

# Normalized Relational Database Schema (ERD)

This schema is designed to track product data, customer transactions, and logistics (shipments), utilizing 3rd Normal Form (3NF) to minimize redundancy.

## I. Core Entities

Table Name	Attributes (Key)	Description
MANUFACTURERS	ManufacturerID (PK), Name	Stores unique manufacturer information.
PRODUCTS	ProductID (PK), Name, ManufacturerID (FK)	General product information (Supertype).
ANIMALS	AnimalID (PK), SpeciesName (Unique)	Stores types of animals the products are targeted towards (e.g., Dog, Cat, Bird).
CUSTOMERS	CustomerID (PK), Name, EmailAddress (Unique)	Stores customer details.
WALMART_LOCATIONS	LocationID (PK), Name, ZipCode	Stores locations that serve as shipment origins or destinations.

## II. Product Subtype Tables (Inheritance)

These tables contain details specific to each product type, linked one-to-one with the PRODUCTS table via ProductID.

Table Name	Attributes (Key)	Description
FOOD_DETAILS	ProductID (PK, FK), Weight (kg), Flavor, TargetHealthCondition	Specific details for pet food products.

<b>TOY_DETAILS</b>	<b>ProductID</b> (PK, FK), Material, Durability	Specific details for pet toy products.
<b>APPAREL_DETAILS</b>	<b>ProductID</b> (PK, FK), Color, Size, CareInstructions	Specific details for pet apparel products.

### III. Transaction and Shipment Entities

Table Name	Attributes (Key)	Description
<b>TRANSACTIONS</b>	<b>TransactionID</b> (PK), CustomerID (FK), TransactionDate	Records a purchase made by a customer.
<b>SHIPMENTS</b>	<b>ShipmentID</b> (PK), OriginID (FK), DestinationID (FK)	Records a transfer of goods between two locations. Both FKs reference <b>WALMART_LOCATIONS</b> .

### IV. Junction Tables (Many-to-Many Relationships)

Table Name	Attributes (Key)	Relationship
<b>PRODUCT_FOR_ANIMAL</b>	<b>ProductID</b> (PK, FK), <b>AnimalID</b> (PK, FK)	Associates a Product with one or more Animals.
<b>TRANSACTION_ITEMS</b>	<b>TransactionID</b> (PK, FK), <b>ProductID</b> (PK, FK), Quantity, UnitPrice	Details of which products were bought in a transaction.
<b>SHIPMENT_PRODUCTS</b>	<b>ShipmentID</b> (PK, FK), <b>ProductID</b> (PK, FK), Quantity	Details of which products and quantities were included in a shipment.

### V. Key Relationships (UML Notation Style)

Entity 1	Relationship Type	Entity 2	Foreign Key /

			<b>Junction Table</b>
MANUFACTURERS	1 to Many	PRODUCTS	PRODUCTS.ManufacturerID
PRODUCTS	Many to Many	ANIMALS	<b>PRODUCT_FOR_ANIMAL</b>
CUSTOMERS	1 to Many	TRANSACTIONS	TRANSACTIONS.CustomerID
WALMART_LOCATIONS	1 to Many	SHIPMENTS	SHIPMENTS.OriginID, SHIPMENTS.DestinationID
TRANSACTIONS	Many to Many	PRODUCTS	<b>TRANSACTION_ITEMS</b>
SHIPMENTS	Many to Many	PRODUCTS	<b>SHIPMENT_PRODUCTS</b>
PRODUCTS	1 to 1	FOOD_DETAILS	FOOD_DETAILS.ProductID
PRODUCTS	1 to 1	TOY_DETAILS	TOY_DETAILS.ProductID
PRODUCTS	1 to 1	APPAREL_DETAILS	APPAREL_DETAILS.ProductID