

User Interface

General

- Parties must be represented in their respective accepted colour
- Local results should be accessed from a map
- The UI should be responsive
- The UI is presented in a neutral way, not favouring certain results, candidates, parties or opinions

Voting

- Voting must include Erststimme and Zweitstimme
- Invalidation of both individually must be possible
- An invalid voting must be clearly indicated

Analysis & Information

Results

- The difference to a selected previous election must be accessible for each type of result.

Voting percentage

- The results and turnout rate for a selected region (hole state, federal state, 'Wahlkreis' or 'Wahlbezirk') must be accessible
- The selection of regions should be done by an interactive map. **[optional]**

Seating in 'Bundestag'

- The assigned seats in terms of number of seats and percentage must be accessible.

Possible coalitions

- It must be possible to select a set of parties to see how much seats they have to analyse, if they are able to reach the majority.

Representative election statistics

Voting by gender

- The overall results and turnout rate, differentiated by gender, based on the representative election statistics, must be accessible.

Voting by age group

- The overall results and turnout rate, differentiated by age group, based on the representative election statistics, must be accessible.

Distribution of 'Erststimme' and 'Zweitstimme'

- The overall results, differentiated by the used combinations of parties, voted for with 'Erststimme' and 'Zweitstimme', based on the representative election statistics, must be accessible.

Voting by voting method

- The overall results and turnout rate, differentiated by the voting method ('Briefwahl', 'Urnenwahl'), based on the representative election statistics, must be accessible.

Estimates

- Estimates must be clearly marked as estimates (i.e. not final results)

Voting percentage

- The estimated overall results and turnout rate must be accessible

Seating in 'Bundestag'

- The estimated assigned seats in terms of number of seats and percentage must be accessible.

Possible coalitions

- It must be possible to select a set of parties to see how much estimated seats they have to analyse, if they are able to reach the majority.

Functional Requirements

Voting

- Every citizen with the right to vote must not vote more than once per election, entering valid or invalid Erststimme and Zweitstimme
- Citizens must not vote in any other Wahlbezirk than the one they are registered in xor by Briefwahl.
- Voting must only work for parties and candidates that are nominated in that year / in that Wahlkreis.
- Votes can be inserted into the database via batch loading interface.

Nominations

- Parties can be nominated once but only once per year
- Parties can hand in exactly one Landesliste per federal state per year
- Candidates can only be listed on exactly one Landesliste per year
- Candidates can only run for a exactly one Wahlkreis per year
- Parties can support only one single candidate per Wahlkreis per year

Evaluation

- Evaluation of election results follows the current system (Saint Lague)
- (Preliminary) Results are updated in real time as soon as voting occurs
- A defined interface exists to change the seat distribution method (e.g. from Saint Lague to D'Hondt) **[optional]**

Non-functional Requirements

- Ease of use
- Privacy
 - Within the database there is no association between citizens and their votes. Within the database no such relation can be derived from other data.
 - Data aggregations that are accessible for user must be limited in a way that ensures no information can be inferred for the individual data subsets.
- Reliability and performance
 - The system must handle at least **100.000** voting transactions nearly simultaneous

- The system must handle at least **200.000** analysis requests per minute
 - both must be handled at the same time
 - Response time for voting transactions of less than **1 second**
 - Response time for analysis requests of less than **3 second**
- Robustness
 - Data is stored in a way that prevents data loss due to hardware or software error
 - Backend systems have automatic failure recovery / restart capabilities.
- Security
 - A secure way of authenticating must be required for the user to cast his vote
 - All data must transported in a way that prevents unauthorized access.
 - Access to the database and the raw data must be restricted.

Acceptance criteria

- Reproduces correct results of previous elections.
- Fulfils all non-optional functional requirements
- Fulfils performance requirements