ONLINE VOTING SYSTEM

A PROJECT REPORT

Submitted by

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Kadi Sarva Vishwavidyalaya

DEC-MAY, 2022-23

LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH

GANDHINAGAR

CE-IT Department

CERTIFICATE

This is to certify that the Project Work entitled **"ONLINE VOTING SYSTEM"** has been carried out by **Vedant Khamar (20BEIT30041)** under my guidance in fulfilment of the degree of Bachelor of Engineering in **Information Technology** Semester-6 of Kadi Sarva Vishwavidyalaya University during the academic year 2022-2023.

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Kadi Sarva Vishwavidyalaya

Presentation-I for Project-II

1. Name & Signature of Internal Guide	
2. Comments from Panel Members	
3. Name & Signature of Panel Members	

ACKNOWLEDGEMENT

With immense pleasure I would like to present the report on my topic "ONLINE VOTING SYSTEM". I have thankful to all that have helped us for successful completion of my project and providing us courage for completing the work.

Firstly, we are thankful to LDRP-ITR for undertaking this project. We are sincerely indebted to Prof. Nilam Thakkar for giving us the opportunity to work on this project. Her continuous guidance and help have proved to be the key to our collective success in overcoming the challenges that we have faced during the project work. Her support made the project making experience a pleasantly memorable one. Without her help at all stages in spite of her own workload; the completion of the project would not have been possible.

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At last I would like to thank my Group Mates and friends who have directly or indirectly helped me in making the project work successfully.

Regards,

ABSTRACT

The Online Voting System project aims to introduce a robust and secure platform for conducting elections in the digital era. Traditional voting methods often face challenges related to accessibility, transparency, and efficiency. This project addresses these issues by leveraging the power of technology to create an inclusive and convenient voting system.

The Online Voting System provides a user-friendly interface that allows eligible voters to cast their votes remotely using their computers or mobile devices. By removing the need for physical polling stations, this system eliminates geographical constraints and enables citizens to participate in the democratic process from anywhere, at any time.

To ensure the integrity of the voting process, various security measures are implemented. These include encryption techniques to safeguard voter information, authentication mechanisms to verify the identity of voters, and tamper-proof storage for preserving the integrity of the ballots. Additionally, advanced algorithms are employed to prevent fraud and maintain anonymity while ensuring that each voter has only one vote.

The system incorporates robust administrative features to streamline the election management process. Election officials can create and manage voter databases, generate unique voter credentials, monitor voting activities in real-time, and generate comprehensive reports for auditing and analysis. Moreover, the system offers accessibility features, such as multilingual support and compatibility with assistive technologies, to accommodate diverse user needs.

The Online Voting System project contributes to strengthening democracy by increasing voter participation, reducing logistical challenges, and enhancing the transparency and efficiency of the election process. It opens up new possibilities for conducting secure and accessible elections, ultimately leading to a more inclusive and representative democratic society.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. Introduction:-

- **INTRODUCTION**
- **SCOPE**
- **PROJECT SUMMARY AND PURPOSE**
- **OBJECTIVES**

1.1 Introduction

The Online Voting System project represents a significant advancement in the realm of democratic processes by harnessing the potential of technology to revolutionize traditional voting methods. In an increasingly digital world, where accessibility, convenience, and security are paramount, the need for an efficient and reliable online voting system has become more pressing than ever.

Conventional voting systems often encounter challenges such as geographical limitations, long queues, logistical complexities, and administrative burdens. These limitations can discourage voter turnout and hinder the democratic process. By transitioning to an online platform, these barriers can be effectively mitigated, empowering citizens to exercise their right to vote conveniently and securely.

The primary objective of the Online Voting System project is to provide a comprehensive and user-friendly platform that ensures the integrity and transparency of the electoral process. By enabling voters to cast their ballots remotely using computers or mobile devices, the system eliminates the constraints imposed by physical polling stations. Voters can participate in elections from the comfort of their homes, workplaces, or any other location, thus enhancing accessibility and convenience for all eligible individuals.

One of the crucial aspects addressed by the project is the security of the online voting process. Robust encryption techniques are employed to protect voter information and maintain the confidentiality of the ballots. Authentication mechanisms are implemented to verify the identity of voters and prevent unauthorized access. The system also guarantees the anonymity and privacy of voters, ensuring that each individual can cast their vote without fear of retribution or coercion.

Administrative functionalities are another key component of the Online Voting System. Election officials are provided with a comprehensive set of tools to manage the entire electoral process efficiently. They can create and maintain voter databases, generate unique voter credentials, monitor voting activities in real-time, and generate detailed reports for auditing and analysis. These administrative features streamline the election management process and enhance transparency and accountability.

Furthermore, the Online Voting System project embraces inclusivity by incorporating accessibility features. It accommodates individuals with diverse needs by offering multilingual support and compatibility with assistive technologies. This ensures that voters with disabilities or language barriers can engage in the electoral process on an equal footing with others.

In conclusion, the Online Voting System project represents a significant advancement in the democratic landscape. By leveraging the power of technology, it seeks to overcome the limitations of traditional voting methods and create a more accessible, transparent, and secure platform for citizens to exercise their democratic rights. By enhancing voter participation, streamlining election management, and preserving the integrity of the process, the project aims to strengthen democracy and foster a more inclusive and representative society.

1.2 Scope

The scope of the Online Voting System project encompasses various aspects involved in the development and implementation of an efficient and secure online voting platform. The following are the key areas within the scope of the project:

System Architecture and Design: The project involves designing the architecture of the online voting system, including the user interface, database structure, security protocols, and integration with other relevant systems. It encompasses determining the technology stack, defining the system components, and establishing the overall structure of the platform.

User Registration and Authentication: The project includes developing a user registration module that allows eligible voters to create accounts on the online voting system. This module also incorporates robust authentication mechanisms to verify the identity of voters and prevent unauthorized access.

Ballot Generation and Management: The system should provide functionality to create and manage ballots for different elections. This includes designing a ballot template, defining candidate options, and ensuring the accuracy and integrity of the ballot information.

Voting Process: The project involves implementing the core functionality of casting votes online. This includes developing an intuitive and user-friendly interface for voters to select their preferred candidates or choices. The system should ensure the security and privacy of the voting process, prevent multiple voting by the same individual, and maintain anonymity.

Security and Encryption: Security is a critical aspect of the project. The online voting system should employ robust encryption techniques to protect voter information and prevent unauthorized access. It should implement measures to safeguard against tampering or manipulation of ballots and ensure the confidentiality and integrity of the entire voting process.

Result Tabulation and Reporting: The system should include features to accurately tabulate the votes and generate election results. It should provide comprehensive reporting

functionalities for election officials to analyze and audit the results. The reporting module should be capable of generating various types of reports, such as voter turnout, candidate-wise results, and overall statistical analysis.

1.3 Objectives

This project is aimed at developing an online voting system for introduction to management for students and lecturers. The purpose of the system is to completely automate the old manual procedure of conducting voting to a computerized system. I will provide a more efficient platform for voting.

1.3.1 General Objectives

The general objective of the project is to develop the platform or system for online voting.

1.3.2 Specific Objective

The specific objective of the Online Voting System is:-

- Develop a Secure and Robust Online Voting Platform.
- Enable Convenient and Remote Voting.
- Ensure Accuracy and Transparency.
- Facilitate Efficient Election Management.
- Enhance Data Analysis and Reporting.
- Foster Trust and Confidence.

2. Technology and Literature Review :-

Technology Review for Online Voting System:

Security Protocols: Implementing robust security protocols is essential for the online voting system. This includes encryption techniques to protect voter data during transmission and storage, secure authentication mechanisms to verify voter identity, and measures to prevent tampering or manipulation of ballots. Technologies such as Secure Socket Layer (SSL), Transport Layer Security (TLS), and Public Key Infrastructure (PKI) can be employed to ensure secure communication and data protection.

Authentication Methods: To ensure the authenticity of voters, various authentication methods can be used, such as two-factor authentication (2FA), biometric authentication (fingerprint, facial recognition), or digital signatures. These technologies enhance the security of the online voting system by verifying the identity of voters and preventing unauthorized access.

Blockchain Technology: Blockchain technology can be leveraged to enhance the transparency and immutability of the online voting system. By utilizing a distributed and decentralized ledger, blockchain can ensure tamper-proof storage of voting records and provide an auditable and transparent trail of the entire voting process. Smart contracts can be utilized for enforcing voting rules and automating the vote-counting process.

Cloud Computing: Cloud computing can provide scalability and flexibility to the online voting system. It allows for the efficient allocation of computing resources, handling increased user traffic during peak voting periods. Cloud-based infrastructure also offers robust data storage, backup, and disaster recovery solutions, ensuring the availability and reliability of the system.

Mobile Application Development: Developing mobile applications for iOS and Android platforms can enhance the accessibility and convenience of the online voting system. Mobile apps enable voters to cast their votes using their smartphones or tablets, making the process more user-friendly and accessible to a wider audience.

Literature Review for Online Voting System:

"A Secure E-Voting System Based on Blockchain Technology" by Q. Chen et al. (2018): This paper explores the integration of blockchain technology in an electronic voting system to enhance security, transparency, and trust. It discusses the use of smart contracts, distributed consensus algorithms, and cryptographic techniques for secure and verifiable voting.

