



Malaysian-Japan International Institute of Technology

SECD2613-15 System Analysis Design

Group Assignment 1

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Topic: Online Voting System

Executive Summary

The Online Voting System (OVS) is a digital platform designed to modernize current election methods. This system will feature authenticating the identity and eligibility of user via thumbprint and identification card to protect user data confidentiality. Another feature of this is digital ballot creation that will be distributed digitally via user ID after registering with OVS in order to protect the vote authenticity. The next feature for Online Voting System (OVS) is calculation for result tabulation. The system will count the total votes for each party and candidate then report it in real-time on OVS to ensure the system transparency.

Background

Election fraudulent is an illegal activity that happens when manual elections are in used. Some of its common cases are double voting, ballot stuffing and tampering with calculation for result tabulation. In order to terminate these fraudulent election cases, a system where it's completely digital is the only solution to stop unethical people from tampering with election result and process. The Online Voting System is fully controlled by computers from authenticating user up to ballot creation and distribution until result tabulation. The system will be protected with a unique security system that won't be defeated by any cyber threat.

Objectives

1. To protect the voting integrity from being tampered by irresponsible organization
2. To ensure transparency of election result for a fair outcome
3. To protect the security of user data from being spread widely
4. To make the system accessible and convenient to everyone around the globe.

Methodology

- Requirement and data collection: conduct interviews and questionnaires to SPR and our sample group consisting of 100 people, 18 above, to understand the requirements needed for the program.
- Design system features and requirements: create structures and diagrams to visualize and simulate the system.
- Coding system: Code all system functionalities including voter authentication, ballot creation and result tabulation.
- Testing and debugging system: ensure all systems are functioning with no errors and ensure the interactive interface is user friendly and accessible, gain input from users for further improvement.
- User acceptance testing: ensure the system functions as intended through a client
- Black box testing: ensure the interface is fully functional by accessing the shell.
- Training and implementation: Provide training to volunteers under SPR to use and teach voters on how to use the program.

Resources

1. Personnel

- ❖ Project Manager – Oversee the entire project by coordinating team effort and milestones are met in line with the schedule.
- ❖ Software Developer – Frontend and backend developers that are proficient in relevant stack.
- ❖ UI/UX Designer – Design an intuitive and user-friendly interface.
- ❖ QA/Tester – Conduct a thorough testing of the system to identify errors, bugs and any issues.
- ❖ Security Expert – Conduct security assessments and ensure implementation of security measures is robust.
- ❖ Technical Support Staff – Provide maintenance and support to users and administrator.

- ❖ Training Staff – Provide an onboarding for election administrator and voters on how to use the system effectively and utilize provided features.

2. Hardware and Infrastructure

- ❖ Servers – Host for the program and database. Can consider cloud-based solutions like AWS, Azure and Firebase for scalability and reliability or physical server for efficiency and performance.
- ❖ Backup Systems – Backup server to ensure data redundancy and disaster recovery.
- ❖ Networking Equipment – Router, switches and firewall to ensure secure communications between client and server.

3. Software and Tools

- ❖ Development Tools – IDE, Project Management Software (e.g. Trello) and communication tools (e.g. Teams, Discord)
- ❖ Security Tools – Vulnerability scanner, Encryption Software (e.g. OpenSSL) and Intrusion Prevention Tools (e.g. Snort)
- ❖ Testing Tools – Security Testing Tools (e.g. PenTest) and Load Testing Tools (e.g. Bees with Machine Guns)

4. Licenses

- ❖ Software Licenses – Licenses for third-party software, API key and libraries that are used in the project.
- ❖ Legal Consultation – Legal advice by experts on compliance with local election law, data protection law and privacy regulations.

5. Training and Documentation

- ❖ Training Materials – Onboarding materials such as video tutorial, user manual and other instructional material for election administrator and voter.
- ❖ Documentation – Technical documentation for developer and system admin such as system architecture, API documentation and troubleshooting guide.

6. Contingency

- ❖ Funds for unexpected setbacks or changes in project scopes.

Budgets

Personnel –

- ❖ Project Manager: RM7,500 per month.
- ❖ Software Developer (Frontend & Backend): RM4,800 per month each.
- ❖ UI/UX Designer: RM3,500 per month.
- ❖ Security Expert: RM4, 500 per month.
- ❖ QA/Tester: RM4,000 per month each (2 testers).
- ❖ Technical Support Staff: RM3,500 per month.
- ❖ Training Staff: RM3,000 per month.

2. Hardware and Infrastructure –

- ❖ Servers: RM2, 500 per month
- ❖ Networking Equipment: RM15, 000 (one-time cost)
- ❖ Backup Systems: RM10, 000 (one-time cost)

3. Software and Tools –

- ❖ Development Tools: RM5, 000 annually
- ❖ Security Tools: RM20, 000 annually
- ❖ Testing Tools: RM10, 000 (license)

4. Licenses –

- ❖ Software Licenses: RM15, 000 (one-time cost)
- ❖ Legal Consultation: RM25, 000 (consultation fees)

5. Training –

- ❖ Training Materials: RM10, 000
- ❖ Documentation: RM5, 000

6. Contingency –

❖ 10% of Total Budget: RM56, 260

7. Total: -

$$\begin{aligned} & (7,500 + 4,800 + 3,500 + 4,500 + 8,000 + 3,500 + 3,000 + 2,500) * 12 + 15,000 + 10,000 \\ & + 5,000 + 20,000 + 10,000 + 15,000 + 25,000 + 10,000 + 5,000 + 56,260 = \\ & \text{RM618, 860} \end{aligned}$$

Measurement and Reporting

Project phase	activity	week														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Planning	P1 briefing															
	Project planning															
	group task assignment															
	requirement and data collection															
	group proposal write-up															
	group proposal submission															
Analysis	P2 briefing															
	designing voter authentication															
	designing ballot creation															
	designing result tabulation															
	designing overall system prototype															
	P2 submission															
	P3 briefing															
	designing case diagram															
	design structure chart															
	P3 submission															
Development	P4 briefing															
	start coding system prototype															
	coding voter authentication															
	coding ballot creation															
	coding result tabulation															
	coding system system interface															
Testing and system implementation	Testing and debugging system															
	User acceptance testing															
	Black box testing															
	write up documentation for training															
	system training and implementation															
	review and final submission															

Risks (WIP)

- Security Risk – Data breach such as unauthorized access to voter’s data, compromising privacy.
- Technical Risk – Unexpected technical issues or bugs leading to system downtime or malfunction during critical periods
- Operational Risk – Spread of false information or rumors regarding the security or integrity of the online voting system, undermining public trust.

To mitigate this risk, implementation of robust security measures, conduct thorough testing, adherence to relevant legal and regulatory frameworks, and provide comprehensive training for users and administrators.