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INTRODUCTION

Student union elections play a crucial role in universities and institutions as they ensure democratic representation and foster active student engagement. However, traditional manual voting systems have several drawbacks that hinder the smooth conduct of elections. Long queues, limited polling stations, and time-consuming processes can discourage student participation. Moreover, the lack of robust authentication methods makes these systems vulnerable to errors, tampering, and fraudulent activities.

To overcome these limitations, Campus Polls, an advanced online voting system, has been developed. It provides a secure and efficient platform for students to cast their votes remotely, eliminating the need for physical attendance at polling stations. The incorporation of eye blink authentication adds an extra layer of security, ensuring that only authorized individuals can participate in the voting process.

By implementing Campus Polls, universities and institutions can overcome the logistical challenges associated with manual voting systems. Students no longer have to endure long queues or face limitations due to limited polling stations. They can conveniently cast their votes from anywhere with internet access, saving time and effort. The system's robust authentication mechanism, utilizing eye blink verification, prevents unauthorized voting and enhances the overall security of the electoral process.

The introduction of Campus Polls addresses the need for a secure and efficient online voting system that fosters student engagement and ensures the integrity of student union elections. By providing a convenient and accessible platform, it empowers students to exercise their voting rights and strengthens democratic representation within universities and institutions.

PROBLEM STATEMENT

The current voting system faces a major challenge during elections when students are not able to cast their votes due to being away from their University. This results in a significant number of eligible voters being disenfranchised, which undermines the democratic process
A manual voting system for university or institute student union elections creates logistical challenges.

- Time constraints during election periods hinder the efficiency of the voting process.
- Potential inaccuracies in the manual vote-counting process raise concerns about fair representation.
- The need for an online voting system arises to streamline the election process.
- Ensuring secure and reliable electronic voting is crucial for maintaining the integrity of the student union elections.

OBJECTIVES

The objective of the online voting system for universities and institutions is to address the limitations of traditional manual voting systems by providing a convenient, efficient, and secure platform for student union elections. The specific objectives of the system are as follows:

- Develop an efficient online voting system for universities and institutions: Campus Polls aims to streamline the voting process and eliminate the shortcomings of manual systems by providing a user-friendly and efficient platform for students to cast their votes electronically.

- Implement eye blink authentication to ensure secure and accurate voting: By incorporating eye blink authentication as a robust verification mechanism, Campus Polls ensures that only authorized individuals can participate in the voting process, preventing fraudulent voting attempts and maintaining the integrity of the election.

- Enhance accessibility by enabling students to cast their votes remotely: Campus Polls eliminates the need for students to physically visit polling stations by offering the flexibility to cast their votes remotely from anywhere with internet access. This significantly enhances accessibility and allows more students to participate in the electoral process.

- Improve the efficiency of the voting process by reducing time and effort: With Campus Polls, the voting process becomes quicker and more efficient as students can cast their votes electronically within a short span of time. This eliminates the need for long queues and manual counting, saving both time and effort for election officials.

- Ensure transparency, fairness, and integrity in student union elections: Campus Polls prioritizes transparency by providing access to candidate information and manifestos to ensure informed voting. The system's secure and anonymous vote casting process, coupled with real-time vote counting and result generation, ensures fairness and integrity in student union elections.

FEASIBILITY STUDY

- The feasibility study for Campus Polls, an online voting system for universities and institutions, demonstrates the viability and benefits of implementing such a system. The use of eye blink authentication adds an extra layer of security and ensures that only authorized individuals can cast their votes.

- Based on the assessment conducted, the study concludes that Campus Polls is a feasible solution for transforming the student election process. The system addresses the

limitations of traditional voting methods by providing a secure, convenient, and efficient platform for students to select their representatives.

- The technical evaluation confirms that the eye blink authentication technology can be effectively integrated into the system, enhancing its security and preventing fraudulent voting. The operational assessment highlights the user-friendliness of the system, ensuring ease of use for students and administrators alike.

- From a legal and security perspective, the implementation of Campus Polls complies with relevant laws and regulations, safeguarding the privacy and data protection rights of voters. The financial analysis indicates that the system offers potential cost savings in the long run compared to manual voting systems.

  In conclusion, Campus Polls offers a promising solution to revolutionize the student election process. By leveraging eye blink authentication and providing a user-friendly online platform, it ensures transparency, accessibility, and accurate representation. The feasibility study affirms the viability of the system and recommends its implementation to enable fair and secure voting in universities and institutions.

SYSTEM REQUIREMENTS

- Windows 7/ 8 / 10 / 11 / Mac / Linux
- i3 or Above
- 4GB or Above RAM
- Min 100GB HDD or Above
- Any Browser (Chrome, Brave, Edge, etc.)