"Secure E-Voting System using Homomorphic Encryption and Blind Signature" by S. B. Dabhade and P. R. Patil (2019): This research focuses on the integration of homomorphic encryption and blind signature techniques to achieve end-to-end verifiability and privacy in electronic voting systems. The paper presents a secure and anonymous e-voting protocol and discusses its implementation.

"Design and Implementation of an Electronic Voting System with Improved Security and

Usability" by M. Z. Rahman and A. I. Salehin (2017): This paper proposes an electronic voting system that incorporates various security measures, including encryption, authentication, and tamper-proof storage. The study also addresses the usability aspect of the system by considering user experience and accessibility.

"Challenges and Solutions in the Development of an Online Voting System" by E. Nurmi et al. (2018): This article discusses the challenges and considerations involved in developing an online voting system, including security, privacy, accessibility, and legal aspects. It provides insights into best practices and lessons learned from the implementation of online voting systems in different contexts.

"Mobile Voting: A Review of the Security Issues and Challenges" by J. R. Amado et al. (2020): This review paper focuses on the security challenges associated with mobile voting systems. It discusses the vulnerabilities, threats, and mitigation strategies specific to mobile platforms, highlighting the importance of secure app development, device integrity, and user authentication.

3. Software Requirements Specifications:-

3.1 User Characteristics:-

Users of the website are members, administrator who maintain the website. Members and manager are assumed to have basic knowledge of computers and internet browsing. Administrators of the system should have more knowledge of internal modules of the system and are able to rectify smallproblems that may arise due to disk crashes, power failures and other catastrophes. Friendly user interface, online help and User guide must be sufficient to educate the users on how to use this product without any problems or difficulties.

3.2 Software and Hardware Requirements:-

3.2.1 Software Requirements:

- OS: Windows 11,10,8
- Browser version 2.1
- COMPILER: Visual Studios Code

3.2.2 Hardware Requirements:

- SYSTEM MODEL: Compaq Presario C700
- PROCESSOR: AMD Ryzen 5000 Series or more than that.
- RAM: 1 GB
- HARDDISK: 160 GB

3.2.3 Functional Requirement of Voting System:-

The functional requirements are listed below:-

Voter Registration: The system should allow eligible users to register as voters, providing their necessary personal information and verifying their identity.

Authentication and Security: Implement a robust authentication mechanism to ensure that only eligible voters can access the voting system. Use techniques like username/password, biometric verification, or two-factor authentication.

Ballot Creation: The system should support the creation of digital ballots for different elections or voting events, including options for candidate names, descriptions, and other relevant details.

Voting Process: Provide an intuitive and user-friendly interface for voters to cast their votes securely. Users should be able to review their choices before submitting their final vote.

Vote Recording: The system should accurately record and store votes in a secure database, ensuring that each vote is counted only once.

Real-time Vote Counting: Implement a vote counting mechanism that allows for real-time or near-real-time vote tallying, displaying the current results during and after the voting process.

Results Publication: Once the voting process is complete, the system should publish the election results in a transparent and easily accessible manner.

Security Measures: Implement security protocols to protect the system from unauthorized access, tampering, or hacking attempts. Employ encryption, firewalls, and other security measures.

Multi-platform Accessibility: Ensure that the online voting system is accessible across different devices and platforms, such as desktops, tablets, and mobile phones.

Voting Deadline Management: The system should enforce voting deadlines and prevent users from voting after the specified closing time.

Verification and Audit Trail: Enable administrators to verify the integrity of the voting process through an audit trail that logs system activities and user interactions.

Multiple Elections Support: The system should be able to handle multiple elections concurrently, without interference between different voting events.

Backup and Recovery: Regularly back up voting data to prevent data loss and ensure smooth recovery in the event of system failures.

3.2.4 Non Functional Requirement of Voting System:-

The non functional requirements are listed below:-

Non-functional requirement are also present in every system. In this case, whena user makes an online voting, the database must keep track on it. It is considered as the high level of execution. All information must be updated in real time.

The non-functional requirements are listed below:-

Security: The system must provide a high level of security to prevent unauthorized access, tampering, or manipulation of votes and voter data. It should comply with industry security standards and best practices.

Performance: The system should be capable of handling a large number of concurrent users and votes without significant slowdowns or downtime. It should offer responsive and smooth user interactions.

Scalability: The system should be able to scale up or down easily based on the number of users and voting events. It should accommodate increased demand during peak times.

Reliability: The system must be reliable and available during the entire voting process, ensuring minimal downtime and data loss.

Usability: The system should be user-friendly and intuitive, requiring minimal training for voters and administrators to use the platform effectively.

Accessibility: The platform should be accessible to users with disabilities, adhering to accessibility standards to ensure inclusivity.

Compatibility: The system should be compatible with various web browsers, operating systems, and devices to reach a broader audience.

Response Time: The system should provide fast response times, ensuring that users do not experience significant delays during the voting process.

Data Privacy: Personal voter data must be handled with strict confidentiality and compliance with relevant data protection regulations. User information should not be shared or used for any other purposes.

Data Integrity: The system should maintain the integrity of votes and data, ensuring that no votes are lost or altered during transmission or storage.

Auditability: The system should be auditable, enabling administrators to track and review user activities and system logs for transparency and accountability.

Interoperability: The system should integrate seamlessly with other election-related systems, such as voter databases and election management tools.

Performance Under Load: The system should be tested for performance under heavy load to ensure it can handle the expected number of voters without compromising speed and responsiveness.

Disaster Recovery: A robust disaster recovery plan should be in place to recover data and system functionality in case of any unforeseen catastrophic events.

Compliance: The system should comply with relevant legal and regulatory requirements for online voting and data privacy.

Maintainability: The system should be designed with maintainability in mind, making it easy for developers to update, enhance, and troubleshoot the system when necessary.

4. System Diagrams:-

4.1 Entity Relationship Diagram:-

In this section we would develop a simple ER model for the Online Voting System. The first step towards the ER modeling is to identify the set of relevant entities from the given problem statement. The two primary sets in this context are “Candidates” and “Counting”. The entity set “Candidates” represents all peoples etc. who have registered for the online voting.

Figure 1 represents Candidates Entity Set and primary key.

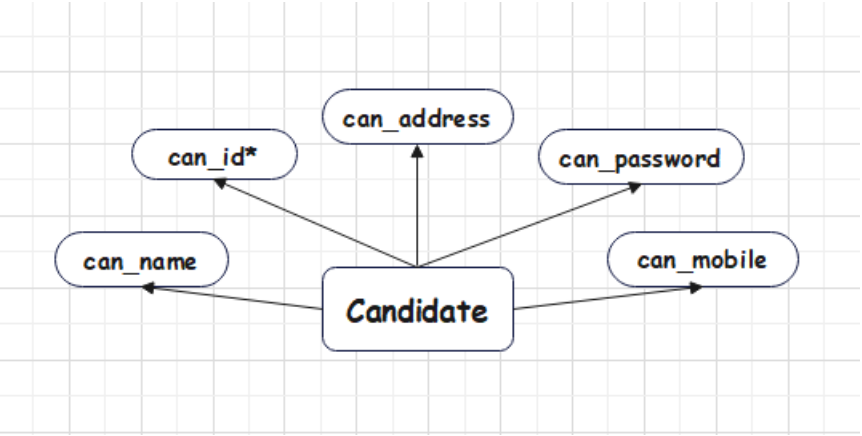


Figure 1: “Candidates” entity set

Figure 2 represents Elections Entity Set.

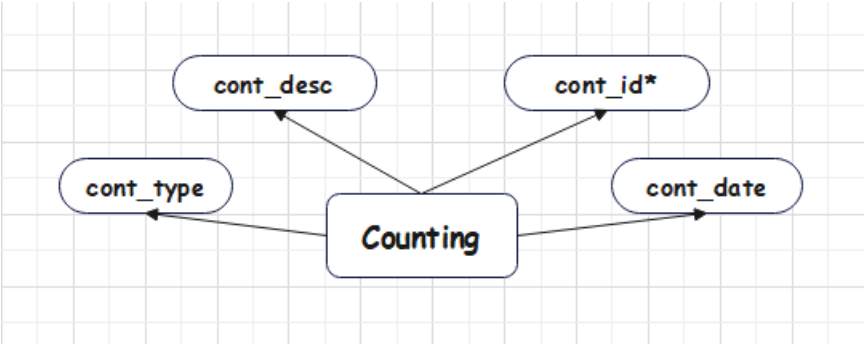


Figure 2: "Counting" entity set

The complete ER diagram is as follows:

