# Business Description

## Business background

A household appliances retail store operates in a competitive market, selling various domestic appliances from multiple brands. The store needs to manage inventory efficiently while handling customer orders and supplier relationships.

## Problems. Current Situation

Household appliances store has several common problems related to products management:

* Difficulty in managing relationships with multiple suppliers
* Challenges in tracking order status and delivery
* Inefficient procurement processes
* Rising costs of inventory management
* Difficulty maintaining accurate stock levels

## the Benefits of implementing a database. Project Vision

Implementing a database for products management offers several significant benefits:

* Real-time inventory tracking and optimization
* Improved accuracy in stock management
* Reduced operational costs
* Enhanced customer satisfaction through better stock availability
* Efficient supplier relationship management
* Better forecasting capabilities
* Automated order processing

The vision for this project is to implement a comprehensive database system that streamlines inventory management, order processing, and supplier relationships while providing real-time insights into business operations.

# Model description

## Definitions & Acronyms

|  |  |
| --- | --- |
| Acronyms | Definitions |
| PK | Primary Key |
| FK | Foreign Key |

## Logical SchemeSQL_Uliana_Krekhovetska_Finaltask_HouseholdAppliancesStore_LogicalModel.png

## Objects

**Table “Products”**

The **Products** table is a central repository of all appliances, including details like name, model, price, and current stock levels.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Products | product\_id | Unique identifier for each product, PK | SERIAL |
| name | Name of the product, NOT NULL | VARCHAR(100) |
|  | brand\_id | References brands table, FK, NOT NULL, UNIQUE | INT |
|  | model | Model number of the product, NOT NULL, UNIQUE | VARCHAR(50) |
|  | category\_id | References categories table, FK, NOT NULL | INT |
|  | price | Price of the product, NOT NULL, CHECK (price > 0) | DECIMAL(10,2) |
|  | stock\_quantity | Current quantity in stock, NOT NULL, CHECK (stock\_quantity >= 0) | INT |
|  | description | Detailed description of the product | TEXT |
|  | record\_ts | Timestamp of product creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* Many (1..\*) to One (1) with Categories: Each product belongs to exactly one category, but a category can have many or no products.
* Many (1..\*) to One (1) with Brands: Each product is associated with exactly one brand, but a brand can have many or no products.
* One (1) to Many (0..\*) with Order\_Details: A product can appear in many order details or none, but each order detail refers to exactly one product.
* One (1) to Many (0..\*) with Procurement\_Details: A product can be in many procurement details or none, but each procurement detail refers to exactly one product.

**Table “Categories”**

The **Categories** table stores classification system for products (e.g., refrigerators, washing machines, dishwashers).

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Category | category\_id | Unique identifier for each category, PK | SERIAL |
| name | Name of the product category, NOT NULL, UNIQUE | VARCHAR(50) |
|  | record\_ts | Timestamp of category creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* One (1) to Many (0..\*) with Products: A category can have many products or none, but each product belongs to exactly one category.

**Table “Brands”**

The **Brands** table stores information about appliance manufacturers, including name and country of origin.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Brands | brand\_id | Unique identifier for each brand, PK | SERIAL |
| name | Name of the brand, NOT NULL, UNIQUE | VARCHAR(50) |
|  | country | Country of origin for the brand | VARCHAR(50) |
|  | record\_ts | Timestamp of brand creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* One (1) to Many (0..\*) with Products: A brand can have many products or none, but each product is associated with exactly one brand.

**Table “Orders”**

The **Orders** table stores customer purchase records including total amount and delivery status.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Orders | order\_id | Unique identifier for each order, PK | SERIAL |
| customer\_id | References customers, FK, NOT NULL | INT |
|  | employee\_id | References employees, FK, NOT NULL | INT |
|  | order\_date | Date and time when the order was placed, NOT NULL, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |
|  | status | Current status of the order, NOT NULL, DEFAULT ‘pending’, CHECK (status IN ('pending', 'shipped', 'delivered', 'cancelled') | VARCHAR(20) |
|  | total\_amount | Total cost of the order, NOT NULL, CHECK (total\_amount > 0) | DECIMAL(10,2) |
|  | delivery\_date | Expected or actual delivery date, CHECK (delivery\_date >= order\_date) | DATE |
|  | record\_ts | Timestamp of order creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* Many (0..\*) to One (1) with Customers: An order belongs to exactly one customer, but a customer can have many orders or none.
* Many (1..\*) to One (1) with Employees: Each order is processed by exactly one employee, but an employee can process many orders.
* One (1) to Many (1..\*) with Order\_Details: An order must have at least one order detail, and can have many. Each order detail belongs to exactly one order.

**Table “Order\_Details”**

The **Order\_Details** table serves as a junction table that contain specific items within each order, including quantity and unit price.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Order\_Details | order\_id | References orders, PK, FK | INT |
| product\_id | References products, PK, FK | INT |
|  | quantity | Number of units of the product ordered, NOT NULL, CHECK (quantity > 0) | INT |
|  | unit\_price | Price per unit of the product at time of order, NOT NULL, CHECK (unit\_price > 0) | DECIMAL(10,2) |
|  | record\_ts | Timestamp of record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* Many (1..\*) to One (1) with Orders: Each order detail belongs to exactly one order, and an order must have at least one detail.
* Many (0..\*) to One (1) with Products: An order detail refers to exactly one product, but a product can appear in many order details or none.

