

CSE 414 Database Project Report*

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*It should be emphasized that, this report is a design report from the early stages of my project and does not include any implementation detail. As a result, it will be altered several times until the project is demoed, and then it will be finalized once the project is implemented. The database as a whole is designed and made concrete here.

Contents

1	Design Overview	3
1.1	Family	3
1.2	Volunteers	4
1.3	Admin	4
2	User Requirements	5
3	E-R Diagram	8
4	Tables	9
4.1	Announcement	9
4.2	Volunteer	9
4.3	Activity	9
4.4	Stock	10
4.5	FamilyApplicationForm	10
4.6	Territory	10
4.7	Family	10
5	Functional Dependencies	10
6	Triggers	11
7	Views	12
8	Transactions	12

1 Design Overview

The project is based on a cooperative management system. I chose this topic after being inspired by the designs that came to me as a result of my volunteer work in a charity association.

I believe the system contains enough complexity for my project assignment because it has many different subjects and objects. Before sharing an E-R diagram, I'll utilize different use-case diagrams to demonstrate the interactions of various actors in the system, as well as their interactions with objects.

An association within a country maintains and organizes its activities through donations. And just like in a company's income/expense indicators, tax processes, an association has to show all of its donations as an input, and each of its payments and activities as an output. Thus, all association employees and volunteers should carry out aids in a coordinated manner and record all aid activities.

This project aims to establish the database of a system in which this coordination is provided.

Before we look at the interfaces and capabilities of the actors who will be included in the system, let's have a look at how the system as a whole appears. There are four actors in the system: Admin, Super-volunteer, co-volunteer, and family (or person) in need of assistance.

We can present the system better if we start from the people with the lowest competence, whose interface is more passive.

1.1 Family

Persons belonging to the needy family actor group represent a family. The purpose of existence and establishment of a charity association is basically to identify these families and to help this family if it deems necessary by doing some research to understand whether they really need help (for example, whether they are a swindler or not). As a result, this group represents a key player in the association system. Families can submit an application to the system. As a result of these applications (details will be provided below), the association's volunteers will arrange for visits to these families' homes to evaluate whether they truly require assistance. Following these visits, volunteers will enter their family information into the system. Some information will be filled in during registration, such as the family's needs and whether the family is qualified for help.

Volunteers can help these families, whom they have identified, when they deem necessary. The volunteers section will go over how this procedure works in detail. The system has only one interface for a family actor, which is to apply. Apart than

that, it has no interaction with the system after the visit has been done and its registration has been taken. In this case, the family will be on the volunteer interface side of the system as a record. If the volunteer deems it necessary, he/she might assist the family by donating commodities, money, and other items. Every one of these assistance must be entered into the system.

1.2 Volunteers

Aside from some staff, organizations have a steady stream of volunteers, or persons who participate in the organization's operations without getting any compensation. Let's go over the specifics.

First of all, each member works in a certain sub-region. For example, a member can manage the Umraniye district in the province of Istanbul. He is responsible for family determinations, aids and activities in that region. Only in the region authorized by the admin (which can be more than one), he can identify the family, leave a family record in the system, see the stocks and, if he deems it necessary, make a help to the family from the stocks.

They can create and plan an activity to work in coordination with each other. The interface in the system is designed both to interact with each other and to follow the families systematically.

1.3 Admin

They accept and verify the membership of new members in the system. They can view and add stocks. Interface is simple. Can see stock/family/activity records in all regions. So there are direct interfaces to view the system. They can assign members can assign regions or remove from their territory.

2 User Requirements

Now we'll go over the requirements and use case diagrams for each of the system's actors that we mentioned earlier and define the system in detail, as all of the functions of each actor will be given in this section.

1. **Family** can apply for assistance in the system.
2. **Volunteer** can register in the system.
3. **Volunteer** can see the post flow in the system.
4. **Volunteer** can comment on posts in the system.
5. **Volunteer** can edit their profile.
6. **Volunteer** can view-edit-add family.
7. **Volunteer** can add post.
8. **Volunteer** can add aid to families.
9. **Volunteer** can donate to stocks.
10. **Volunteer** can participate in activities.
11. **Volunteer** can create activity.
12. **Volunteer** can view and edit stocks.
13. **Admin** can view-edit-add all families.
14. **Admin** can expand or narrow a Volunteer's territory.