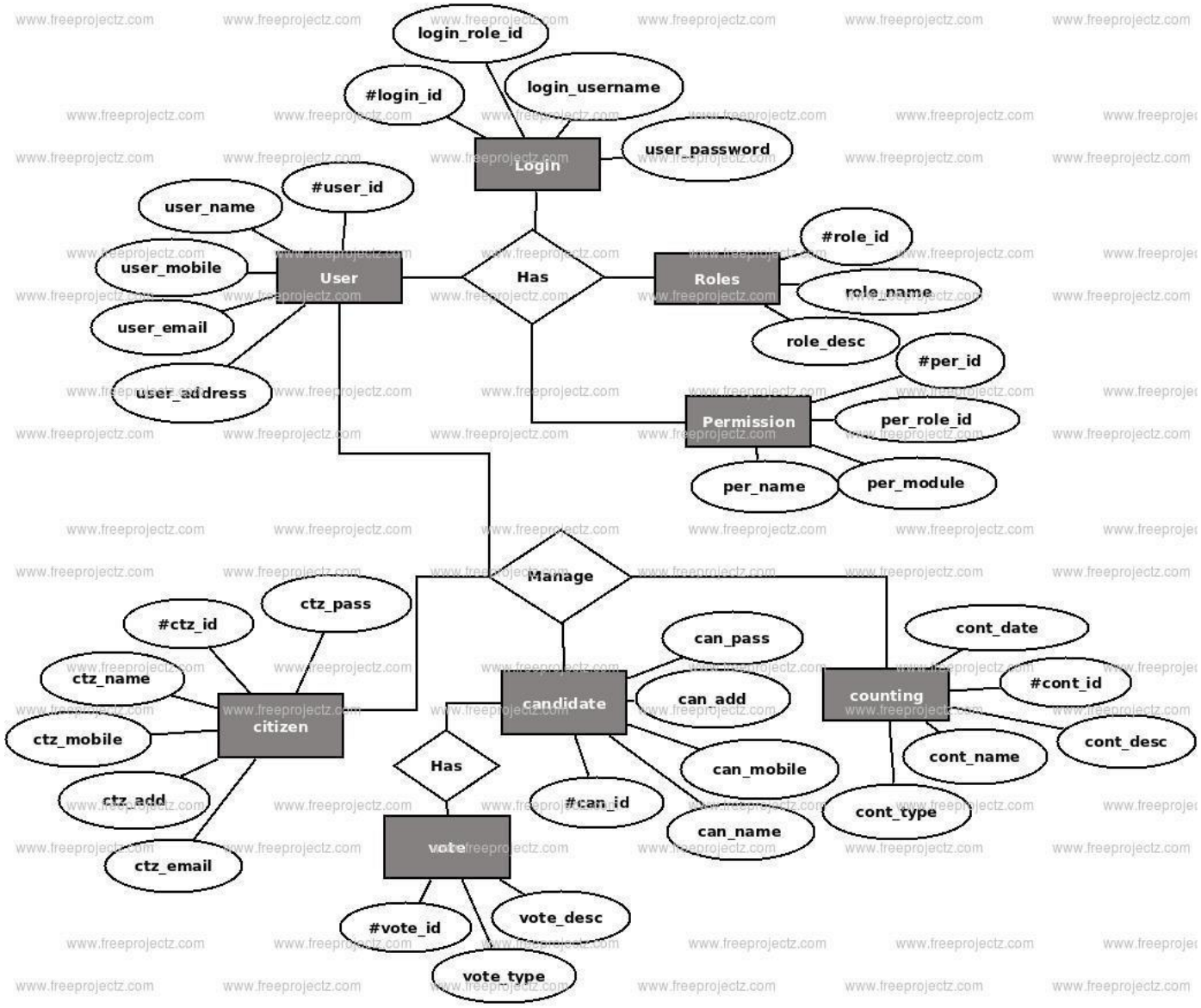


Figure 3: ER diagram of Online Voting System

4.2 Data Flow Diagram:-

4.2.1 Context Level:

The context diagram is an alternative name for the **Level 0 DFD Diagram for Online Voting System**. Users, the main process, and data flow make up its parts. Also, the project concept is demonstrated using the single process visualization.

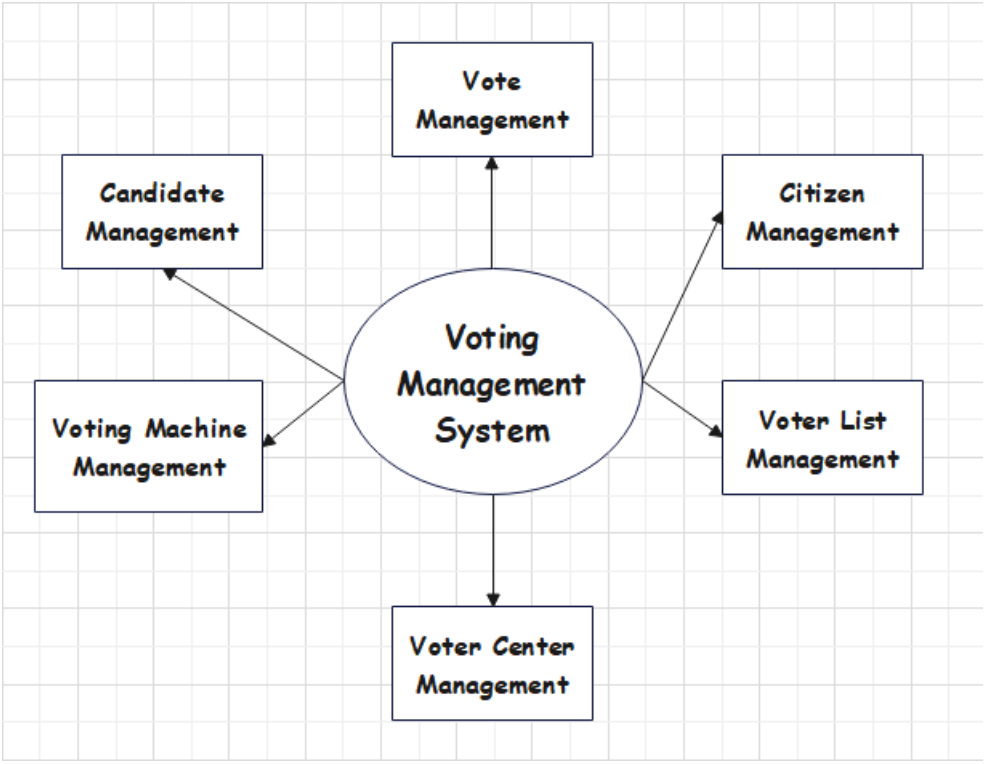


Figure 4.2.1: Data Flow Diagram LEVEL 0 of Online Voting System

4.2.2 First level DFD of Admin:

The "detonated view" of the context diagram is **Online Voting System DFD Level.**

1. Its function is to deepen the concept derive from the context diagram.

Specifically, level 1 shows the broader details of Online Voting System DFD Level 0. This is to clarify the paths (flow) of data and its transformation from input to output.

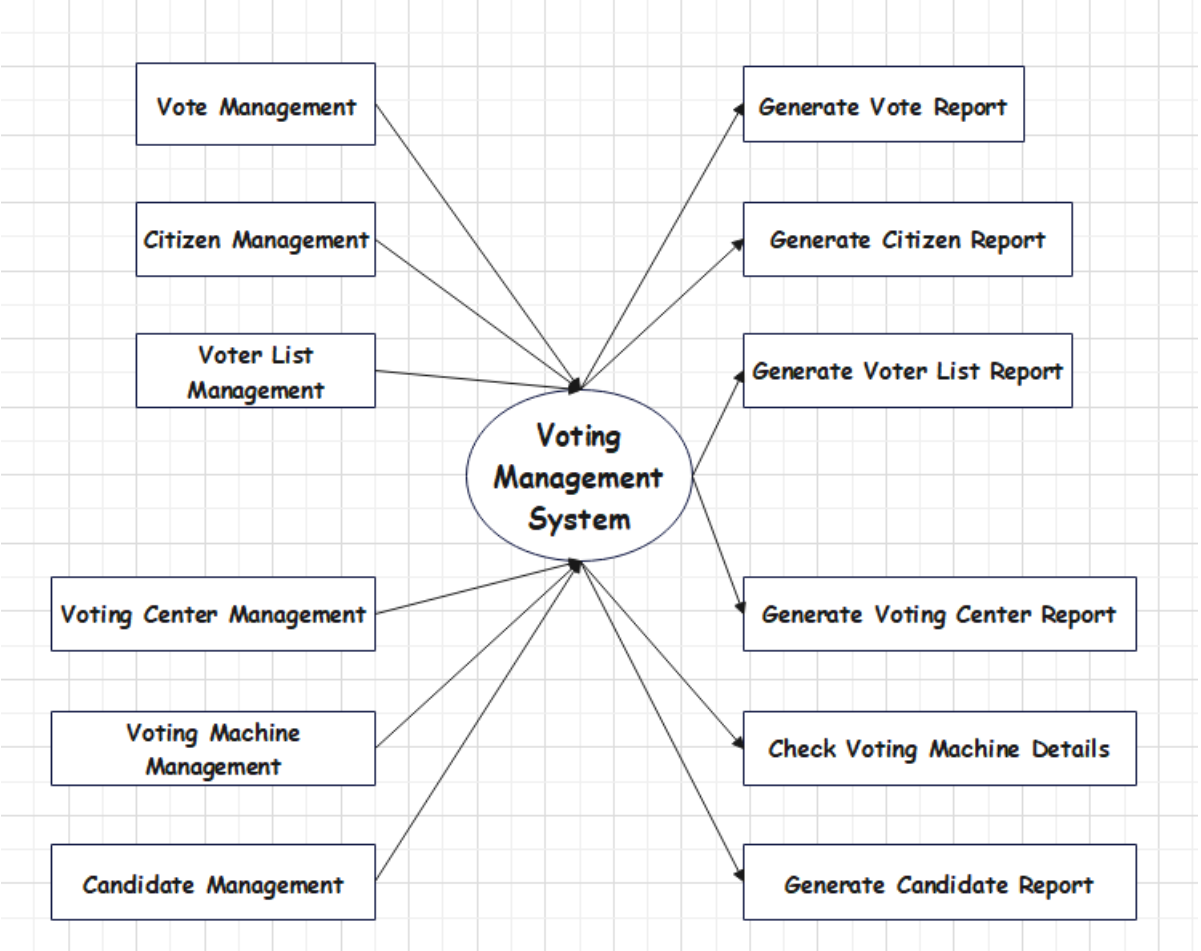


Figure 4.2.2: Data Flow Diagram LEVEL 1 of Online Voting System

4.2.3 Second level DFD of Admin:

Level 2 DFD for Online Voting System is also the highest abstraction of the data flow diagram. This level also broadens the idea from the DFD level 1. It includes the sub- processes from level 1 as well as the data that flows.

