CRWin

Submitted in partial fulfillment of the requirements of the degree of

BACHELOR OF COMPUTER ENGINEERING

by

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CERTIFICATE

This is to certify that the Mini Project 2B entitled " **CRWin**" is a bonafide work of **"Vihang Patil (20102020), Sidddeesh Patil (20102130), Pratik Pawade (20102014), Kshitij Waikar (20102096)"** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Computer Engineering.**

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Project Report Approval for Mini Project-2B

This project report entitled **"CRWin"** by *Vihang Patil (20102020), Siddhesh Sawant (20102130), Pratik Pawde (20102014), Kshitij Waikar (20102096)* is approved for the partial fulfillment of the degree of *Bachelor of Engineering* in *Computer Engineering*, *2022-23*.

Examiner Name   Signature

1._____   _____

2._____   _____

Date:

Place:

Declaration

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

The college class representative election voting and prediction system is a software project designed to streamline the election process in colleges. The aim of the system is to provide an efficient and reliable way of conducting elections and predicting the results based on the data collected during the voting process.

The system consists of two main components, the voting module, and the prediction module. The voting module allows students to cast their votes securely and anonymously. The prediction module uses machine learning algorithms to analyze the voting data and predict the winners of the election.

The project's significance lies in its ability to reduce the time and effort required to conduct elections, eliminate manual errors, and provide accurate predictions based on data analysis. It will help in making the election process transparent and fair, thus promoting democracy in educational institutions.

Keywords: Election process,Voting module,Prediction module,Machine learning algorithms

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Chapter 1

Introduction

College class representative elections are an essential part of democratic processes in educational institutions. The election process helps students to elect their representatives who will represent their interests and voices in various student-led organizations and decision-making bodies. However, the traditional election process is often time-consuming and prone to manual errors, and may lead to inaccurate results. This is where technology can play a crucial role in streamlining the election process and ensuring fair and transparent results.

In this report, we present the college class representative election voting and prediction system, a software project designed to address the challenges of traditional election processes. The system aims to provide an efficient and reliable way of conducting elections and predicting the results based on the data collected during the voting process.

The project's objective is to build a user-friendly and secure system that enables students to cast their votes securely. The system uses modern technologies and frameworks to provide a robust and scalable solution suitable for use in colleges of varying sizes and requirements. Additionally, the system's prediction module uses machine learning algorithms to analyze the voting data and predict the winners of the election accurately.

The report will provide a detailed description of the system's features, architecture, and design. Additionally, the report will present the results of the testing conducted to validate the system's effectiveness in conducting elections and predicting the results.

Overall, the use of prediction voting apps in class representative elections can improve the student governance process and enhance the participation of students in the democratic process. This report aims to explore the benefits and limitations of prediction voting apps in class representative elections, including the features and functionalities that such apps may provide.

Furthermore, this report will investigate the feasibility of implementing such an app and the potential implications for educational institutions.

The college class representative election voting and prediction system has several features, including a user-friendly interface, secure authentication, and transparent results. The system's architecture is designed to ensure that it is scalable, reliable, and easy to maintain. The system's design incorporates modern technologies such as cloud computing, data encryption, and machine learning algorithms to provide a robust and efficient solution.

The system has two primary components, the voting module, and the prediction module. The voting module allows students to cast their votes securely, while the prediction module uses machine learning algorithms to analyze the voting data and predict the winners of the election accurately. The system's design ensures that the voting data is encrypted and secure, and the results are transparent and easily accessible to all stakeholders.

The college class representative election voting and prediction system has been tested extensively to validate its effectiveness in conducting elections and predicting the results. The testing was conducted in various college settings, including small and large colleges, to ensure that the system is scalable and suitable for use in different contexts.The testing results showed that the system is efficient, reliable, and user-friendly, making it easy for students to cast their votes securely. The prediction module's accuracy was also tested, and the results showed that the system's machine learning algorithms could predict the election results accurately.

In conclusion, the college class representative election voting and prediction system is an innovative solution that can revolutionize the traditional election process in educational institutions. It is a reliable and efficient tool that promotes fairness, transparency, and democracy in the election process. This report aims to provide insights into the system's design and effectiveness and serves as a valuable resource for educational institutions planning to implement such a system.

Chapter 2

Literature Survey

1. L. PANIZO ALONSO, M. GASCÓ, D. Y. MARCOS del BLANCO, J. Á. Hermida Alonso, J. Barrat and H. Aláiz Moreton, "E-Voting System Evaluation Based on The Council of Europe Recommendations: Helios Voting," in IEEE Transactions on Emerging Topics in Computing, vol. 9, no. 1, pp. 161-173, 1 Jan.-March 2021, doi: 10.1109/TETC.2018.2881891.

This article addresses the challenges hindering the wider adoption of e-voting and evaluates the Helios Voting tool using a framework based on Council of Europe's technical and security requirements. It aims to provide valuable information to improve decision-making processes for secure e-voting expansion.E-voting adoption is slower than expected due to technical, social, and cultural challenges, including the evaluation and harmonization of systems across different legal frameworks. This article evaluates the Helios Voting tool using a practical framework based on Council of Europe's security requirements, providing valuable information for decision-making and supporting secure e-voting expansion.

2.X. Yang, X. Yi, S. Nepal, A. Kelarev and F. Han, "A Secure Verifiable Ranked Choice Online Voting System Based on Homomorphic Encryption," in IEEE Access, vol. 6, pp. 20506-20519, 20 March 2018, doi: 10.1109/ACCESS.2018.2817518.

This paper reviews various e-voting approaches proposed in the literature, including mix-net-based, homomorphic, blind signature-based, blockchain-based, post-quantum, and hybrid e-voting. It compares the structures, advantages, and disadvantages of these approaches, summarizes their security properties, and discusses practical considerations in their design. Potential research directions are suggested based on observations of the distinctive features and weaknesses of each approach.

Research Paper	ANALYSIS
1. L. PANIZO ALONSO, M. GASCÓ, D. Y. MARCOS del BLANCO, J. Á. Hermida Alonso, J. Barrat and H. Aláiz Moreton, "E-Voting System Evaluation Based on The Council of Europe Recommendations: Helios Voting," in IEEE Transactions on Emerging Topics in Computing, vol. 9, no. 1, pp. 161-173, 1 Jan.-March 2021, doi: 10.1109/TETC.2018.2881891.	E-voting technologies and implementation methods are being implemented more slowly than anticipated, There are several technological, sociological, and cultural challenges that limit the effectiveness of e-voting. But the literature hasn't given this topic much consideration.
2.X. Yang, X. Yi, S. Nepal, A. Kelarev and F. Han, "A Secure Verifiable Ranked Choice Online Voting System Based on Homomorphic Encryption," in IEEE Access, vol. 6, pp. 20506-20519, 20 March 2018, doi: 10.1109/ACCESS.2018.2817518.	Advanced security methods are necessary to introduce effective online voting in the whole world. Recent online voting experiences in countries, such as the United States, India, and Brazil, demonstrated that further research is needed to improve security.
3. L. O. Jimenez, A. Morales-Morell and A. Creus,"Hyperdimensional data classified via fusion techniques: projection pursuit, majority voting, neural networks.," in IEEE Transactions on Geoscience and Remote Sensing, vol. 37, no. 3, pp. 1360-1366, May 1999, doi: 10.1109/36.763300.McDonald, P., & Thompson, P. (2013).	Hyperspectral sensors provide a large amount of data. The inherent characteristics of hyperspectral feature space still require the development of information extraction algorithms with a high degree of accuracy. Data fusion techniques can enable one to analyze high-dimensional data that is provided by hyperspectral sensors.
4. S. E. Polykalas, G. N. Prezerakos and A. Konidaris, "An algorithm based on Google Trends' data for future prediction. Case study: German elections," IEEE International Symposium on Signal	The analysis of the high volume of statistics generated by web search engines worldwide on a daily basis, allow researchers to examine the relation between the user's search preferences and future

Research Paper	ANALYSIS
Processing and Information Technology, Athens, Greece, 2013, pp. 000069-000073	facts.The paper investigates whether prediction of election results is possible by analyzing the behavior of potential voters before the date of the elections.