SYSTEM DESIGN

- **Flow Chart - Admin**

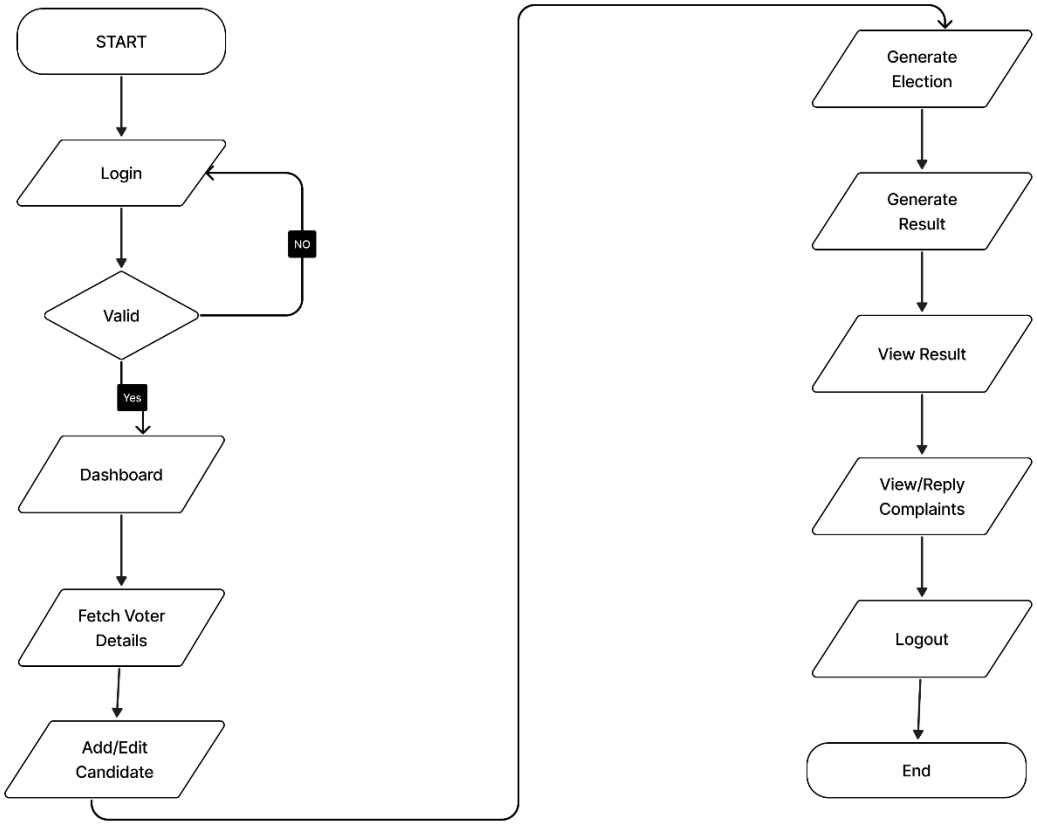


Figure: 01

- **Flow Chart – User**

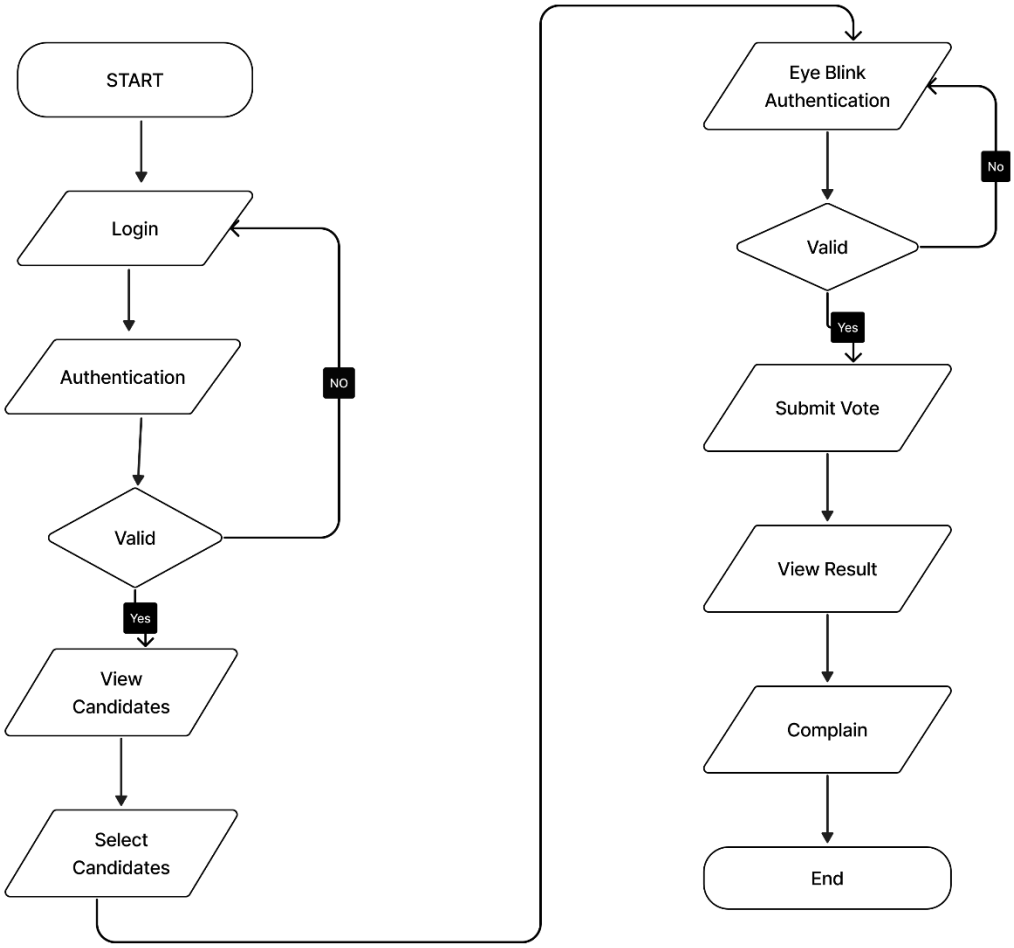


Figure: 02

- **ER Diagram**

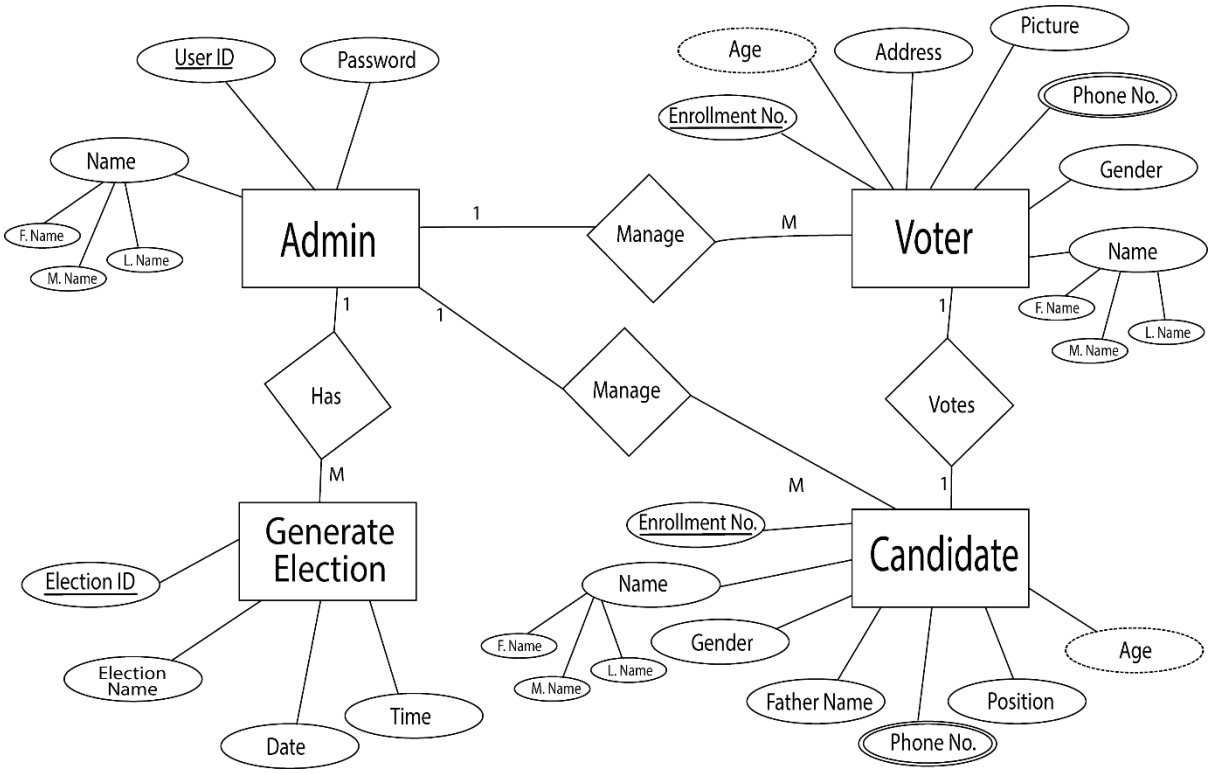


Figure: 03

- **DFD – Level 0**

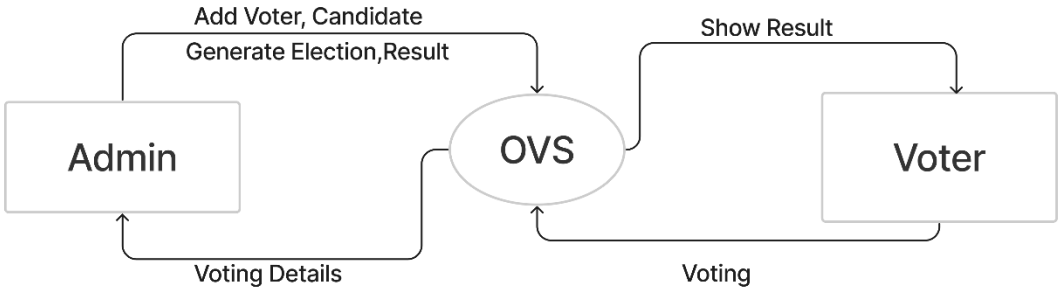


Figure: 04

- **DFD – Level 1**

TOOLS AND TECHNOLOGIES USED

- **Figma & Canva**
    - Figma is a cloud-based design and prototyping tool that allows teams to collaborate and create user interfaces (UI) and user experience (UX) designs. It offers a wide range of features, including a powerful vector editing tool, real-time collaboration, design components and styles, and interactive prototyping capabilities. Figma enables designers to work together in real-time, making it easy to share designs, gather feedback, and iterate on designs efficiently. It has gained popularity due to its versatility, cross-platform compatibility, and seamless collaboration features, making it a preferred choice for many design teams.
      In this project we are using Figma to make our UI/UX.

    - Canva is a web-based graphic design platform that allows users to create a wide range of visual content, including presentations, social media graphics, posters, flyers, and more. It provides an intuitive interface with a vast library of templates, images, icons, and fonts that users can customize to suit their needs. Canva is popular for its user-friendly drag-and-drop functionality, making it accessible for both professional designers and individuals without prior design experience. It has become a go-to tool for creating visually appealing and professional-looking designs quickly and easily.
      We are using Canva for designing works like Logo and background images.
- **VS Code**
    - VS Code, short for Visual Studio Code, is a popular source code editor developed by Microsoft. It is lightweight, customizable, and widely used by developers across various programming languages. VS Code provides a rich set of features, including syntax highlighting, code completion, debugging, version control integration, and an extensive ecosystem of extensions to enhance its functionality. Its user-friendly interface, efficient performance, and cross-platform compatibility make it a preferred choice for many programmers and software developers.
      We are using VS Code as our IDE to develop this project as this IDE is really useful.

- **HTML**
    - HTML stands for HyperText Markup Language. It is the standard markup language used for creating web pages and applications. HTML uses a set of tags to structure the content and define the elements on a webpage. These tags are enclosed in angle brackets (< >) and are composed of opening and closing tags.

    - HTML tags represent various elements such as headings, paragraphs, links, images, tables, forms, and more. By using HTML tags and attributes, developers can define the structure, layout, and formatting of a webpage. CSS (Cascading Style Sheets) is commonly used in conjunction with HTML to add visual styles and enhance the presentation of the HTML elements.

- Web browsers interpret HTML documents and render them as web pages that users can view and interact with. HTML is a fundamental language for web development and serves as the backbone of most websites and web applications on the internet.

- **CSS**
  - CSS stands for Cascading Style Sheets. It is a stylesheet language used to describe the look and formatting of a document written in HTML or XML. CSS separates the content of a web page from its presentation, allowing developers to control the visual appearance and layout of elements on a website.

  - With CSS, you can specify various properties for HTML elements, such as colors, fonts, spacing, borders, backgrounds, and more. It provides a flexible and powerful way to style web pages and create visually appealing and consistent designs across different devices and screen sizes.

  - CSS works by selecting HTML elements based on their tags, classes, IDs, or other attributes, and applying specific styling rules to them. These rules define how elements should be displayed, positioned, and behave in response to user interactions or different media types.

  - CSS is an essential tool for web developers, as it enables them to achieve desired designs, improve accessibility, and enhance the user experience on websites and web applications. It is widely supported by modern web browsers and has become a standard technology for styling web content.
- **JavaScript**
  - JavaScript is a high-level, interpreted programming language primarily used for web development. It is a versatile language that allows developers to create dynamic and interactive web pages and web applications. JavaScript can be embedded directly into HTML code and executed by web browsers without the need for compilation.

  - JavaScript enables functionalities such as form validation, interactivity, content manipulation, and asynchronous communication with servers. It provides a wide range of built-in objects and methods that facilitate tasks like manipulating strings, arrays, dates, and handling events.

  - With the advent of Node.js, JavaScript can now also be used for server-side development, allowing developers to build entire web applications using JavaScript on both the client and server sides.

  - JavaScript is supported by all major web browsers, making it a fundamental language for front-end web development. It has a large and active community, offering numerous libraries, frameworks, and resources for developers to leverage and build powerful applications.

- **React JS**
    - ReactJS, or simply React, is a JavaScript library for building user interfaces. It was developed by Facebook and is widely used for creating interactive and dynamic web applications. React allows developers to create reusable UI components that efficiently update and render in response to changes in data. It follows a declarative approach, where developers describe how the UI should look at any given time, and React automatically handles the underlying updates and optimizations.

    - React uses a virtual DOM (Document Object Model) to efficiently update only the necessary parts of a web page, resulting in better performance. It also promotes the concept of a unidirectional data flow, making it easier to understand and maintain the application state.

    - React is often used in conjunction with other tools and libraries, such as Redux for state management and React Router for routing. Its component-based architecture, efficient rendering, and strong community support have made it a popular choice for building modern web applications.

- **Node JS**
    - Node.js is an open-source, cross-platform JavaScript runtime environment that allows developers to run JavaScript code outside of a web browser. It is built on Chrome's V8 JavaScript engine and provides an event-driven, non-blocking I/O model that makes it efficient and scalable for building server-side and network applications.

    - Node.js enables developers to create server-side applications using JavaScript, which was traditionally associated with client-side scripting in web browsers. It provides access to various modules and libraries that simplify tasks such as file system operations, networking, and database connectivity. Node.js also supports the development of real-time applications, streaming applications, and microservices.

    - One of the key advantages of Node.js is its ability to handle a large number of concurrent connections with low overhead, making it well-suited for applications that require high performance and responsiveness. Additionally, Node.js has a vibrant and active community that continuously contributes to its ecosystem, providing a vast range of modules and frameworks to facilitate web development.

- **Express JS**
    - Express.js, often referred to as Express, is a fast and minimalist web application framework for Node.js. It provides a robust set of features and tools for building web applications and APIs. Express simplifies the process of handling HTTP requests, routing, and middleware integration, making it a popular choice for developing server-side applications.

    - Express.js offers a flexible and unopinionated approach, allowing developers to structure their applications as they see fit. It provides a straightforward API for

handling HTTP methods such as GET, POST, PUT, and DELETE, enabling the creation of RESTful APIs easily. Additionally, Express supports the use of middleware functions, which can perform various tasks like authentication, logging, error handling, and more.

- Express.js has a large and active community, which means there is extensive documentation, numerous third-party libraries, and a wide range of tutorials and resources available. This ecosystem makes it easier for developers to extend the functionality of their Express applications by incorporating additional modules and integrations.

- Overall, Express.js is a popular choice for developers seeking a lightweight, flexible, and efficient framework for building web applications and APIs using Node.js.