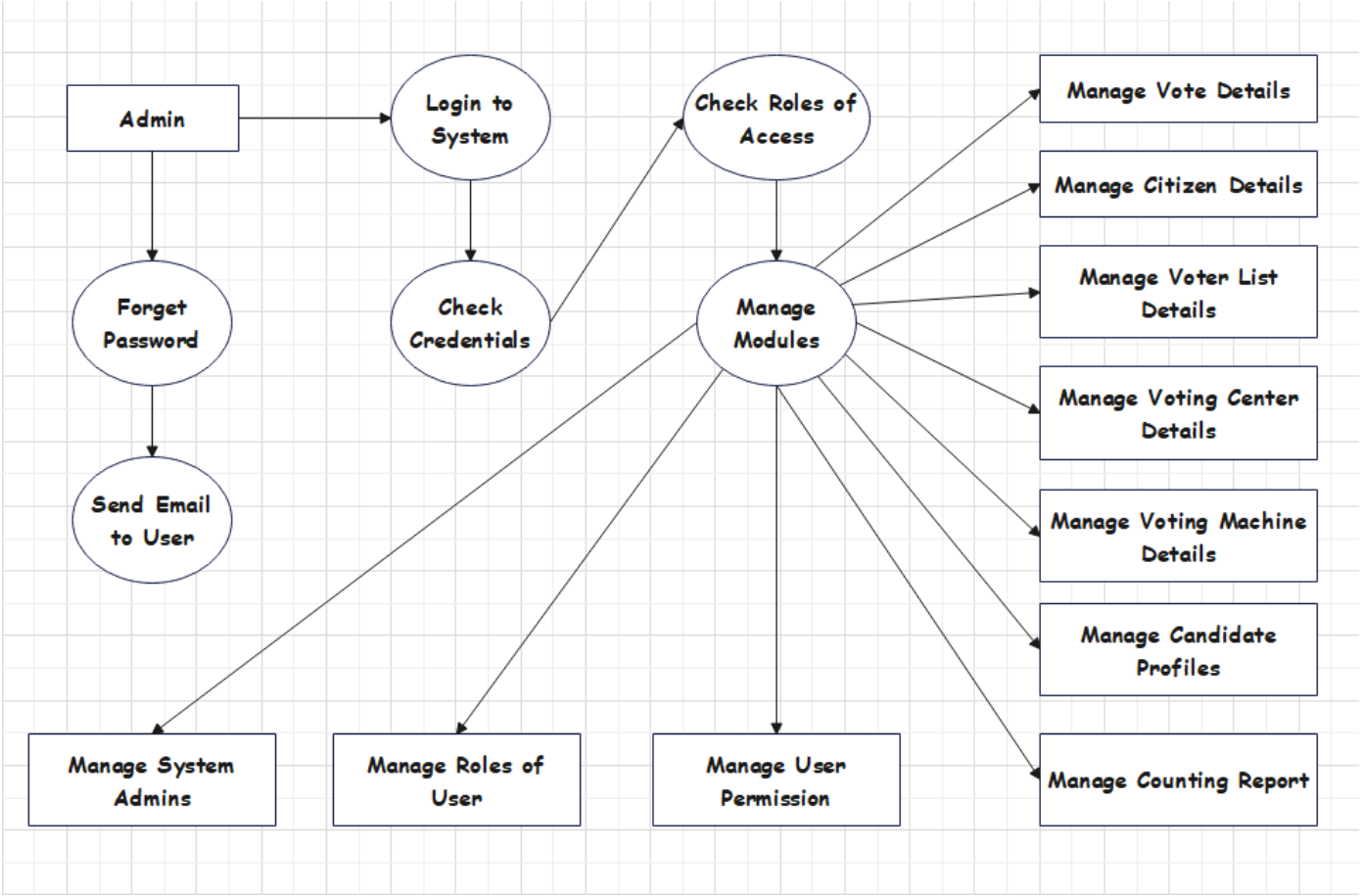


Figure 4.2.3: Data Flow Diagram LEVEL 2 of Online Voting System

4.3 Activity Diagram:-

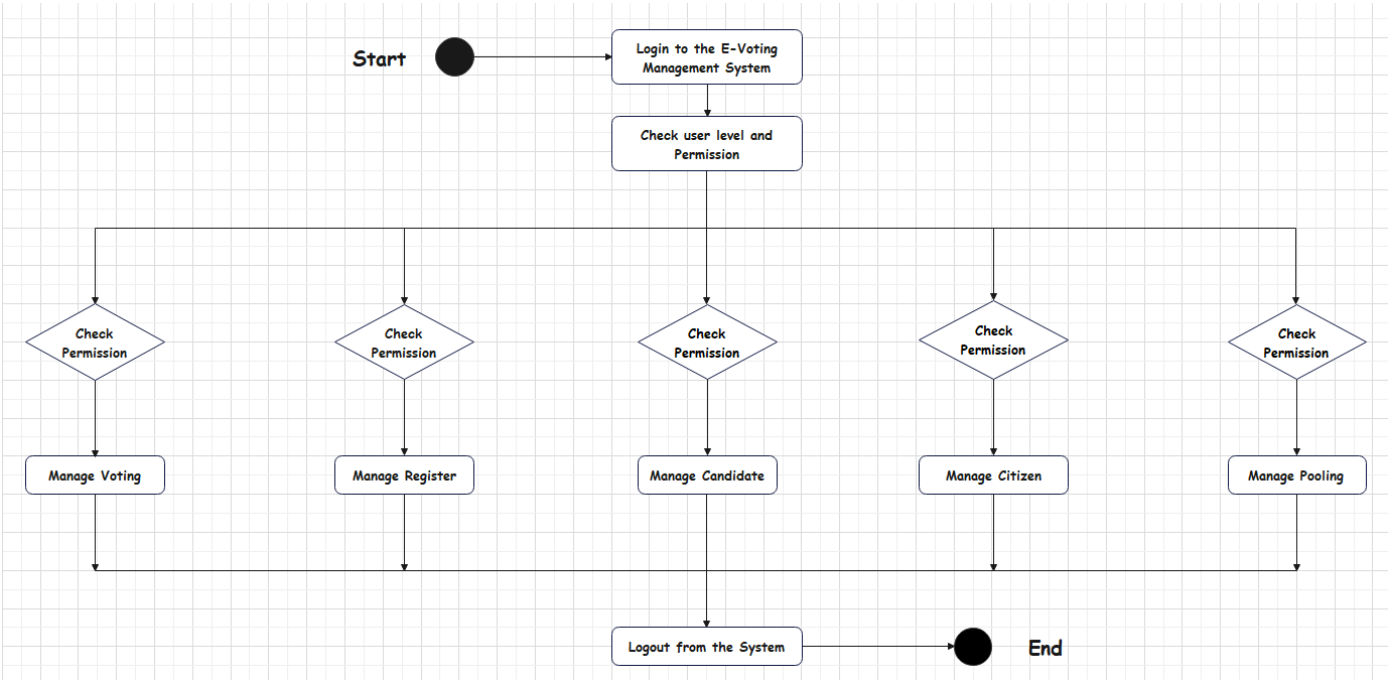


Figure 4.3.1: Activity diagram of Online voting system

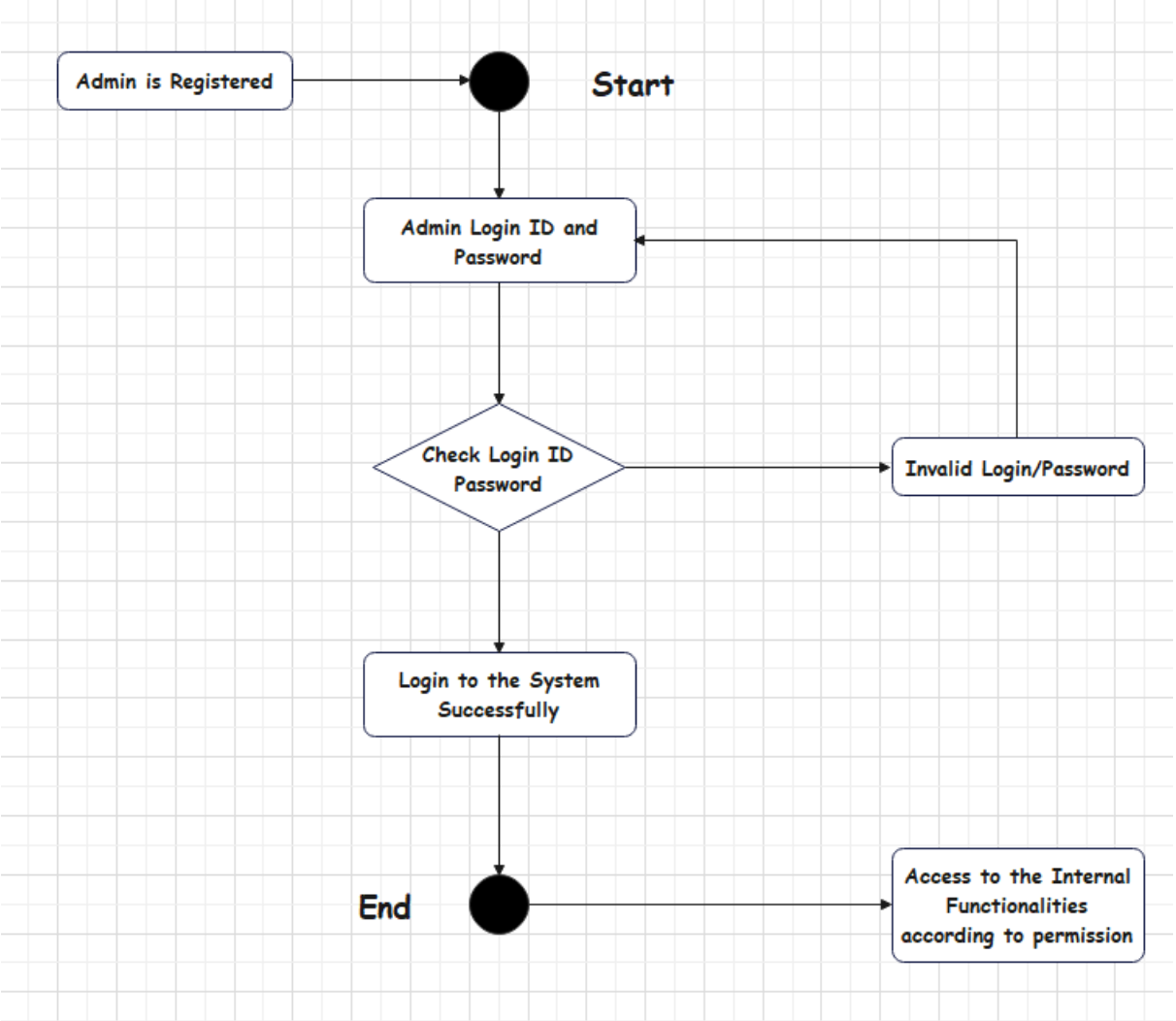


Figure 4.3.2: Activity diagram of Online voting system

4.4 Class Diagram:-

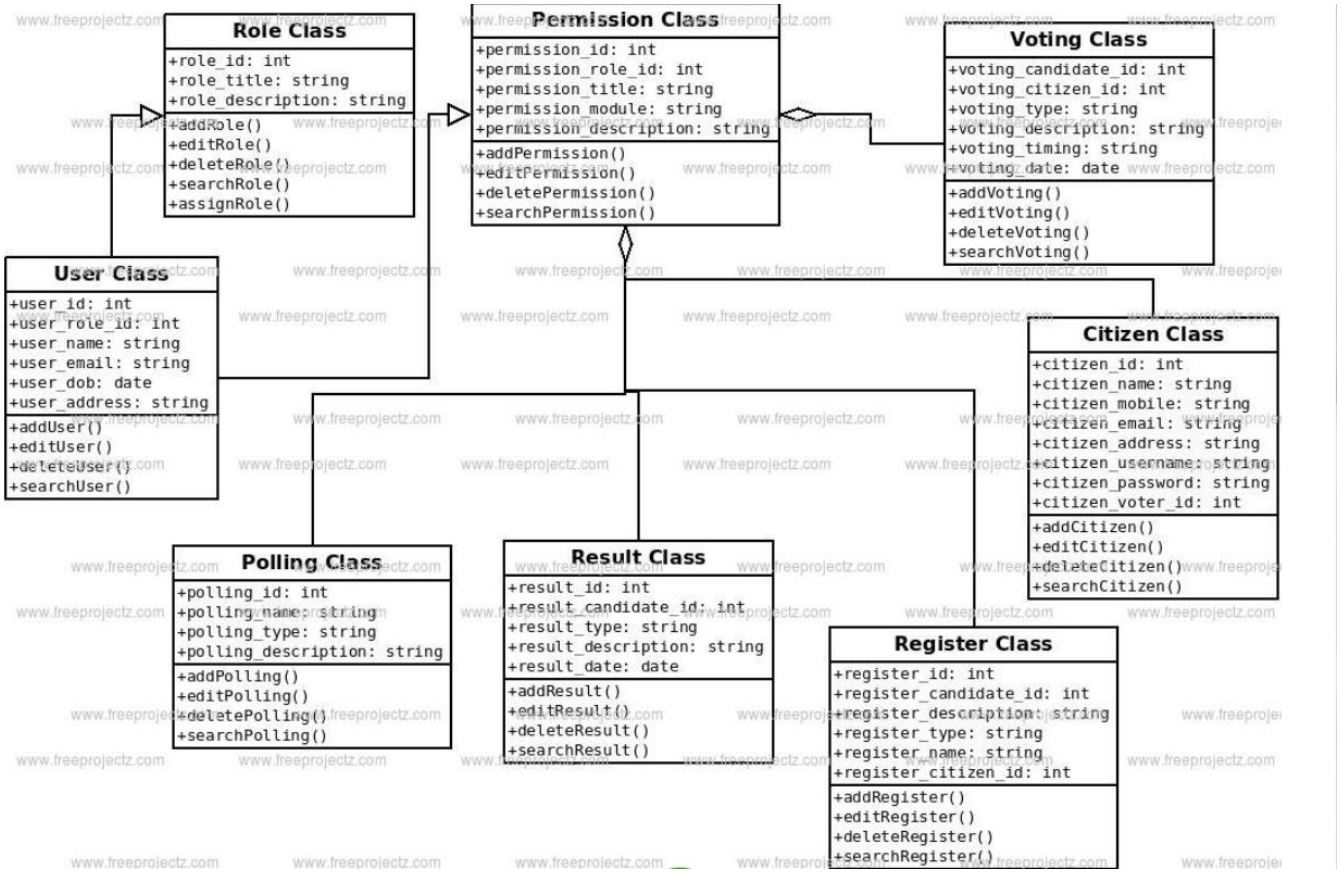


Figure 4.4: Class diagram of Online Voting System

4.5 Use Case Diagram:-

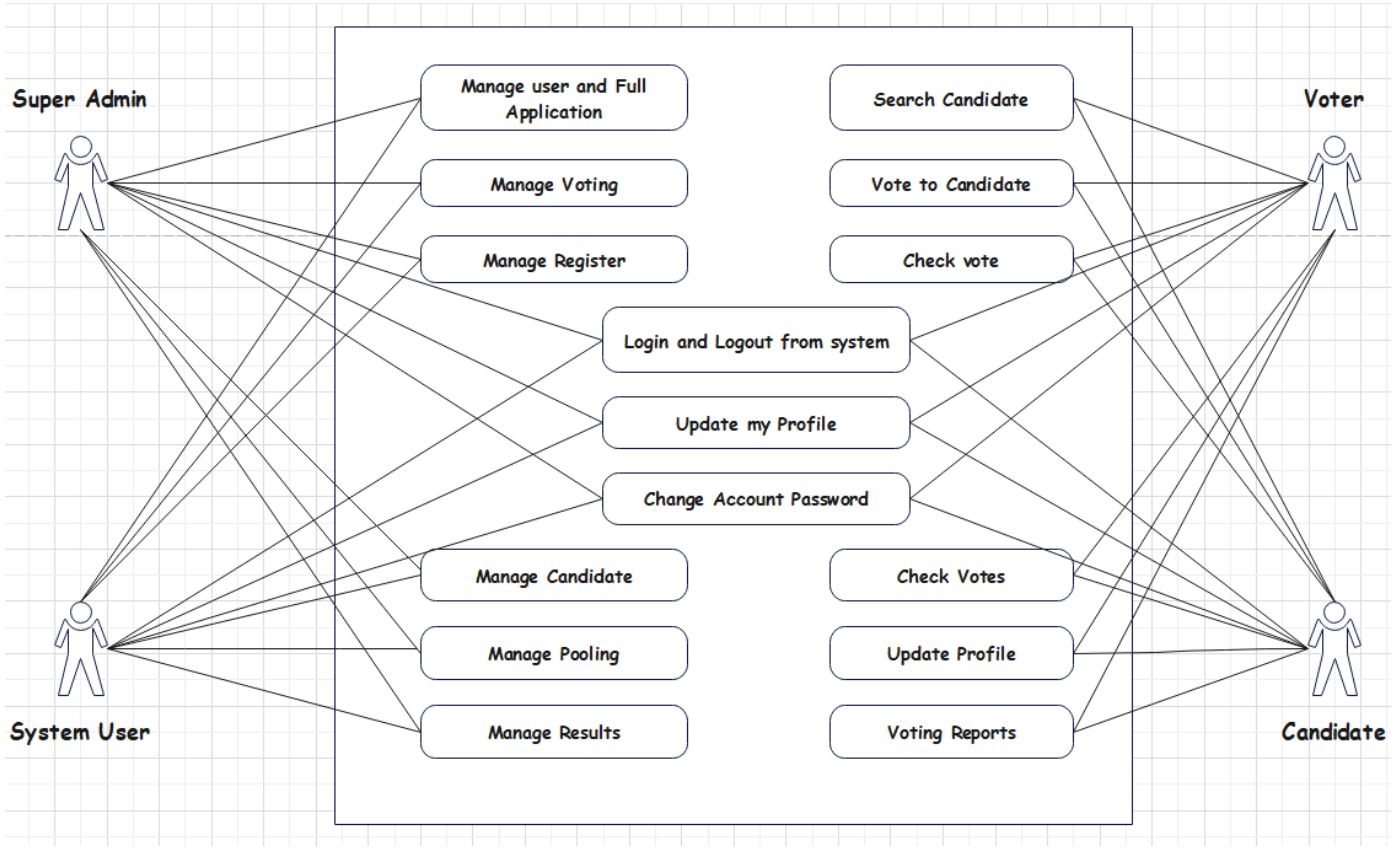


Figure 4.5: Use Case diagram of Online Voting System

4.6 Sequence Diagram:-

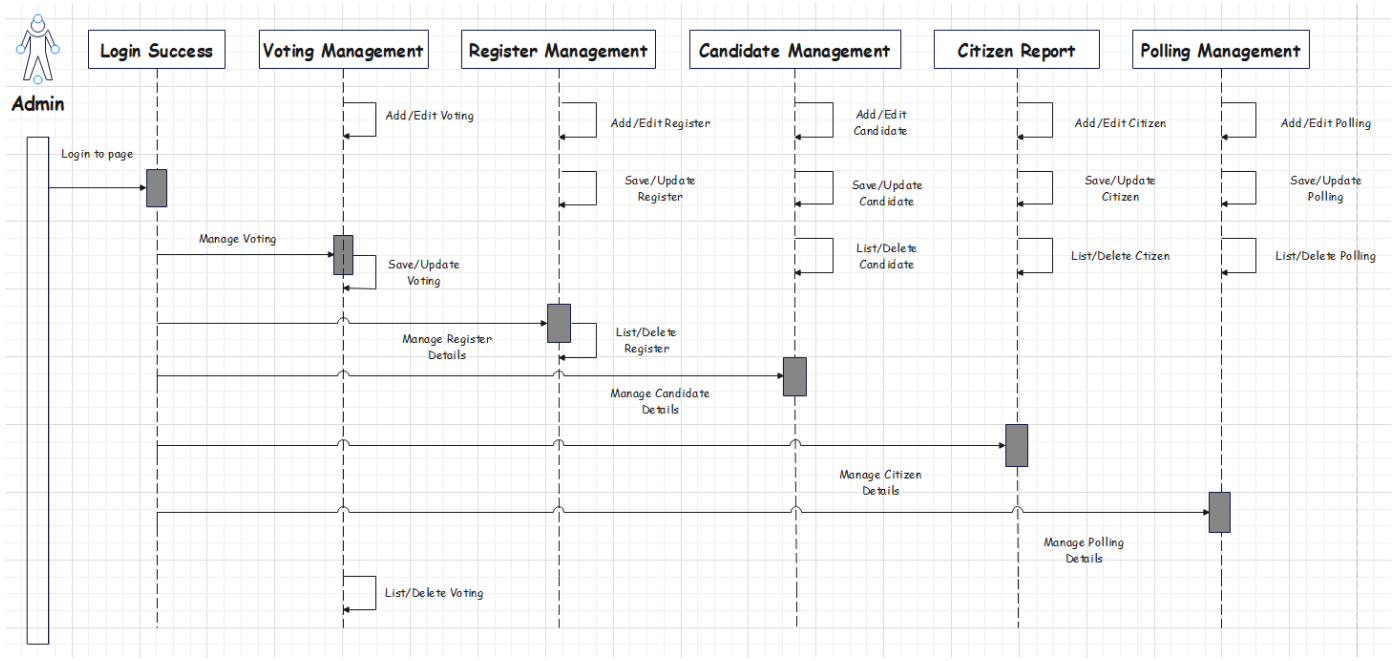


Figure 4.6: Sequence diagram of Online Voting System

5. DATA DICTIONARY :-

5.1 INTRODUCTION:

Data Dictionary is a store of information about the data in database. The dictionary defines the name, description, source of data, users of data, and keywords in data, formula to derive the data, specification and such other details. Data dictionary brings common understanding of the data in the organization. RDBMS provides software to create the dictionary. Use of data dictionary enforces the standards of processing, usage's application and documentation in the organization.

Data Dictionaries are an integral component of structured analysis, since data flow diagram by them do not fully describe the information about the system. The data dictionary provides additional information about the system.

A data dictionary is a catalogue a repository of the elements in a system. These elements centre on data the way they are structured to meet user requirements and organization needs. In a data dictionary, a list of all the elements composing the data flowing through a system is included. If a project team member wants to know the definition of a data item name or the contents of a particular data flow, the information will be available in the data dictionary.

