Electoral Database Software (EDS)

Software Requirement Specification

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1. Introduction

1.1 Purpose

The Purpose of this document is to provide a detailed description of the requirements for the "Electoral Information software". It will illustrate the purpose and will contain complete declaration for the development of system. It will also explain system constraints, interfaces and the interactions with other external applications. This document is primarily intended to be proposed to a customer for its approval and a reference for developing the first version of the system for the development team.

1.2 Scope

Electoral Database software (EDS) is software for automating the process of applying for voter id, getting queries that are generally required by the voters, candidates who stand for election and political party. Then there is a super-user who is essentially the election commission and who can view everything. Hence the software is important for improving Electoral System for election.

1.3 Definitions and Acronyms

Term	**Meaning**
Part No.	Related to Polling Booth, a mapping from polling booth to a number
AC No.	Related to Assembly Constituency(AC), mapping from constituency to a number
ID No.	For the Voter ID this the voter Id number which is a unique identification number for voter
PIC	Photo Identity Card
PICtype	Type of Photo Identity: can be driving license, PAN card etc
ACname	Assembly Constituency Name
AC_participate	Assembly Constituency from where the candidate is participating. This may be different from the constituency from where he votes.

2. General Description

2.1 Product Functions

The EDS will provide the following functionalities for its users who interact with the UI:

- **Voters** can apply for new voter id, view the status of their application and view their own information. In case a voter changes his/her location/constituency they have to apply again.
- **Candidates** can apply for candidate ship from a constituency from any political party or as individual candidate. Candidates can view the information of the constituency like the number of votes given in the last election and the distribution of votes etc.
- **Political Party** can register to database for election, can view its own candidate's data, view previous year's stats etc.
- **Public,** some data will be public like previous year's election stats, anyone can view it.
- **Election Commissioner (super admin),** this is a single user who adds new voters, candidates, political parties etc. when they apply; he can view/modify every information. He is the one who is responsible for accepting or rejecting a voter or a candidate or a party.

2.2 General Constraints

In general the following constraints exist on the users,

1. **Voters** have to be above 18 years of age
2. **Candidates** have to be above 25 years of age and Citizen of India.
3. **Political Parties** must have number of seats greater than some percentage in Assembly in state or center the exact constraints will be worked out later.
4. **Caste** can be General, SC, ST or OBC.
5. **Gender** can be Male or Female

2.3 Assumptions

We made the following assumptions for the design of software system:

1) The whole nation is divided into assembly constituencies and there are approximately equal numbers of voters in each constituency. The data is populated keeping this constraint in mind.
2) No assumption is made on reservation of seats for minorities.
3) Candidate will either stand for MLA or MP.
4) Voter will have only one registered phone no. So it is not a multivalued attribute.
5) It is assumed that all the voters registered on a particular polling booth have the same part number. Also there is a unique reference number of each voter.
6) It is assumed that the software will be tried and tested for a legislative assembly election of a particular state but will be later scaled up to cater to the service of nation.
7) It is assumed that each parliamentary constituency is further broken down into assembly constituencies. No two legislative constituency overlap with a single parliamentary constituency.

8) The general election schema of Indian Government election is followed in this software and is not applicable for the electoral database of any other country of the world except those having similar election structure as that of India.
9) One thing should be kept in mind that there are very minor assumptions which would be taken later on as the project proceeds. This is due the fact that Indian Voter's data is kept private and is difficult to access via public domain. So dummy entries will be used to mimic the behavior of Indian Voters.

3. Requirements and specifications:

3.1 Hardware Interface Requirements

- Hardware: Personal Computer
- Network interface card.
- Internet providing equipment to be used for accessing the software online.
- Operating Systems: Linux