- **NPM Package**
  - An NPM package refers to a software package or module that is published and made available through the Node Package Manager (NPM). NPM is a package manager for JavaScript and is primarily used for managing and distributing reusable code and dependencies for Node.js projects.

  - NPM packages can contain various resources, such as JavaScript files, configuration files, documentation, and other assets required for a specific functionality or feature. These packages are typically published to the NPM registry, which serves as a centralized repository where developers can discover, download, and install packages for their projects.

  - NPM packages can be created and published by individuals or organizations, and they can range from small utility libraries to comprehensive frameworks. They can be easily installed and managed in a project by using the NPM command-line interface (CLI) or by integrating with build tools like webpack or Grunt.

  - By leveraging NPM packages, developers can benefit from code reuse, accelerate development, and tap into the extensive ecosystem of open-source libraries and tools available in the JavaScript community.

- **Mongo DB**
  - MongoDB is a widely-used, open-source, NoSQL (non-relational) database management system. It is designed to store and manage large amounts of structured and unstructured data in a flexible and scalable manner. MongoDB uses a document-oriented model, where data is stored in JSON-like documents with dynamic schemas, allowing for easy and agile data manipulation.

  - One of the key advantages of MongoDB is its ability to handle high-volume, high-velocity data with horizontal scalability. It supports automatic sharding, which enables data to be distributed across multiple servers or clusters, improving

performance and allowing for seamless scalability as data grows.

- MongoDB offers various features such as indexing, ad-hoc querying, aggregation framework, full-text search, and geographic information system (GIS) capabilities. It also provides replication and failover support for high availability and data redundancy.

- Additionally, MongoDB provides a comprehensive set of drivers and APIs for developers to interact with the database using a wide range of programming languages. It is commonly used in web applications, real-time analytics, content management systems, and other use cases that require flexible data storage and retrieval.

- **Rest API**
  - REST, which stands for Representational State Transfer, is an architectural style for designing networked applications. RESTful APIs (Application Programming Interfaces) are a way to implement the principles of REST in web services.

  - A REST API is an interface that allows different software applications to communicate with each other over the internet using standard HTTP methods such as GET, POST, PUT, and DELETE. It operates on the concept of resources, which are identified by unique URLs (Uniform Resource Locators).

  - In a REST API, resources are manipulated by sending requests to their respective URLs, and the server responds with the requested data or performs the requested actions. The API follows a stateless client-server communication model, meaning that each request contains all the necessary information, and the server does not maintain any session state between requests.

  - REST APIs typically use JSON (JavaScript Object Notation) or XML (eXtensible Markup Language) formats for data exchange. They are widely used in web development for building scalable and interoperable systems, allowing different applications and services to interact and share data in a standardized way.

- **Open CV / Classification / Object Detection**
  - OpenCV (Open Source Computer Vision Library) is an open-source computer vision and machine learning software library. It provides a wide range of functions and algorithms that enable developers to perform various tasks related to computer vision, image processing, and machine learning.

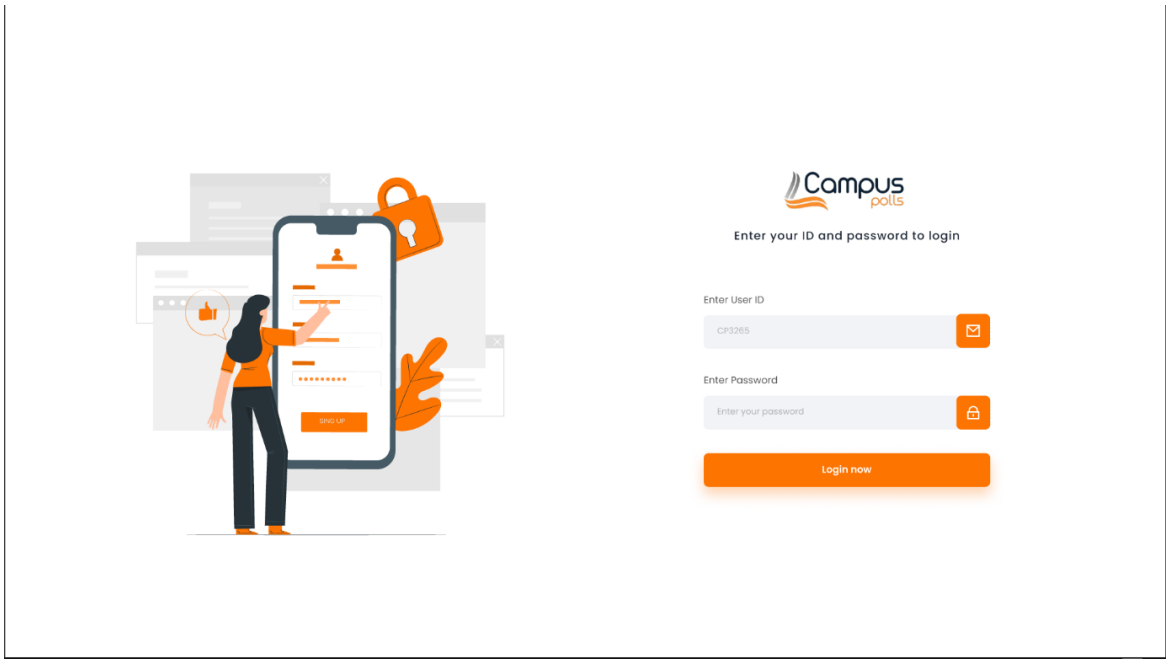
  - Classification is a task in machine learning where the goal is to assign a label or category to a given input. In the context of computer vision, image classification involves training a model to recognize and classify images into different predefined categories or classes. This is typically done by extracting relevant features from the images and using them as input to a machine learning algorithm.

- Object detection, on the other hand, is a computer vision task that involves identifying and localizing objects of interest within an image or video. Unlike classification, object detection not only determines the class of the object but also provides the bounding box coordinates around the object. Object detection algorithms typically use various techniques, such as feature extraction, image segmentation, and machine learning, to detect and recognize objects in images or videos. OpenCV provides a set of powerful tools and algorithms for object detection tasks, including Haar cascades, HOG (Histogram of Oriented Gradients), and deep learning-based models like YOLO (You Only Look Once) and SSD (Single Shot MultiBox Detector).

SYSTEM IMPLEMENTATION

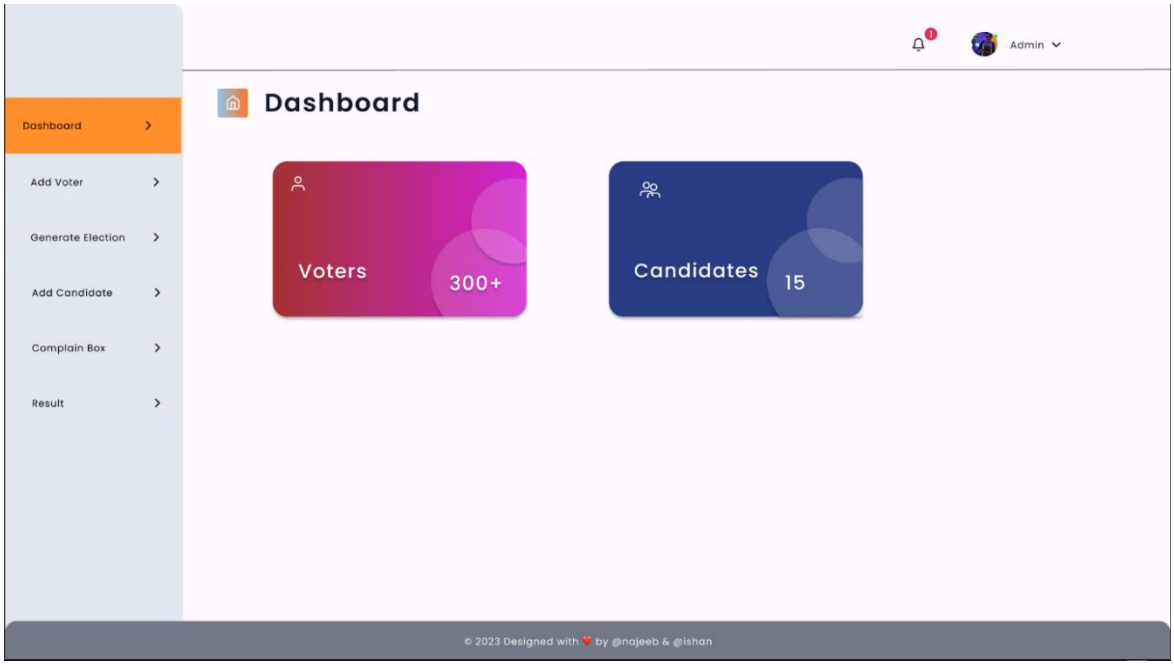
- **UI / IX - (Admin)**

    - **<u>Login Page</u>** – User can Login here to access admin dashboard by using their login credentials.



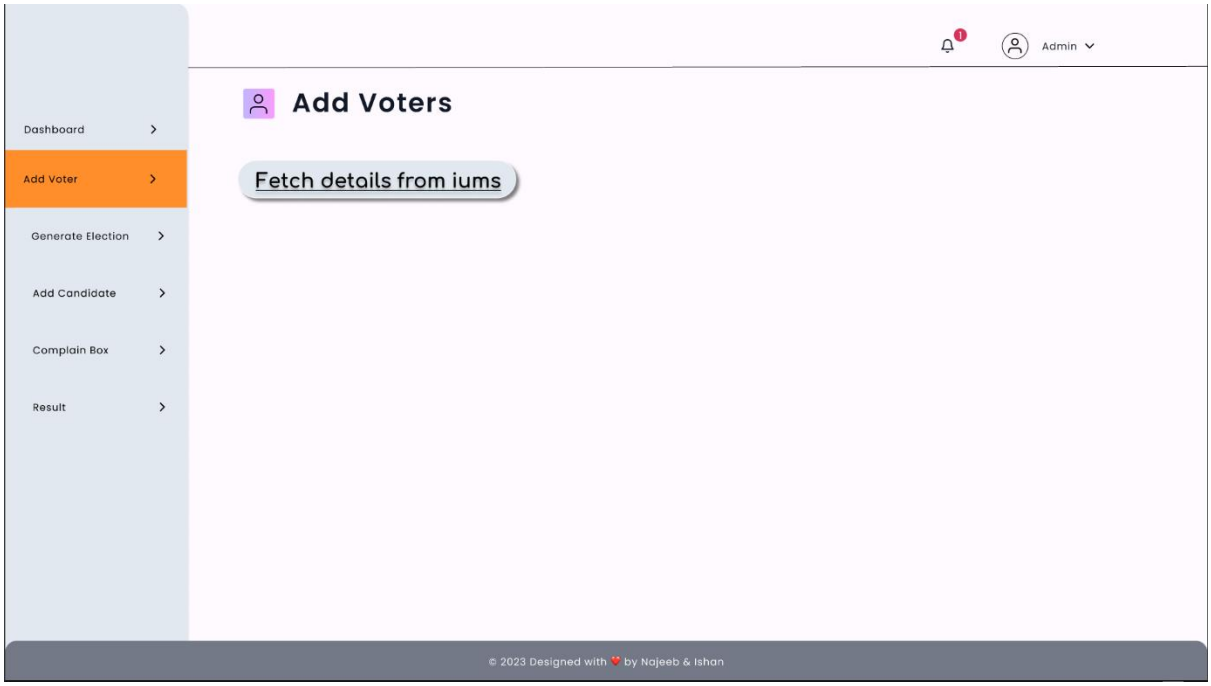
Pic – 01

    - **<u>Dashboard</u>** - Admin can access everything from here.