Table 1 Literature survey

Chapter 3

Problem Statement, Objective & Scope

Problem Statement: -

.To develop an online voting system using modern technology and methodologies for the purpose of improving the current College Class Representative (CR) election process. This project aims to create a machine learning model that can predict the winner of the election based on previous year's election data and student population qualities.

The current CR voting system in our college is based on paper ballots, manual counting, and a centralized counting process, which can lead to errors and slow results. To modernize this system, we aim to create an online platform that allows registered voters to cast their votes securely from anywhere with internet access, reducing the potential for errors and increasing accessibility. Furthermore, we plan to develop a machine learning model that can predict the winner of the election based on previous year's election data and the qualities of the student population.

Objective: -

● To make the voting process easier and more convenient for students, by allowing them to cast their ballots from any location with an internet connection.

● To provide Predictions based on data analysis and machine learning algorithms.

● To provide insights into the factors that are most likely to influence the outcome of the CR election.

Scope: -

● The goal of this project is to develop a voting system and a machine learning model to predict the winner of a College Class Representative Election based on characteristics of the students.

● The project will involve collecting and cleaning data, exploring and visualizing the data to gain insights, optimizing the models, training machine learning models, and deploying the final model for prediction.

● The project will also involve creating a user-friendly interface for end-users to interact with the model and view the election predictions. The project timeline is estimated to be 2-3 months.

Chapter 4

Proposed System Architecture

4.1 Proposed System:

Architecture / Block Diagram
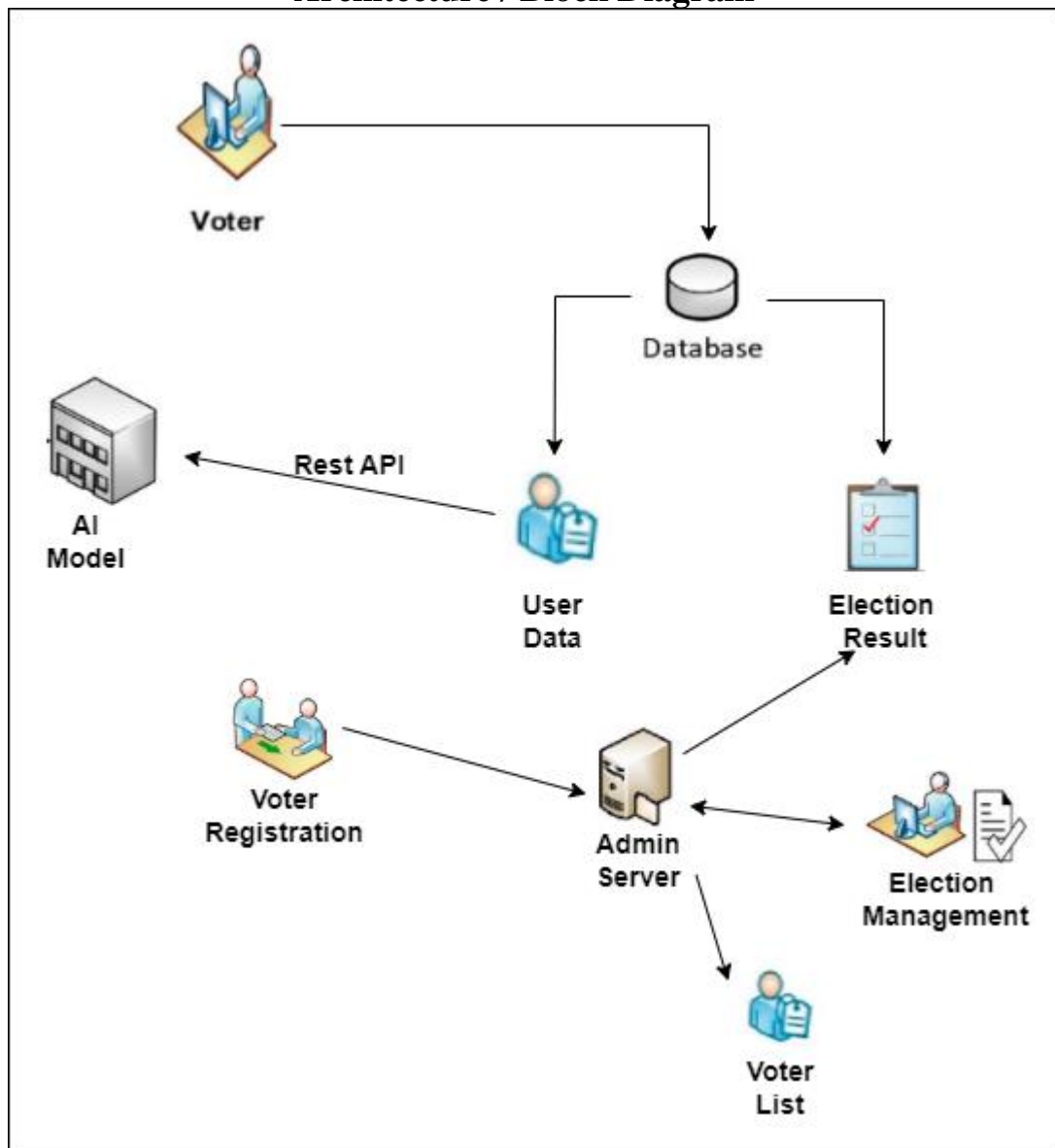
fig 4.1 Architecture Diagram

