Backend System for Disaster Site Resources Locator
Phase 1

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Objective

The objective of this project is to design, implement and use an application backed by a database system.The application will be used to manage resources on a disaster site, such as in Puerto Rico during the aftermath of Hurricane María. As part of the first phase of this project we were tasked with the creation of the Entity-Relationship diagram which will govern the design of the system.

Description

The following section describes each of the relationships and entities of the Entity-Relationship diagram, which is included in the appendix.

Entities

Admin - Represents an administrator of the system
- AID - Provides an administrator's identification number
- AName - Provides an administrator's name
- APassword - Provides an administrator's password

SalesRecords - Represents a sales record for an individual supplier
- SRID - Provides a sales record identification number
- SID - Provides a supplier's identification number
- Earnings - Provides the earnings for a particular supplier
- Sales - Provides the sales for a particular supplier

Supplier - Represents a supplier
- SID - Provides a supplier's identification number
- SName - Provides a supplier's name
- SPassword - Provides a supplier's password
- SCity - Provides a supplier's current city
- SPhone - Provides a supplier's current phone number
- SLocation - Provides a supplier's current location

CreditCard - Represents a credit card
- CCNum - Provides a credit card number
- CCHolder - Provides the name of the credit card's owner
- ExpDate - Provides a credit card's expiration date

Client - Represents a client
- CID - Provides a client's identification number
- CName - Provides a client's name
- CPassword - Provides a client's password
- CCity - Provides a client's current city
- CreditCardNum - Provides a client's credit card number

Resources - Represents a resource
- RID - Provides a resource's identification number
- RName - Provides a resource's name
- Category - Provides a resource's category
- RPrice - Provides a resource's price
- Available - Provides a resource's availability
- RequestCount - Provides the number of requests placed on a specific resource

Relationships

Supplier-*Has*-SalesRecords
>A supplier has only one sales record. *Has* represents the relationship between these two entities.

Supplier-*Supplies*-Resources
>A supplier's job is to provide one or more types of resources. A resource may be provided by one or more suppliers. Also, a supplier may provide more than one resource. *Supplies* relates the information for a single resource to a single supplier.

- Stock - Provides the current stock of a resource for a specific supplier
- SID - Provides the supplier's identification number
- RID - Provides the resource's identification number

Client-*Purchases*-Resources
>A client is a person who acquires resources. A resource may be acquired by many different clients, and a single client can also acquire different resources. *Purchases* relates the information for a single client to a single resource.

- PID - Provides a purchase's identification number
- RID - Provides a resource's identification number
- CID - Provides a client's identification number
- Total - Provides the total amount of money paid by a client towards the purchase of a particular resource
- Qty - Provides the quantity of a particular resource purchased by a client

Client-*Reserves*-Resources
>Aside from purchasing resources, a client may reserve a resource, or reserve many different resources. Also, a single resource may be reserved by different clients. *Reserves* relates the information of a particular client to a specific resource.

- CID - Provides a client's identification number
- ReserveId - Provides a reservation's identification number
- Qty - Provides the quantity of resources reserved by a client
- RID - Provides a resource's identification number

Client-*Owns*-CreditCard

      A client may own more than one credit card. *Owns* represents the relationship between these two entities.

