Bayerische Landtagswahl Lastenheft

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1. User Interfaces

Results Interface

The results interface provides a detailed report about the election and parliamentary assignments. It displays statewide results (e.g. parliamentary allocations), as well as results by county (Stimmkreis). The interface makes heavy use of visual displays (e.g. tables and pie charts) in order to display data in an intuitive and visually-appealing way. Finally, the interface allows the user to compare results between the 2018 and 2013 elections.

State-Wide Results
The results interface provides a graphical visualization of the parliamentary allocations (seats won per party).

Members of the Parliament
The results interface provides a table with information about every person who received a seat in Parliament. The table will display the following information for each candidate:

- Full name
- Political Party
- Region elected in
- County elected in (if direct candidate)

Regional results (Wahlkreis)
The results interface provides a table with information about parliamentary allocations at the regional level.This table displays:

- Number of seats allocated to each party for this region
- Number of overhang and compensation mandates allocated to each party for this region

County results (Stimmkreis)
The results interface provides one table of results for each county. This includes:

- Direct candidates running for election, and number of votes received by each
- The direct candidate winner
- Percentage and count of first votes and second votes per party
- Each parties' change in vote percentage compared to the previous election
- Turnout rate (percentage of registered voters who cast ballots)

Voter interface

This interface is to be used by voters in order to enter their votes into the system.

Potential features:

- Allow voters to submit votes using their identifying key.
- Require authentication before submitting a vote (e.g., valid voter key).
- Ensure that no voter can vote twice.

2. Functional Requirements

FR1: The system must have the capacity to store tens of millions of vote records. For example, roughly 7 million people voted in 2018*.

FR2: The system must store information for all officially-recognized political parties.

FR3: The system must allow election officials to access and modify information about individual parties. It must also allow election officials to register new parties in the system.

FR4: The system must store information for all officially-recognized candidates (direct candidates and list candidates).

FR5: The system must allow election officials to access and modify information about individual candidates. It must also allow election officials to register new candidates in the system. Direct candidates must be registered for a specific county. List candidates must be registered for a specific party and region. Each candidate must have the following information:

- Full name
- Political Party
- County and Region

FR6: The system must be able to correctly calculate parliamentary seat allocations based on voting records from an election. It must use the Hare-Niemayer method, observe the “5% hurdle” rule, and correctly handle Overhang Mandates.

FR7: The system must be reusable for elections in different years. It must be able to store data from multiple elections.

FR8: The system must produce statistics about voting trends at the state and county levels. This includes:

- Number of votes for each party
- Percentage of votes for each party

FR8: The system must be able to compare statistics between the 2018 and 2013 elections.

FR9: The system must provide a way for new votes to be submitted electronically.

*Data from official 2018 results: www.bayern.landtag.de

3. Non-Functional Requirements

NFR1: The system must protect user data. Votes must be secret and anonymous. Database access and modification must be restricted to authorized individuals.

NFR2: Because the system is crucial to The State of Bavaria's government, data integrity must be preserved. The system must follow modern guidelines for cyber security.

NFR3: The system must never lose data. Recovery of data must be possible after catastrophic failure.

NFR4: The system must be able to support a very high amount of concurrent access. Submitting a vote should return a confirmation of success or failure within 5 seconds.

NFR5: The results interface must be visually appealing and intuitive to use.

4. Criteria for Acceptance

CA1: All artifacts (e.g. source code, documentation, tests) must be delivered by the project deadline.

CA2: All functional and non-functional requirements must be fulfilled.

CA3: The system must pass a stress test in which 500 votes are submitted per second for five minutes.