Online Voting System

Project Proposal

Ishrat Jahan; Md.Shakib Patoary; Md.Ramjan Ali

Department of Software Engineering
Gazipur Digital University

August 2025

Contents

1 Problem Analysis and Motivation

Bangladesh, as one of the world's largest democracies, requires a secure, transparent, and efficient voting system to ensure credible elections. The existing manual process is time-consuming, resource-intensive, and vulnerable to irregularities. To address these challenges, we propose an online voting system that combines security, convenience, and transparency. Our system uses Login/Registration, OTP verification and confirmation, election selection, ballot viewing and candidate selection, vote confirmation, and receipt generation to validate voter identity and prevent duplicate voting. Voters can securely cast their votes remotely from any location, while an RFID-based method supports offline voting. A unique feature of the system allows voters to verify whether their vote has been correctly recorded for the chosen candidate or party, thereby increasing trust. Automatic vote tallying reduces counting time and enables instant, tamper-proof result declaration. The prototype has been implemented entirely in Java, demonstrating that the system is robust, scalable, and suitable for future elections in Bangladesh.

2 Literature Review

Voting is a fundamental aspect of a democracy, enabling citizens to elect representatives and participate in governance. Traditional manual voting methods, though widely used, are often time-consuming, resource-intensive, and prone to errors and malpractice. To address these issues, researchers have proposed various online voting systems.

Govindaraj and Kumaresan [1] proposed an online voting system using cloud technology that allows voters to cast their vote remotely. Their system focuses on convenience and accessibility, enabling voting from anywhere through the internet.

Prabhu et al. [2] introduced a smart online voting system incorporating face recognition and OTP-based multi-factor authentication. This method enhances security and ensures that votes are cast only by authenticated users.

Agarwal and Pandey [3] developed an online voting system for India using AADHAAR ID to verify voter identity. Their model emphasizes security and transparency, providing a robust framework for preventing multiple votes and ensuring vote integrity.

Despite these advancements, challenges such as secure offline voting, ease of use for voters without internet access, and real-time verification remain. Motivated by these limitations, the current project proposes a Java-based online voting system for Bangladesh that combines multi-factor authentication, offline voting through RFID, and real-time vote verification to improve security, convenience, and transparency.

3 Methodology

A set of methods, practices, processes, techniques, procedures, and rules for development. Block diagram of Online Voting System is given in figure 1.
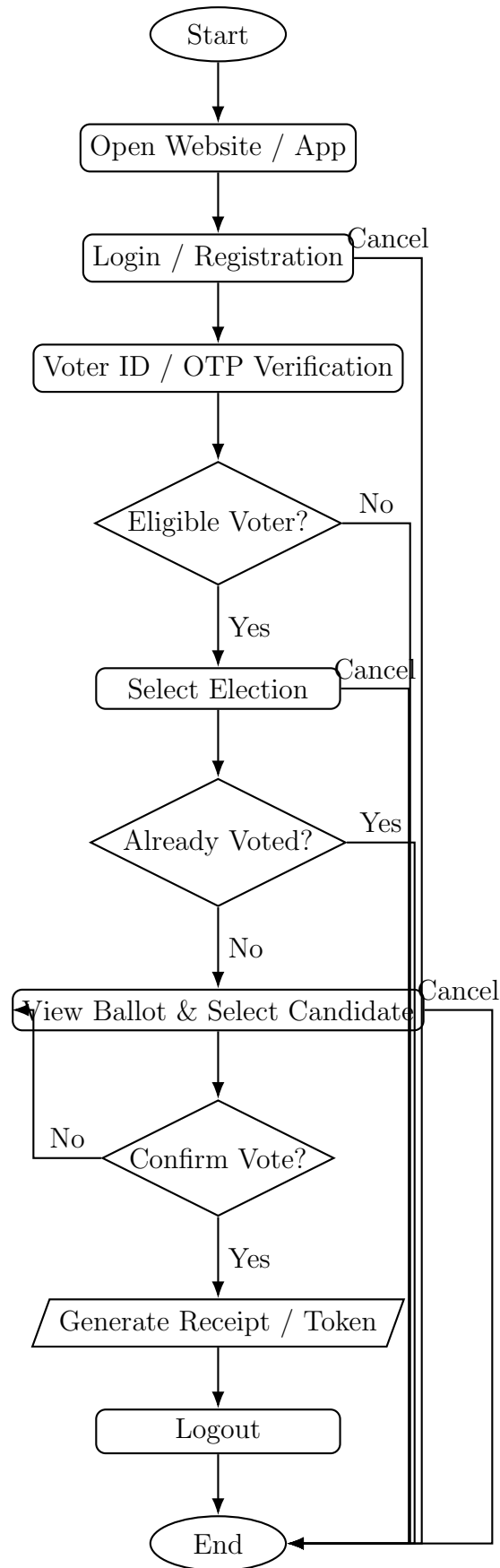
Figure 1: Block diagram of the Online Voting System

4 Feasibility Study

Economic Feasibility

- Evaluating system performance to ensure it reduces manual effort and errors.

- Reviewing operational efficiency compared to the current manual process.