4.2 Data Flow Diagram (Level 0, Level 1 & Level 2):
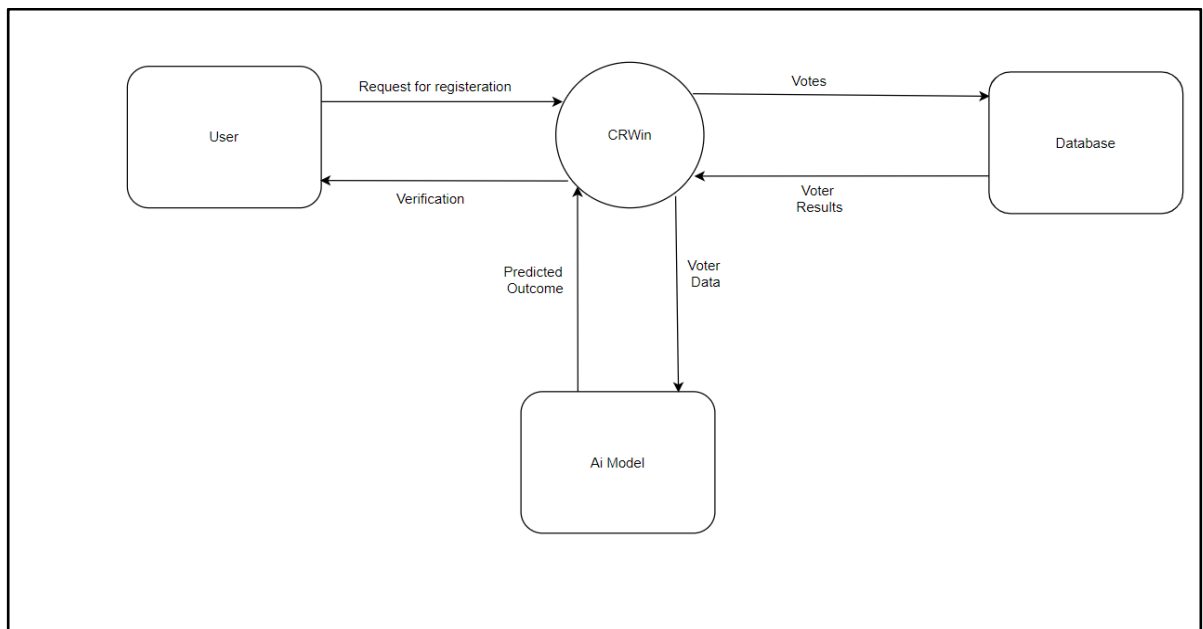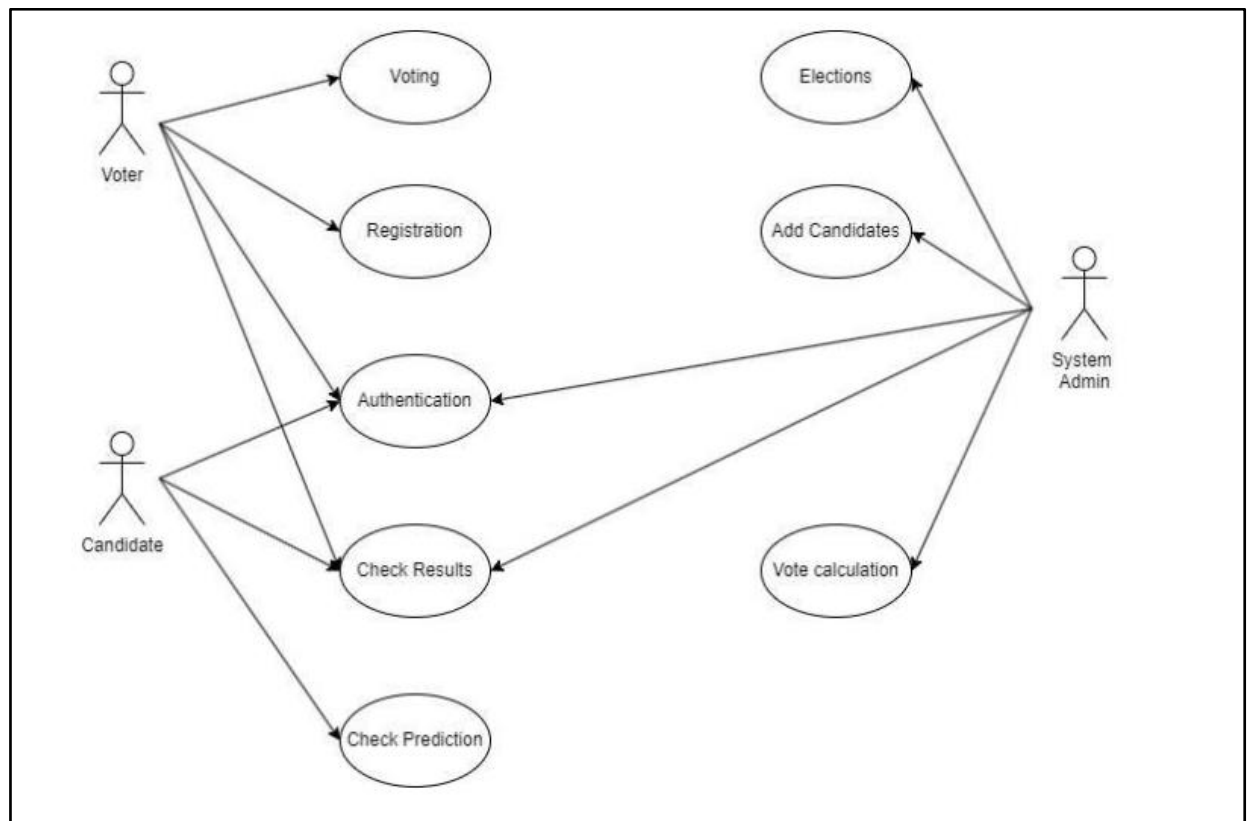