Descriptions of all data used in the system are given in a data dictionary.

Analysts use Data Dictionary for five important reasons:

- To manage the detail in large systems.
- To communicate a common meaning for all system elements.
- To document the features of the system.

To facilitate analysis of the details in order to evaluate characteristics and determine where system changes should be made to locate errors and omissionsin the system.

5.2 DATABASE Design:-

1) TABLE NAME : USER

FIELD	TYPE	NULL	KEY	DEFAULT
User_id	Int(255)	NO	PRIMARY	NULL
Name	Varchar(255)	NO		NULL
Email	Varchar(255)	NO		NULL
Password	Varchar(255)	NO		NULL

Table-5.2.2.1 User Login

FIELD	TYPE	NULL	KEY	DEFAULT
User_id	Int(255)	NO	PRIMARY	NULL
Name	Varchar(255)	NO		NULL
Email	Varchar(255)	NO		NULL
Password	Varchar(255)	NO		NULL
Confirm_Password	Varchar(255)	NO		NULL

Table-5.2.2.1 User Signup

2) TABLE NAME : ADMIN

FIELD	TYPE	NULL	KEY	DEFAULT
Admin_id	int(255)	NO	PRIMARY	NULL
Name	Varchar(255)	NO		NULL
Email	Varchar(255)	NO		NULL
Password	Varchar(255)	NO		NULL

Table-5.2.2.2 Admin Login

FIELD	TYPE	NULL	KEY	DEFAULT
Admin_id	int(255)	NO	PRIMARY	NULL
Name	Varchar(255)	NO		NULL
Email	Varchar(255)	NO		NULL
Password	Varchar(255)	NO		NULL
Confirm_Password	Varchar(255)	No		NULL

Table-5.2.2.2 Admin Signup

6. Future Enhancement:-

As technology advances and user needs evolve, there are several potential future enhancements that could be considered for an Online Voting System project. Here are some future enhancement ideas:

Biometric Authentication: Introducing biometric authentication, such as fingerprint or facial recognition, can further enhance the security of user logins and ensure that voters are uniquely identified, reducing the risk of identity fraud.

Voter Education and Verification: Implementing voter education modules within the system can help inform voters about candidates, their policies, and election procedures. Additionally, integrating a voter verification mechanism to validate voter eligibility can enhance the accuracy and legitimacy of the votes.

Accessibility Features: Adding accessibility features, such as support for screen readers and assistive technologies, can make the online voting system more inclusive and accessible to voters with disabilities.

Real-time Voting Analytics: Providing real-time voting analytics and visualizations can offer valuable insights to election officials, candidates, and voters, helping them understand the voting trends and results.

Multi-language Support: Incorporating multi-language support can cater to diverse voter populations and encourage participation from individuals who prefer using their native languages.

Secure Remote Voting: Exploring methods for secure remote voting, such as using cryptographic protocols, can enable voters who are unable to physically visit polling stations to cast their votes securely.

Dispute Resolution Mechanism: Introducing a dispute resolution mechanism to handle complaints and address any issues that may arise during or after the election can ensure a fair and transparent election process.

Advanced Data Protection: Strengthening data protection measures, such as encryption and data anonymization, to safeguard user data and voting information from potential cyber threats.

Integration with National IDs: Integrating the system with national identification databases can streamline voter registration and authentication, reducing the chances of duplicate voting

