**Project Design Phase-II**
**Solution Requirements (Functional & Non-functional)**

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| Project Name | Quantitative Analysis of Candidates in 2019 Lok Sabha Elections |

## Functional Requirements: -

When creating a system for the quantitative analysis of candidates in the Lok Sabha Election 2019, it is important to define clear and comprehensive functional requirements to ensure that the system meets its objectives effectively. Here are some functional requirements that such a system might have:

**User Authentication and Authorization:**

1. **User Registration:** Allow users to create accounts with appropriate credentials.
2. **User Login:** Provide a secure login system for authenticated users.
3. **Role-Based Access Control:** Implement different user roles (admin, analyst, viewer) with varying levels of access rights.

**Data Management:**

4. **Data Collection:** Gather data on all candidates participating in the Lok Sabha Election 2019, including personal details, party affiliation, constituency, campaign expenses, criminal records, educational background, etc.
5. **Data Validation:** Ensure accuracy and consistency of the collected data.
6. **Data Storage:** Store the data securely in a database with proper indexing for efficient retrieval and analysis.
7. **Data Update:** Allow authorized users to update candidate information as needed.

**Data Analysis:**

8. **Candidate Comparison:** Implement a feature to compare multiple candidates based on various parameters such as vote share, criminal records, education, etc.
9. **Data Visualization:** Provide graphical representations of candidate data for easy understanding and analysis.
10. **Trend Analysis:** Analyse voting trends across different constituencies and parties.
11. **Predictive Analytics:** Implement algorithms to predict potential winners in specific constituencies based on historical data and current trends.
12. **Correlation Analysis:** Identify correlations between campaign expenses, criminal records, education, and electoral success.

**Reporting and Presentation:**

13. **Custom Reports:** Allow users to generate custom reports based on selected criteria.
14. **Export Functionality:** Provide the option to export data and reports in various formats (CSV, PDF, Excel) for further analysis and sharing.
15. **Interactive Dashboards:** Create interactive dashboards for real-time monitoring and analysis of election data.
16. **Geospatial Analysis:** Include geospatial data representation, showing voting patterns and candidate performance on maps.

**Compliance and Security:**

17. **Data Privacy:** Ensure compliance with data privacy regulations and protect sensitive candidate information.
18. **Audit Trail:** Maintain an audit trail to track user activities within the system for accountability.
19. **Security Measures:** Implement encryption, secure sockets layer (SSL), and other security protocols to protect data transmission and storage.
20. **Backup and Recovery:** Regularly back up the data and establish a robust disaster recovery plan.

**User Engagement and Feedback:**

21. **User Feedback:** Provide a mechanism for users to provide feedback on the system's usability and performance.
22. **User Support:** Offer user support services, such as FAQs, tutorials, and customer support channels.

These functional requirements form the basis of a comprehensive system for the quantitative analysis of candidates in the Lok Sabha Election 2019. Tailor these requirements according to the specific needs and objectives of the project.

## **Non-Functional Requirements**:

Non-functional requirements specify how a system should behave and perform rather than what it should do. For the quantitative analysis of candidates in the Lok Sabha Election 2019, several non-functional requirements are crucial to ensure the effectiveness, efficiency, and reliability of the analysis. Here are some non-functional requirements specific to this context:

1. **Performance:**
    - **Response Time:** The system should provide real-time or near-real-time analysis results to users querying the data.
    - **Scalability:** The system should be scalable to accommodate increasing data volume and user load, especially as the election date approaches.
2. **Reliability:**
    - **Availability:** The system should be available 24/7, especially during critical periods such as election day and result announcement.

- **Fault Tolerance:** The system should be resilient to hardware or software failures, ensuring that data integrity and analysis capabilities are not compromised in case of a failure.

3. **Security:**
   - **Data Encryption:** Candidate data and analysis results should be encrypted to prevent unauthorized access, ensuring the confidentiality of sensitive information.
   - **Access Control:** Role-based access control should be implemented, allowing only authorized personnel to view, modify, or delete specific data and analysis results.
4. **Usability:**
   - **User Interface Design:** The user interface should be intuitive and user-friendly, allowing users to easily navigate, query, and interpret the analysis results.
   - **Accessibility:** The system should be accessible to users with disabilities, complying with accessibility standards to ensure inclusivity.
5. **Scalability and Capacity:**
   - **Database Scalability:** The database system should be capable of handling a large volume of candidate data and be scalable to accommodate future elections' data.
   - **Processing Capacity:** The system should have sufficient processing power to perform complex analytical operations on the vast amount of election data.
6. **Compliance and Standards:**
   - **Regulatory Compliance:** The system should adhere to legal and regulatory requirements related to data privacy, election regulations, and other relevant laws.
   - **Data Standards:** The system should follow standard data formats and structures, ensuring compatibility and interoperability with other systems and tools used for election analysis.
7. **Performance Testing:**
   - **Load Testing:** The system should undergo rigorous load testing to ensure it can handle the expected number of concurrent users and data queries without performance degradation.
   - **Stress Testing:** The system should be tested under extreme conditions to evaluate its behaviour and performance under stress, ensuring it can recover gracefully after peak loads.

These non-functional requirements are essential to guarantee the reliability, security, and usability of the quantitative analysis system for Lok Sabha Election 2019 candidates. Adhering to these requirements will enhance the overall user experience and ensure the integrity of the analysis results.

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