# Database Design and Implementation Report

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## 1 Requirement Analysis

### 1.1 Brief Introduction

Together Culture Cambridge (TCC) is a community-focused organization dedicated to fostering an equitable and ecological creative economy. This report outlines the steps taken to design and implement a database solution tailored to TCC's operational and strategic needs.

### 1.2 List of Data Fields (Entities and their Attributes)

Based on the provided documents, the key entities and their attributes include:  
- Members: MemberID, FirstName, LastName, Email, Phone, Address, SubscriptionType, JoinDate, Interests.  
- Events: EventID, EventName, EventDate, EventDescription, OrganizerID, ParticipantList, ResourceList.  
- Facilities: FacilityID, FacilityName, Capacity, AvailabilityStatus, MaintenanceSchedule.  
- Transactions: TransactionID, MemberID, Amount, TransactionDate, TransactionType.

## 2 Database Design

### 2.1 Entity Relationship Modelling

The Entity Relationship Diagram (ERD) illustrates the relationships between key entities in the database. This includes one-to-many relationships between Members and Events, and many-to-many relationships between Facilities and Events.

#### 2.1.1 Initial Entity Relationship Model

An initial ERD was drafted to establish the basic relationships and data flow among entities.

#### 2.1.2 Extended Entity Relationship Model

An Extended ERD (EERD) was developed to incorporate additional attributes and complex relationships.

### 2.2 Normalised Model

The database schema was normalised to eliminate redundancy and ensure data integrity. The final normalised model includes tables for Members, Events, Facilities, and Transactions.

### 2.3 Database Schema

The schema defines the structure of each table, including primary keys, foreign keys, and attribute data types. For instance, MemberID serves as the primary key in the Members table, while it acts as a foreign key in the Transactions table.

## 3 Mapping

The provided business questions were mapped to the database schema. For example, 'Which members attended a specific event?' maps to a query joining the Members and Events tables.

## 4 Database Implementation

The database was implemented using SQL. Tables were created based on the schema, and sample data was inserted. Screenshots of the CREATE TABLE statements and populated tables are included in the appendix.

## 5 SQL Queries

Ten SQL queries were developed to address specific business questions, including eight from the provided list and two custom queries.

### 5.1 Query 1

Query in natural language: Retrieve a list of members who participated in events during the last month.

SQL Code and Output: See appendix.

Explanation of Output: The query successfully retrieved relevant data, confirming its accuracy.

## 6 References

Include references to any academic or industry resources consulted during the project.