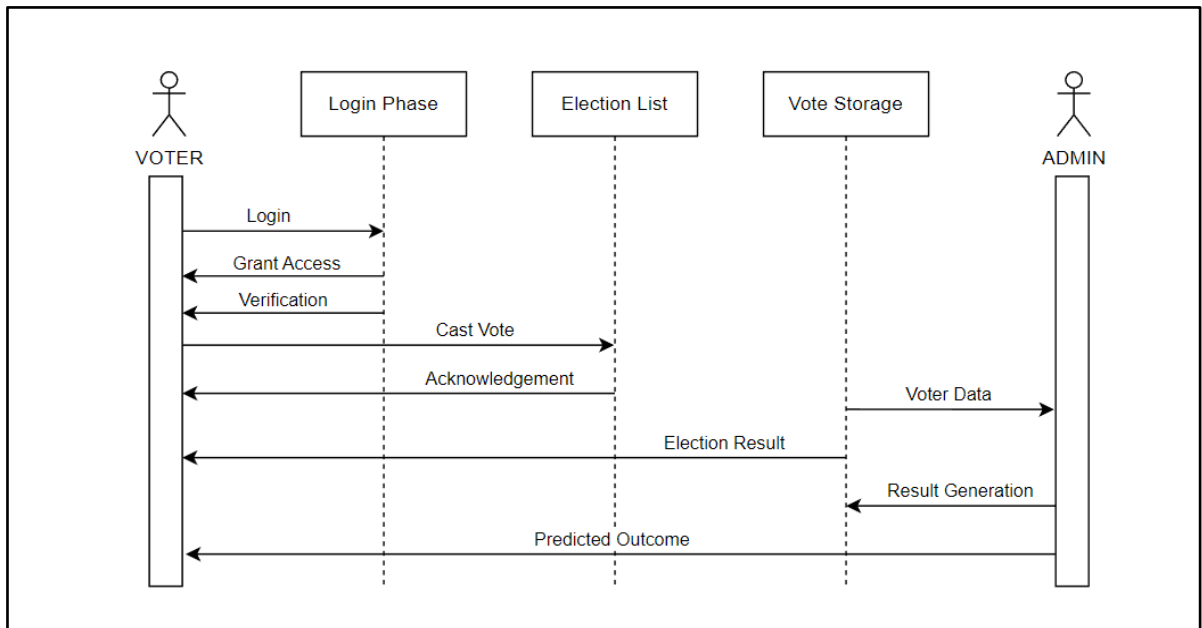*fig 4.2. Level 0 of DFD*
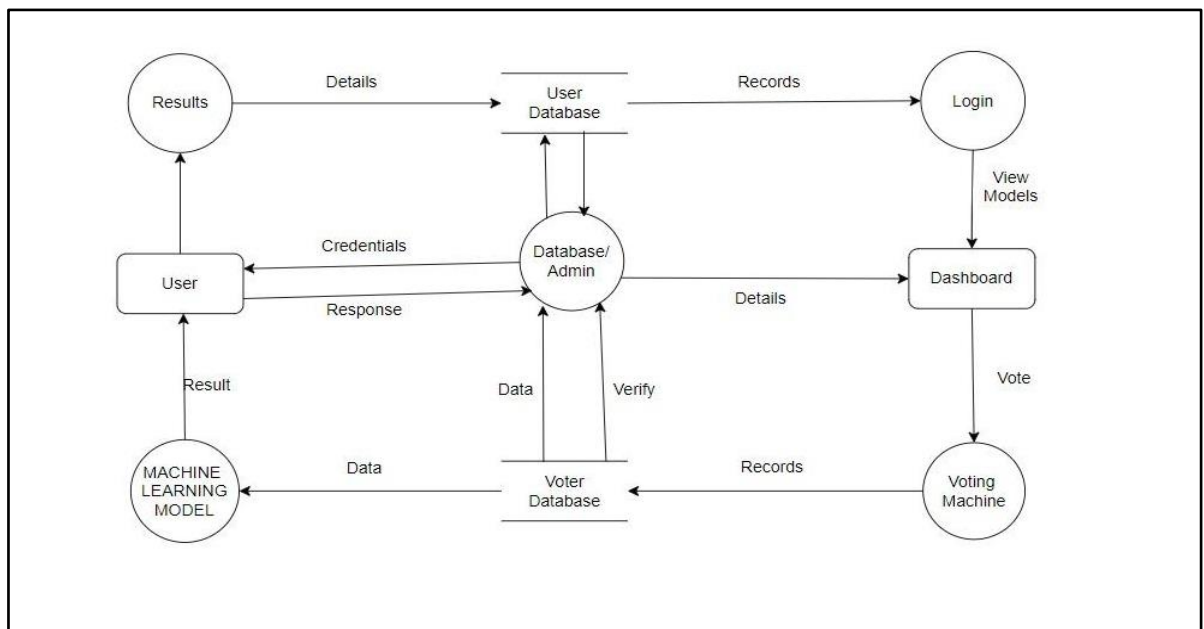
fig 4.3 Level 1 of DFD
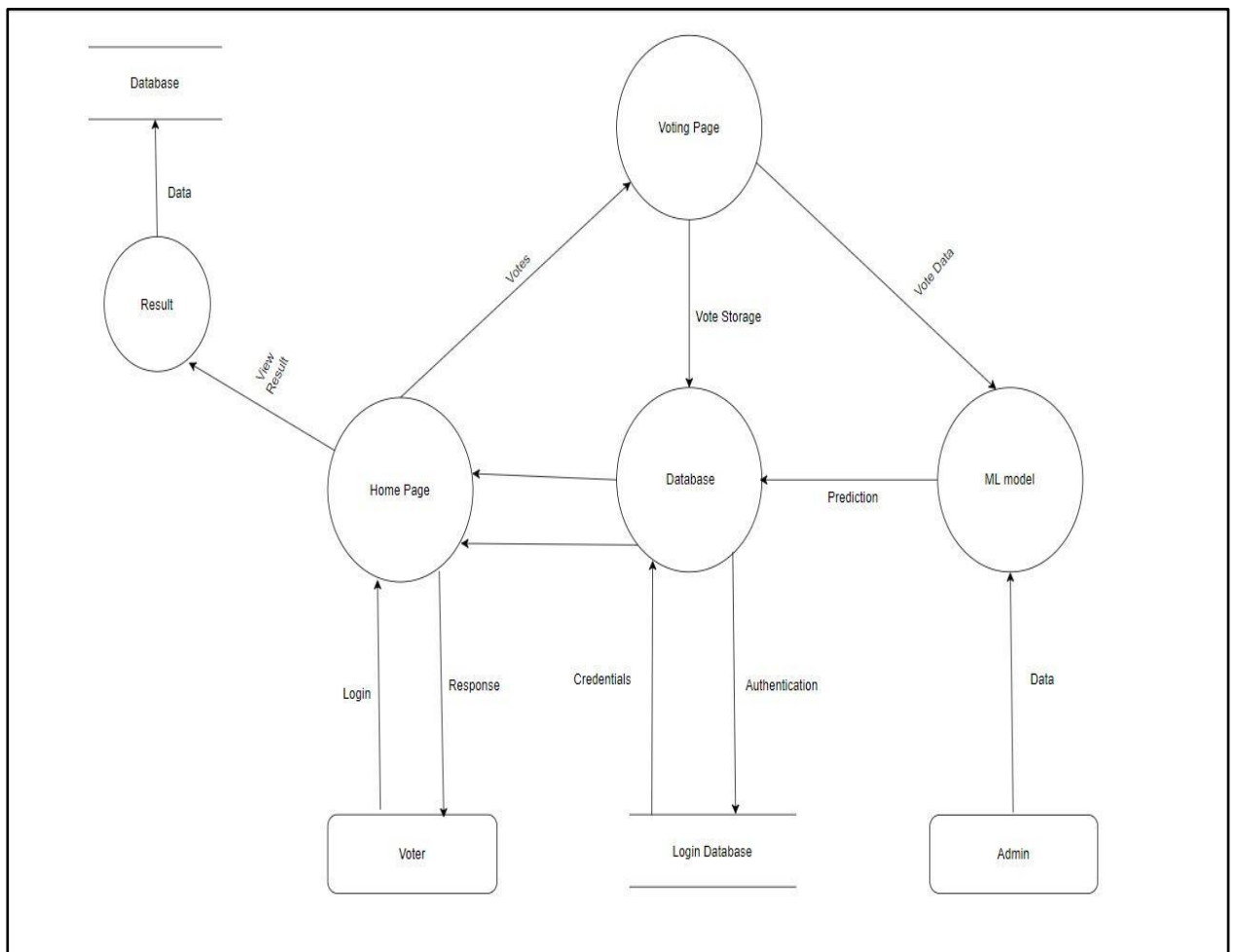
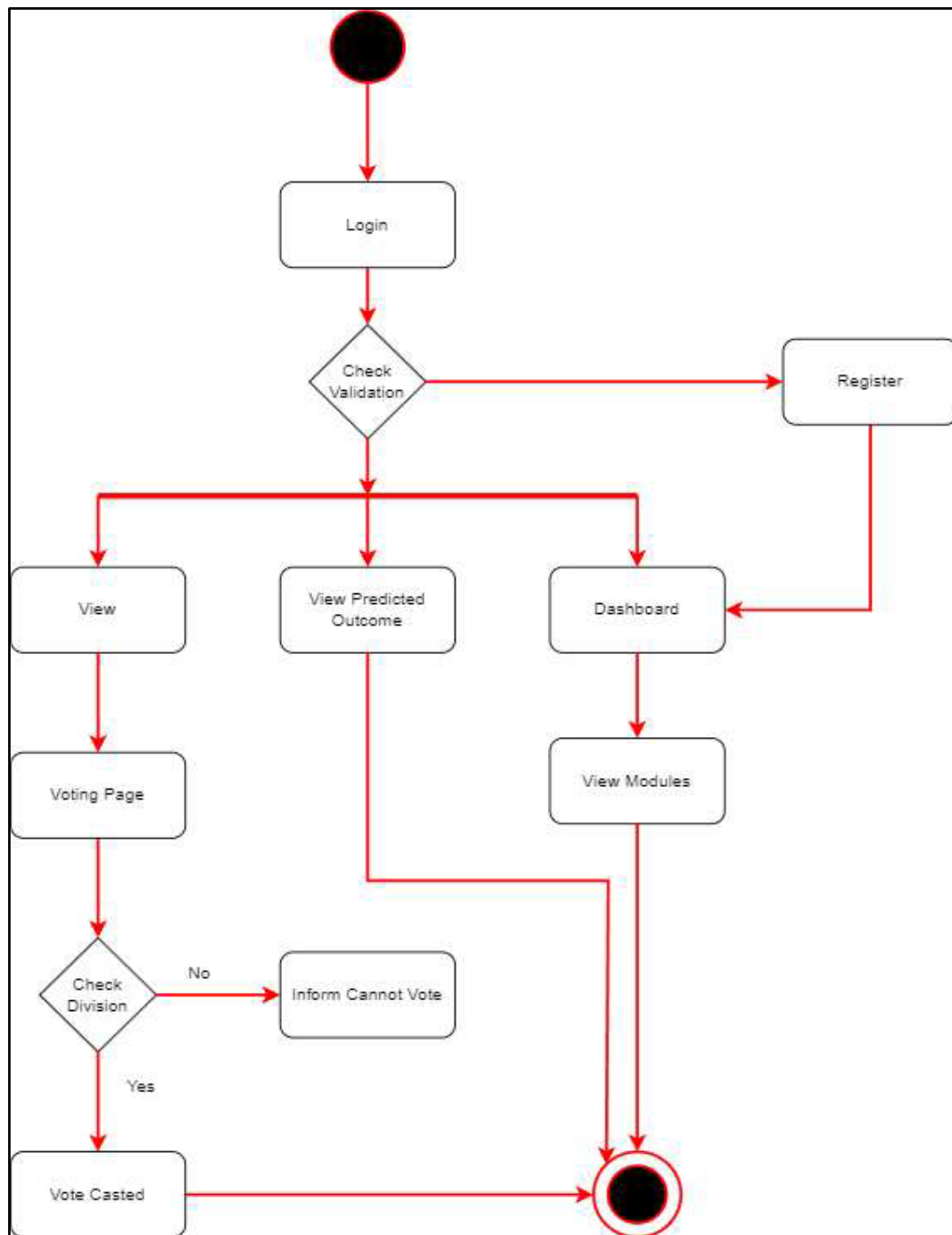*fig 4.4 Level 2 of DFD*