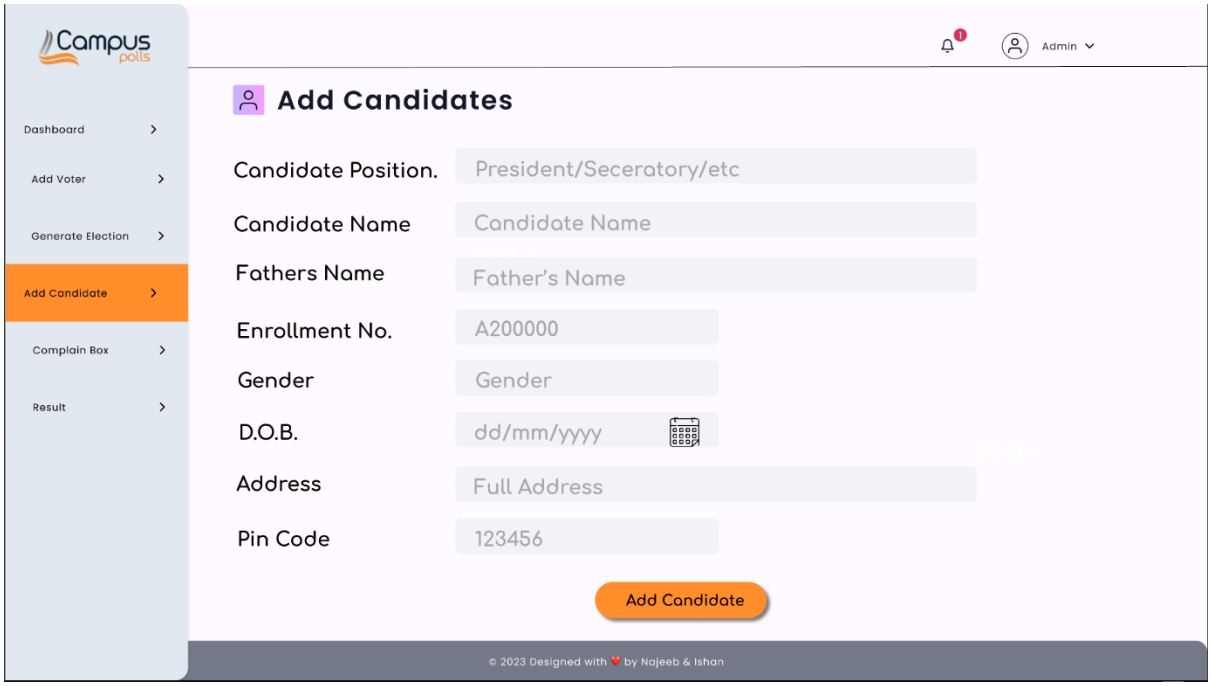
Pic – 02

- **Add page** – Admin can add/fetch users data.

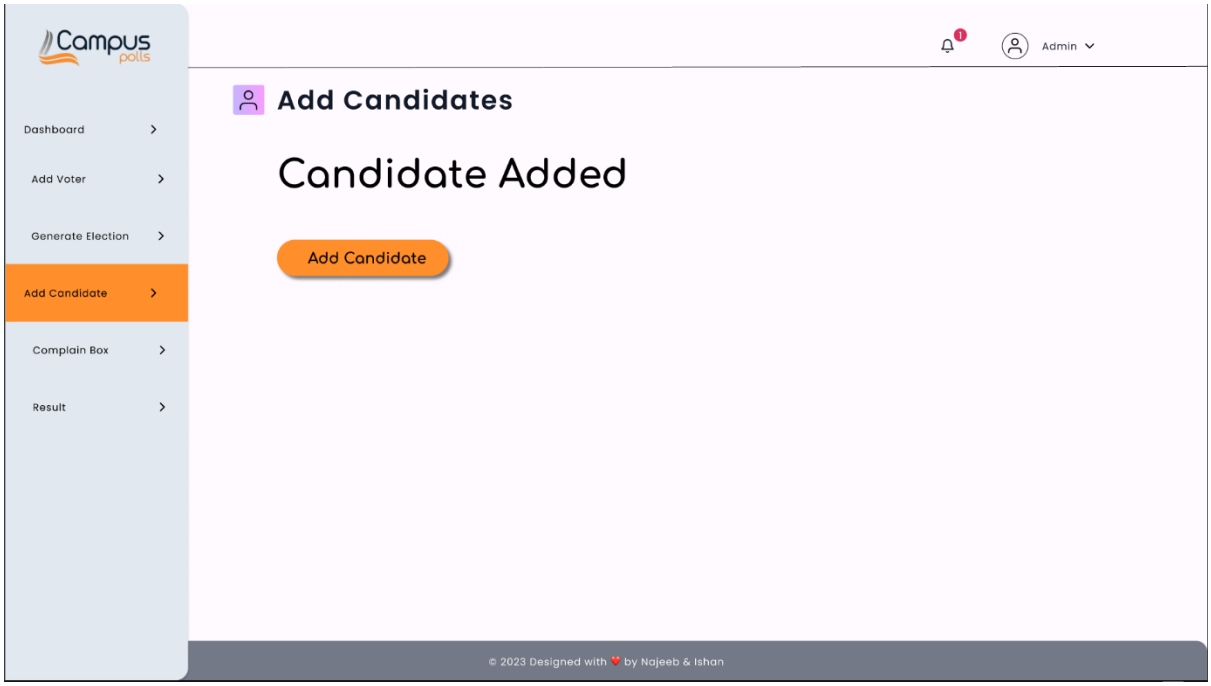


Pic – 03

- **Add Candidate** – Admin can add Candidate details here.

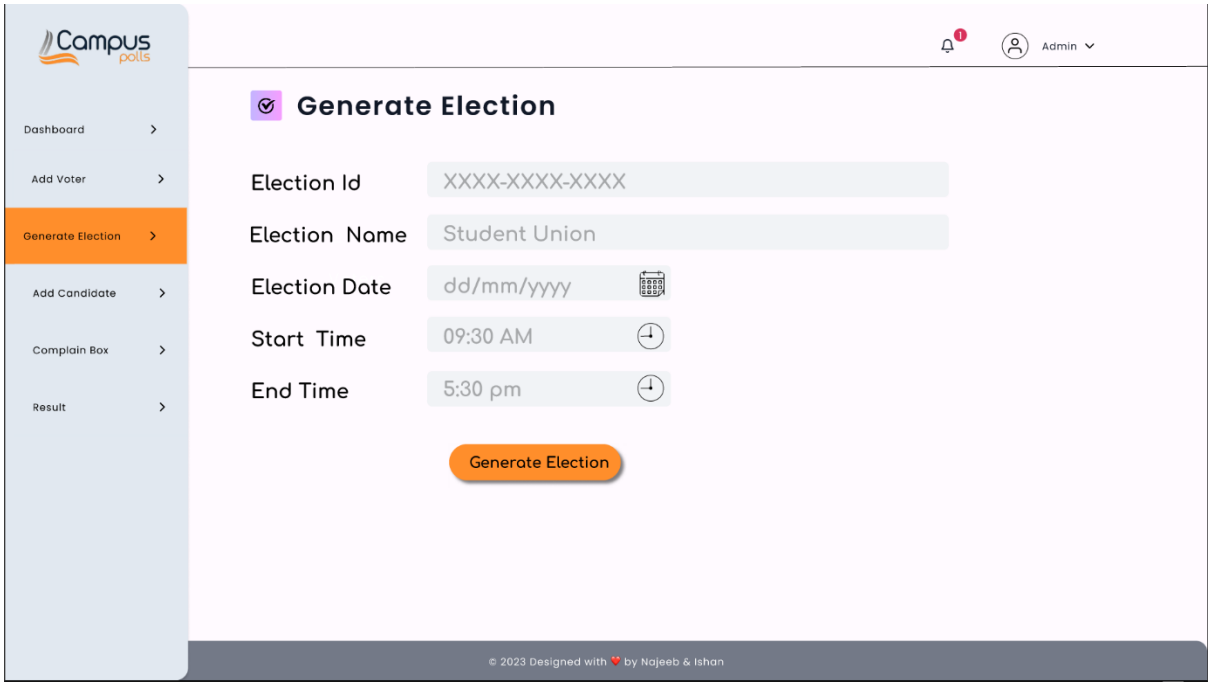


Pic - 04

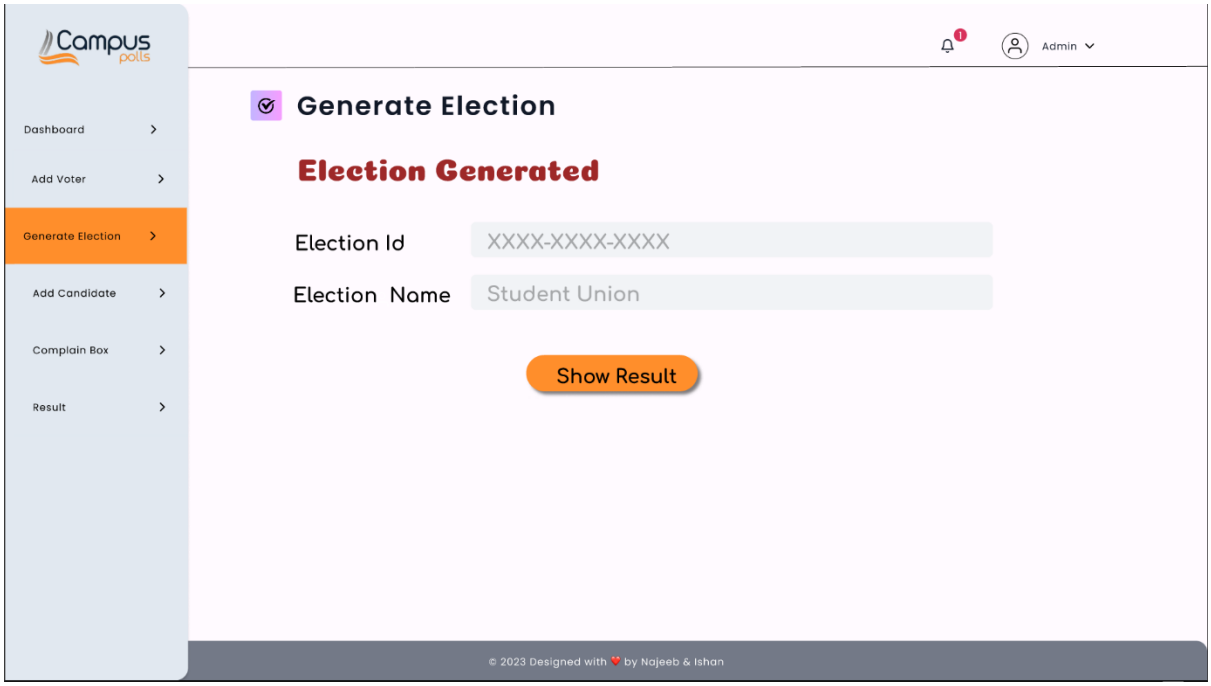


Pic - 05

- **Generate Election** - Admin can generate election from this page.

