

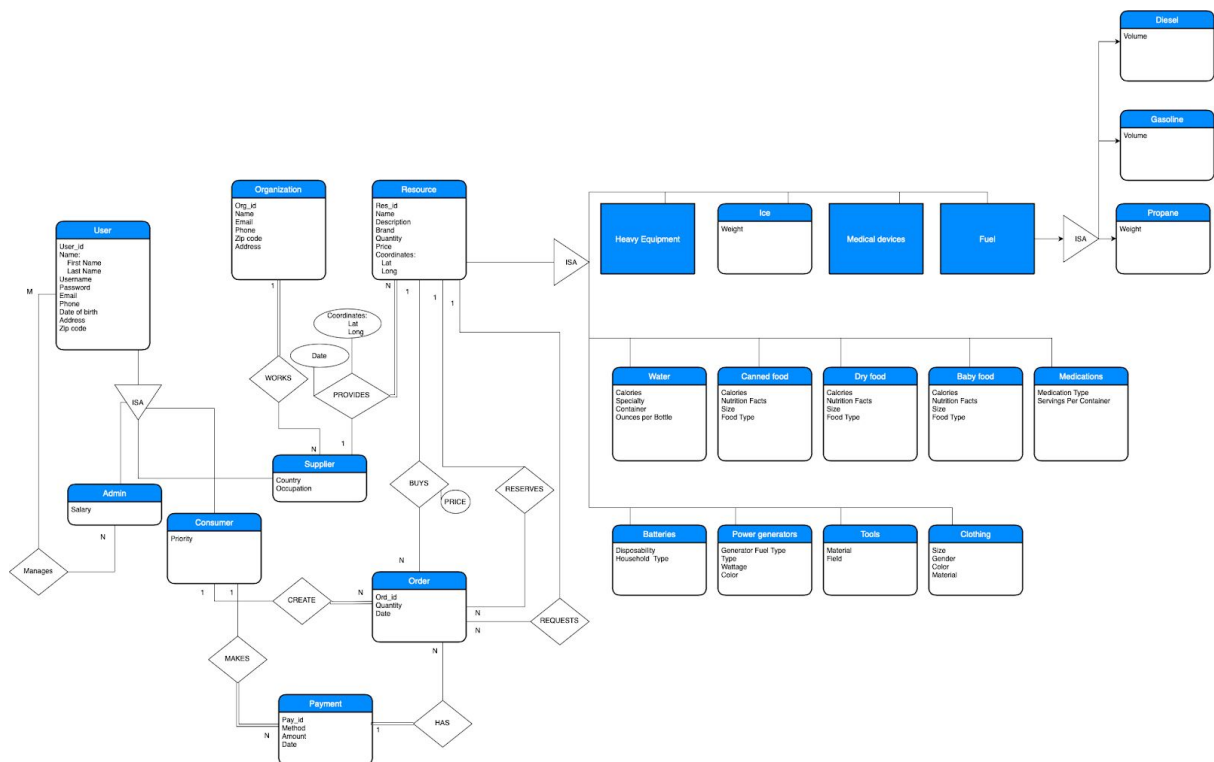


Backend System for Disaster Site Resources Locator

Phase 1 - Conceptual Design

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ER Diagram



Link to ER Diagram <https://bit.ly/2WRiBU9>

Entities

1. User

All users have the following attributes: their first and last name, username, email, password, email, phone, date of birth, address and zip code. Users are composed of three types: admin, consumer and supplier.

a. Admin

- i. An admin is a user that has a salary and that manages users. An admin can manage many accounts and many admins can manage the same account.

b. Consumer

- i. A consumer is the type of user that performs the actions related to consuming a resource, these can be buying, reserving or requesting a scarce resource. Consumers may have a priority if their age is higher than 65 years old. They get resources by creating orders for resources they want and pay them if they are not free.

c. Supplier

- i. A supplier is the type of user that provides resources and may or may not be working for an organization. Suppliers have a country and occupation as attributes.

2. Organization

- a. An organization is an entity with the following attributes: Organization ID, name, email, phone, zip code and address. This entity has total participation since every organization has some suppliers that work for them.

3. Payment

- a. Payment is an entity with the following attributes: payment ID, method, amount and date. Payments are made by consumers when an order is placed. Many orders can have a payment which would be the total of more than one resource bought by a consumer, a single consumer can make many payments in multiple orders.

4. Order

Is an entity with the following attributes: Order id, quantity and date. Everytime that a consumer buys, reserves or requests a resource, an order is created for each of those resources.

