Exercise 3 - Functional Specification

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1 Objectives

1.1 Mandatory criteria

- **Analysis**
  - Composition of the Bundestag by party, taking into consideration: Direkt-, Überhangs- and Ausgleichsmandate. Figure 1.
  - Overview for each Wahlkreis. Figure 4.
  - Each vote has to be stored separately.
  - Compare results of current elections to former elections, especially those from 2009 and 2013
- **Voting**
  - Accept and store votes from people who are eligible to vote.
  - Only one first and second vote per person allowed
- **Privacy**
  - Votes have to be completely anonymous.
  - Access to sensitive information (voters, adresses, names, ...) is to be restricted in such a way as to guarantee privacy.
  - Reports are only generated when data sizes are large enough to guarantee anonymity.
- **Robustness**
  - Consistent state even after power loss or resetting of the system.
- **Scalability**
  - An input of 150 million votes can be handled in 12 hours.
  - Over the next 6 hours after voting has ended: 200,000 requests per minute can be handled at peak.
- **Performance**
  - The average vote has to be registered in less than 15 seconds.
  - Calculation of the partial election results in less than 10 minutes.

  - A web-page, showing the current election status has to be served in less than 20 seconds.

- **Security**: The system has to be SQL-Injection-proof.

1.2 Desired criteria

- **Security**: The system has to reasonably resist attempts of intrusion or disruption (e.g. DDoS ...)
- **Performance**
  - The vote has to be registered in less than 5 seconds.
  - A web-page, showing the current election status has to be served in less than 2 seconds on average.

1.3 Optional critria

- Votes can be aggregated on Wahlkreis-level for faster analysis.
- Votes from former elections don't have to be kept.

1.4 Demarcation criteria

- No full compliance with the BWahlGV (partial results during running election, ...).
- Voting Frontend running not only on hardware compliant with the BWahlGV.

2 Technical implementation

- **DBMS** storing the data specified in the data model.
- **Application Server** allows access to the data while ensuring privacy and security.
- **Web-Frontend** to show an analysis of the gathered data.
- **Voting-Terminal** has access to the database over the Application Server to register votes.

3 GUI-Mockups

See figures 1 to 5.

4 Data Model

See Figure 6.

