

OPIM 5272: Data Management and Business Process Modeling

Project Phase 1

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1. INTRODUCTION

A B2B e-commerce platform allows manufacturers, wholesalers, retailers, and traders to buy and sell products. For an e-commerce business, multiple logistic requirements need consideration. Company stores terabytes of data on its vendors and customers. If managed well, the processes and operations become smooth. One of the most critical logistic processes is the return process and policies. Therefore, here, we have taken a real-life scenario of one of the B2B e-commerce companies that want to optimize its current return process. We will analyze and improve on the existing return process management system.

2. ABOUT THE COMPANY'S WORKFLOW

The company tracks two types of return, RTO and RETURN. The Order_Status attribute captures this information. When a customer receives an order, he has the option of raising a return.

First, it is critical to see how the database captures order information. Each order can have multiple order lines. Each order line signifies a listing that is part of that order. For all order lines, information regarding its quantity, unit price, and the total line amount are available in the Order entity.

All orders delivered to the customer qualifies for a return. After a return request, the agent reviews it. The agent requests the customer to submit proofs, the basis of which the agent approves the request. For each return, the customer has access to a review form. He can share his experience with the return process in that form.

Returns that are approved are shipped back to the seller. There is a deadline for the return shipment to reach the seller. If the firm does not deliver the reverse shipment on time, they absorb the loss by liquidating the item. If an issue arises, a seller can raise a dispute to receive a claim against his return.

This system is currently in use by many teams in the organization. It is used for analytical purposes as well as in decision making. Category, logistics, business finance, strategy, and management, rely on this data for improving business performance.

3. PROBLEM STATEMENT

We identified a few shortcomings in the return management system of the company. They are as follows:

- For orders, we have all the information at an order-line level. For returns, our system only captures data at the order level. We do not get the information about return approval, quantity approval, or total line amount approval. Therefore, the system is not unified.
- Currently, the system relies heavily on the due diligence of the agent for its accuracy. However, tweaking the system a bit can lead to significant gains for the organization. It will reduce human input into the system and introduce data consistency at the line item level.
- Database lacks the provision to store information regarding return types.
- The current system is rigid and has many opportunities to introduce new processes. The average order size being greater than 25 lbs for 80% of the categories, the company loses a lot of money due to all additional shipping costs. Introduction of Partial RTO and return types will alleviate a lot of those costs.

4. **BUSINESS RULES**

- Old Process:

A customer can place many or no orders. For order, there has to be a unique customer. A customer can raise multiple returns on the same order or none at all. A customer can initiate a return on many orders. For a return, there is always a unique customer. A return is a part of only one return shipment. A return shipment can have one or many return airway bill numbers.

Each return shipment is delivered back to a unique seller who can receive multiple return shipments. A seller can raise multiple disputes on the same return shipment.

- New Process:

The customer has the option to accept a partial RTO. One order can have only one partial RTO related to it. Each partial RTO has one reverse shipment. For a particular partial RTO shipment, the seller receives just one reverse shipment.

After raising a return, the customer has a choice between three types of returns. He can now complete the return at a nearby store, have it picked up without a replacement, or have it picked up with an exchange order. A return has to be one and only one of the three types. A return state transition entity looks after the progressive stages of a return.

A return can have multiple return line IDs. A return line ID can only be related to one return. A return line ID is a part of only one order ID but multiple order line IDs. An order line ID can only have one corresponding return line ID.