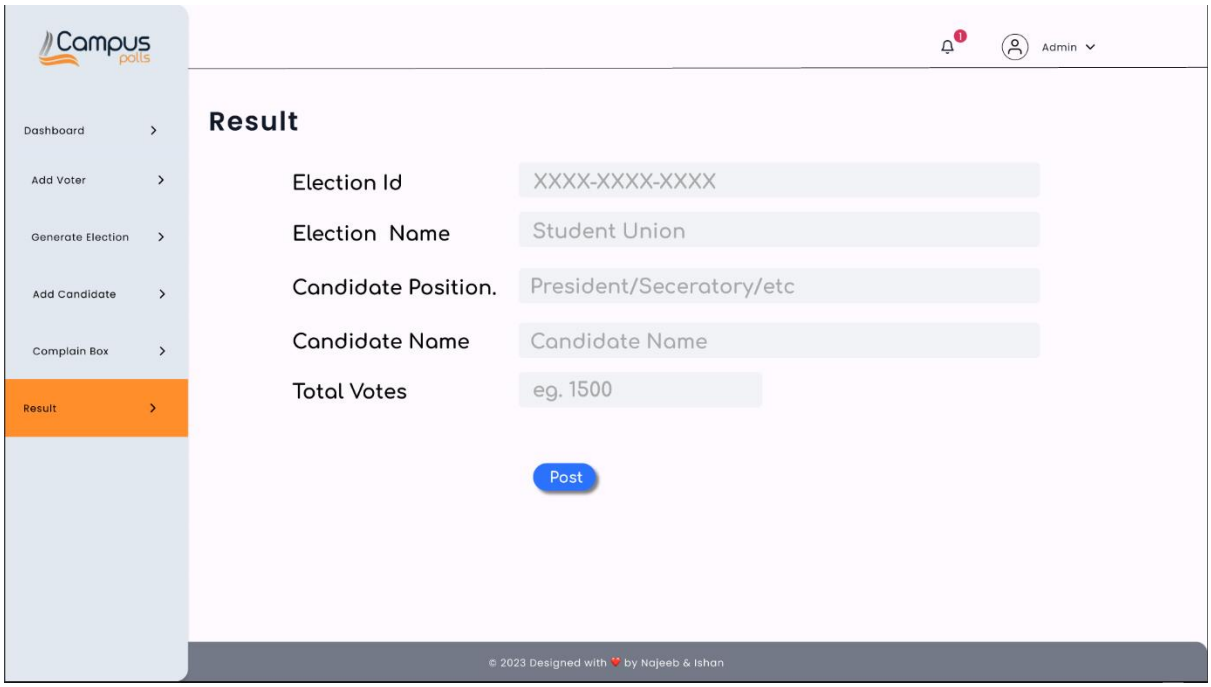


Pic – 06



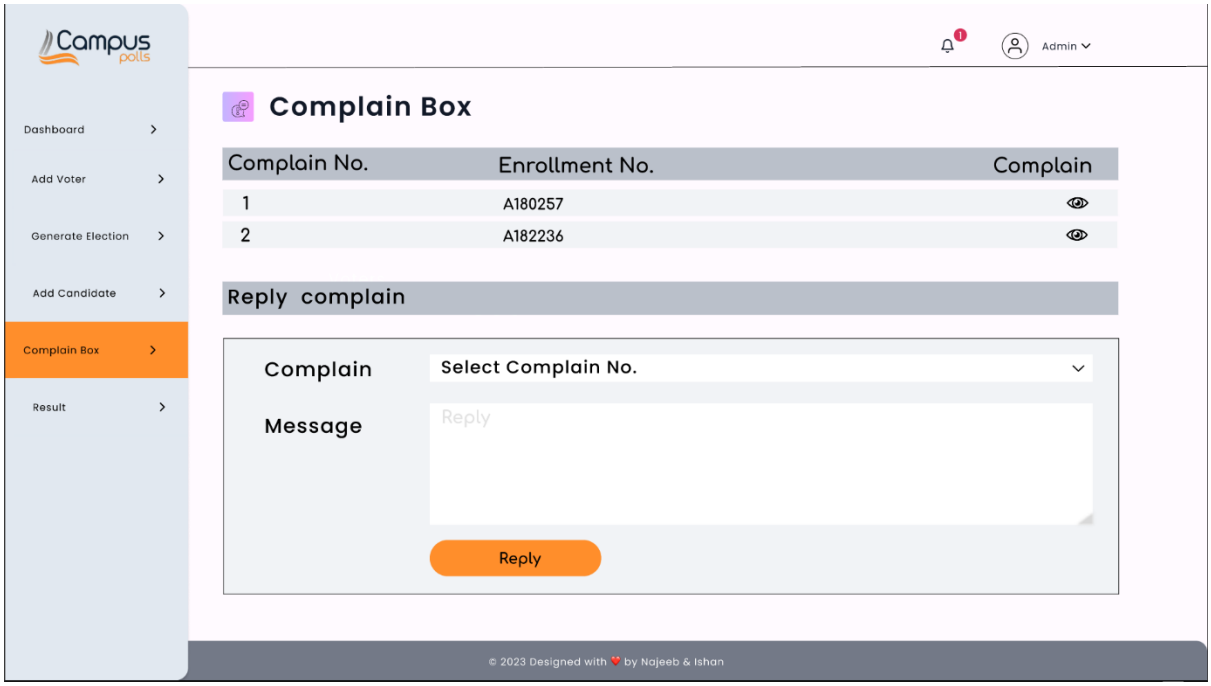
Pic – 06

- **Generate Result** - Admin can generate election result from this page.