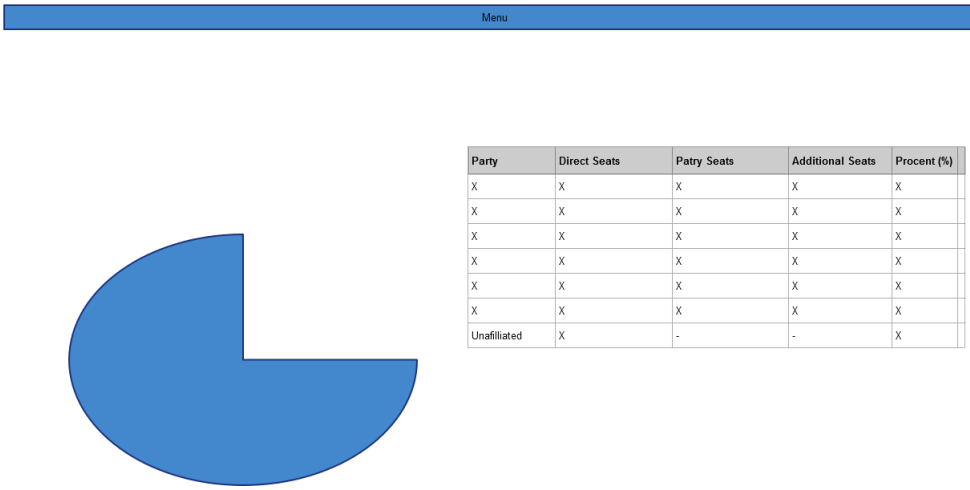

Figure 1: Homepage

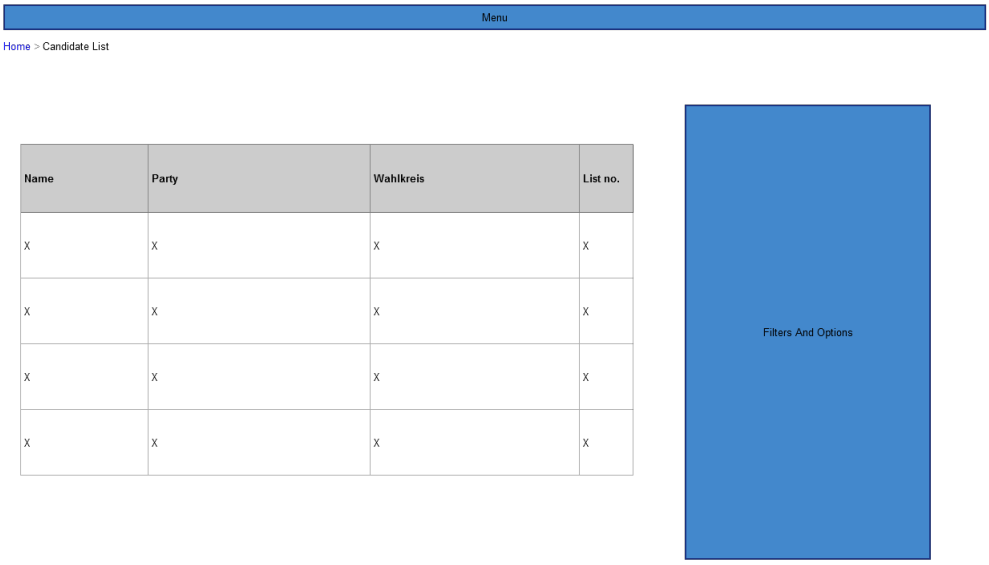

Figure 2: Candidate List

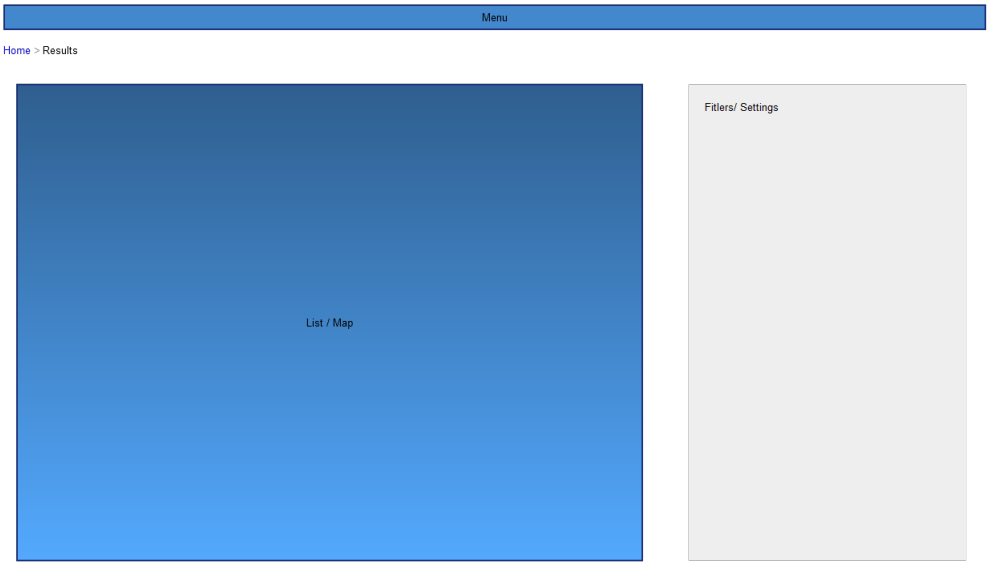