4.3 Use Case Diagram

fig 4.5 Use Case Diagram

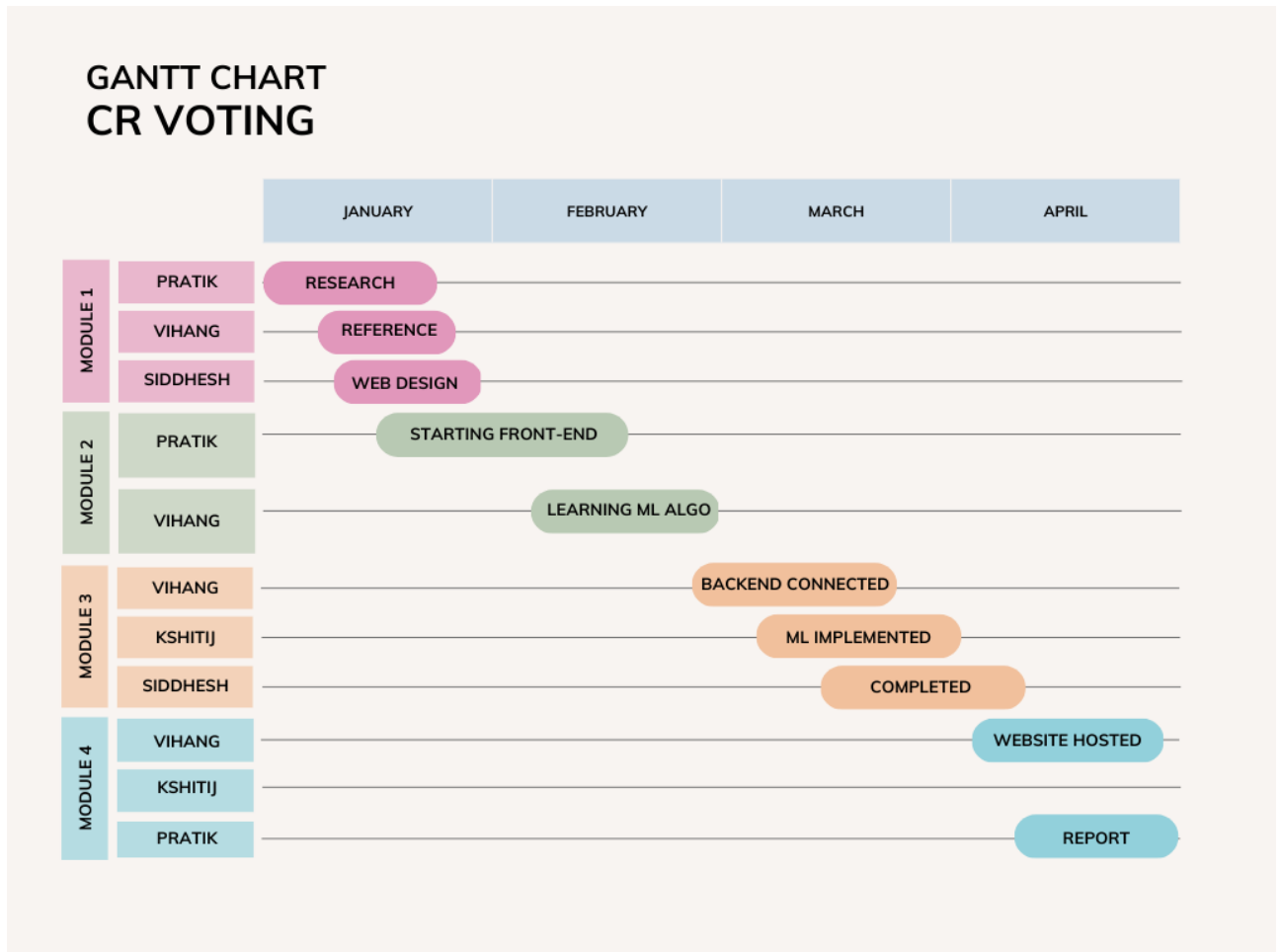## 4.4 Sequence Flow Diagram

fig 4.6 Sequence Flow Diagram

4.5 Activity Diagram:

fig 4.7. Activity Diagram

Chapter 5

Project Planning

fig 5.1. Gantt chart

Chapter 6

Experimental Setup

6.1 Software Requirements: -

Web App:-

1. **CSS Framework**: Pico css

2. **Server-side:** Node.js

3. **Back-end**: Firebase

4. **Front-end**: JavaScript

AI-Model:-
1. **Machine learning library:** Pandas, Scikit-learn

2. **Algorithms:** Logistic Regression, Random Forest

3. **Integration**: Google Cloud Firestore REST API

6.2 Hardware Requirements: -

1. **Processor:** 1.5 GHz dual-core processor or higher

2. **RAM:** 2 GB or higher

3. **Storage:** 2 GB or higher of available storage space

4. **Internet Connection:** A stable and reliable internet connection

Operating System: Windows 10, macOS High Sierra or later, or a modern Linux distribution (Ubuntu, Debian, CentOS)

