Project (Phase-3)
TOPIC : ELECTIONS IN INDIA

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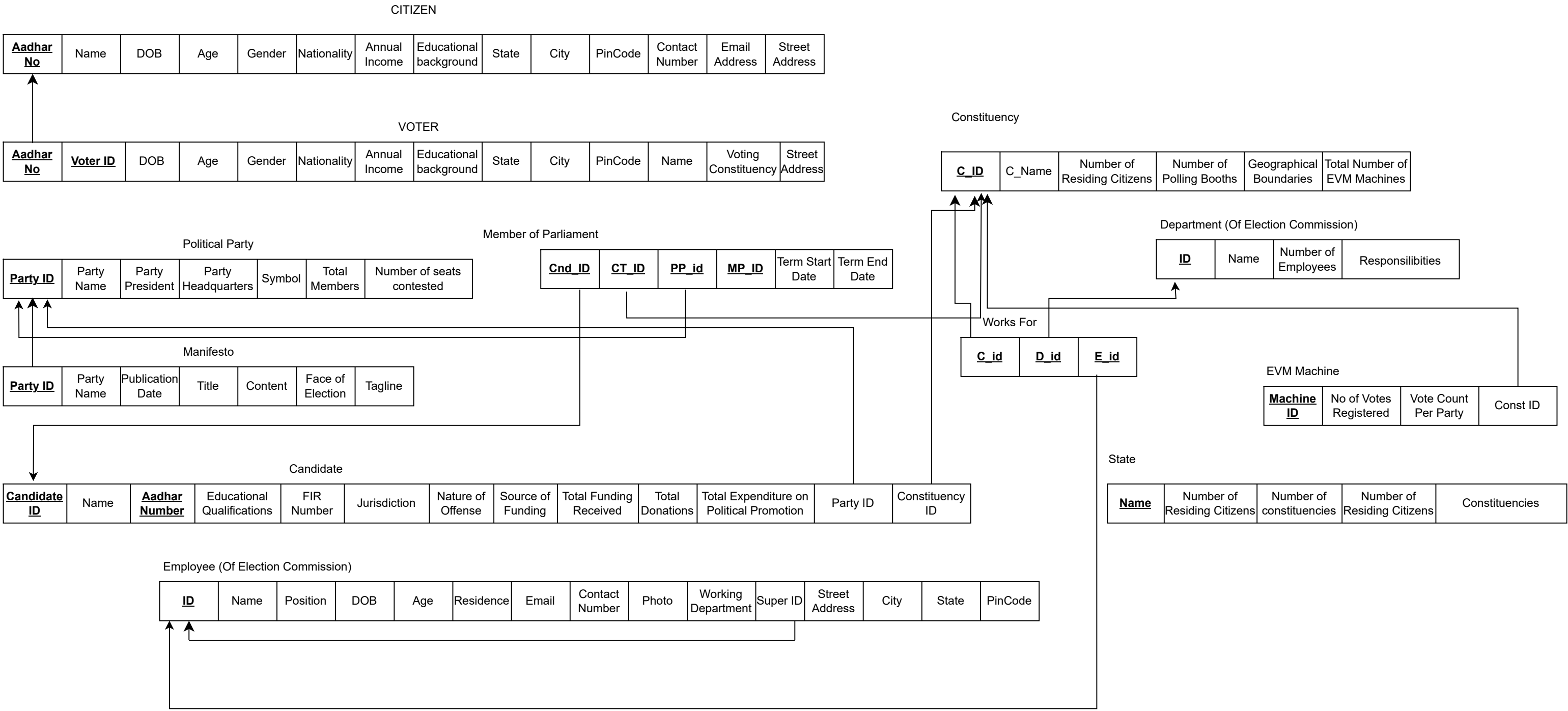

Firstly ER Diagram was converted to Relational Model.

- All the entities are made into tables with the same attributes
- All the Primary keys are marked, and the foreign keys joined
- For the weak entities, the column for identifying relations has been added to make the values of the table identifiable.

- All N:1 Relationships are converted from ER to Relational Model By making foreign keys in suitable tables.
- For n>2 relationship New tables have been made , and all primary keys for the corresponding entities have been done .
- Some attributes were removed from some entities which were of not much use .