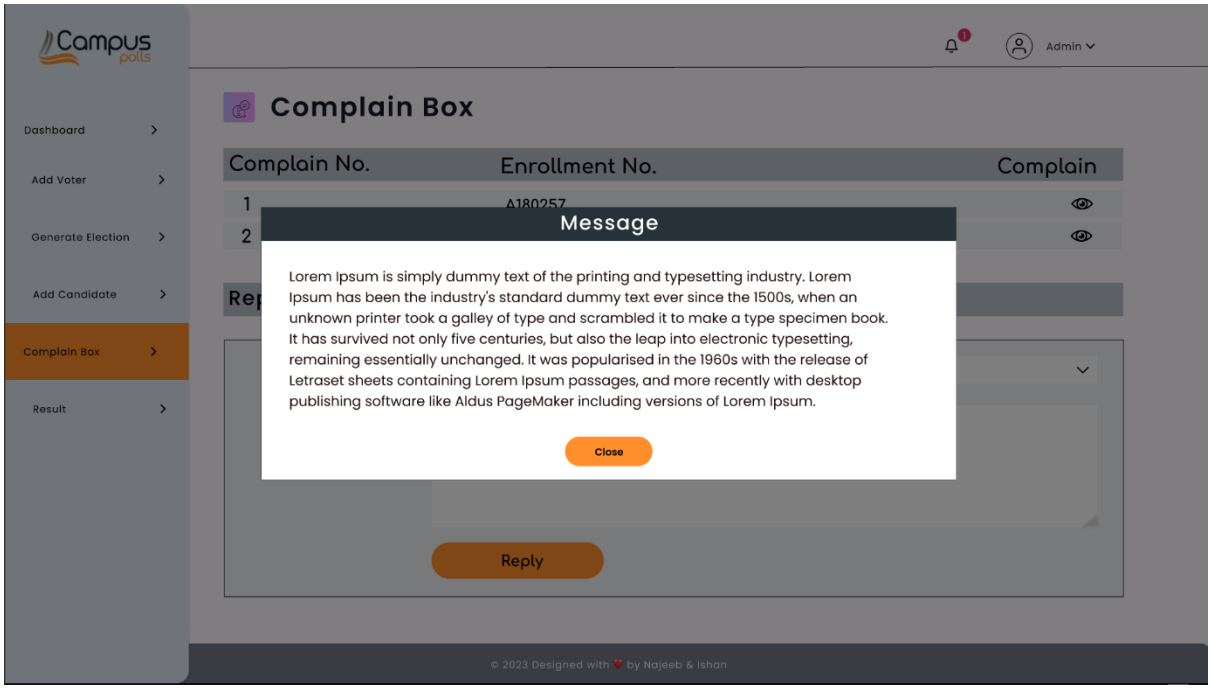


Pic – 07

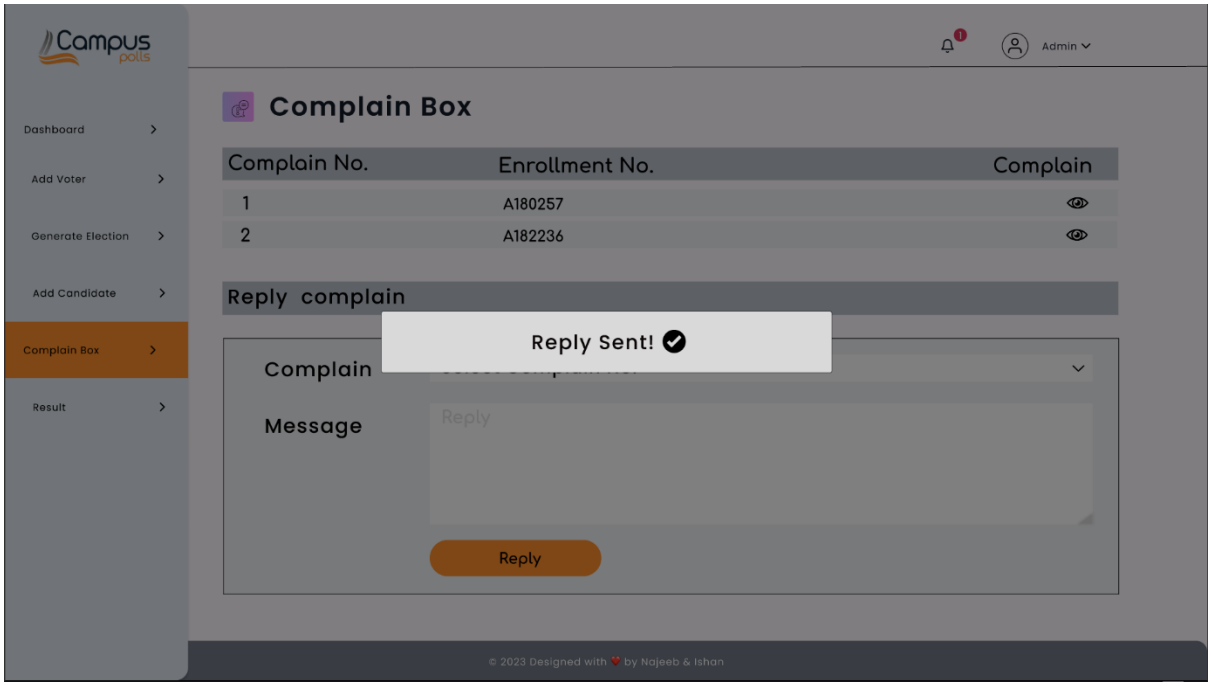
- **<u>Complain Box</u>** - Admin can resolve user complains / doubts here in this page.



Pic - 08



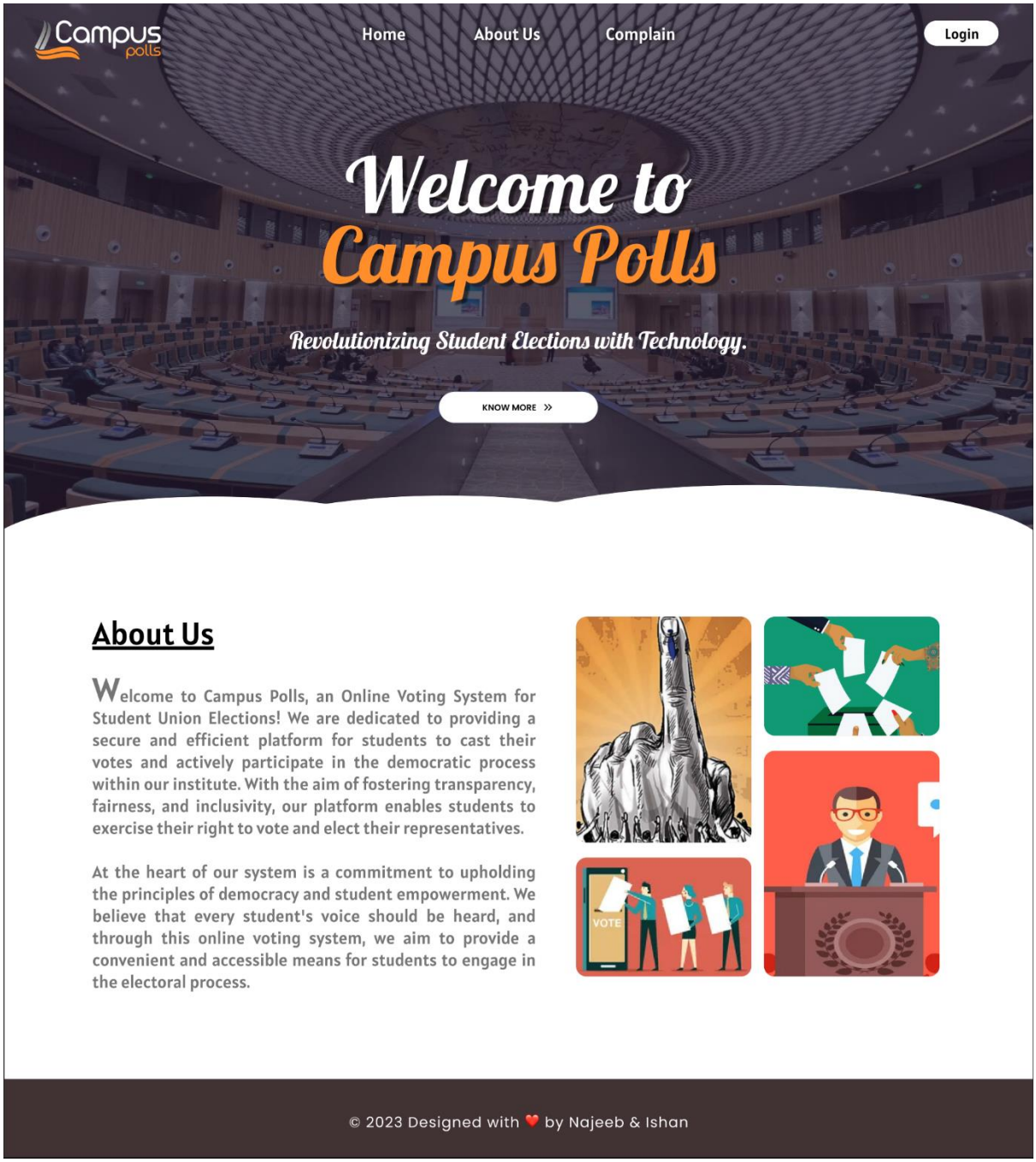
Pic - 09


Campus polls
Admin
Dashboard
Add Voter
Generate Election
Add Candidate
Complain Box
Result
Complain Box
Complain No.
Enrollment No.
Complain
1
A180257
2
A182236
Reply complain
Reply Sent!
Complain
Message
Reply
Reply
© 2023 Designed with by Najeeb & Ishan

Pic - 10

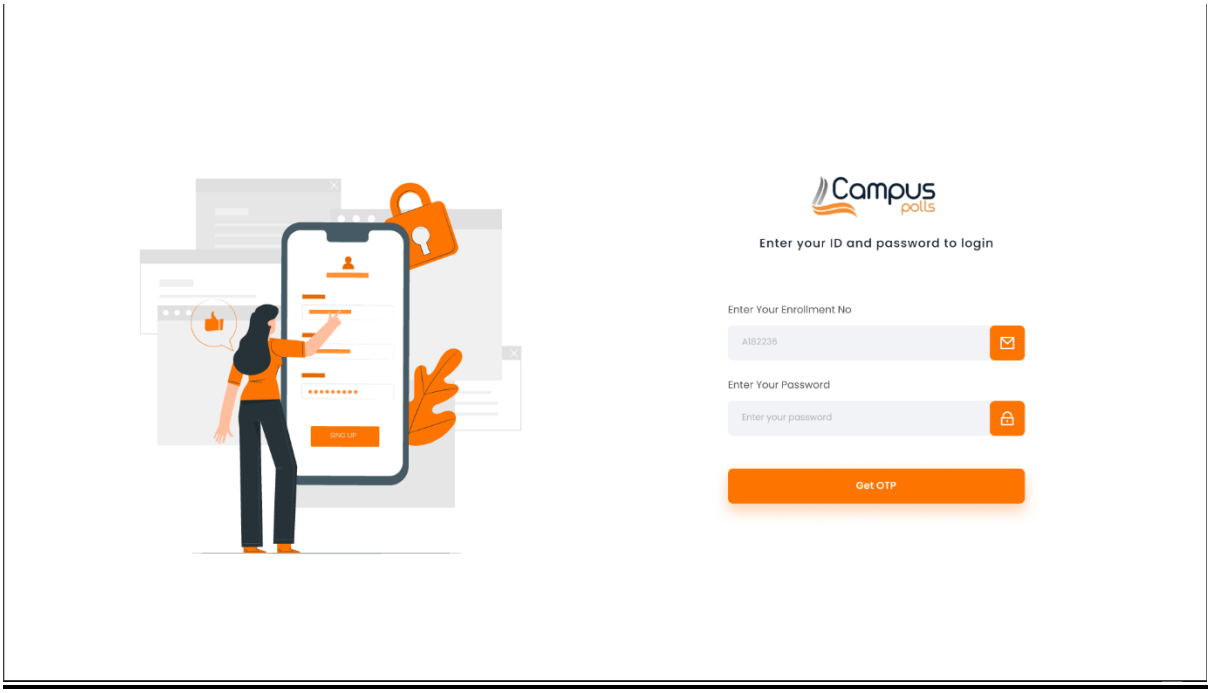
- **UI / IX - (User)**

    - **Home Page** – This is the home page of user where they'll be showed some information about this Online Voting System and they can see the rules and regulations here.



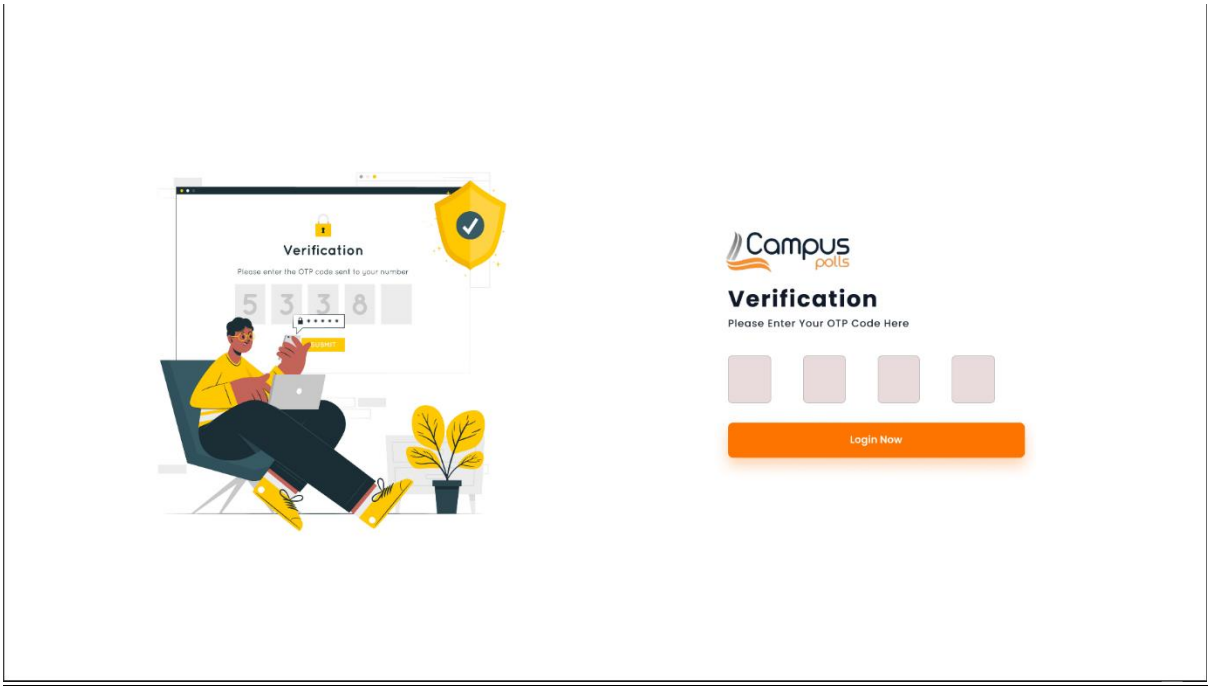
Pic - 11

- **Login Page** – User can login here to cast their vote or to ask their doubts if they're facing any issue. User can only ask the doubts or cast their votes if they are logged in.