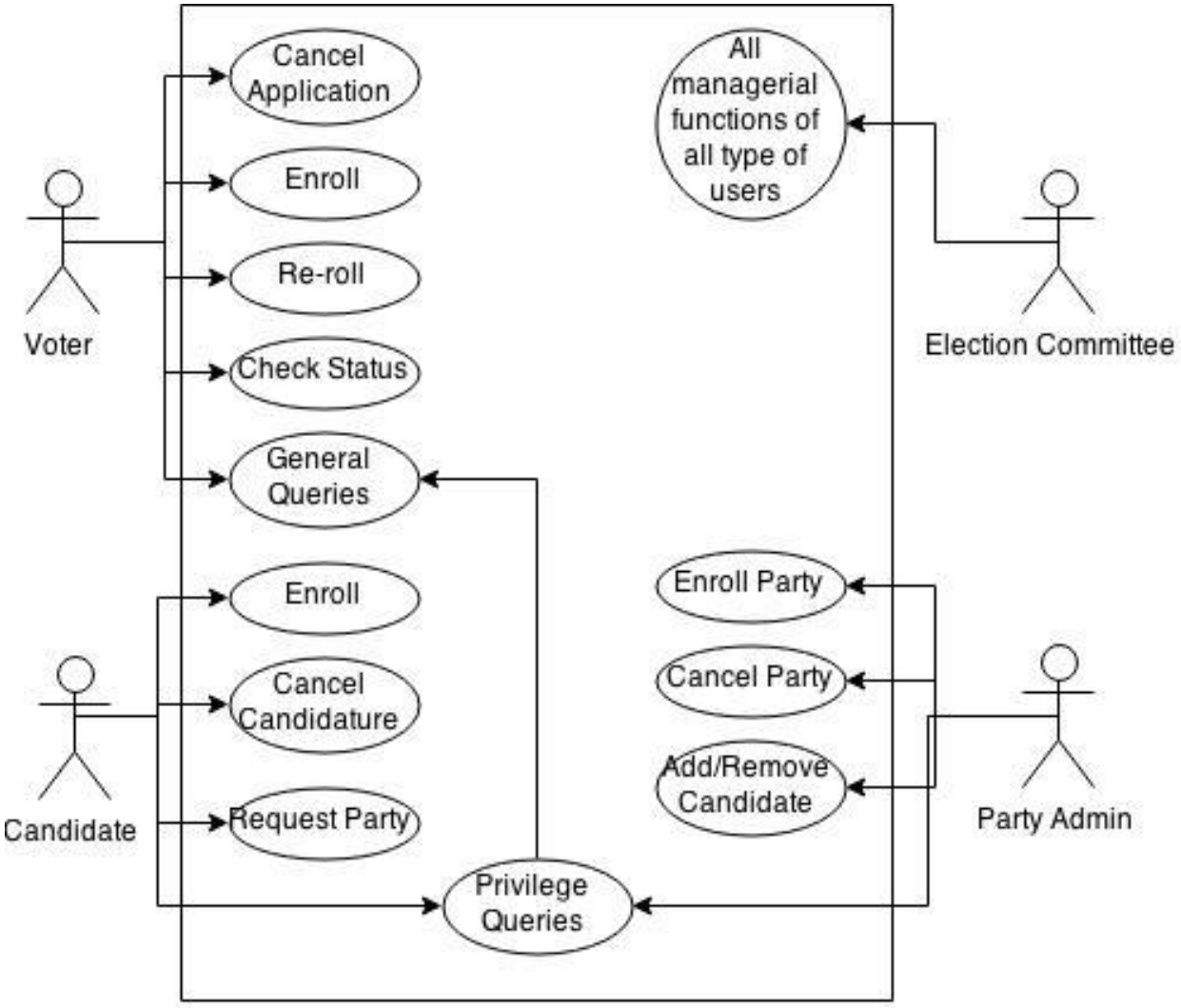
3.2 Software Requirements

We want this software to be **a web application** which is accessible to everyone with internet connectivity. Hence the application require extensive usage of languages that support the world wide web and Internet protocols. The backend of this web application will be created using **Django** (high-level python web framework) which would also take care of handling SQL queries from the database and providing the result to the frontend application interface. All the processing will be done in backend and the use of JavaScript in the front end will be minimized. On the other hand, the frontend will use **Hyper Text Markup Language(HTML)**, **Cascading Style Sheet** and **JQuery** implemented using JavaScript (to make it responsive). The software aims for a decent GUI so that it is convenient and easy to use. Data from all the users will be saved in a global database. We plan to use the most popular open source database **MySQL**. It will be ensured that the database access is kept completely private and only the specified voter and election commissioner can see the information related to a particular voter.

3.3 UI Specifications

We will have 4 different views for 4 types of users (namely voters, candidates, party admin, election committee member). The landing page/homepage will consist of links of all these pages and link to the general query page. General queries can be made by any user without any requirement of any kind of login. Accessing any private data based on a particular individual would require the authentication using user id and password.

