Table of Contents

[Introduction 2](#_Toc129337397)

[Table Creation and Population 3](#_Toc129337398)

[Creating tables 3](#_Toc129337399)

[Populating tables 6](#_Toc129337400)

[Querying Database 9](#_Toc129337401)

[Security, Integrity and Ethical Aspects of Data Governance 13](#_Toc129337402)

[General Considerations 13](#_Toc129337403)

[Scenario-specific Considerations 14](#_Toc129337404)

[Conclusion 19](#_Toc129337405)

[References 20](#_Toc129337406)

# Introduction

This is a report which focuses on the implementation of an information system for an international organization earlier introduced in the database design and modelling report. My scenario specifically focuses on the implementation of a database for a humanitarian organization which receives donations in order to tackle global humanitarian crises.

This database will manage information about donations, donors, crises, staff and bank accounts. This will help the organization to perform financial, administrative and operational analyses as required.

The conceptual model is illustrated in the logical and relational models in Figure 1 and Figure 2 respectively.

Diagram

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Figure 1: Logical ER Model

Diagram

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Figure 2: Relational ER Model

# Table Creation and Population

The database is created and populated using Oracle SQLPlus (data definition language). Five tables were created for Donor, Donation, Crisis, Staff, and Account. The SQL statements used in creating, altering and populating these tables are shown in the following sections.

## Creating tables

Tables are created using CREATE TABLE statements, as demonstrated in the figures below.

### Account table

The CREATE TABLE statement in Figure 3 creates account table.

### Donor table

The CREATE TABLE statement in Figure 4 creates donor table.

### Donation table

The CREATE TABLE statement in Figure 5 creates donation table.

### Crisis table

The CREATE TABLE statement in Figure 6 creates crisis table.

### Staff table

The CREATE TABLE statement in Figure 7 creates staff table.

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Figure 3: CREATE TABLE account statement.

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Figure 4:CREATE TABLE donor statement.

Figure 4:CREATE TABLE donor statement.

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Figure 5: CREATE TABLE donation statement.

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Figure 6: CREATE TABLE crisis statement.

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Figure 7: CREATE TABLE staff statement.

## Populating tables

### Account

The INSERT INTO statements in Figure 8 populates the account table.

### Donation

The INSERT INTO statements in Figure 9 populates the donation table.

### Donor

The INSERT INTO statements in Figure 10 populates the donor table.

### Crisis

The INSERT INTO statements in Figure 11 populates the crisis table.

### Staff

The INSERT INTO statements in Figure 12 populates the staff table.

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Figure : INSERT INTO account.

Text

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Figure : INSERT INTO donation.

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Figure : INSERT INTO donor.

Text

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Figure : INSERT INTO crisis.

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Figure : INSERT INTO staff.

# Querying Database

Query 1: The query below selects total donation amount of each donor.

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Figure : Donation amount by Donor query

Query 2: The query below selects total donation amount received by each crisis.

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Figure : Donation amount by Crisis query

Query 3: The query below selects each account and number of donations received.

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Figure : frequency of account usage query

Query 4: The query below selects total salary grouped by staff role.

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Figure : Salary by staff role query.

Query 5: The query below shows total donations received.

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Figure : Total donation amount received query.

# Security, Integrity and Ethical Aspects of Data Governance

Security:

Data security is critical for humanitarian organizations, which may deal with sensitive personal information such as personal identification information, and data related to communities in conflict or disaster situations. The organization should have a clear policy regarding data access and should ensure that staff members are trained in secure data handling practices.

The following are some ways to ensure data security in a humanitarian organization's database:

* **Use strong passwords**: Require strong passwords that include a mix of letters, numbers, and special characters. Implement policies for password expiration and complexity.
* **Access control**: Limit access to sensitive data to authorized personnel only. Implement access control policies to ensure that only those who need to access specific data can do so.
* **Encryption**: Use encryption to protect sensitive data both in transit and at rest. This includes data in databases, backups, and archives.
* **Regular backups**: Regularly back up data to ensure that it can be restored in case of a security breach or system failure.

Here is an example of SQL code that can be used to set up access control policies for the donor table:



This code grants privileges to a user called privileged\_user, allowing them to select, insert, update, and delete data from the donor table.

Integrity:

Data in a humanitarian organization's database should be reliable, and there should be no chance of losing it or altering it unintentionally.

Data integrity is made up of the following parts:

* **Entity integrity**

To identify each row in a table, the table must have a primary key. The primary key is a unique value that identifies each row. This requirement is called the entity integrity constraint.



Figure : account entity constraint



Figure : crisis entity constraint

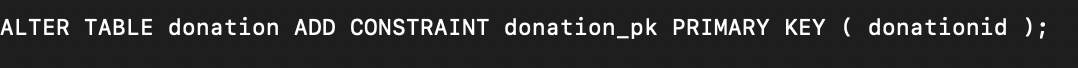


Figure : donation entity constraint



Figure :donor entity constraint



Figure : staff entity constraint

* **Semantic integrity**

Semantic integrity ensures that data entered into a row reflects an allowable value for that row. The value must be within the domain, or allowable set of values, for that column. For example, the ACCOUNTID column of the **account** table permits only 8-digit numbers. If a value outside the domain is entered into a column, the semantic integrity of the data is violated.

A picture containing diagram

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Figure : Semantic Integrity constraints

* **Referential integrity**

Referential integrity refers to the logical dependency of a foreign key on a primary key. The integrity of a row containing a foreign key depends on the integrity of the row it references i.e., the row containing the matching primary key.

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Figure : Referential Integrity constraints.

Data Ethics:

organizations need to ensure that they are using data in ways that are consistent with their mission and values. Here are some ways to ensure ethical data use:

* **Privacy policies**: Create clear and concise privacy policies that explain how data is collected, stored, and used.
* **Data anonymization**: Remove personally identifiable information from datasets to protect the privacy of individuals.
* **Informed consent**: Obtain informed consent from individuals before collecting their data.
* **Data transparency**: Be transparent about how data is collected, used, and shared.

# Conclusion

In this project, I have implemented the information system by creating the required entities, defined integrity constraints for each entity. I have also populated each entity with mock values and queried the tables to gather insights. I have discussed data security, ethics, and integrity in the context of my scenario, and in general.

# References

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