- Identifying training requirements for voters and administrators.

- Estimating budget requirements for software development, hosting, and maintenance.

- Assessing availability and cost of human resources for system management.

Technical Feasibility

- Calculating system accuracy for vote recording and counting.

- Assessing potential for future scalability and growth.

- Measuring response time for user actions and system transactions.

- Evaluating user-friendliness for both voters and administrators.

Operational Feasibility

- Calculating operation time for casting and counting votes.

- Evaluating reliability, accuracy, and retrieval rate of election results.

- Ensuring the system integrates smoothly with existing procedures and policies.

5 Main Phases of Development

- **Project Proposal and Planning**

- **Requirement Specification**

- **SDLC Selection**

- **Develop Data Flow Diagram (DFD)**

- **Develop UML Diagrams**

- **Software Development (Coding)**

- **Software Testing**

Table 1 : Project Task Schedule for Online Voting System Development

SL.	Task	Week	Responsible	Phase
1	Requirement Specification and Data Collection	1	Team	Research
2	Requirement Finalization	1	Team	Analysis
3	System Design and Modeling	1	Team	Design
4	System Modeling and Finalization	1	Team	Design
5	System Development (Coding)	1	Team	Implementation
6	Testing and Feedback Sharing	1	Team	Testing
7	Beta Version Delivery for Feedback	1	Team	Testing
8	Feedback Sharing and Requirement Change	1	Team	Testing
9	Final Deployment	1	Team	Deployment

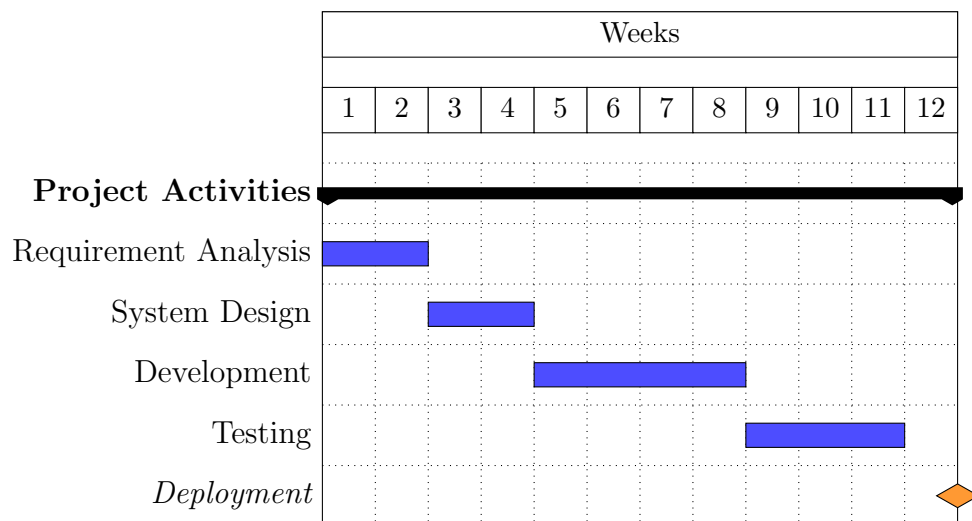# 6 Work Plan (Gantt Chart)

Figure 2 provides......

Figure 2: Project Development Timing

7 Budget Details

Budget details are given in Table 2.

Table 2. Budget Details of Online Voting System

SL	Criteria	Specification	Existing (tk)	New (tk)
1	Office Cost	Team meeting	22,000	18,000
		Project meeting	20,000	15,000
		First aid	1,000	800
2	Website Cost	Maintenance	12,000	10,000
3	Equipment	Computer	1,20,000	1,00,000
		Laptop	80,000	70,000
4	Salary	Team Leader	70,000	65,000
		System Designer	45,000	40,000
		Software Engineer	55,000	50,000
		Developer	35,000	30,000
		Officer	25,000	22,000
			Total	5,15,800

8 Conclusion

The proposed system offers a robust, scalable, and user-friendly solution for online voting in Bangladesh. It improves election efficiency, transparency, and trust while minimizing the limitations of traditional manual voting.

References

1. R. Govindaraj and P. Kumaresan, "Online voting system using cloud," in *2020 International Conference on Emerging Trends in Information Technology and Engineering (IC-ETITE)*, 2020. [Online]. Available: https://doi.org/10.1109/ic-ETITE47903.2020.245

2. S. G. Prabhu, A. Nizarahammed, and S. Prabu, "Smart online voting system," in *2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS)*, 2021. [Online]. Available: https://doi.org/10.1109/ICACCS51430.2021.94418

3. H. Agarwal and G. N. Pandey, "Online voting system for India based on AADHAAR ID," in *2013 Eleventh International Conference on ICT and Knowledge Engineering*, 2013. [Online]. Available: https://doi.org/10.1109/ICTKE.2013.6756265

Contribution Table:

Name	Contribution	Percentage
Md.Shakib Patoary	Problem Analysis, Literature Review,Methodology, References, Report Writing	33%
Ishrat Jahan	System Design, Budget Estimation, Diagram Preparation, Report Writing	34%
Ramjan Ali	Methodology, workplan	33%