# System Specification

Version 1.0

2.11.2015

## Targets

* The system is easy to use by voters.
* The system is able to manage a high workload.
* The system ensures protection of data privacy for voters.
* The system is able to calculate the voting results according to the ‘*Bundeswahlgesetz’*.
* The system is able to create analysis of the results, while complying with the ‘*Bundswahlstatistikgesetz’*.

## Requirements

#### Functional Requirements

##### Election setup

* The system hast to be able to set up an election by performing a batch load of the needed data. (This includes parties, voters, ‘*Wahlkreise’,* their‘*Wahlbezirke’* and‘*Briefwahlbezirke’*,candidates who run for a *‘Listenmandat’,* candidates who run for a *‘Direktmandat’* and the selected *‘Wahlbezirke’ and ‘Briefwahlbezirke’* for the representative election statistics)
* The system must not provide a graphical user interface to set up an election.

##### Voting

* The system has to ensure that each voter can only vote once.
* The system has to ensure that votes can only be submitted in a given period of time.
* The system should be able to differentiate between the two voting methods ‘*Briefwahl*’ and ‘*Urnenwahl*’.
* The system hast to provide a graphical user interface for ‘*Urnenwahl*’, which is further specified by the following requirements.
* The system has to be able to authenticate a voter by his ‘*Ausweisnummer*’.
* The system has to give the user the possibility to register his ‘*Wahlschein*’ if existing.
* The system has to be able to verify, that the registered ‘*Wahlschein*’ belongs to the user.
* The system has to verify that the user is in the right ‘*Wahlbezirk*’.
* The system has to be able to show the user the right election possibility, according to his ‘*Wahlkreis*’.
* The system has to be able to take the users ‘*Erststimme*’ and ‘*Zweitstimme*’.
* The system has to give the user the possibility to fix wrong inputs.
* The system has to give the user the possibility to mark his vote as invalid.

##### Results

* The system has to be able to calculate the result of a finished election according to the ‘*Bundeswahlgesetz’*.
* The system has to be able to show the distribution of the seats in ‘Bundestag’ for the different parties.
* The system has to be able to show the candidates who won a seat in ‘Bundestag’.
* The system has to be able to calculate the turnout rate.

##### Projections

* The system has to be able to calculate a projection of the results of an unfinished election according to the ‘*Bundeswahlgesetz’*.
* The system has to be able to show the projected distribution of the seats in ‘Bundestag’ for the different parties.

##### Analysis

* The system should be able to compare each of the following analysis modes with a past election.
* The system has to be able to show the voting results and difference to the previous election per party and turnout rate for a selected area (overall, federal state, ‘*Wahlkreis*’, ‘*Wahlbezirk*’). This could be done by an interactive map.
* The system should be able to give the user the possibility to analyse possible coalitions. This should be done by letting the user select the possible coalition partners and showing the reached number of seats and showing if the majority is reached.
* The system should be able to show the overall voting results by gender, based on the representative election statistic.
* The system should be able to show the overall voting results by age-group, based on the representative election statistic.
* The system should be able to show the overall voting results by distribution of ‘*Erststimme*’ und ‘*Zweitstimme*’, based on the representative election statistic.

#### Non-Functional Requirements

##### Voting

* The system has to be able to process a submitted vote within 1s.
* The system has to ensure the protection of data privacy for voters at every time.
* The system has to ensure that either a voting is submitted after a system crash or has to request the user to vote again.
* The system has to ensure that votes can only be submitted by an authorized voter.
* The system should be able to withstand a denial of service attack.

##### Results

* The system has to be able to calculate the results for an election within 5min after the voting ends.

##### Projections

* The system has to calculate projections every X minutes.
* The system has to be able to calculate the projections within 5min.

##### Analysis

* The system has to be able to provide the analysis modes within 15min after the election ends.

## Technical Conception

## User Interface

##### Voting

##### Results

##### Analysis

## Glossary

* ***Briefwahl****: =*Postal voting. Can only be done by voters who have a ‘*Wahlschein’*
* ***Briefwahlbezirk****:* Certain district for postal voting. Each ‘Wahlkreis’ is subdivided in ‘Briefwahlbezirke’.
* ***Bundeswahlgesetz****:* German law to regulate nationwide elections.
* ***Bundswahlstatistikgesetz****:* German law to regulate representative statistics for nationwide elections.
* ***Direktmandat****: C*andidates can run for a direct mandates in ‘Wahlkreisen’.
* ***Erststimme****:* First vote a voter can give for a direct candidate in his ‘Wahlkreis’.
* ***Listenmandat****:* Candidates can run for a list mandate in federal states. Each lined up party has a list, in which its candidates are ranked.
* ***Urnenwahl****:* Voting method where the voter votes per ballot box in a polling station
* ***Wahlbezirk****:* Certain district for voting per ballot box. Each ‘Wahlkreis’ is subdivided in ‘Wahlbezirke’.
* ***Wahlkreis***: Certain voting district where candidates can run for a ‘Direktmandat’. Each federal state is subdivided in ‘Wahlkreise’
* ***Wahlschein***: = voting paper. Can be requested by voter before an election to do postal voting or to vote in a different ‘Wahlbezirk’ but within the same ‘Wahlkreis’.
* ***Zweitstimme****:* Second vote a voter can give for a party in his federal state.