Chapter 7

Implementation Details

Module 1- Sign Up/Login

Our login/registration page provides a secure and streamlined way for users to access our voting platform. The page includes intuitive and easy-to-use forms that guide users through the process of creating an account or logging in. To ensure the safety of users' personal information and data, our login/registration page utilizes industry-standard security protocols. Overall, our login/registration page is designed to provide a user-friendly and secure experience for users, while also safeguarding their privacy and data.

Module 2 – Predictor AI Module

Our class representative election predictor AI module is a cutting-edge tool that uses machine learning algorithms to analyze historical election data and predict the outcome of upcoming class representative elections. The module takes into account a variety of factors, including candidate profiles, voter demographics, and voting patterns, to generate accurate and reliable predictions. By leveraging the power of AI and machine learning, our class representative election predictor module offers a powerful tool for improving the accuracy and reliability of class representative elections, and for developing data-driven strategies to increase participation and engagement.

Module 3 – Voting

Our voting section provides a user-friendly interface for participants to cast their votes securely and conveniently. The section includes clear instructions and prompts to guide users through the voting process, as well as visual aids to help them make informed decisions. Users can access the voting section from any device with an internet connection and the section is optimized for

compatibility with all major web browsers. To ensure the integrity of the voting process, the section employs robust security measures. Overall, our voting section is designed to provide a seamless and transparent experience for participants, while also safeguarding the accuracy and security of the voting results.

Module 4 –Home Page

The Home page module for a college class representative election voting website would feature a prominent section for casting votes, with clear instructions and options for each candidate. Additionally, the module would include a section for viewing information about the candidates, including their names, pictures, and brief biographies. Overall, this homepage module would provide a user-friendly interface for casting votes, while also offering an innovative feature to make the election more exciting and engaging for students.
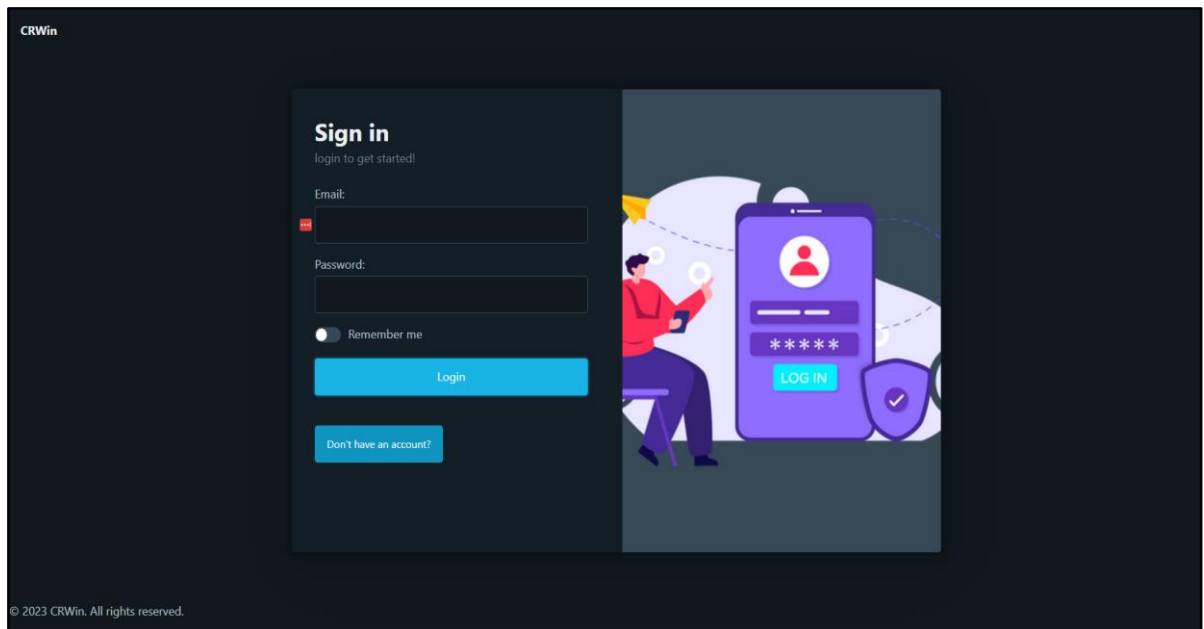
Chapter 8