Figure 3: Overview Wahlkreise

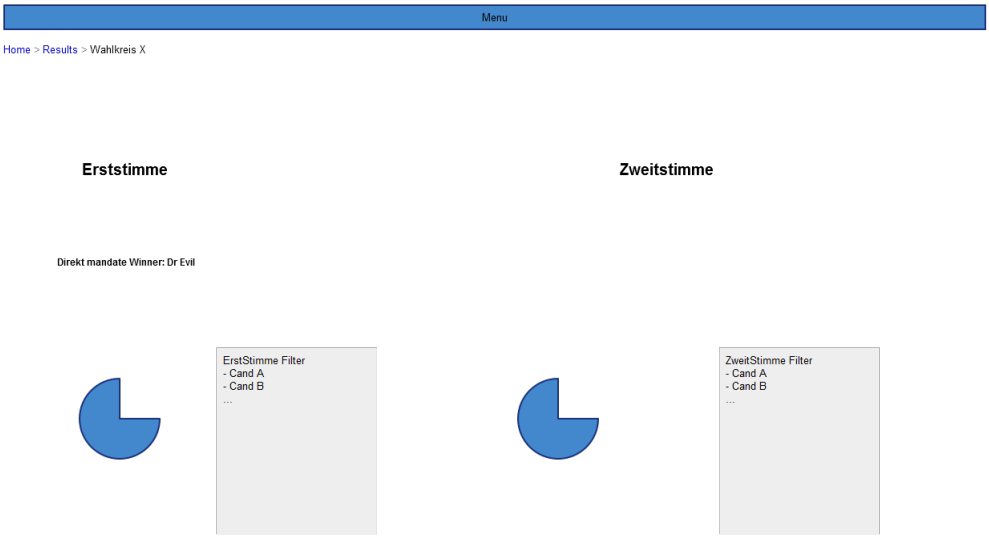

Figure 4: Detailed view for Wahlkreis

Figure 5: Voting GUI

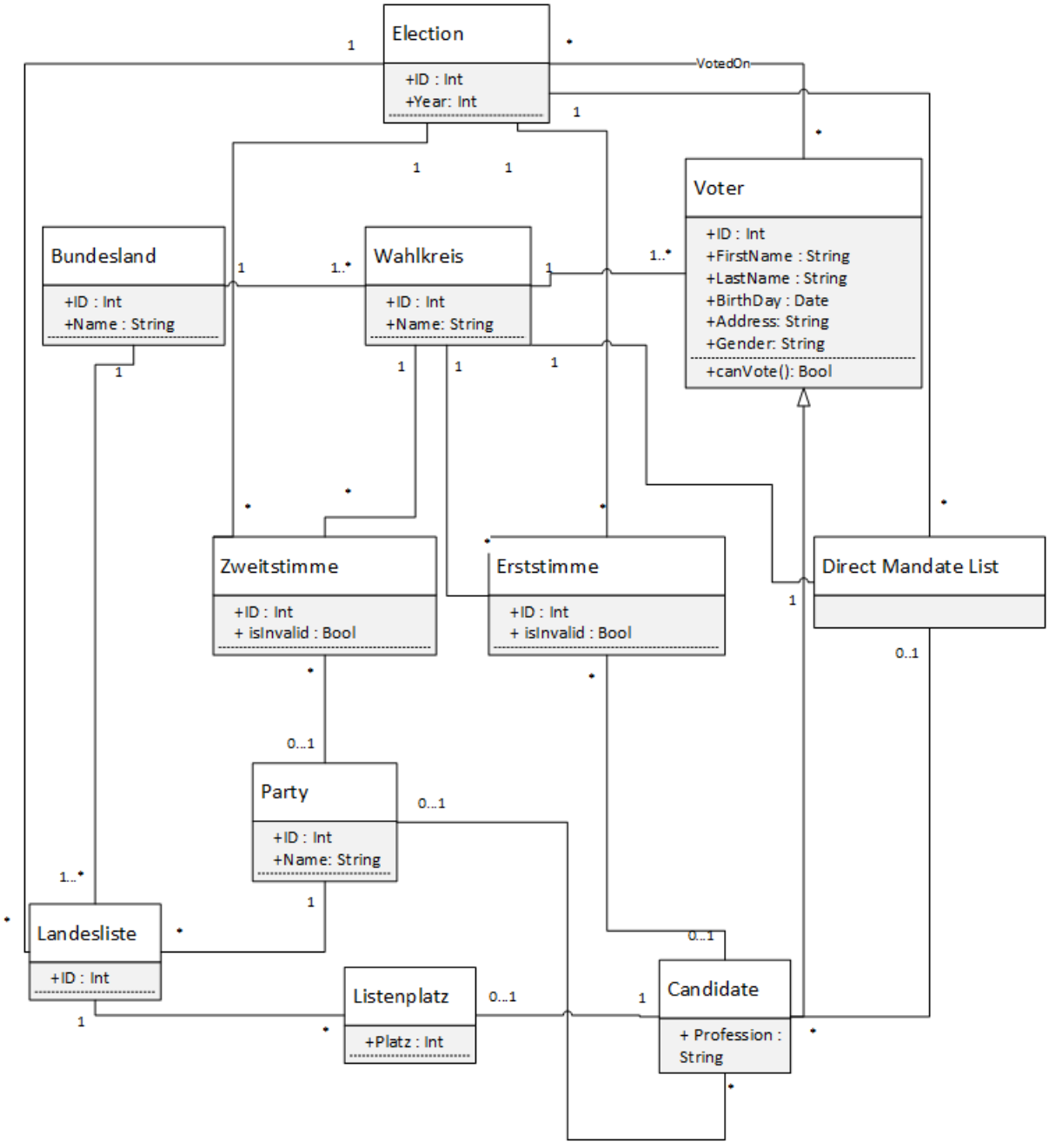

Figure 6: Data Model