

# MS805 Group Assignment

## Deliverable D — Normalisation Report

### Group: Thu 203

#### **1. Which normal form (1NF, 2NF, 3NF, other?) have you reached?**

As conditions of 1NF, 2NF and 3NF are satisfied by all the ERD's, all are in Third Normal form(3NF).

To minimize data redundancy and to ensure sufficient data is only stored related to each entity, 3NF is suitable for all the ERD's. Being 3NF makes it easier and reliable for maintaining data and the database will be less prone to errors during updates.

#### **2. How do you know that you have reached that normal form?**

##### **Proposal ERD 1:**

The primary key attribute in this ERD serves as a unique identifier for each entity, and each attribute has a single value. Additionally, there are no functional dependencies. It is confirmed that the first normal is normal.

Because there are no composite keys, all of the non-key attributes are totally reliant on the primary keys. As a result, the second normal form is verified and there are no partial dependencies. Ultimately, the third form is attained because there are no **transitive dependencies—non-key** qualities that are determined by another non-key attribute.

##### **Proposal ERD 2:**

Since the primary key attribute serves as a unique identifier for each entity (table) in this design, every table row is distinct. A single value, not a collection of values, makes up each characteristic as well. There are no functional dependencies, meaning that the value of one property does not dictate the value of another. This design's first normal form is verified by verifying those conditions.

The campaign and location have many to many relationships we have created another table called campaign\_location with respect to partial dependencies. The second type is accomplished in this architecture. Furthermore, none of the entities' non-key attributes can influence another attribute. Transitive dependencies are thus absent, and this design's third normal form is verified.

### **Proposal ERD 3:**

1NF: Every table has a distinct primary key and does not contain arrays or repeating groups.

2NF: It fits the 1NF criteria. Additionally, any partial dependencies are eliminated because every non-key attribute is entirely dependent on the primary key.

3NF satisfies 2NF criteria and eliminates transitive dependencies by creating **all non-** key attributes directly dependent on the primary key.

### **3. Why is that normal form appropriate for your design? (You may wish to refer to points that you made in Deliverable B.) / 4. If you have reached only 1NF or 2NF — would further normalisation into higher normal forms have a positive, negative, or neutral impact on your work**

- **Minimizes Redundancy:** Reaching 3NF for both ERDs guarantees that redundant data is kept to a minimum, which lowers storage needs and facilitates data management easier. For instance, by linking location and currency entities via foreign keys, the design avoids storing repeated currency details in multiple tables.
- **Maintains Data Integrity:** Since 3NF eliminates transitive dependencies, each table only includes information that is directly related to its primary key. This helps to reduce possible risk of inconsistent data updates. For example, in ERD 2 the campaign\_location table connects campaigns to places and the direct connection of donations from supporters to campaigns, makes the design flexible for tracking purpose.
- **Enhances Query Efficiency:** As the 3NF structure avoids complex joins caused by redundant data, query efficiency is increased. Easier access and quicker retrieval of data are made possible by this. It is particularly useful when querying data for reports, such as total donations per campaign or supporter subscriptions, allowing for streamlined access and faster retrieval.

### **Impact of Further Normalization (Beyond 3NF):**

Further normalizing this design into an elevated normal version of 4NF, that is, by necessitating the establishment of more tables and sophisticated queries, would have a neutral to negative effect. When we break down tables further, SQL queries start to get trickier and often need a bit more processing power to get the same info, which can affect the performance. Reduced redundancy and data integrity are already met by the 3NF configuration as it stands.