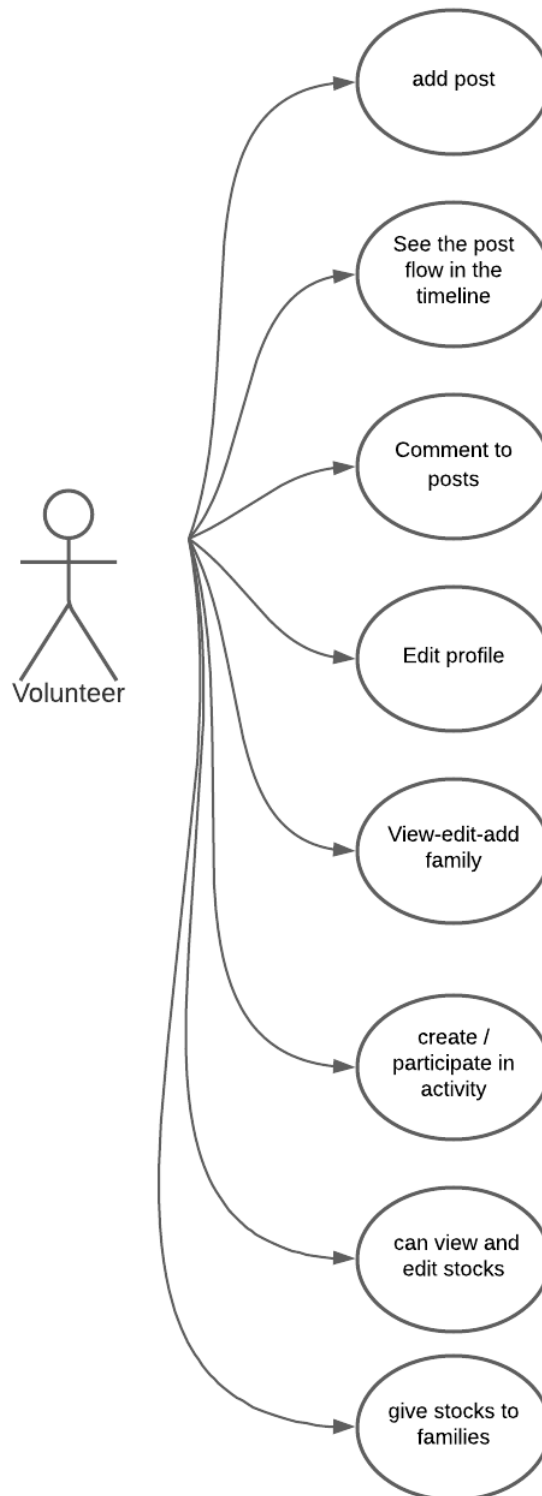


Figure 1: User volunteer use-case

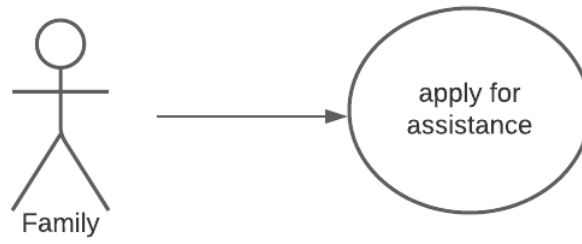


Figure 2: User family use-case

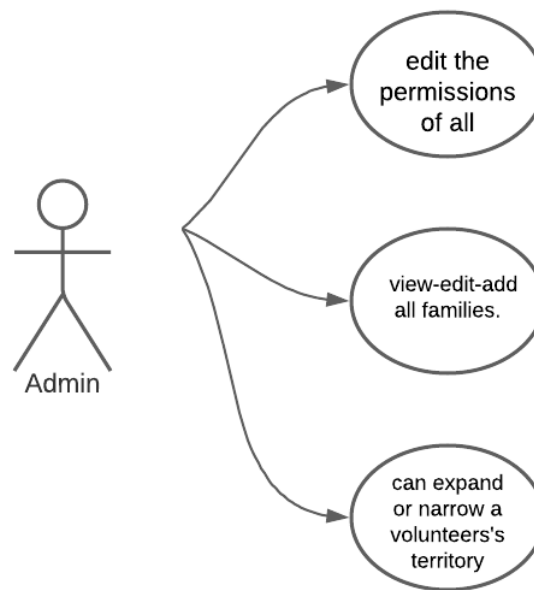


Figure 3: User admin use-case

3 E-R Diagram

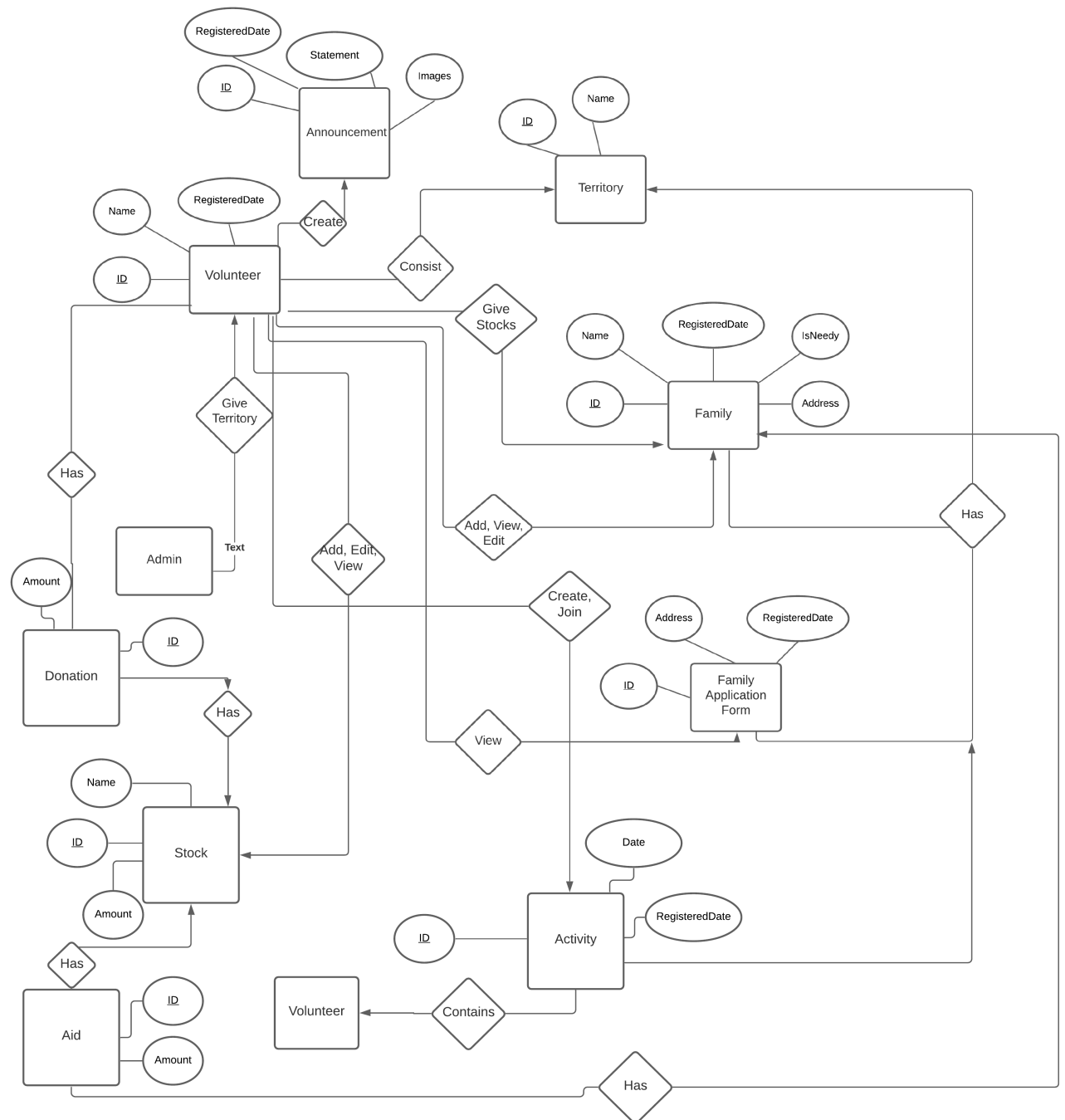


Figure 4: E-R Diagram of the System

4 Tables

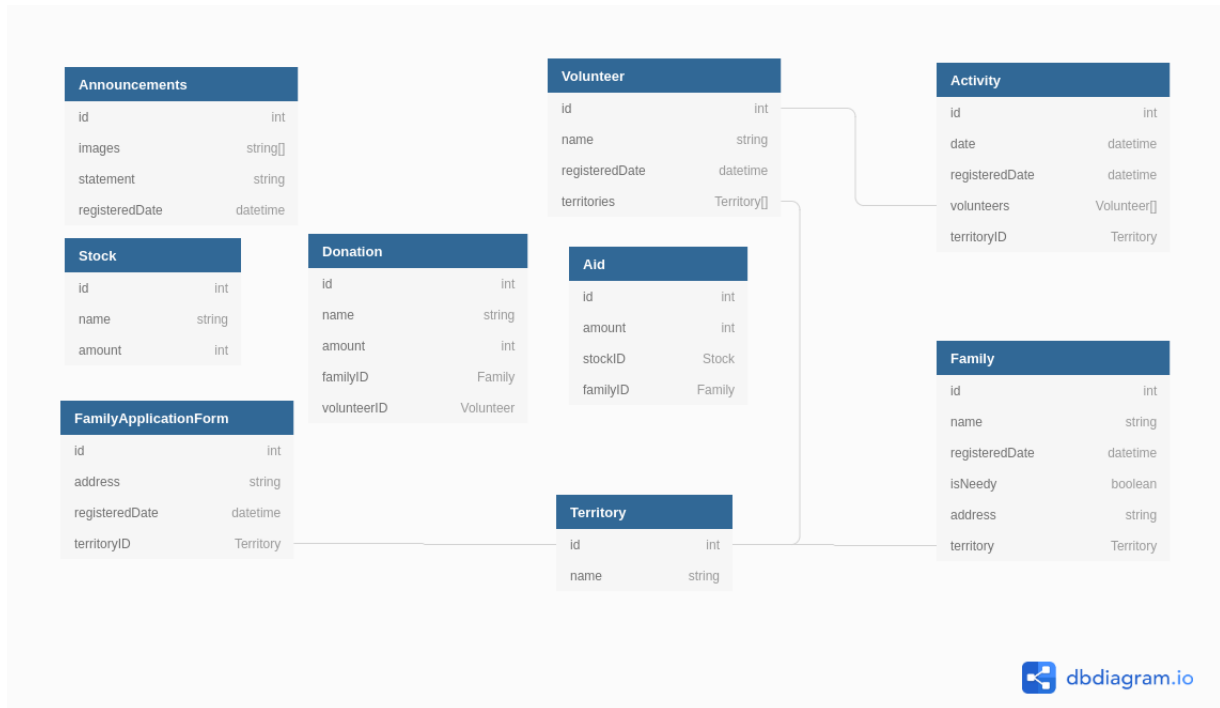


Figure 5: Tables and Relations

4.1 Announcement

Posts will be data types that users use to tell each other a situation with pictures. For example, a family situation or aid announcement, etc. In such cases, members will be able to provide coordination here by sharing with each other. The post contains only the image buffer.

4.2 Volunteer

Volunteer, as is already known, represents a typical member. Members include name, date of registration, post and region.

4.3 Activity

An activity is created by members. As can be seen again, the activities include the member group included in the activity. And finally, it includes the date when the activity will take place.

4.4 Stock

Stock is a data class that represents the quantity of a particular item. Members can see the stocks and process what they are given to families as a report.

4.5 FamilyApplicationForm

These are the information that includes the data of the families when they first applied, the address and the region. In this way, members can see these forms and make a determination.

4.6 Territory

The district system is important because the entire structure of the association works through regions. In many data, the region is stored as an information.

4.7 Family

