

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.



- Individual binary relationships of entity '**SHIPPING PARTNERS**' with other entities have been merged into a single quaternary relationship.

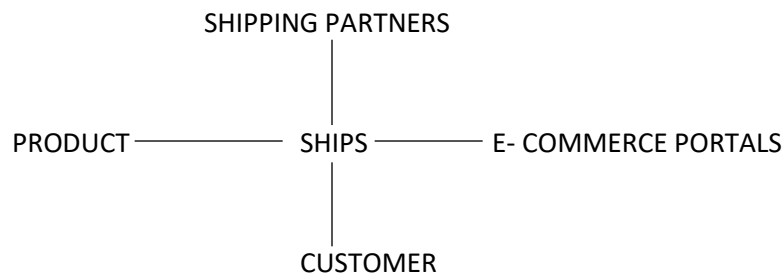
E.g. **Binary Relationships: (Entity – Relation – Entity)**

'SHIPPING PARTNERS' – SHIPS – 'PRODUCT'

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

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

Quaternary relationship:



- '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

<u>Supplier ID</u>	Name	Type	City	State	Contact Person	Contact No
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PRODUCTS

<u>Product ID</u>	Name	Type
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SUPPLY

<u>Supplier ID</u>	<u>Product ID</u>	<u>Purchase Date</u>	Quantity	Price
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- **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

<u>Warehouse ID</u>	City	State	Total Capacity
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PRODUCTS

<u>Product ID</u>	Name	Type	WH ID
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- **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

<u>Portal ID</u>	Name	Country
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PRODUCTS

<u>Product ID</u>	Name	Type	WH ID
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LISTED ON

<u>Portal ID</u>	<u>Product ID</u>	Price	Quantity
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- **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

<u>Customer ID</u>	Name	City	State	Country	Pin Code
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PRODUCTS

<u>Product ID</u>	Name	Type	WH ID
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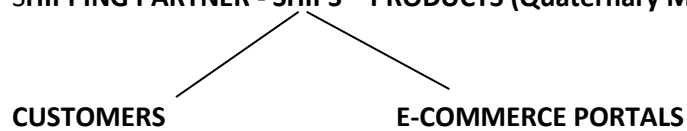
E-COMMERCE PORTALS

<u>Portal ID</u>	Name	Country
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BUY/RETURN

<u>Buy/Return ID</u>	Customer ID	Product ID	Portal ID	Status	Purchase Date	Quantity	Rate
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- **SHIPPING PARTNER - SHIPS – PRODUCTS (Quaternary M: N relationship)**



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

<u>SP ID</u>	Name of Company	City	State
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CUSTOMER

<u>Customer ID</u>	Name	City	State	Country	Pin Code
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PRODUCTS

<u>Product ID</u>	Name	Type	WH ID
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E-COMMERCE PORTALS

<u>Portal ID</u>	Name	Country
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SHIPS

<u>SP ID</u>	<u>Buy/Return ID</u>	Product ID	Portal ID	Shipping Charge
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Mapping:

SUPPLIER

<u>Supplier ID</u>	Name	Type	City	State	Contact Person	Contact No
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SUPPLY

<u>Supplier ID</u>	<u>Product ID</u>	<u>Purchase Date</u>	Quantity	Price
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PRODUCTS

<u>Product ID</u>	Name	Type	WH ID
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WAREHOUSES

<u>Warehouse ID</u>	City	State	Total Capacity
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LISTED ON

<u>Portal ID</u>	<u>Product ID</u>	Price	Quantity
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E-COMMERCE PORTALS

<u>Portal ID</u>	Name	Country
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CUSTOMER

<u>Customer ID</u>	Name	City	State	Country	Pin Code
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BUY/RETURN

<u>Buy/Return ID</u>	<u>Customer ID</u>	<u>Product ID</u>	<u>Portal ID</u>	Status	Purchase Date	Quantity	Rate
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SHIPPING PARTNERS

<u>SP ID</u>	Name of Company	City	State
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SHIPS

<u>SPS ID</u>	<u>Buy/Return ID</u>	<u>Product ID</u>	<u>Portal ID</u>	Shipping Charge
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