# User Interface

## General

* Parties must be represented in their respective accepted coulour
* 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](http://dict.leo.org/ende/index_de.html#/search=representative&searchLoc=0&resultOrder=basic&multiwordShowSingle=on) election statistics

#### Voting by gender

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

#### Voting by age group

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

#### Distribution of ‘Erststimme’ and ‘Zweistimme’

* The overall results, differentiated by the used combinations of parties, voted for with ‘Erststimme’ and ‘Zweistimme’, 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 by 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 Erstimme and Zweitstimme
* Citizens must not vote in any other Wahlbezirk than the one they are registered in *x*or 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