CITIZEN

Aadhar No	Name	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Contact Number	Email Address	Street Address

VOTER

Aadhar No	Voter ID	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Name	Voting Constituency	Street Address

Constituency

C_ID	C_Name	Number of Residing Citizens	Number of Polling Booths	Geographical Boundaries	Total Number of EVM Machines

Political Party

Party ID	Party Name	Party President	Party Headquarters	Symbol	Total Members	Number of seats contested

Member of Parliament

Cnd_ID	CT_ID	PP_id	MP_ID	Term Start Date	Term End Date

Department (Of Election Commission)

ID	Name	Number of Employees	Responsibilities

Manifesto

Party ID	Party Name	Publication Date	Title	Content	Face of Election	Tagline

Works For

C_id	D_id	E_id

EVM Machine

Machine ID	No of Votes Registered	Vote Count Per Party	Const ID

Candidate

Candidate ID	Name	Aadhar Number	Educational Qualifications	FIR Number	Jurisdiction	Nature of Offense	Source of Funding	Total Funding Received	Total Donations	Total Expenditure on Political Promotion	Party ID	Constituency ID

State

Name	Number of Residing Citizens	Number of constituencies	Number of Residing Citizens	Constituencies

Employee (Of Election Commission)

ID	Name	Position	DOB	Age	Residence	Email	Contact Number	Photo	Working Department	Super ID	Street Address	City	State	PinCode

ER Diagram

CITIZEN

Aadhar No	Name	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Contact Number	Email Address	Street Address

VOTER

Aadhar No	Voter ID	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Name	Voting Constituency	Street Address

Constituency

C_ID	C_Name	Number of Residing Citizens	Number of Polling Booths	State Name	Total Number of EVM Machines

Political Party

Party ID	Party Name	Party President	Party Headquarters	Symbol	Total Members	Number of seats contested

Member of Parliament

Cnd_ID	CT_ID	PP_id	MP_ID	Term Start Date	Term End Date

Department (Of Election Commission)

ID	Name	Number of Employees

Responsibilities

D_ID	Responsiblity

Works For

C_id	D_id	E_id

Manifesto

Party ID	Party Name	Publication Date	Title	Content	Face of Election	Tagline

EVM Machine

Machine ID	No of Votes Registered	Vote Count Per Party	Const ID

State

Name	Number of Residing Citizens	Number of constituencies	Number of Regional Parties

Candidate

Candidate ID	Name	Aadhar Number	Source of Funding	Total Donations	Total Funding Received	Total Expenditure on Political Promotion	Party ID	Constituency ID

Employee (Of Election Commission)

ID	Name	Position	DOB	Age	Residence	Email	Contact Number	Photo	Working Department	Super ID	Street Address	City	State	PinCode

Votes Count for Machine

Party ID	Machine ID	Vote Count

Criminal Records

Candidate ID	FIR Number	Nature of Offense	Jurisdiction

Educational Qualification

C_ID	Educational Qualifications

- To convert to 1 CNF model we make each attribute atomic that is remove nested relations which means to simplify multi valued , composite attributes.
- We remove Responsibilities as an attribute from the Department of EC relation and create a new relation based on Department ID and Responsibilities with Department ID,Responsibilities acting as a Primary Key and D_ID as a Foreign Key.
- We remove multivalued composite attribute Criminal records(Jurisdiction,FIR Number,Nature of offense) from Candidates relation and make a new relation Criminal records with Candidate ID , FIR number as primary key and Candidate ID as foreign key.
- We remove multi valued attribute Educational background and create a new relation Educational Qualification with Candidate_ID and Qualification with C_Id,Qualification as Primary key and C_Id as foreign key.
- We removed the attribute constituencies from State relation and created a foreign key state name in Constituencies relation to create an entity relationship.