The relationship with the consumer is a total participation since an order can't exist without a consumer that creates it.

Each order that is related with buying a resource has a related payment.

If the user buys, reserves or requests multiple resources an order is created for each resource.

5. Resource

Is an entity with the following attributes: Resource id, Name, Description where the supplier can mention details or restrictions of the resource, Brand, Quantity, Price and the Coordinates where it is. All the resources are provided by a supplier which is who specifies the values of the attributes.

Resources can be of different categories and for some of these will have additional attributes.

- a. Batteries
 - i. Batteries have the following attributes: disposability, which are if the battery can be disposed in trash or not, and household type which refers if the battery is made of Alkaline, Lithium, Nickel Metal Hydride, Lead Acid, Lithium Ion or Nickel Cadmium.
- b. Power generators
 - i. Generators have the following attributes: fuel type which is the fuel that uses (Diesel, Gasoline or Propane), the type of generator (Portable, Inverter or Standby), Wattage which is the amount of watts the generator provides and finally Color which is the color of the generator.
- c. Tools
 - i. Tools have two attributes: material which is the material that the tool is made and Field which is if the tool is used by electricians, carpenters, construction or general purpose.
- d. Clothing
 - i. Clothing has the following attributes: Size which is if shirts (extra small, small, medium, large, extra large), Gender which is for male or female, Color which describes the color, Children which is false if the

clothing is for adults and true if it is for children and finally material which is the material the clothing is made of.

- e. Water
 - i. Is a category of resources which has the following additional attributes: Calories, Speciality (Kosher, Local or Organic), Container (6 packs, 12 packs, 16 packs, 1 gallon, 5 gallon, etc), Ounces (number of ounces in each bottle).
- f. Canned/Dry/Baby Food
 - i. Is a category of resources which has the following additional attributes: Calories, Nutrition Facts (Fat free, low fat, Sugar free, etc.), size (Ounces, grams or other measure) and Food type (Kosher, organic or USDA organic).
- g. Medication
 - i. Is a category of resources which has the following additional attributes: Medication type (Analgesics, Antiallergic, Antiacids, Antidiarrheals, etc.) and servings per container.
- h. Heavy Equipment
 - i. Is a category of resources which does not have additional attributes, so the details and specifications should be included in the name and description of the resource.
- i. Ice
 - i. Is a category of resources which has the additional attribute Weight measured in pounds.
- j. Medical Devices
 - i. Is a category of resources which does not have additional attributes, so the details and specifications should be included in the name and description of the resource.
- k. Fuel (Diesel, Gasoline, Propane)
 - i. Diesel
 - 1. It's a type of fuel whose additional attribute is the unit of measure for its volume.
 - ii. Gasoline
 - 1. It's a type of fuel whose additional attribute is the unit of measure for its volume.
 - iii. Propane
 - 1. It's a type of fuel whose additional attribute is the unit of measure for its volume.

Relationships

1. Works

A supplier works for an organization, this can be a company, foundation, etc. The cardinality is many to one as many suppliers can work for a certain organization. There is total participation since every organization has at least one supplier that works for them.

2. Provides

A supplier provides resources, this provision holds attributes for the date it was provided and the coordinates for where it will be stored. The cardinality is one to many as one supplier can provide many resources. There is total participation given that a resource needs a supplier to be provided.

3. Manages

An admin will manage users. The cardinality is many to many as there can be many admins and they will manage many users.

4. Create

A consumer creates an order for a resource. The cardinality is one to many as a consumer can create various orders but an order can only belong to one consumer. There is total participation as an order needs to have a consumer.

5. Buys

A resource can be purchased by a consumer. For this an order is created and then related to the resource adding the attribute "price". This price can be different from the entity "Resource" since a user may have a discount or special price. The cardinality is many to one as multiple users can buy units of the same resource.

6. Reserves

An order reserves a resource when this resource is free of cost. The cardinality is many to one as many orders can reserve one resource as long as it is available.

7. Requests

An order requests a resource when this resource is not available. The cardinality is many to one as many orders can request one resource.

8. Makes

A consumer makes a payment of his orders in case that he purchased one or more resources. The cardinality is many to one as a payment can be done only by one user and a consumer can pay multiple times.

9. Has

If an order was purchased, then this order will have an associated payment. The cardinality is many to one as a consumer can pay for multiple resources in a single transaction, creating a relationship of one payment to multiple orders.