

## PRODUCT SPECIFICATION

This document briefly describes the functional requirements as well as the non-functional requirements. In addition, it specifies what criteria are applied during acceptance tests. Graphical User Interface descriptions are presented at the end of this document.

## NON-FUNCTIONAL REQUIREMENTS

**SECURITY:** It is ensured that every voter is allowed to submit his vote only once and only authorized persons are allowed to vote. Measures against SQL injection are taken as well as against brute force attacks. Access right to the database are restricted.

**ROBUSTNESS:** The analysis service is available during 99.9% of the election time. After a crash of the system, the single votes are still archived.

**SCALABILITY:** The database system can handle votes and person amounts up to 150 million people. Up to 10 million incoming votes per 5 minutes must be handled at peak times. The analysis tool is able to handle 100 Mio displays using caching. It is sufficient to update cached data every 20 Minutes.

**PERFORMANCE:** The time period necessary to vote (modulo time consuming human decision making) takes less than 2 minutes. After submitting the vote, every user gets feedback that his vote was committed within 5 seconds. As the analysis interface updates its cached data every 20 minutes, the analysis shall take less than 10 Minutes. Displaying analysis results in the interface lasts 30 seconds or less.

**PRIVACY:** Votes in the database cannot be related to single voters.

## REQUIREMENTS FOR USER INTERFACES

**USER INTERFACE | VOTING TERMINAL:** Voting is permitted only once per user and election. The order of the Erststimme and Zweitstimme is not restricted. All candidates and parties must be displayed neutrally and distinct borders between fields indicate different electables.

**USER INTERFACE | ANALYSIS INTERFACE:** Forced by law, sum of Erststimme, Zweitstimme and invalid votes must be displayed. In addition, the seat distribution is available as well as Direktmandate, Überhangsmandate and Ausgleichsmandate. It is possible for the user to manually compare election results to previous elections and to manually compare states with states and districts with other districts. Detailed information is available for every district consisting of how many of the allowed persons voted, which candidate was elected by Erststimme, how many votes every party achieved (relative and absolute) and the development of the votes relatively to the previous election. For every party, up to 10 district winners with the smallest amount of votes ahead of the other candidates can be seen. If a party has no district winning members, the ones with the smallest deficit are shown.

## FUNCTIONAL REQUIREMENTS

**ANALYSIS:** Direktmandate, Überhangmandate and Ausgleichsmandate are computed by the system. The seat distribution in the Bundestag is computed with respect to these data. Direktmandate are computed for parties, regions, states and overall Germany.

Detailed information is computed for every district consisting of how many of the allowed persons voted, which candidate was elected by Erststimme, how many votes every party achieved (relative and absolute) and the development of the votes relatively to the previous election. For five Bavarian districts this information is computed without the use of any aggregated tables.

For every party, up to 10 district winners with the smallest amount of votes ahead of the other candidates can be seen. If a party has no district winning members, the ones with the smallest deficit are shown.

**VOTING:** The voting interface allows submitting of Erststimme and Zweitstimme with the possibility to give an invalid vote. Voting is only possible for authorized persons and only once per election.

## ACCEPTANCE CRITERIA

Requirements specified above that are highlighted with **brown font color** are treated as the acceptance criteria of the election tool.