Result
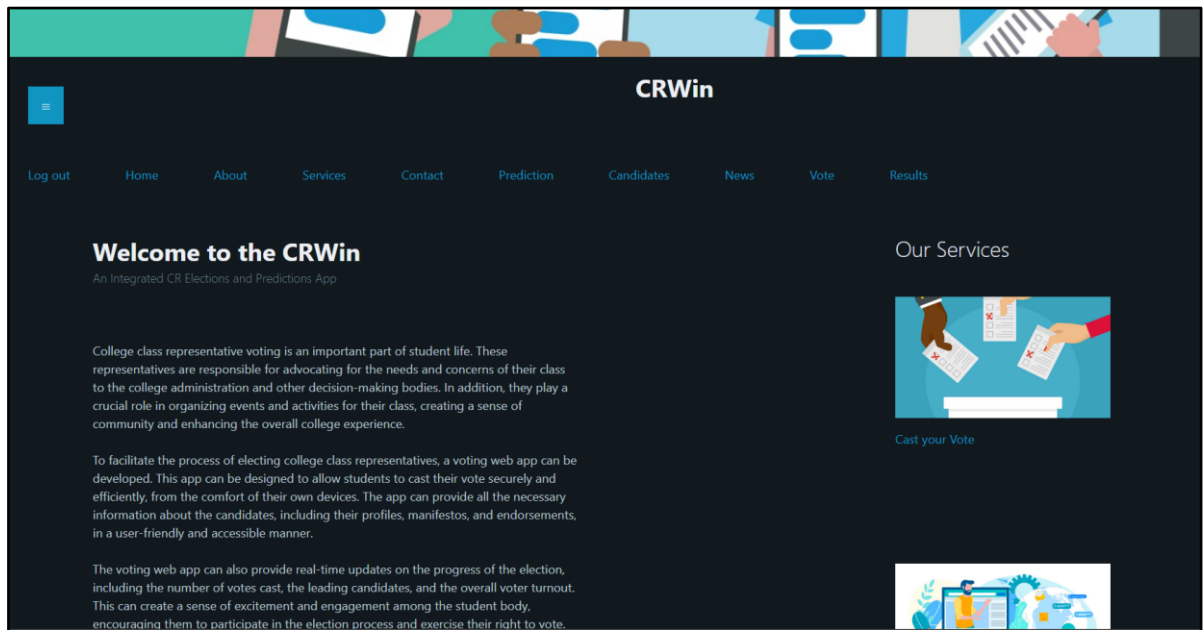
fig 8.1 Homepage
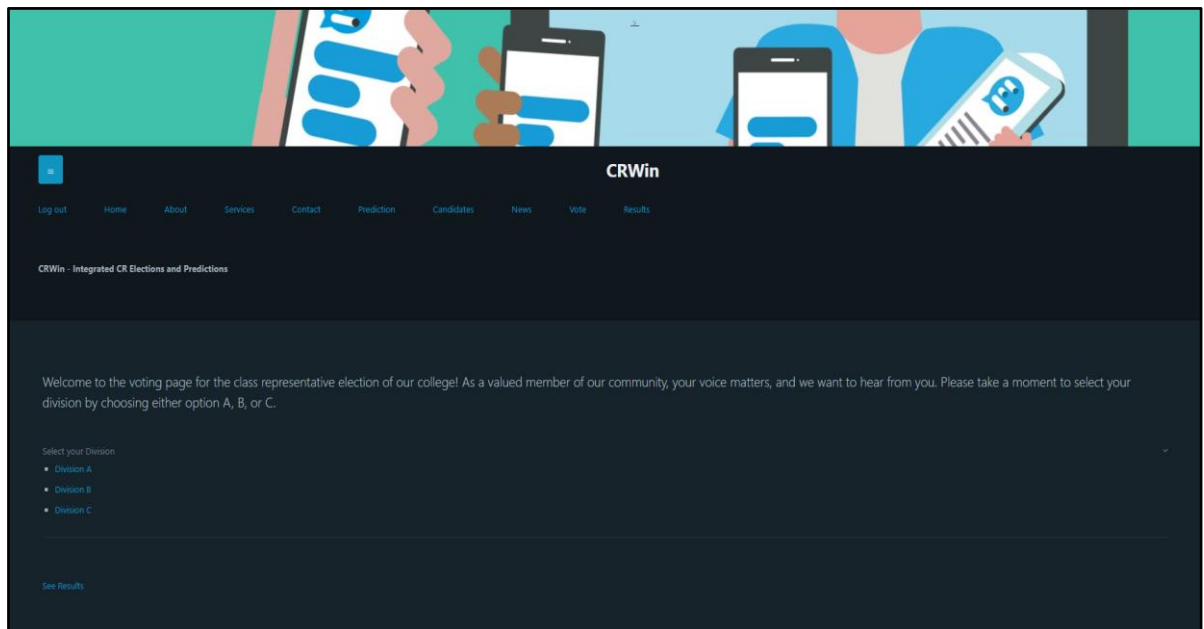
fig 8.2 Division Selection Page

fig 8.3 Login Page
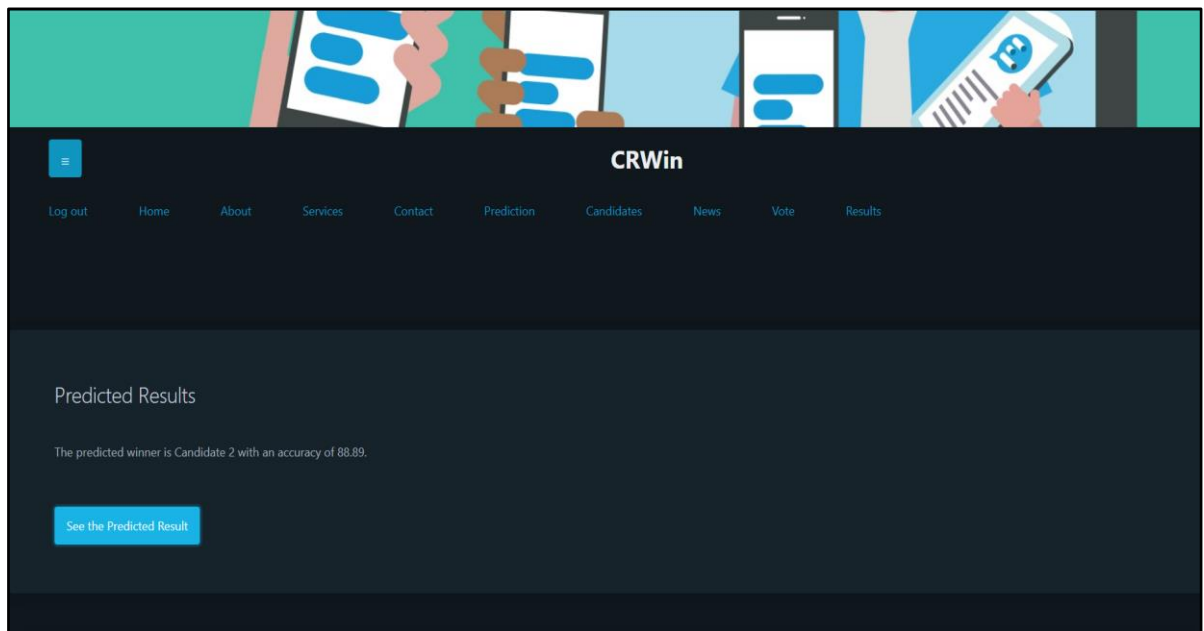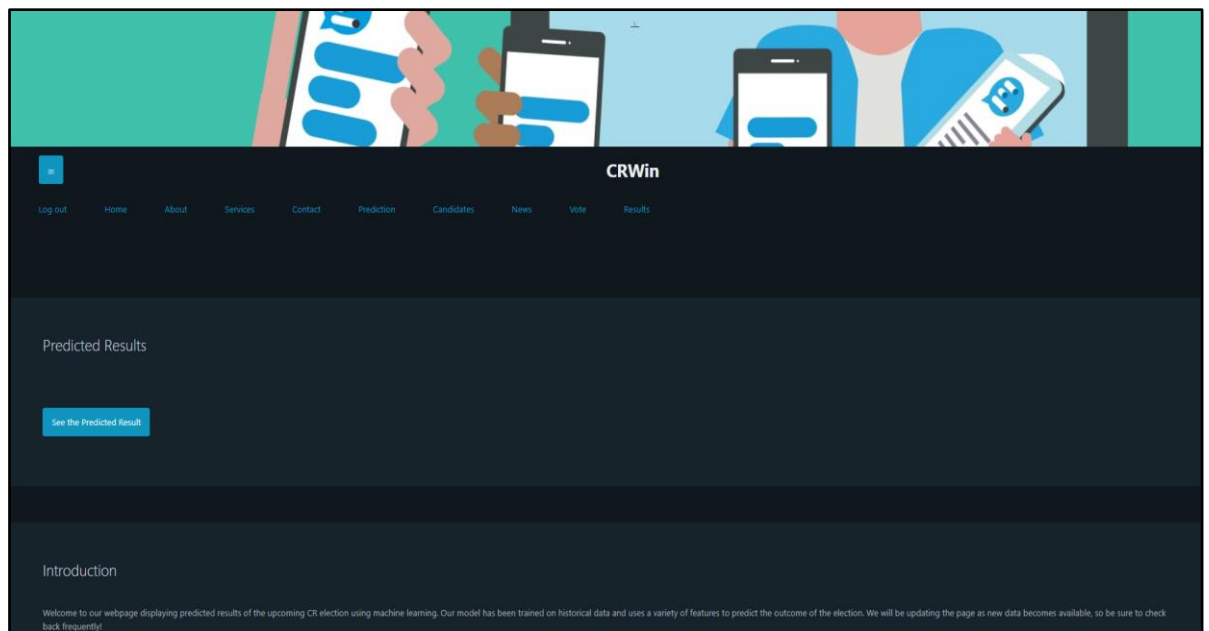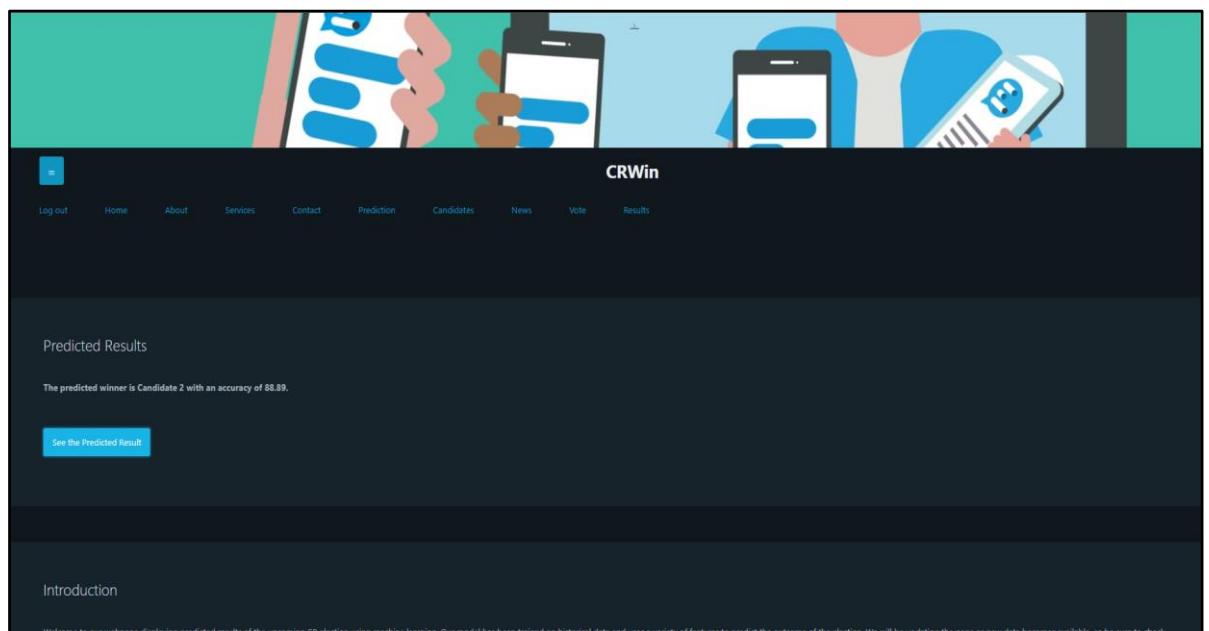