**Table “Suppliers”**

The **Suppliers** table contains company information and contact details for all product suppliers.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Suppliers | supplier\_id | Unique identifier for each supplier, PK | SERIAL |
| company\_name | Name of the supplier company, NOT NULL, UNIQUE | VARCHAR(100) |
|  | contact\_name | Name of the primary contact person, NOT NULL | VARCHAR(100) |
|  | email | Email address for the supplier, NOT NULL, UNIQUE, CHECK (email LIKE '%@%.%') | VARCHAR(100) |
|  | phone | Contact phone number, NOT NULL | VARCHAR(20) |
|  | address | Physical address of the supplier, NOT NULL | TEXT |
|  | record\_ts | Timestamp of supplier record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* One (1) to Many (0..\*) with Procurement: A supplier can have many procurement orders or none, but each procurement order is associated with exactly one supplier.

**Table “Procurement”**

The **Procurement** table represents orders placed with suppliers to restock inventory, including order date, status, and total cost.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Procurement | procurement\_id | Unique identifier for each procurement order, PK | SERIAL |
| supplier\_id | References suppliers, FK, NOT NULL | INT |
|  | order\_date | Date when the procurement order was placed, NOT NULL, DEFAULT CURRENT\_DATE, CHECK (order\_date >= ‘2024-07-01') | DATE |
|  | delivery\_date | Expected or actual delivery date of the order, CHECK (delivery\_date >= order\_date) | DATE |
|  | status | Current status of the procurement order, NOT NULL, DEFAULT ‘ordered’, CHECK (status IN ('ordered', 'received', ‘cancelled') | VARCHAR(20) |
|  | total\_cost | Total cost of the procurement order, NOT NULL | DECIMAL(10,2) |
|  | record\_ts | Timestamp of procurement record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* Many (0..\*) to One (1) with Suppliers: A procurement order is associated with exactly one supplier, but a supplier can have many procurement orders or none.
* Many (1..\*) to One (1) with Employees: Each procurement order is created by exactly one employee, but an employee can create many procurement orders.
* One (1) to Many (1..\*) with Procurement\_Details: A procurement order must have at least one procurement detail, and can have many. Each procurement detail belongs to exactly one procurement order.

**Table “Procurement\_Details”**

The **Procurement\_Details** table serves as a junction table that contains line items for each procurement order, including product, quantity, and unit cost.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Procurement\_Details | procurement\_id | Unique identifier for each location, PK, FK | INT |
| product\_id | Country where the mountain is located, PK, FK | INT |
|  | quantity | Number of units of the product ordered, NOT NULL, CHECK (quantity > 0) | INT |
|  | unit\_cost | Cost per unit of the product in this procurement, NOT NULL, CHECK (unit\_cost > 0) | DECIMAL(10,2) |
|  | record\_ts | Timestamp of record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* Many (1..\*) to One (1) with Procurement: Each procurement detail belongs to exactly one procurement order, and a procurement order must have at least one detail.
* Many (0..\*) to One (1) with Products: A procurement detail refers to exactly one product, but a product can appear in many procurement details or none.

**Table “Customers”**

The **Customers** table stores information about customers who place orders.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Customers | customer\_id | Unique identifier for each customer, PK | SERIAL |
| first\_name | Customer's first name, NOT NULL | VARCHAR(50) |
|  | last\_name | Customer's last name, NOT NULL | VARCHAR(50) |
|  | full\_name | Concatenation of first and last name, automatically generated, GENERATED ALWAYS, STORED, NOT NULL | VARCHAR(100) |
|  | email | Customer's unique email address, NOT NULL, UNIQUE, CHECK (email LIKE '%@%.%') | VARCHAR(100) |
|  | phone | Customer's contact phone number, NOT NULL | VARCHAR(20) |
|  | record\_ts | Timestamp of customer record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* One (1) to Many (1..\*) with Orders: A customer can place multiple orders. Each order is linked to one customer.

**Table “Employees”**

The **Employees** table stores information about employees handling orders.

|  |  |  |  |
| --- | --- | --- | --- |
| Table Name | Field name | Field Description | Data Type |
| Employees | employee\_id | Unique identifier for each employee, PK | SERIAL |
| first\_name | Employee's first name, NOT NULL | VARCHAR(50) |
|  | last\_name | Employee's last name, NOT NULL | VARCHAR(50) |
|  | full\_name | Concatenation of first and last name, automatically generated, GENERATED ALWAYS, STORED, NOT NULL | VARCHAR(100) |
|  | email | Employee's email address, NOT NULL, UNIQUE, CHECK (email LIKE '%@%.%') | VARCHAR(100) |
|  | phone | Employee's contact phone number, NOT NULL | VARCHAR(20) |
|  | position | Employee's job title or position, NOT NULL | VARCHAR(50) |
|  | hire\_date | Date when the employee was hired, NOT NULL | DATE |
|  | record\_ts | Timestamp of employee record creation or modification, DEFAULT CURRENT\_TIMESTAMP | TIMESTAMP |

Table relationships:

* One (1) to Many (1..\*) with Orders: An employee handles multiple orders. Each order is processed by one employee.