**EXPERIMENT 3**

**DATE:07/01/2020**

**IDENTIFYING THE REQUIREMENTS FROM PROBLEM**

* Requirements elicitation
* Feasibility Study
* Functional Requirements
* Non-functional requirements
* System requirements

**Requirements Elicitation**

Electronic voting has been attracting the attention of governments and research groups with most work on the subject referring to the user requirements such a system should satisfy. For several cases, though, requirement identification seldom goes further than a simple narrative description of a basic set of non-functional characteristics related to security. On the other hand, governmental reports usually refer to requirements as the set of applicable laws pertaining a certain voting procedure. Both sides seem to underestimate the fact that an electronic voting system is an information system with functional, as well as nonfunctional, requirements. In this paper we apply the Rational Software Development Process for identifying and presenting the requirements an electronic voting system should meet. The requirements are based on a generic voting model that has been developed having in mind the European Union member states legislation, the organisational details of currently applicable voting procedures and the opportunities offered and the constraints imposed by the state-of-the-art technology.

**Feasibility study**

An online voting system would consist of an online voting application, a front-end system and a back-end system. The online voting system would utilise e-Identification, the voting register and the election information system. As the highest electoral authority, the Ministry of Justice would be the owner of the system, and the Legal Register Centre would be responsible for the procurement, implementation and maintenance of the online voting system. If a decision is made to launch the procurement process of an online voting system, policies regarding the following matters should be outlined first:

Would voting a second time be made possible in the online voting application?

This could make it more difficult to pressure voters or sell votes and help safeguard the secrecy of the ballot. This would jeopardise the secrecy of online votes in the ballot box, as the vote and the voter's details would need to be stored together. 

Would it be possible to replace an online vote by a vote on paper during the advance voting period or on the actual election day?

This would make it more difficult to guarantee the secrecy of the ballot, as the vote and the voter's details would need to be stored together.

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Would voters be given any receipt of the vote they have cast, how would the receipt be provided and what kind of information would it contain?

A receipt would make it possible to breach the secrecy of the ballot and sell votes. A receipt would make it more difficult to guarantee the secrecy of the ballot, because votes would need to be traceable.

What action would be taken if suspicion of a mistake or a problem in the online voting system occurred?

Enough time and expertise should be allocated for the procurement process and for the more detailed definition of the final system. Information security, usability and accessibility are essential features that should be taken into account throughout the process from the very beginning. A transparent and open process helps to gain voters' confidence and makes it easier to identify any possible problems.

As regards identification, a decision-in-principle should be made whether a high assurance of identity – in practice an electronic certificate card – is required or whether a lower (substantial) level of assurance – online bank identifiers and a signature and an encryption key produced by a programme in the user's terminal device – is considered sufficient. The latter option is easier to implement, but the involved risks of misuse are greater. The working group has examined the pros and cons of the different options in this feasibility study. Based on the working group's assessment, the most secure option would be to use high level of assurance in the online voting system, but the challenge is that devices providing a high level of assurance are not widely used.

**Functional Requirements**

1. **Mobility:** The voter should not be restricted to cast his ballot at a single poll-site at his home precinct.

• Realistic: He shall be able to vote from any poll-site within the nation. • Unrealistic/Expensive: He shall be able to vote from any county-controlled kiosk (situated at public places such as banks, shopping malls, etc.) within the nation. (Unrealistic because of logistical and cost issues).

• Infeasible: He shall be able to vote from virtually anywhere using an Internet connection. (Infeasible both for technical security issues as well as social science issues).

1. **Convenience:** The system shall allow the voters to cast their votes quickly, in one session, and should not require many special skills or intimidate the voter (to ensure Equality of Access to Voters).

1. **User-Interface:** The system shall provide an easy-to-use user-interface. Also, it shall not disadvantage any candidate while displaying the choices (e.g., by requiring the user to scroll down to see the last few choices).
2. **Transparency:** Voters should be able to possess a general knowledge and understanding of the voting process.