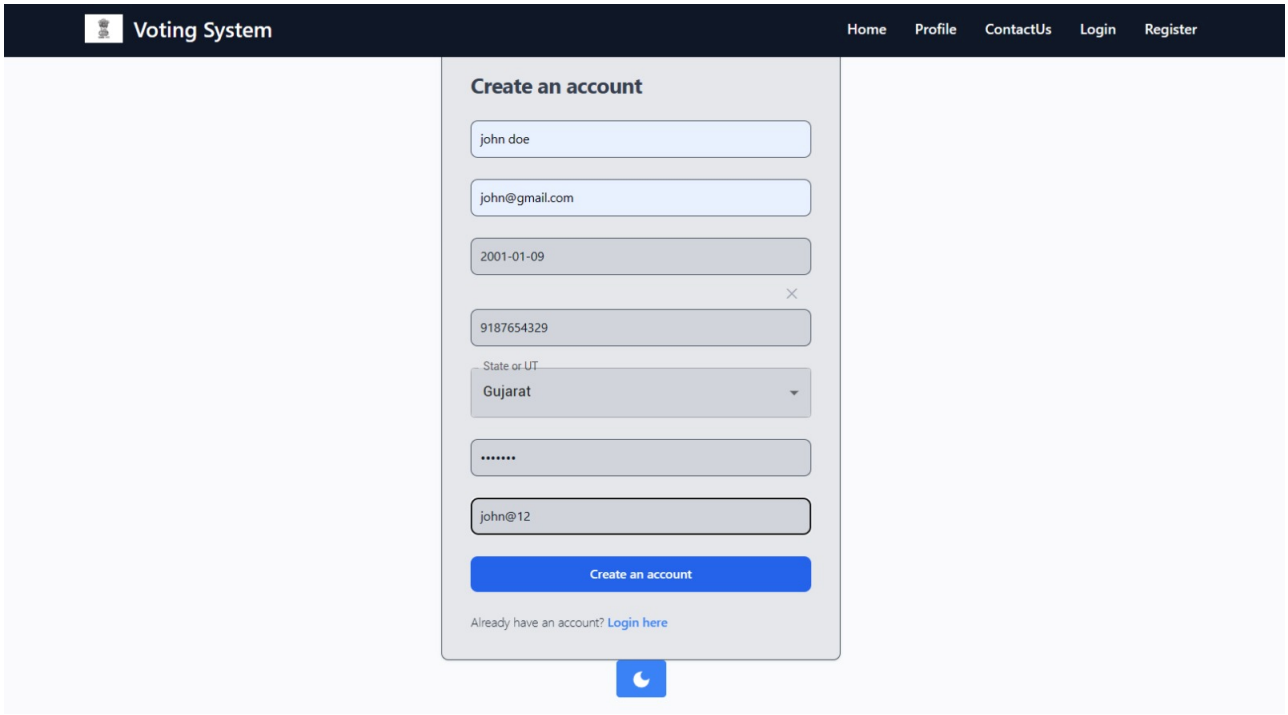
and ensuring accurate voter information.

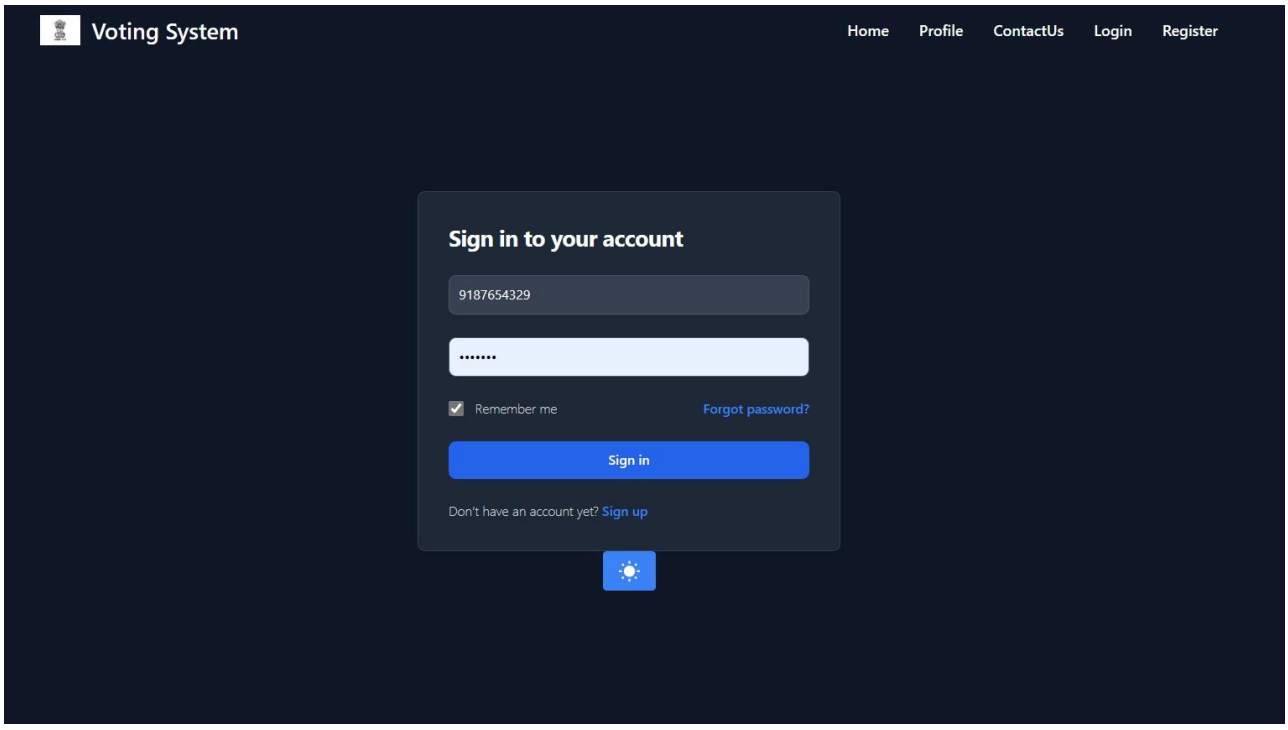
Two-factor Authentication (2FA): Adding two-factor authentication as an extra layer of security during the login process can reduce the risk of unauthorized access.
User Feedback and Ratings: Implementing a user feedback and rating system can collect user opinions about the system's usability and overall experience, helping to identify areas for improvement.

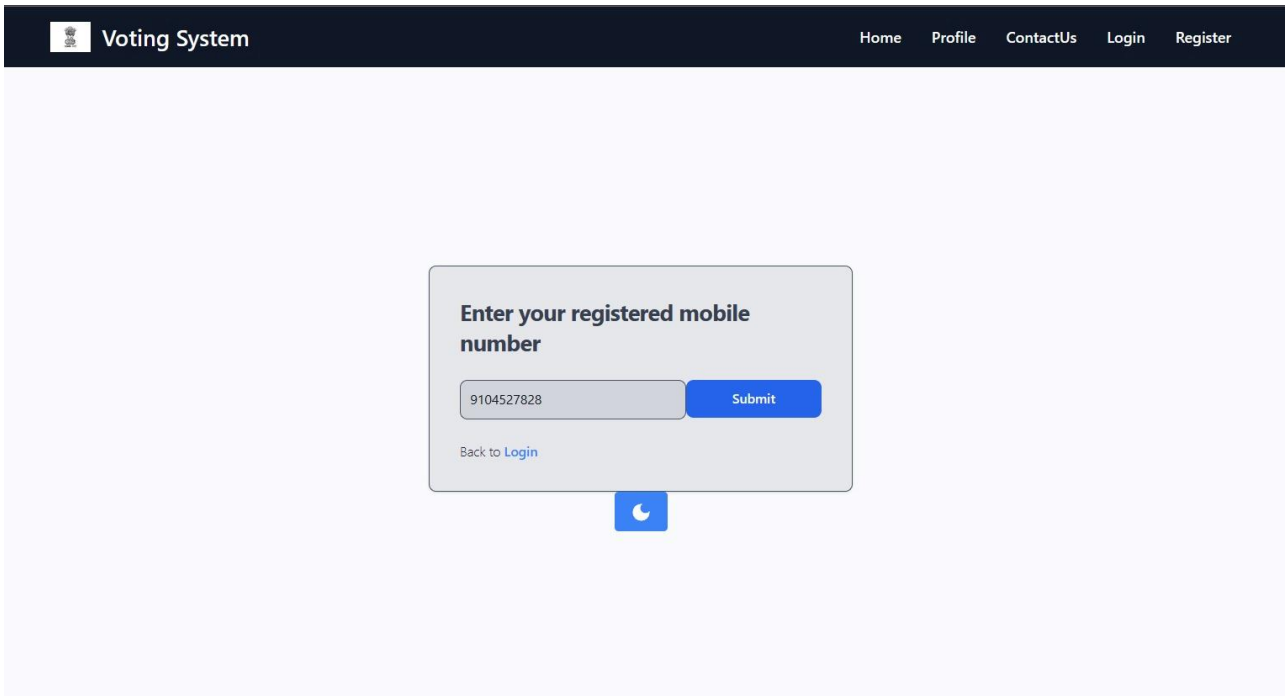
Legal and Regulatory Compliance: Ensuring compliance with relevant laws and regulations related to online voting, privacy, and security is critical for maintaining trust and legality.