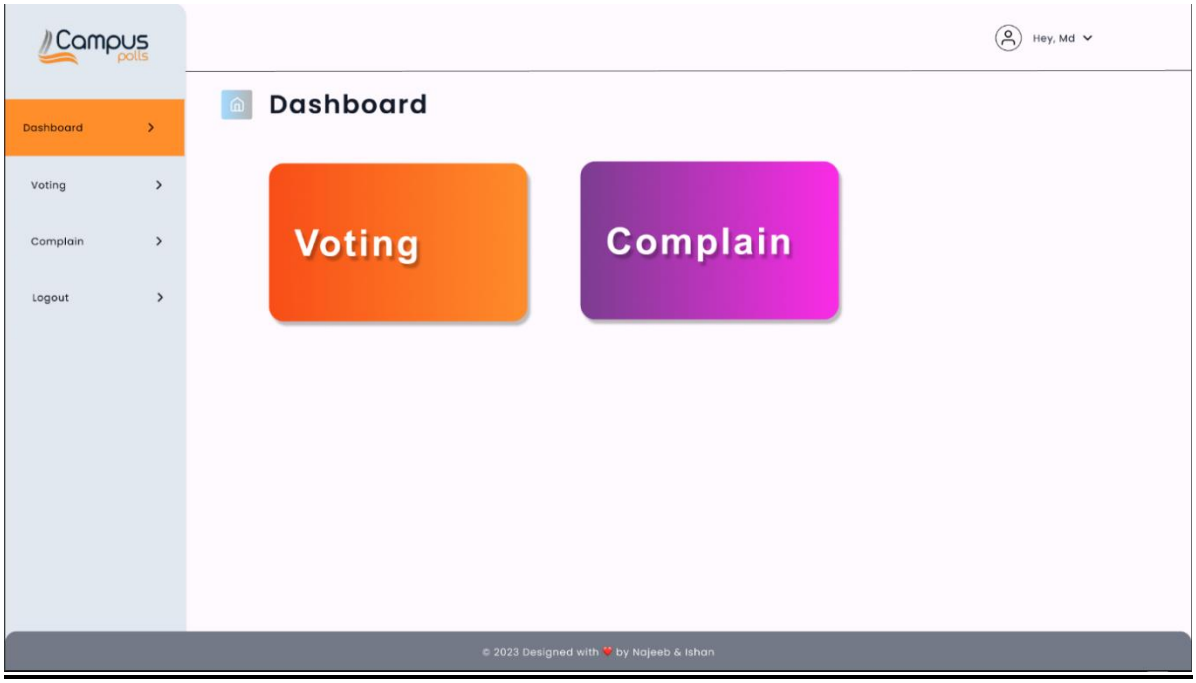
Pic - 12

- **Authentication** – If user/Students wants to login then they have to pass this OTP Verification. Without OTP Verification user can not login.



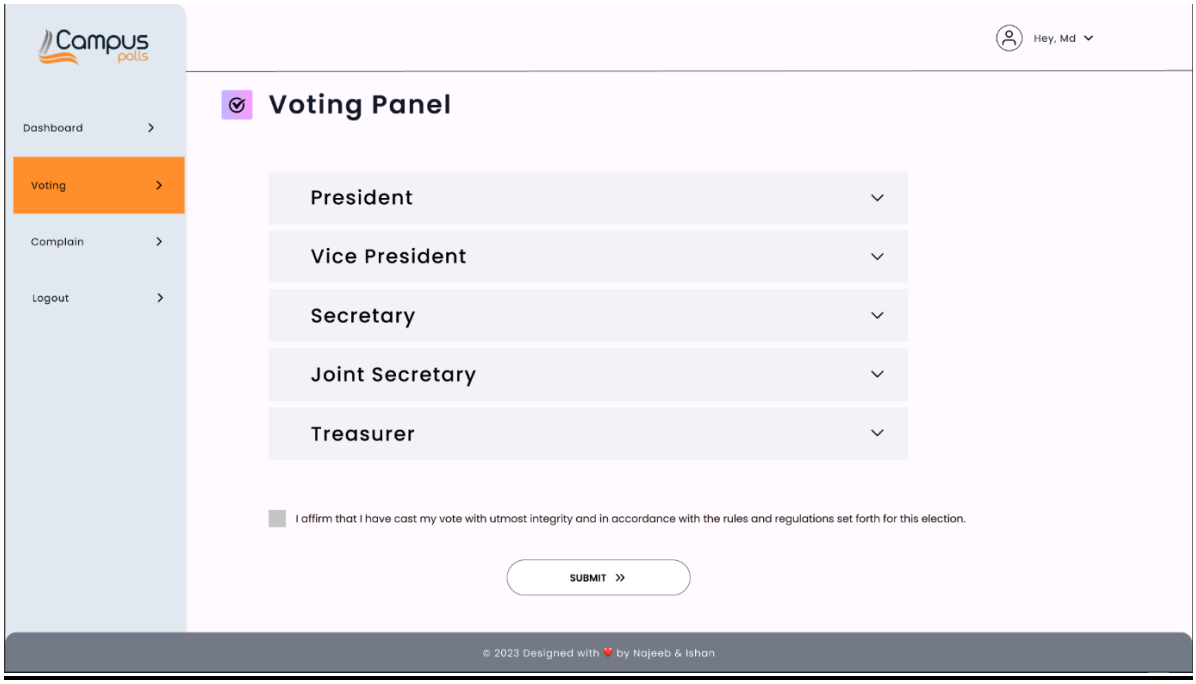
Pic – 13

- **Dashboard** – User can cast their vote or raise their complain from this dashboard.

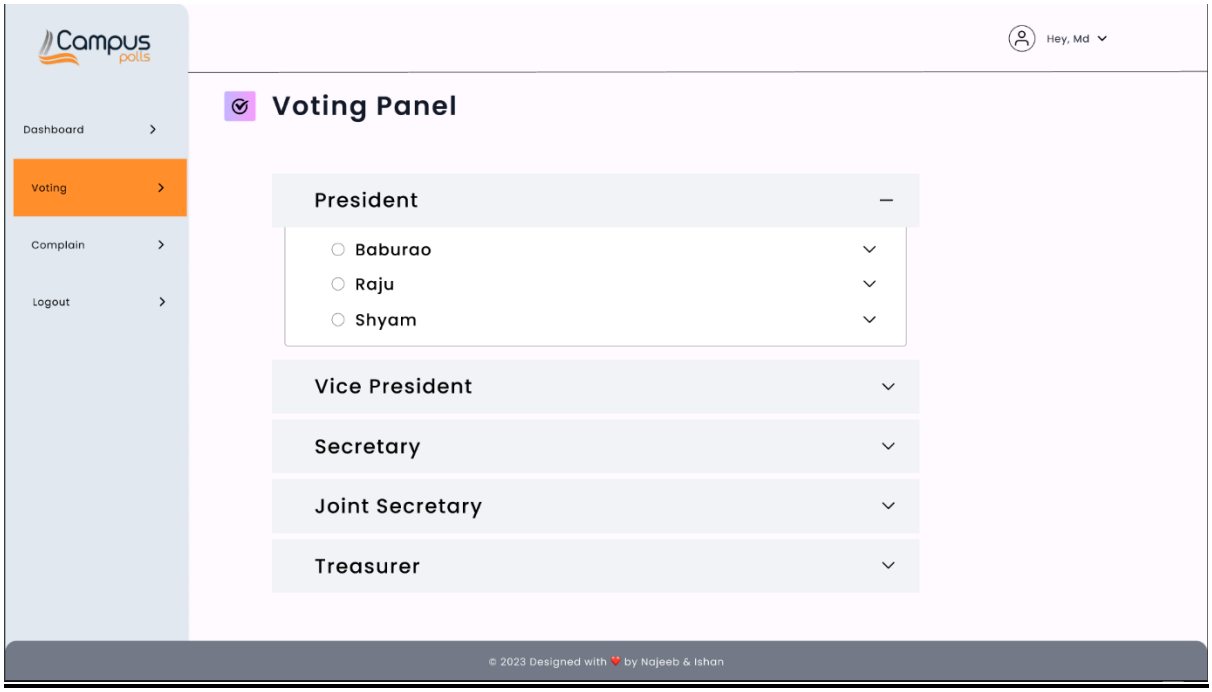


Pic - 14

- **Voting Panel** – User can cast their vote by selecting the candidate names. Once they click on the candidate name then they can see candidate details and then as per their choice they can cast their vote. After selecting the candidate names and agreeing the terms and conditions they have to pass the eye blink authentication to verify their originality.