5. ENTITY RELATIONSHIP DIAGRAM

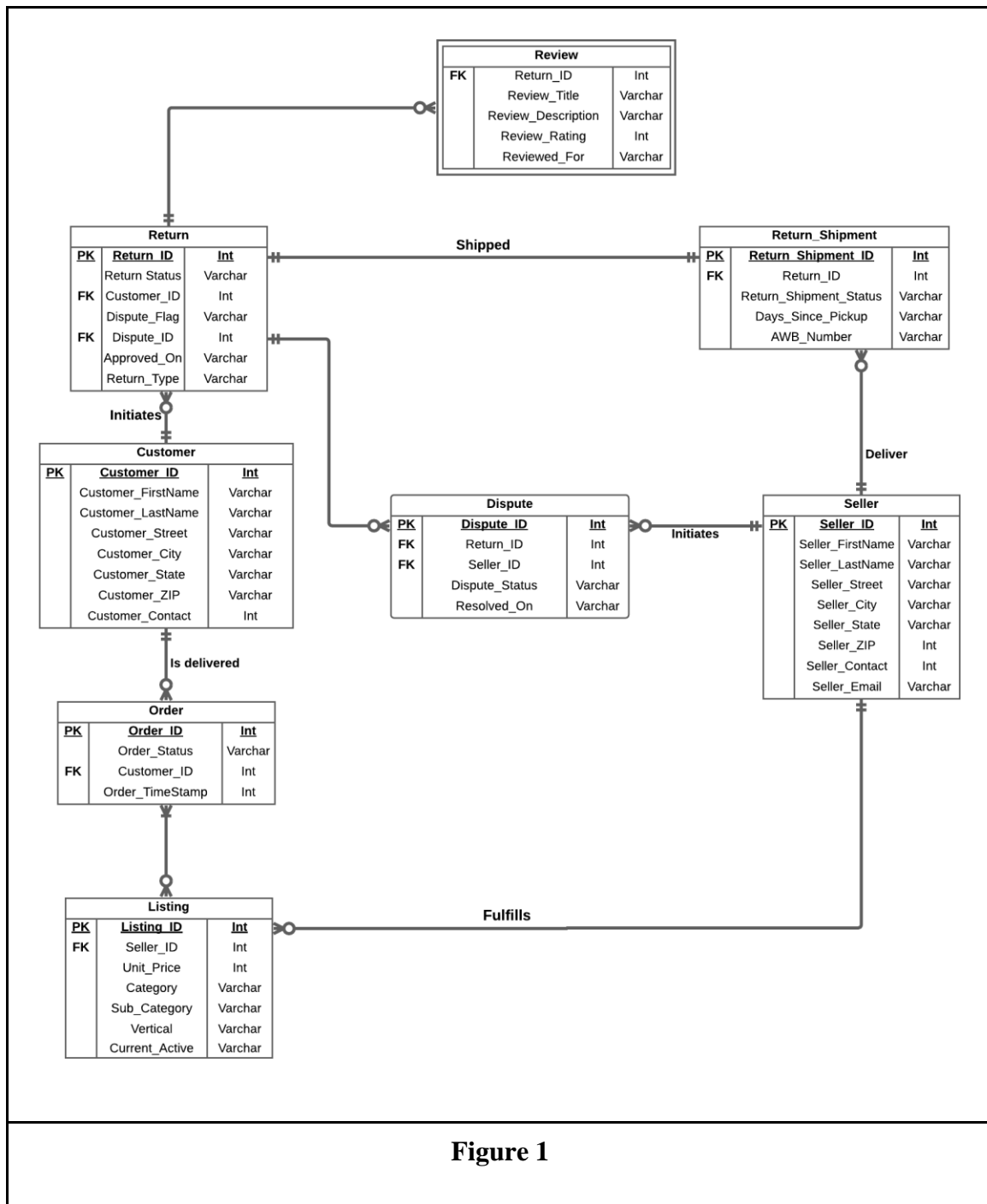


Figure 1

6. ENHANCED ENTITY RELATIONSHIP

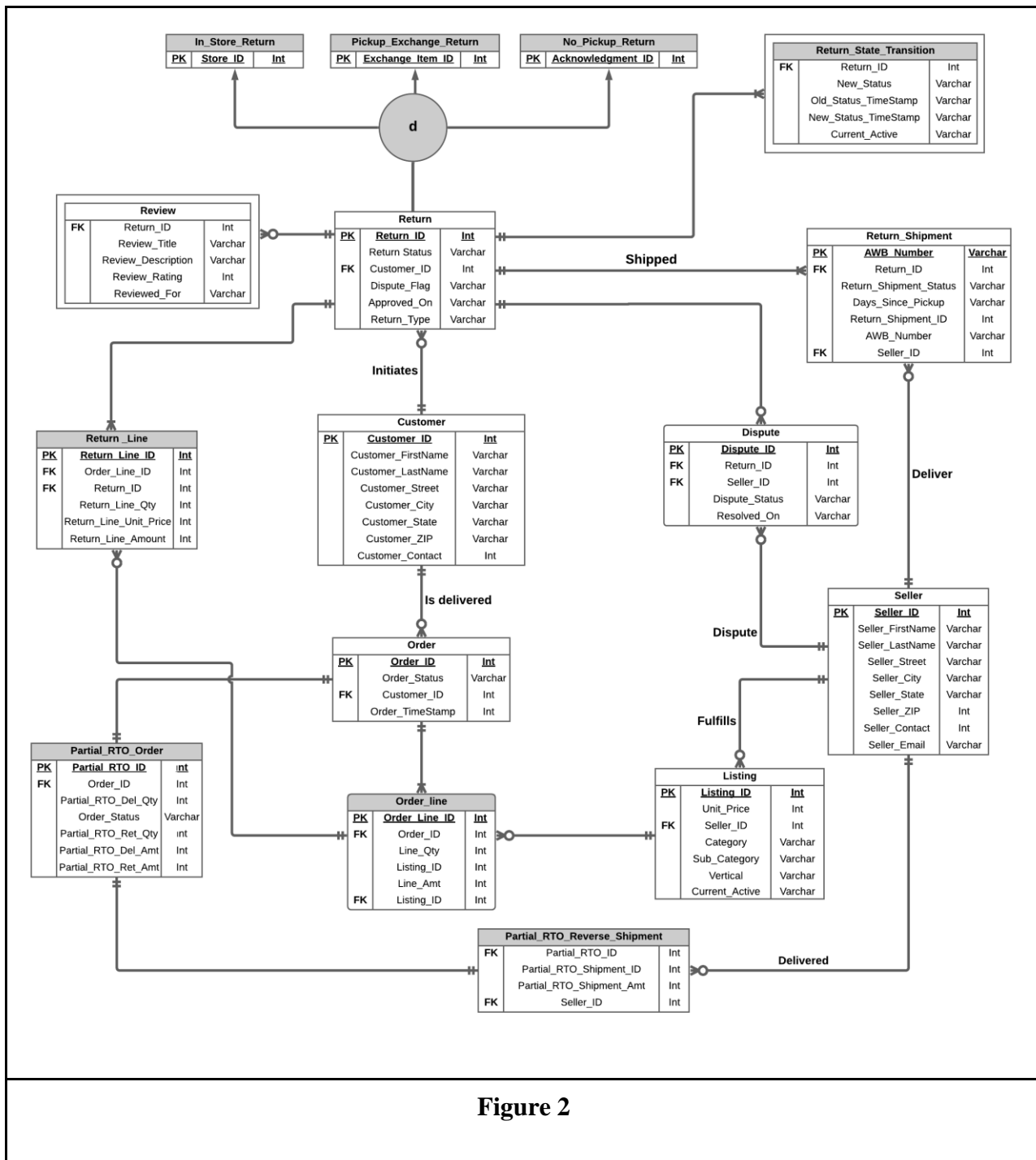


Figure 2

7. DATA DICTIONARY

- Entity description

SR.NO.	ENTITIES	DESCRIPTION	ENTITY TYPE
1	Customer	Details of the customer (person/organization)	Strong
2	Order	It gives us the information about the orders placed by a customer	Strong
3	Order_line	Individual item information in a particular order	Associative
4	Return	It gives us the information of a particular return once raised by the customer	Strong
5	Return_State_Transition	Status table of the return request	Weak
6	Return_Shipment	Reverse shipment details	Strong
7	Seller	Details of the seller (person/organization)	Strong
8	Dispute	Seller Return Dispute Details	Associative
9	Review	Customer review for different aspects of the return	Strong
10	In_Store_Return	Return subtype; Dropping the items at the store	Strong
11	Pickup_Exchange_Return	Return Subtype; Exchanging product	Strong
12	No_Pickup_Return	Return Subtype; Without pickup	Strong
13	Partial_RTO_Order	Partially delivered order details	Strong
14	Listing	List of the products available	Strong
15	Partial_RTO_Reverse_Shipment	Reverse shipment details for partially delivered order	Strong