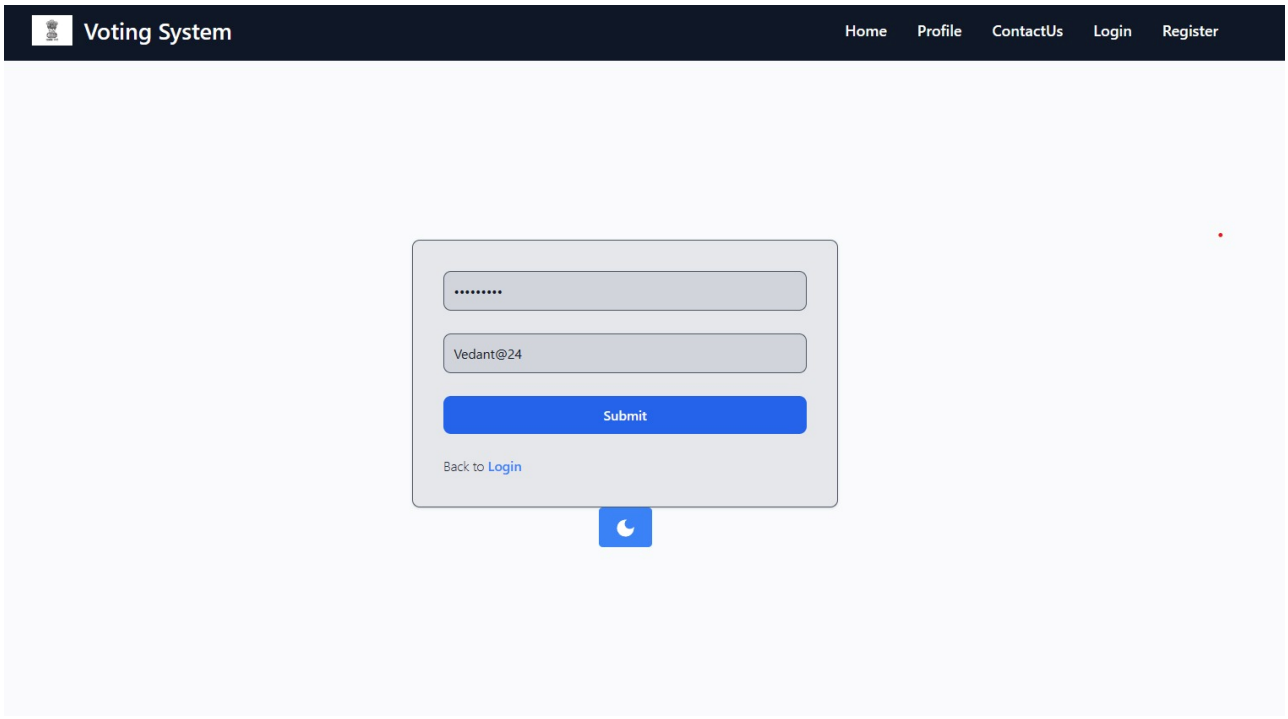
7. Result, Discussion and Conclusion:-

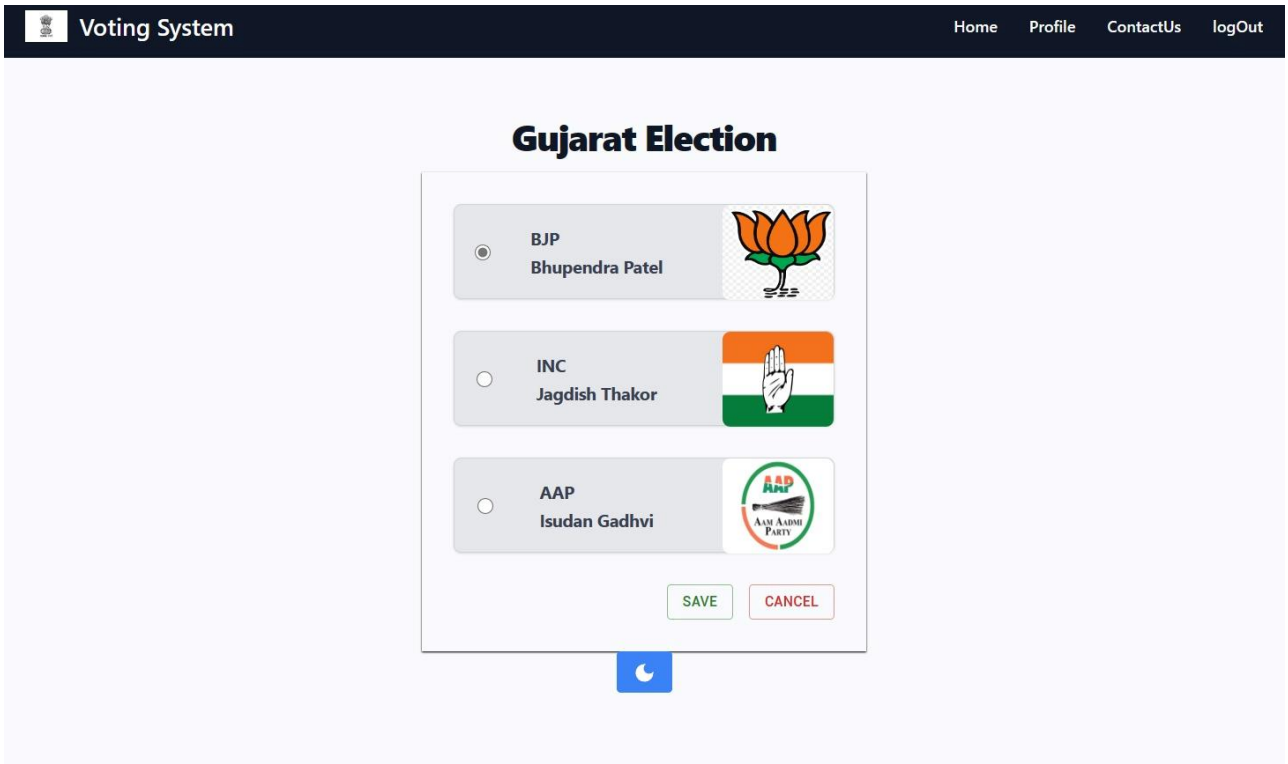
7.1 Result:

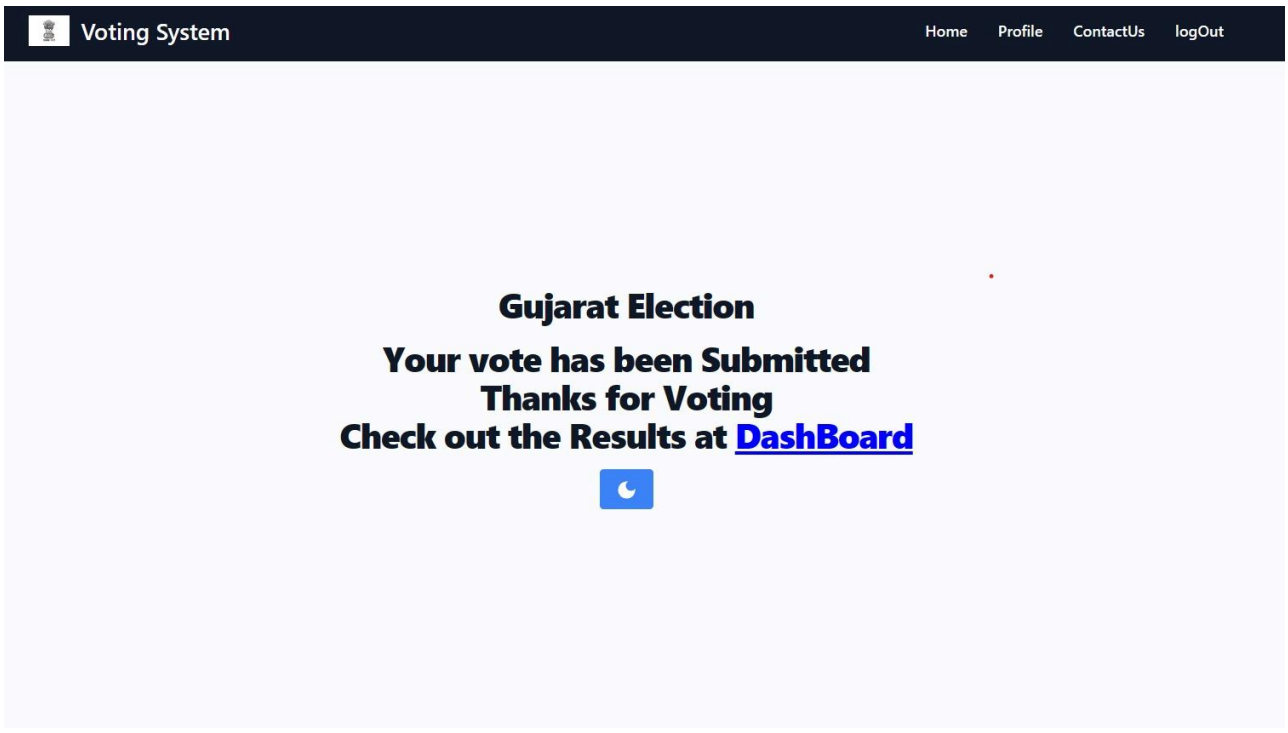





Voting System
Home
Profile
ContactUs
Login
Register
Enter your registered mobile number
9104527828
Submit
Back to Login


Voting System
Home
Profile
ContactUs
Login
Register
Vedant@24
Submit
Back to Login


Voting System
Home
Profile
ContactUs
logOut
Gujarat Election
BJP
Bhupendra Patel
INC
Jagdish Thakor
AAP
Isudan Gadhvi
SAVE
CANCEL


Voting System
Home
Profile
ContactUs
logOut
Gujarat Election
Your vote has been Submitted
Thanks for Voting
Check out the Results at DashBoard

7.2 Discussion:

- Here first user needs to new signup, after Signup User needs to Loginthe Credentials.
- If the Credentials are correct as per Signed Up then user will navigateto Online voting system portal and can access the it.
- In Online Voting System website user can vote for any party they want.
- They will able to vote only once on single Aadhar Card.
- After voting the slip will be generated in which details of user will be returned along with voted party name.

7.3 Conclusion:

The System was designed in such a way that future modifications can be done easily. The following conclusions can be deduced from the development of the project.

- Automation of the entire system improves the efficiency
- It provides a friendly graphical user interface which proves to be better whencompared to the other system.
- It gives appropriate access to the authorized users depending on their permissions.
- It effectively overcomes the delay in communications.
- Updating of information becomes so easier.
- System security, data security and reliability are the striking features.
- The System has adequate scope for modification in future if it is necessary.

8. References:-

Websites Referred:

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