

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.

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

III. Transaction and Shipment Entities

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

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

Table Name	Attributes (Key)	Relationship
PRODUCT_FOR_ANIMAL	ProductID (PK, FK), AnimalID (PK, FK)	Associates a Product with one or more Animals.
TRANSACTION_ITEMS	TransactionID (PK, FK), ProductID (PK, FK), Quantity, UnitPrice	Details of which products were bought in a transaction.
SHIPMENT_PRODUCTS	ShipmentID (PK, FK), ProductID (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 /
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			Junction Table
MANUFACTURERS	1 to Many	PRODUCTS	PRODUCTS.ManufacturerID
PRODUCTS	Many to Many	ANIMALS	PRODUCT_FOR_ANIMAL
CUSTOMERS	1 to Many	TRANSACTIONS	TRANSACTIONS.CustomerID
WALMART_LOCATIONS	1 to Many	SHIPMENTS	SHIPMENTS.OriginID, SHIPMENTS.DestinationID
TRANSACTIONS	Many to Many	PRODUCTS	TRANSACTION_ITEMS
SHIPMENTS	Many to Many	PRODUCTS	SHIPMENT_PRODUCTS
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