Political Campaign

Luka Alughishvili



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# Political Campaign - Logical Data Model

DataBase purpose:  
*The purpose of this database is to organize and manage all key data related to political campaigns. It provides a structured way to store information about commissions, elections, candidates, campaigns, donors, contributions, voters, surveys, volunteers, and events.  
The goal is to support operations such as tracking donations, managing volunteers, organizing campaign events, collecting voter feedback, and maintaining data integrity across multiple elections and campaigns.*

Key entities

- Commission: the independent body overseeing elections (one commission many elections).  
- Election: specific election instance (local, national) belonging to a Commission.  
- Campaign: campaign participating in a specific Election; linked to a Candidate.  
- Candidate: person running in an election. Candidate linked to Campaign (1:many).  
- Donor: individual or organization providing funds. Many-to-many with Campaign via Contribution table.  
- Contribution: stores donation amounts with donor, campaign, date, method (resolves M:N Donor-Campaign).  
- Volunteer: people who help campaigns. Volunteers may report to other volunteers (self-referential FK).  
- Event: campaign events (rallies, town halls). Event belongs to a Campaign.  
- Volunteer\_Assignment: join table for many-to-many Volunteer <-> Event with composite PK (volunteer\_id, event\_id).  
- Survey and Survey\_Response: survey questions per campaign and responses captured per voter (Survey\_Response links Survey and Voter). Response stored as JSONB for flexibility.  
- **3NF: attributes stored only once, no transitive dependencies. Join tables remove many-to-many into two 1:many relations.**  
  
Fields used for connections

* Election.commission\_id -> Commission.commission\_id
  + (Each election is overseen by one commission.)
* Campaign.election\_id -> Election.election\_id
  + (Each campaign belongs to a specific election.)
* Campaign.candidate\_id -> Candidate.candidate\_id
  + (Each campaign is run by one candidate.)
* Contribution.donor\_id -> Donor.donor\_id
  + (Each contribution originates from a donor.)
* Contribution.campaign\_id -> Campaign.campaign\_id
  + (Each contribution is given to a campaign.)
* Event.campaign\_id -> Campaign.campaign\_id
  + (Each event is hosted by a campaign.)
* Volunteer\_Assignment.volunteer\_id -> Volunteer.volunteer\_id
  + (Assignment references volunteer.)
* Volunteer\_Assignment.event\_id -> Event.event\_id
  + (Assignment references event.)
* Survey.campaign\_id -> Campaign.campaign\_id
  + (Survey belongs to a campaign.)
* Survey\_Response.survey\_id -> Survey.survey\_id
  + (Response references survey.)
* Survey\_Response.voter\_id -> Voter.voter\_id
  + (Response provided by voter.)
* Volunteer.reports\_to -> Volunteer.volunteer\_id
  + (Self-reference: volunteer reports to another volunteer; can be NULL.)

**Major Design Decisions**

### Many-to-Many Relationships

Two M:N relationships were identified:

Volunteers & Events: A volunteer can participate in many events, and each event can have many volunteers.

Implemented using the Volunteer\_Assignment junction table, with a composite primary key (volunteer\_id, event\_id).

Voters & Surveys : A voter can answer many surveys, and each survey can receive many responses.

Implemented through the Survey\_Response table.

### Normalization and 3NF Compliance

The design achieves Third Normal Form (3NF) by:

Ensuring that every table has a primary key uniquely identifying each record.

Removing partial dependencies: every non-key attribute depends on the whole key (not part of a composite).

Eliminating transitive dependencies: non-key attributes depend only on the primary key and not on other non-key attributes.

For example, donor contact information is stored only in the Donor table, and campaign details are not repeated in Contribution or Event tables.

### Self-Referential Relationship

The Volunteer table includes a reports\_to field referencing volunteer\_id within the same table, allowing representation of volunteer hierarchies (e.g., team leaders supervising other volunteers).

### Referential Integrity

All foreign key constraints ensure that data remains consistent between related tables (e.g., a campaign must reference a valid candidate and election).

## Conclusion

This database design provides a normalized, scalable, and logically connected data structure for managing political campaigns. It captures the real-world relationships between campaigns, candidates, donors, voters, and volunteers while maintaining data integrity and minimizing redundancy.