- Entity-wise attribution description

7.1 ENTITY: CUSTOMER

Sr.No.	Attributes	Definitions	Data Type
1	Customer_ID	Unique ID of a customer for the company records	INT
2	Customer_FirstName	First name of the customer	VARCHAR
3	Customer_LastName	Last name of the customer	VARCHAR
4	Customer_Street	Address - street	VARCHAR
5	Customer_City	Address - city	VARCHAR
6	Customer_State	Address - state	VARCHAR
7	Customer_ZIP	Zip code	INT
8	Customer_Contact	Contact number of the customer	INT
9	Customer_Email	Email ID of the customer	VARCHAR

7.2 ENTITY: ORDER

Sr.No.	Attributes	Definitions	Data Type
1	Order_ID	Unique number created when the order is initiated	INT
2	Customer_ID	ID of the customer who initiates the order	INT
3	Seller_ID	ID of the items' seller	INT
4	Order_Status	Status of the order*	VARCHAR
5	Order_TimeStamp	Date and time of the activity in Order_Status	VARCHAR

*Different status of the order can be:

- Order placed
- Shipped

- Shipment cancelled
- RTO
- Partial_RTO
- Lost
- In Transit
- Delivered
- Absorbed

7.3 ENTITY: ORDER_LINE

Sr.No.	Attributes	Definitions	Data Type
1	Order_Line_ID	Unique number of each order item	INT
2	Listing_ID	Unique number of each product	INT
3	Order_ID	Unique number of each order	INT
4	Line_Qty	Quantity of a particular item	INT
5	Line_Amt	Total price of a particular line item	Derived

7.4 ENTITY: LISTING

Sr.No.	Attributes	Definitions	Data Type
1	Listing_ID	Unique number of each product	INT
2	Unit_Price	Price of single unit of the product	INT
3	Category	The category in which the product belongs to*	VARCHAR
4	Sub-Category	Second level division of categories	VARCHAR
5	Vertical	Third level division of categories	VARCHAR
6	Current_Active	1 if listing is available to be sold	VARCHAR

Example:

1. Clothing category has 3 subcategories: Mens, Womens, and Kids. Each has multiple verticals. Men's category can have Denim, T-Shirt, Shirt etc. Women's subcategory can have Tops, Shirts, Shorts, Dresses etc.
2. Accessories & CE category can have multiple subcategories: audio, video, TV, Washing machine etc. Audio subcategory can have verticals like earphones, bluetooth speakers, 5.1 speakers etc. Video subcategory can have verticals like camera, DSLR, Stage Lights, Studio Lights, Camera Filters etc.

7.5 ENTITY: RETURN

Sr.No.	Attributes	Definitions	Data Type
1	Return_ID	Unique number of the request	INT
2	Return_Line_ID	Unique number of each item in the return request	INT
3	Return_Status	Status of the return request	VARCHAR
4	Approved_On	Date when the return request was approved	VARCHAR
5	Return_Type	Type of the return	VARCHAR
6	Customer_ID	Customer who has raised the request	INT
7	Dispute_Flag	1 if seller raises a dispute	VARCHAR
8	Dispute_ID	Unique id for a dispute	INT

7.6 ENTITY: RETURN_LINE

Sr.No.	Attributes	Definitions	Data Type
1	Return_Line_ID	Unique number of each item in the return request	INT
2	Order_ID	Unique number of each order	INT