CITIZEN

Citizen ID	Aadhar No	Name	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Contact Number	Email Address	Street Address

VOTER

Aadhar No	Voter ID	DOB	Age	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Name	Voting Constituency	Street Address

Constituency

C_ID	C_Name	Number of Residing Citizens	Number of Polling Booths	State Name	Total Number of EVM Machines

Political Party

Party ID	Party Name	Party President	Party Headquarters	Symbol	Total Members	Number of seats contested

Member of Parliament

Cnd_ID	CT_ID	PP_id

Department (Of Election Commission)

ID	Name	Number of Employees

Responsibilities

D_ID	Responsiblity

Manifesto

Party ID	Party Name	Publication Date	Title	Content	Face of Election	Tagline

Tenure

Candidate ID	Term Start Date	Term End Date

Works For

C_id	D_id	E_id

EVM Machine

Machine ID	No of Votes Registered	Vote Count Per Party	Const ID

Candidate

Candidate ID	Name	Aadhar No	Source of Funding	Total Donations	Total Funding Received	Total Expenditure on Political Promotion	Party ID	Constituency ID

State

Name	Number of Residing Citizens	Number of constituencies	Number of Regional Parties

Employee (Of Election Commission)

ID	Name	Position	DOB	Age	Residence	Email	Contact Number	Photo	Working Department	Super ID	Street Address	City	State	PinCode

Votes Count for Machine

Party ID	Machine ID	Vote Count

Criminal Records

FIR Number	Nature of Offense	Jurisdiction

Educational Qualification

C_ID	Educational Qualifications

Candidate ID	FIR Number

FIRs filed against a candidate

Converting to 2CNF model :

- To convert a 1CNF model to 2CNF we have to remove partial dependencies from the model.
- We remove Aadhar No as a primary key from Citizens , Voters and Candidates and make it a candidate key. This resolves the partial dependencies in the respective tables since the 2 attributes in the primary key (the id of the table and aadhar) are individually unique to all non prime attributes.
- In the table Member of Parliaments , we remove the MP_id attribute since a partial dependency (MP_id , Candidate Id-> Term Start Date , Term End Date) and (Candidate_id -> Mp_id)exists in the table.Also attribute Candidate ID can identify term start date and term end date , hence we decompose the relation into Member of Parliament and a new relation Tenure with Candidate ID as PK and Term start date , Term end date.
- In criminal records of a candidate , we have a partial dependency Candidate ID , FIR Number with a partial dependency FIR Number -> Nature of offense , Jurisdiction hence we decompose into two relations one being criminal records and a new relation FIRS filed against a candidate with Candidate ID , FIR Number

- **2NF TO 3NF**

1. We remove transitive dependencies from the model which means If an attribute in a relation is uniquely identified by another attribute which is not a primary or candidate key.
2. We removed attribute AGE in employee , citizen , voter relations since it can be derived from DOB and decomposing the transitive dependency to a new relation between DOB and AGE does not make sense.
3. Also , we removed tenure end date since it is in a transitive dependency with tenure start date and again is not making sense to create a new relation based on tenure start and tenure end date.

CITIZEN

Citizen ID	Aadhar No	Name	DOB	Street Address	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Contact Number	Email Address

VOTER

Aadhar No	Voter ID	DOB	Street Address	Gender	Nationality	Annual Income	Educational background	State	City	PinCode	Name	Voting Constituency

Constituency

C_ID	C_Name	Number of Residing Citizens	Number of Polling Booths	State Name	Total Number of EVM Machines

Political Party

Party ID	Party Name	Party President	Party Headquarters	Symbol	Total Members	Number of seats contested

Member of Parliament

Cnd_ID	CT_ID	PP_id

Department (Of Election Commission)

ID	Name	Number of Employees

Responsibilities

D_ID	Responsiblity

Manifesto

Party ID	Party Name	Publication Date	Title	Content	Face of Election	Tagline

Tenure

Candidate ID	Term Start Date

Works For

C_id	D_id	E_id

EVM Machine

Machine ID	No of Votes Registered	Vote Count Per Party	Const ID

Candidate

Candidate ID	Name	Aadhar No	Source of Funding	Total Donations	Total Funding Received	Total Expenditure on Political Promotion	Party ID	Constituency ID

State

Name	Number of Residing Citizens	Number of constituencies	Number of Regional Parties

Employee (Of Election Commission)

ID	Name	Position	DOB	PinCode	Residence	Email	Contact Number	Photo	Working Department	Super ID	Street Address	City	State

Votes Count for Machine

Party ID	Machine ID	Vote Count

Criminal Records

FIR Number	Nature of Offense	Jurisdiction

Educational Qualification

C_ID	Educational Qualifications

Candidate ID	FIR Number

FIRs filed against a candidate