3.4 Use Case Diagram



4. Database Specification

4.1 Schema Description

The following are the schemas:

1. Voter = (voterid, partno, name, acno, age, gender, DOB, DOI, DOA, address, emailid, phoneno, PIC, PICtype, PICno, caste)
2. Constituency = (acno, acname, population)
3. Address = (houseno, street, PIN, PO, town, district, state)
4. Relation = (voterid, relationvoterid, relation, relationname)
5. Candidate = (voterid, candidateid, ac_participate, type, partyid)
6. Party = (partyid, partyname, symbol, type)
7. Election = (electionid, year)
8. Statistics = (electionid, partyid, STvotes, SCvotes, OBCvotes, GENvotes, Femalevotes, Malevotes)

Now we have the following dependencies:

a. voterid -> partno, acno, name, age, gender, DOB, DOI, DOA, address, emailid, phoneno, PIC, PICtype, PICno, caste
b. PICno -> PICtype, PIC
c. partno -> acno
d. PIN -> PO, Dist, Town, State
e. relationvoterid, voterid -> relation, relationname
f. relationvoterid -> relationname
g. acno -> acname, population
h. candidateid -> voterid, ac_participate, type, partyid
i. partyid -> partyname, symbol, type
j. electionid -> year
k. electionid, partyid -> STvotes, SCvotes, OBCvotes, GENvotes, Femalevotes, Malevotes

Obviously the above schema is not in BCNF. We can have a BCNF dependency preserving decomposition of the above schema in the following ways:

Steps…

i) Decompose Voter into Voter = (voterid, partno, name, age, acno, DOB, DOI, DOA, emailid, phoneno, caste, address, PIC) and Identity = (PIC, PICtype, PICno)
ii) We further decompose Voter into Voter and Address as Voter = (voterid, partno, …, house, street, PIN) and Address = (house, street, PIN, PO, town, state, district)
iii) We decompose Voter again into Voter (voterid, partno, name, age, …) , Polling = (partno, acno), and Constituency = (acno, acname, population)

iv) We drop the functional dependency relationvoterid -> relationname as it is redundant.

v) We have the schema Relation = (voterid, relationvoterid, relation). The rest remain the same.

So we get the following decomposition:

1. Voter = (voterid, name, age, gender, DOB, DOI, DOA, emailid, phoneno, partno, PICno, houseno, street, PIN, caste)
2. Identity = (PICno, PICtype, PIC)
3. Polling = (partno, acno)
4. Constituency = (acno, acname, population)
5. Address = (houseno, street, PIN, PO, town, district, state)
6. Candidate = (candidateid, voterid, ac_participate, type, partyid)
7. Party = (partyid, partyname, symbol, type)
8. Election = (electionid, year)
9. Statistics = (electionid, partyid, STvotes, SCvotes, OBCvotes, GENvotes, Femalevotes, Malevotes)
10. Relation = (voterid, relationvoterid, relation)