A family hides in this class, the address of the family, whether they need help, etc, is stored

5 Functional Dependencies

Announcement

ID \rightarrow images, statement, registeredDate

Volunteer

ID \rightarrow name, registeredDate, territories

Activity

ID \rightarrow date, registeredDate, volunteers, territory

Stock

ID \rightarrow name, amount

Donation

ID \rightarrow name, amount, familyID, volunteerID

Aid

ID → name, amount, stockID, familyID

FamilyApplicationForm

ID → address, registeredDate, territory

Territory

ID → name

Family

ID → name, registeredDate, isNeedy, address, territory

6 Triggers

DeleteFamilyApplicationFormWhenFamilyAdded

When a new family is added, this form should be deleted by that family name as it has already been added to the action from a previous form application.

UpdateStockAmountWhenAidCreated

When a grant is made to a family, it reduces a certain stock. A non-stock already cannot be helped to the family. When an item that is in stock is donated, the quantity of that available stock must be reduced.

CreateAnnouncementWhenActivityCreated

As soon as the activity is created by a member, it should have been added to the announcements with a specific statement, as a new announcement.

UpdateStockAmountWhenDonationCreated

When a donation is made, it creates a certain stock. If a stock with a different name is created, this stock should be created with this donation, or if it is a stock that was previously in a certain amount, the number of this existing stock should be increased.

DeleteVolunteerFromActivityWhenTerritoryDropped

Each member can participate in the activity in their own region. First, let's say member X can work in territory Y, and because it has this permission, it can join an activity in that region. But if the admin gets this permission from him, if he is currently in an activity for this region, he will be removed from that activity.

7 Views

NeedyFamilies

In specific activity gatherings to assist, volunteers working in the area will want to view families in need at a time, i.e. families assigned the *isNeedy* variable value of *true*.

LastAids

All volunteers and the admin will be able to see the latest donations, as they want to follow the donations made and want to report them.

LastDonations

All volunteers and the admin will be able to see the last donations made, as they want to follow the donations made and want to report them.

ActivitiesInTerritories

A member will see the activities in their region.

AvailableStocks

A member or admin will want to view all products that are currently in stock.

8 Transactions

CreateAid

As soon as an aid is created, the stock status required for the goods/cash or in-kind aid to be provided must be available in the system. This is checked first and

then, if the family is eligible for assistance, the granting of assistance to the family is approved and the assistance is recorded.

JoinActivity

When a member requests to participate in an activity, it is first checked whether the region in their jurisdiction and the activity they want to participate in are in the same region, and if appropriate, the member participates in the activity.

CreateDonation

When a member makes a donation, the donation is recorded in the system and the stocks are updated accordingly.