BUY/RETURN ——————— PRODUCTS
                      |
                      |
                 E-COMMERCE PORTALS
```

- Individual binary relationships of entity 'SHIPPING PARTNERS' with other entities have been merged into a single quaternary relationship.
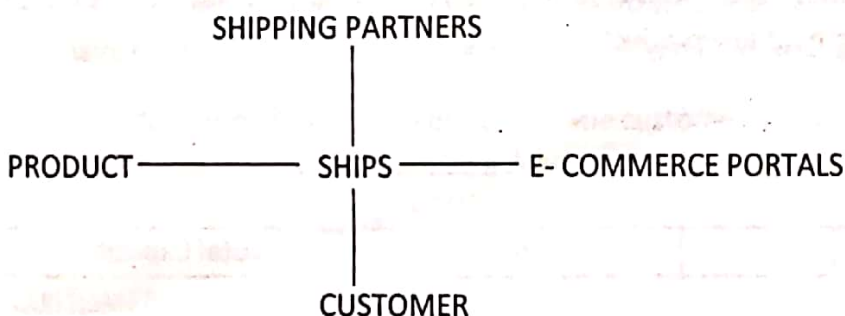
  E.g. **Binary Relationships: (Entity – Relation – Entity)**

    'SHIPPING PARTNERS' – SHIPS – 'PRODUCT'

    'SHIPPING PARTNERS' – 'SHIPS FOR' – 'E- COMMERCE PORTALS'

    'SHIPPING PARTNERS' – 'SHIPS TO' – 'CUSTOMER'

  Quaternary relationship:

```
                    SHIPPING PARTNERS
                          |
                          |
PRODUCT——————— SHIPS ——————— E- COMMERCE PORTALS
                          |
                          |
                      CUSTOMER
```

- 'Supply Date' attribute between 'PRODUCTS' and 'WAREHOUSES' has been dropped.

❖ *Conventions and color coding rules:*

Foreign Keys are in Blue. Primary Keys are underlined.

Given below is a brief explanation about some of the relationships and that is followed by the mapping of these relationships so that idea is clearly explained.

- **SUPPLIER – SUPPLY – PRODUCTS (Binary M:N Relationship)**

A Supplier can Supply multiple Products. Same way, a Product can have multiple Suppliers.

Total participation from both the entities. There can't be a Supplier in the records who does not have any items to supply. Same way, there can't be Product who does not have any Supplier.

SUPPLIER

Supplier ID	Name	Type	City	State	Contact Person	Contact No

PRODUCTS

Product ID	Name	Type

SUPPLY

Supplier ID	Product ID	Purchase Date	Quantity	Price

- **PRODUCTS – STORED IN – WAREHOUSES (Binary N:1 Relationship)**

A Warehouse can have multiple products stored inside it. A product can be stored in only one warehouse.

Total participation from both the entities. There can't be a product who doesn't have a dedicated warehouse and no warehouse can be without any products.

WAREHOUSES

Warehouse ID	City	State	Total Capacity

PRODUCTS

Product ID	Name	Type	WH ID

- **PRODUCTS – LISTED ON – E-COMMERCE PORTALS (Binary M:N Relationship)**

A Product can be listed on multiple E-Commerce Portals. Same way an E-Commerce Portal can have multiple products listed on its platform.

Partial participation from Products. There can be a product which is not listed on any of the portals. But there can't be an E-Commerce Portal that doesn't have any products listed on it.

E-COMMERCE PORTALS

Portal ID	Name	Country

PRODUCTS

Product ID	Name	Type	WH ID

LISTED ON

Portal ID	Product ID	Price	Quantity

- **CUSTOMER – BUY/RETURN – PRODUCTS (Ternary M:N Relationships)**

  E-COMMERCE PORTALS

A Customer can buy/return multiple Products from multiple E-Commerce Portals. Same way a Product can have multiple Customers buying it from multiple E-Commerce Portals.

Partial participation from all the entities. Some customer may exist in the system which doesn't have buy anything as well as there can be a Product that doesn't have any Customer till now.

CUSTOMER

Customer ID	Name	City	State	Country	Pin Code

PRODUCTS

Product ID	Name	Type	WH ID

E-COMMERCE PORTALS

Portal ID	Name	Country

BUY/RETURN

Buy/Return ID	Customer ID	Product ID	Portal ID	Status	Purchase Date	Quantity	Rate

- **SHIPPING PARTNER - SHIPS – PRODUCTS (Quaternary M: N relationship)**

    CUSTOMERS   E-COMMERCE PORTALS
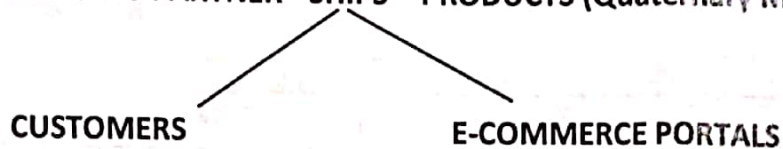
A Shipping Partner can ship to multiple customers based on the E-Commerce Portals they have done shopping from. Same way, a product can be shipped by multiple Shipping Partners based on the E-Commerce Portal they are being listed on.

SHIPPING PARTNERS

SP ID	Name of Company	City	State

CUSTOMER

Customer ID	Name	City	State	Country	Pin Code

PRODUCTS

Product ID	Name	Type	WH ID

E-COMMERCE PORTALS

Portal ID	Name	Country

SHIPS

SP ID	Buy/Return ID	Product ID	Portal ID	Shipping Charge

Mapping:

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SUPPLIER

Supplier ID	Name	Type	City	State	Contact Person	Contact No

SUPPLY

Supplier ID	Product ID	Purchase Date	Quantity	Price

PRODUCTS

Product ID	Name	Type	WH ID

WAREHOUSES

Warehouse ID	City	State	Total Capacity

LISTED ON

Portal ID	Product ID	Price	Quantity

E-COMMERCE PORTALS

Portal ID	Name	Country

CUSTOMER

Customer ID	Name	City	State	Country	Pin Code

BUY/RETURN

Buy/Return ID	Customer ID	Product ID	Portal ID	Status	Purchase Date	Quantity	Rate

SHIPPING PARTNERS

SP ID	Name of Company	City	State

SHIPS

SPS ID	Buy/Return ID	Product ID	Portal ID	Shipping Charge