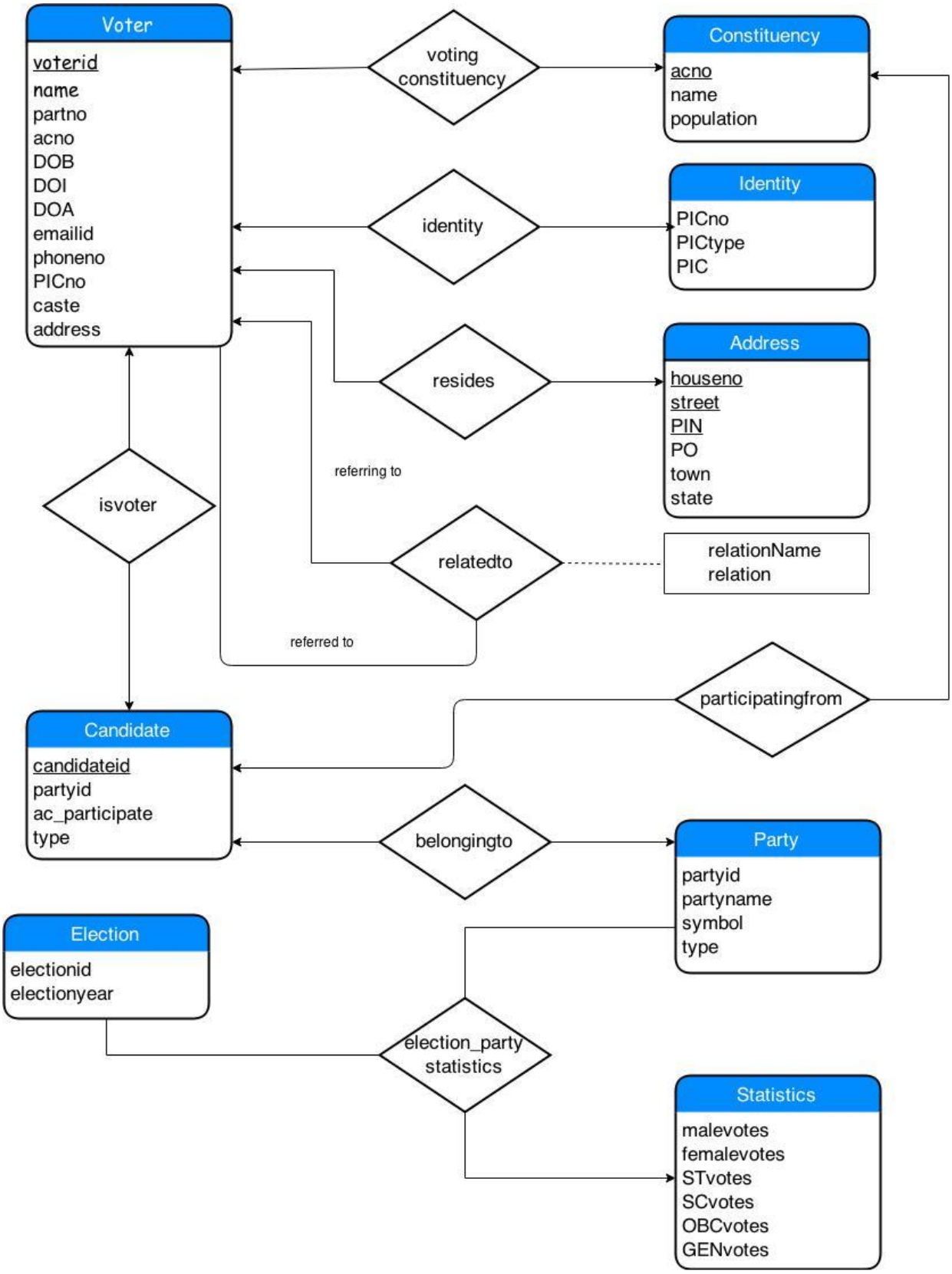
The primary keys are the underlined attributes. This is in BCNF and is a dependency preserving decomposition. The foreign key are stated in later sections.

4.2 Entity Relationship Model

The entities are shown in rounded rectangles and relationships in diamond boxes.

An arrow represents a one to one relationship

A line represents a many to one relationship.


Voter
voterid
name
partno
acno
DOB
DOI
DOA
emailid
phoneno
PICno
caste
address
voting constituency
Constituency
acno
name
population
identity
Identity
PICno
PICtype
PIC
resides
Address
houseno
street
PIN
PO
town
state
referring to
isvoter
relatedto
relationName
relation
referred to
participatingfrom
Candidate
candidateid
partyid
ac_participate
type
belongingto
Party
partyid
partyname
symbol
type
Election
electionid
electionyear
election_party statistics
Statistics
malevotes
femalevotes
STvotes
SCvotes
OBCvotes
GENvotes

4.3 Constraints on Attributes

There are certain value constraints on the attributes:

1. caste can be of the following types: SC, ST, OBC, GEN
2. type of the candidate can be MLA, or MP
3. data will be filled by us and we are assuming that the population per constituency will roughly be the same.
4. Gender will be either male or female.
5. There will be several foreign key constraints such as:
    a. Voter.partno -> Polling.partno
    b. Voter.house, Voter.street, Voter.PIN -> Address.house, Address.street, Address.PIN
    c. Voter.PICno -> Identity.PICno
    d. Relation.voterid -> Voter.voterid and Relation.voterid -> Voter.voterid
    e. Candidate.voterid -> Voter.voterid, and many (they are actually intuitive)
6. We have a non null constraints on all of the attributes except for the attributes in the Statistics schema as data may not be available for that particular election.
7. The PIC type is a blog type and is not null.
8. Relation can be only from the following: Father, Mother, Brother, Sister, Spouse

4.4 Table to be made exactly

The mysql tables to be made are the follows:

1. Voter
2. Relation
3. Address
4. Polling
5. Constituency
6. Election
7. Candidate
8. Statistics
9. Party
10. Identity

5. References

http://eci.nic.in/eci/eci.html : Official Website of election commission of India

http://eci.nic.in/eci_main/forms/FORM6.pdf : Voter application form, India

http://en.wikipedia.org/wiki/List_of_constituencies_of_the_Lok_Sabha : Wikipedia for list of constituencies in India and more information.