3	Return_Line_Qty	Quantity of order item being returned	INT
4	Return_Line_Unit_Price	Unit price of an order item being returned	INT
5	Return_Line_Amount	Total amount of the items being returned	INT
6	Return_ID	Unique number of the request	INT

7.7 ENTITY: PARTIAL_RTO_Order

Sr.No.	Attributes	Definitions	Data Type
1	Partial_RTO_ID	Unique Partial Order Identifier	INT
2	Order_ID	Unique number of each order	INT
3	Partial_RTO_Del_Qty	Partial Order delivered quantity	INT
4	Partial_RTO_Ret_Qty	Partial Order returned quantity	INT
5	Partial_RTO_Del_Amt	Partial Order Delivered Amount	INT
6	Partial_RTO_Ret_Amt	Partial Order Returned Amount	INT

7.8 ENTITY: PARTIAL_RTO_REVERSE_SHIPMENT

Sr.No.	Attributes	Definitions	Data Type
1	Partial_RTO_ID	Partial Order Identifier	INT
2	Partial_RTO_Shipment_ID	Partial Order Reverse Shipment Identifier	INT
3	Partial_RTO_Shipment_Amt	Partial Order Shipment Amount	INT
4	Seller_ID	Partial Order receiving seller identifier	INT

7.9 ENTITY: RETURN_SHIPMENT

Sr.No.	Attributes	Definitions	Data Type
1	Return_Shipment_ID	Unique Number for Return Shipment	INT
2	Return_ID	Unique number of the request	INT
3	Return_Shipment_Status	Status of Return Shipment	VARCHAR
4	Days_Since_Pickup	Number of days since Pickup	VARCHAR
5	AWB_Number	Air WayBill number of the return shipment	VARCHAR

7.10 ENTITY: DISPUTE

Sr.No.	Attributes	Definitions	Data Type
1	Dispute_ID	Unique ID for a Dispute	INT
2	Return_ID	Unique ID of the request	INT
3	Seller_ID	Unique ID for a seller	INT
4	Dispute_Status	Status of the Dispute Request	VARCHAR
5	Resolved_On	Date on which Dispute Resolved	VARCHAR

7.11 ENTITY: Review

Sr.No.	Attributes	Definitions	Data Type
1	Return_ID	Unique ID of the request	INT
2	Review_Title	Review title of the product	VARCHAR
3	Review_Description	Review statement	VARCHAR
4	Review_Rating	Ratings	INT

5	Reviewed_For	Service offering reviewed	VARCHAR
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7.12 ENTITY: RETURN_STATE_TRANSITION

Sr.No.	Attributes	Definitions	Data Type
1	Return_ID	Unique ID for a return raised	INT
2	New_Status	Current status	VARCHAR
3	Old_Status_TimeStamp	Timestamp of the previous status	VARCHAR
4	New_Status_TimeStamp	Timestamp of the current status	VARCHAR
5	Current_Active	Active status	VARCHAR

7.13 ENTITY: In_Store_Return

Sr.No.	Attributes	Definitions	Data Type
1	Store_ID	Unique ID for a Store	INT

7.14 ENTITY: Pickup_Exchange_Return

Sr.No.	Attributes	Definitions	Data Type
1	Exchange_Item_ID	Unique ID for Item Exchange	INT

7.15 ENTITY: No_Pickup_Return

Sr.No.	Attributes	Definitions	Data Type
1	Acknowledgment_ID	Unique ID for the Acknowledgment for No pickup	INT

7.16 ENTITY: Seller

Sr.No.	Attributes	Definitions	Data Type
1	Seller_ID	Unique ID for a Seller	INT
2	Seller_FirstName	First name of the Seller	VARCHAR
3	Seller_LastName	Last name of the seller	VARCHAR
4	Seller_Street	Address - street	VARCHAR
5	Seller_City	Address - city	VARCHAR
6	Seller_State	Address - state	VARCHAR
7	Seller_ZIP	Zip code	INT
8	Seller_Contact	Contact number of the seller	INT
9	Seller_Email	Email ID of the seller	VARCHAR