

12. Online Voting System

Objective

To develop a secure and transparent full-stack web application using Django and React that facilitates the creation, management, and participation in online voting events. The system will ensure voter authentication, anonymous vote casting, real-time result tracking, and protection against fraud or manipulation, making it suitable for academic, organizational, or community elections.

Core Features

1. User Authentication and Role Management

- Secure registration and login using JWT authentication
- User roles: Admin, Election Manager, Voter
- Role-based access control to manage voting processes
- Optional two-factor authentication for added security

2. Election Creation and Management

- Election Managers can create, configure, and launch elections
- Define election title, description, start/end time, candidates, and voter eligibility
- Support for single or multiple position voting and voting types (e.g., single choice, ranked choice)
- Option to make elections public or private

3. Voter Management

- Add voters manually or through bulk CSV upload
- Assign voters to specific elections based on roles or eligibility
- Track voter participation without compromising anonymity
- Email invitations and secure links for private elections

4. Secure Voting Process

- Voters can view ongoing elections and cast votes within active timeframes
- Each voter can vote only once per election
- Votes are anonymized and encrypted before storage
- Confirmation prompt before final vote submission

5. Real-Time Results and Analytics

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- Display vote counts, percentages, and graphical results in real-time after polls close
 - Filter results by position or category
 - Restrict access to results based on role or election settings

6. Dashboard for All Roles

- **Admin:** View all elections, user activity, logs, and system health
- **Election Manager:** Monitor voter turnout, manage candidates, and view analytics
- **Voter:** View upcoming, active, and past elections with voting status

7. Notification and Communication

- Automated email reminders for upcoming elections or incomplete votes
- Alerts for election start/end and result publication
- Secure in-app messaging between admins and election managers

8. Responsive and Accessible UI

- React frontend styled with Bootstrap UI
- Fully responsive design for mobile and desktop
- WCAG-compliant accessibility features

Success Criteria

- Fully functional, secure, and scalable authentication and role system
- Accurate and tamper-proof vote recording and counting
- Reliable performance under concurrent voting scenarios
- User-friendly interface for managing and participating in elections
- Real-time result calculation with clear visualization
- Proper deployment with SSL encryption and database security
- Complete technical documentation and test coverage

Optional Enhancements

- Blockchain-based vote storage for enhanced integrity and auditability
- OTP-based secure voter login for highly sensitive elections
- Support for referendums, polls, or multi-round elections
- Voter activity heatmap and turnout analysis tools
- Multilingual support for diverse voter groups
- QR code-based quick login for verified votes
- Mobile app using React Native for easy vote access
- Offline voting data capture with auto-sync when back online