Implementation

The Entity-Relationship diagram previously described will be implemented using the following schema.

```
Create Table Admin (
        AID     bigserial       primary key, --admin id
        AName varchar(10)       NOT NULL,
        APassword       varchar(20)     NOT NULL,
)

Create Table Client(
        CID     bigserial        primary key,
        CName varchar(10)        NOT NULL,
        CPassword       varchar(20)     NOT NULL,
        CCity   varchar(10)      NOT NULL,
        CreditCardNum char(16)           NOT NULL,
)

Create Table SalesRecord (
        SRID    bigserial       primary key,
        Sid     bigint          FOREIGN KEY REFERENCES Supplier(SID),
        Earnings        float, --revenue from all sales
        Sales   bigint, --amount of succesfull sales completed
)



Create Table Supplier (
        SID     bigserial       primary key, --supplier id
        SName varchar(10)       NOT NULL, --supplier name
        SPassword       varchar(20)     NOT NULL FOREIGN KEY REFERENCES User(Password),
        SCity   varchar(10)     NOT NULL, -- supplier city where it is located
        SPhonechar(10)          NOT NULL, --suppliers phone number
        SLocation       varchar(20)     NOT NULL
)

Create Table Resources (
        RID     bigserial       primary key,
        RName varchar(20)       NOT NULL,
        Category        varchar(20) NOT NULL,
        RPrice  float    NOT NULL,
        Available boolean NOT NULL,
        RequestCount bigint NOT NULL,
```

```
)

Create Table CreditCard (
        CCNum           char(16)        FOREIGN KEY REFERENCES Client(CreditCardNum),
        CCHolder        varchar(10)     FOREIGN KEY REFERENCES Client(CName)),
        ExpDate               date      NOT NULL,
        Primary Key(CCNum, CCHolder)
)

Create Table Purchases (
        PID     bigserial       primary key,
        RID     bigint  FOREIGN KEY REFERENCES Resources(RID),
        CID     bigint FOREIGN KEY REFERENCES Client(CID),
        Qty     bigint NOT NULL,
        Total   float   NOT NULL, --Cost of the the purchase
)

Create Table Reserves (
        ReserveID    bigserial      primary key,
        RID    bigint  FOREIGN KEY REFERENCES Resources(RID),
        CID    bigint FOREIGN KEY REFERENCES Client(CID),
        Qty    bigint NOT NULL
)

Create Table Supplies (
        SID     bigint  FOREIGN KEY REFERENCES Supplier(SID),
        RID     bigint FOREIGN KEY REFERENCES Resources(RID),
        Stock   bigint NOT NULL
        Primary Key(SID, RID)
)
```
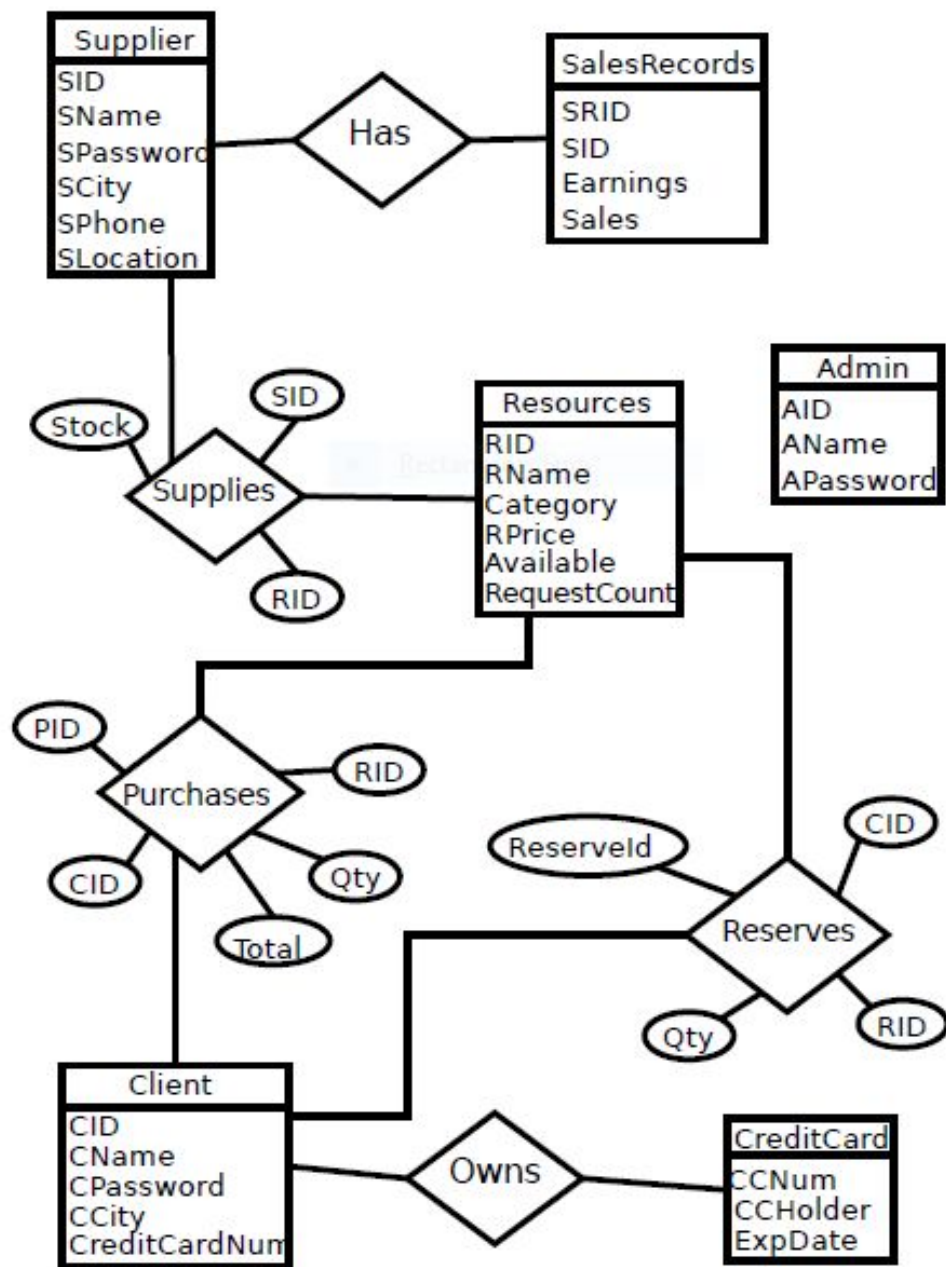
Appendix

Figure 1: The Entity-Relationship Diagram