fig 8.4 Registration Page
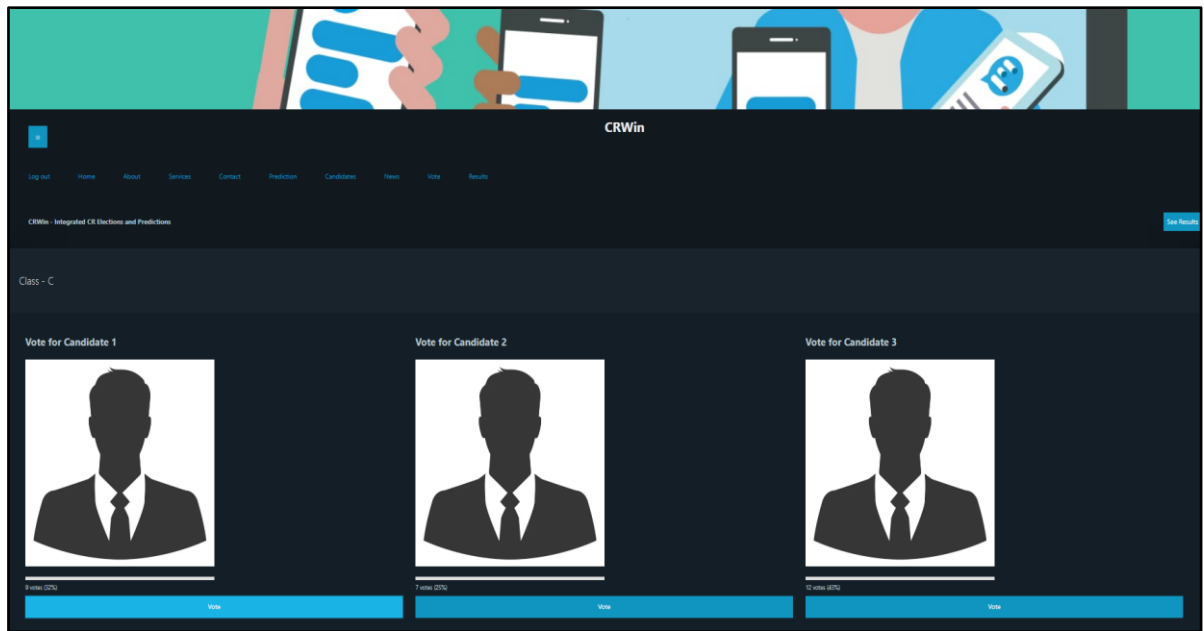
fig 8.5 Voting Page

fig 8.6 AI Model Page

fig 8.7 Prediction Page

fig 8.8 Predicted Results Page

Chapter 9

Conclusion

In conclusion, The CR prediction module utilizes machine learning algorithms to predict the most likely candidates to be elected based on historical data, providing insights for campaign strategies and helping to reduce the influence of bias and favoritism in the election process. Overall, the development of the College Class Representative Election and CR Prediction software project has been a significant milestone in the evolution of the electoral process in colleges. This project has introduced cutting-edge technology to the traditional voting process, facilitating a more efficient, inclusive, and secure election system.One of the key objectives of this project is to streamline the voting process and make it more accessible for all eligible voters. The user-friendly interface and intuitive features make it easy for students to participate in the election process, irrespective of their technical proficiency or familiarity with the electoral process. This has resulted in a significant increase in voter turnout, ensuring that every student's voice is heard and their opinions are considered.

In addition, the CR prediction module is a game-changer in the college election process. Using sophisticated machine learning algorithms, this module analyzes historical data to predict the most likely candidates to be elected, providing valuable insights for campaign strategies. This not only increases the efficiency of the election process but also helps to reduce the influence of bias and favoritism in the election process, thereby creating a fairer and more transparent election platform.The success of this project has far-reaching implications for the future of electoral processes in colleges. By leveraging the power of technology to enhance transparency, efficiency, and inclusiveness, we can pave the way for a more democratic and participatory society. The College Class Representative Election and CR Prediction software project is a testament to this vision and is poised to revolutionize the way we approach elections in colleges and beyond.

Chapter 10

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