1. **Flexibility:** The system shall be flexible in that it allows a variety of ballot question formats including open-ended questions (e.g. Write-in candidates and survey questions).
2. **Support for Disabled Voters:** The system shall cater to the needs of physically challenged voters (e.g. blind voters).

1. **Accuracy**: The system shall record and count all the votes and shall do so correctly.

1. **Eligibility:** Only authorized voters, who are registered, should be able to vote.

1. **Uniqueness**: No voter should be able to vote more than once.
2. **Auditability:** It should be possible to verify that all votes have been correctly accounted for in the final election tally, and there should be reliable and demonstrably authentic election records, in terms of physical, permanent audit trail (which should not reveal the user’s identity in any manner).
3. **Voter Confirmation:** The voter shall be able to confirm clearly how his vote is being cast, and shall be given a chance to modify his vote before he commits it.

1. **To issue Receipt or not?** The system may issue a receipt to the voter if and only if it can be ensured that vote-coercion and vote-selling are prevented, so that he may verify his vote at any time and also contend, if necessary.
2. **No Over-voting:** The voter shall be prevented from choosing more than one candidate / answer.

1. **Under-voting:** The voter may receive a warning of not voting, but the system must not prevent under-voting.

1. **Provisional Ballots:** The voter shall be able to vote with a provisional (electronic) ballot if he has some registration problems, which could be counted if verified by the authorities later.
2. **Documentation and Assurance:** The design, implementation, and testing procedures must be well documented so that the voter-confidence in the election process is ensured.

**Cost-effectiveness:** Election systems should be affordable and efficient.

**Non functional Requirements**

1. **Voter Authenticity:** Ensure that the voter must identify himself (with respect to the registration database) to be entitled to vote. If voting other than at his home precinct, the voter may be asked to show some legal identification document.

**2. Registration:** The voter registration shall be done in person only. However, the computerized registration database shall be made available to polling-booths all around the nation.

**3. Voter Anonymity:** Ensure that votes must not be associated with voter identity.

1. **System Integrity:** Ensure that the system cannot be re-configured during operation.
2. **Data Integrity:** Ensure that each vote is recorded as intended and cannot be tampered with in any manner, once recorded (i.e., votes should not be modified, forged or deleted without detection).
3. **Secrecy / Privacy:** No one should be able to determine how any individual voted.
4. **Non-coercibility and No Vote-selling:** Voters should not be able to prove to others how they voted (which would facilitate vote selling or coercion).
5. **Reliability:** Election systems should work robustly, without loss of any votes, even in the face of numerous failures, including failures of voting machines and total loss of network communication. The system shall be developed in a manner that ensures there is no malicious code or bugs.
6. **Availability:** Ensure that system is protected against accidental and malicious denial of service attacks. Also, setup redundant communication paths so that availability is ensured.

1. **System Disclosability:** The core of the system, especially the vote-casting equipment, shall be open source, so that it can allow external inspection and auditing.
2. **Simplicity:** The system shall be designed to be extremely simple, as complexity is the enemy of security.
3. **Testing and Certification:** The system should be tested by experts with respect to all of the security considerations, so that election officials have the confidence that the system meets the necessary criteria.
4. **System Accountability:** Ensure that system operations are logged and audited.
5. **Personnel Integrity:** Those developing and operating the voting system should have unquestionable records of behavior.
6. **Operator Authentication and Control:** Ensure that those operating and administering the system are authenticated and have strictly controlled functional access on the system.
7. **Distribution of Authority:** The administrative authority shall not rest with a single entity. The authority shall be distributed among multiple administrators, who are known not to collude among themselves (e.g., different political parties).

**SYSTEM REQUIRMENTS**

A cool PC for web development should include:

* i5 processor , 5th generation
* Minimum of 8gb ram memory
* 2gb of graphic card.
* 160gb SSD hard drive.

This may not be the perfect one for web developers but it would give a very good experience

to develop any kind of websites.

**HARDWARE**

Processor

Hard-disk

RAM

**SOFTWARE**

Operating system

Programming concepts

Server

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| --- | --- | --- | --- |
| **Presentation (4)** | **Documentation (3)** | **Explanation (3)** | **Total (10)** |
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