Pic - 15


Campus polls
Hey, Md
Dashboard
Voting
Complain
Logout
Voting Panel
President
Baburao
Raju
Shyam
Vice President
Secretary
Joint Secretary
Treasurer
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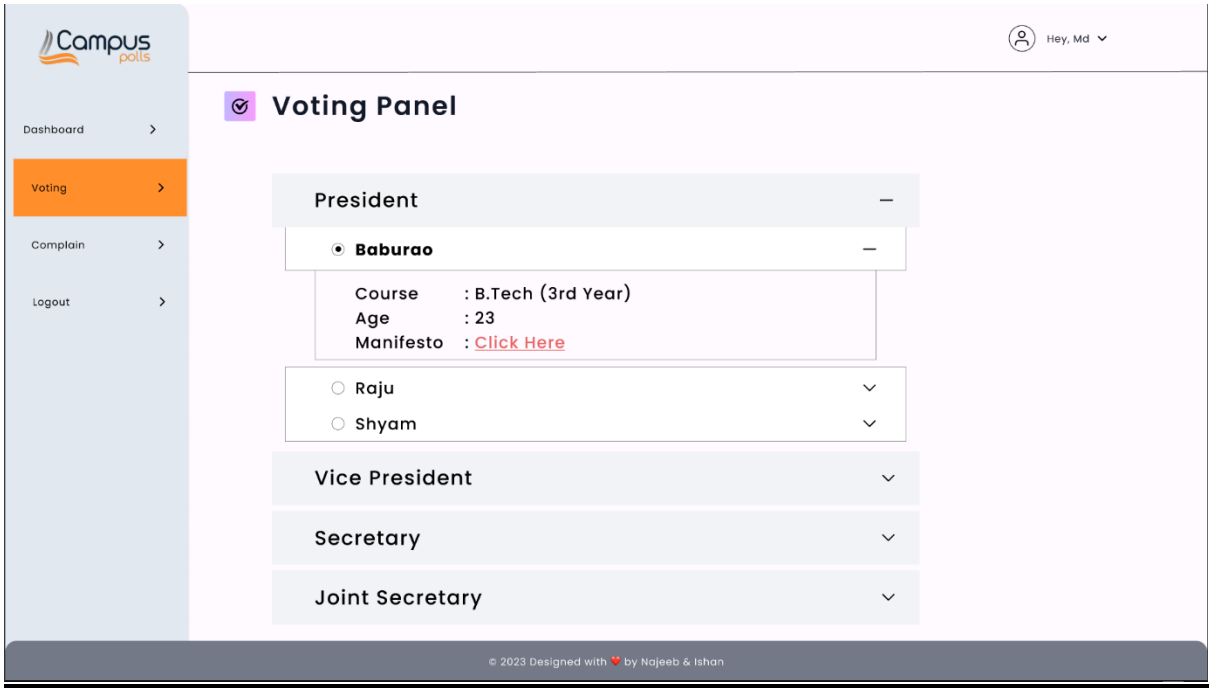
Pic - 16


Campus polls
Hey, Md
Dashboard
Voting
Complain
Logout
Voting Panel
President
Baburao
Course : B.Tech (3rd Year)
Age : 23
Manifesto : Click Here
Raju
Shyam
Vice President
Secretary
Joint Secretary
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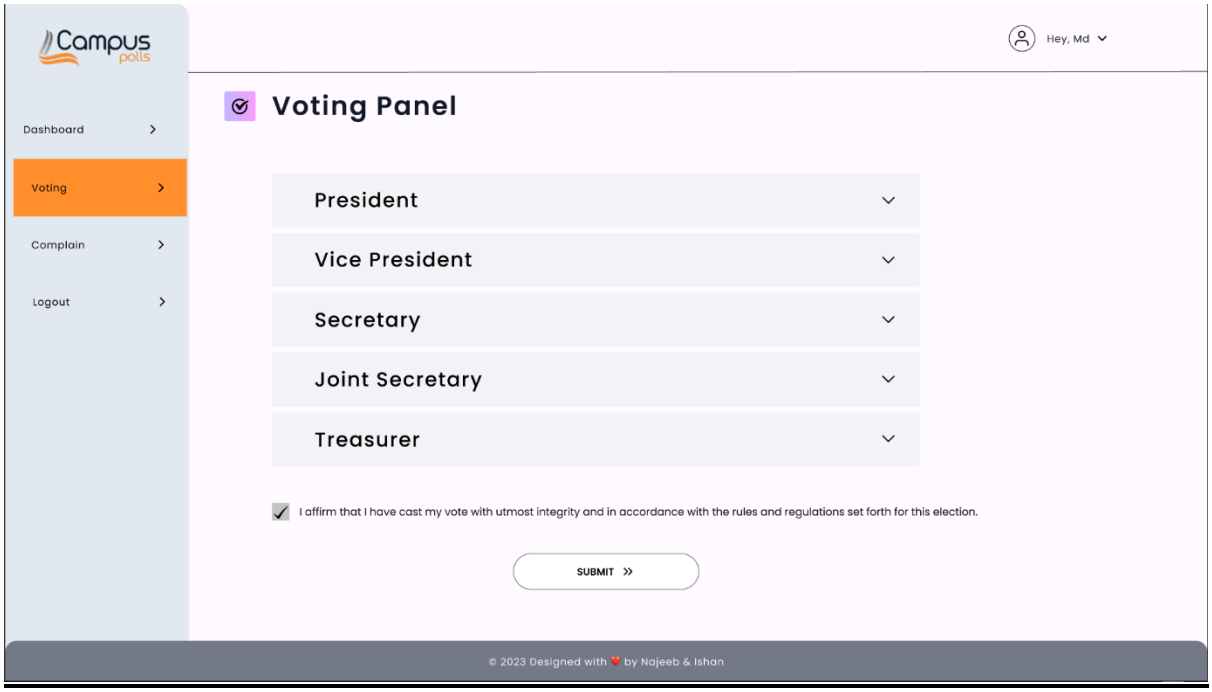
Pic - 17


Campus polls
Hey, Md
Dashboard
Voting
Complain
Logout
Voting Panel
President
Vice President
Secretary
Joint Secretary
Treasurer
I affirm that I have cast my vote with utmost integrity and in accordance with the rules and regulations set forth for this election.
SUBMIT
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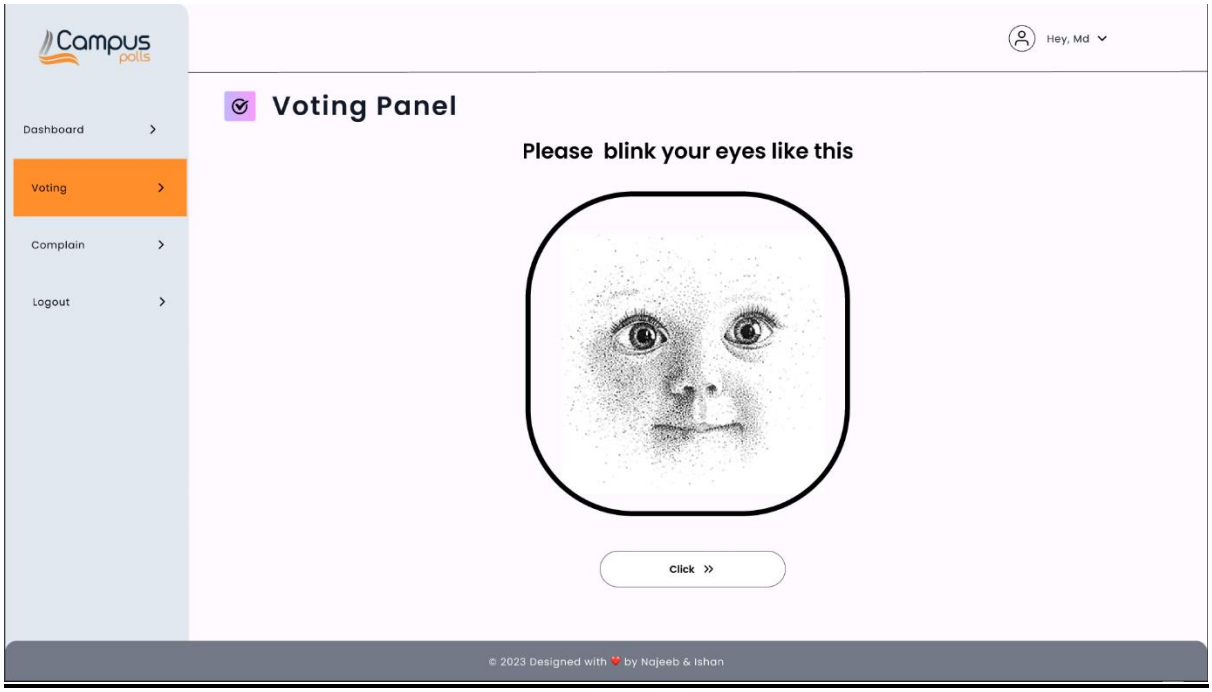
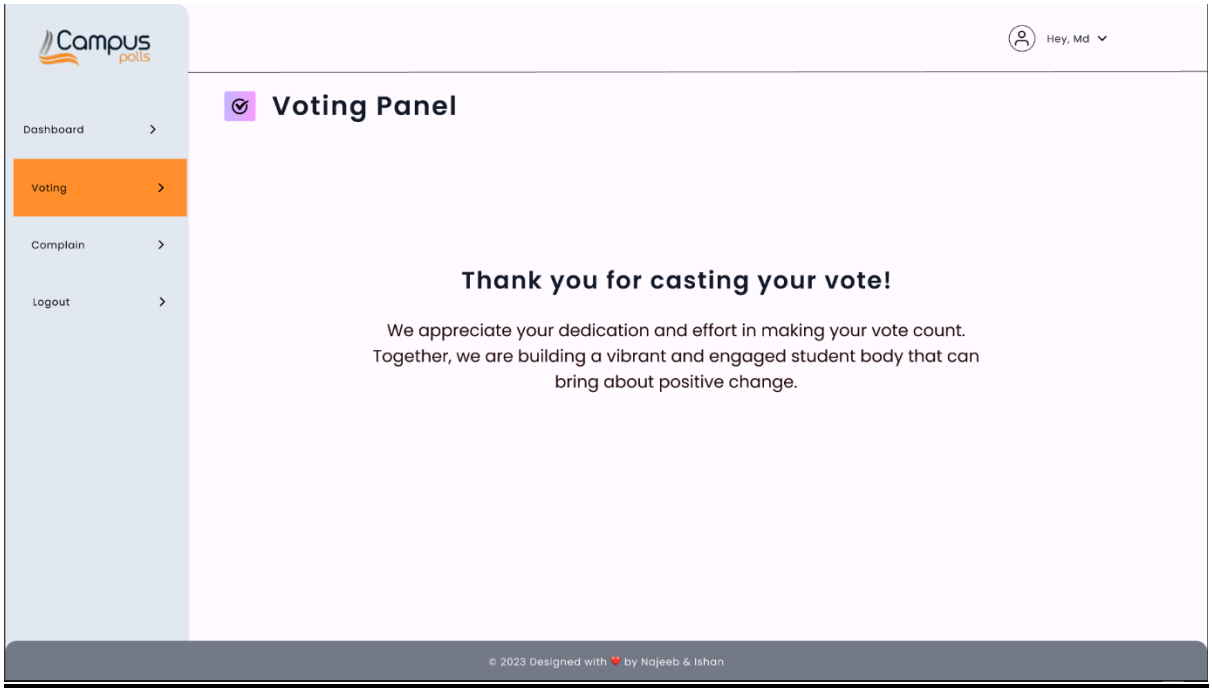
Pic - 18

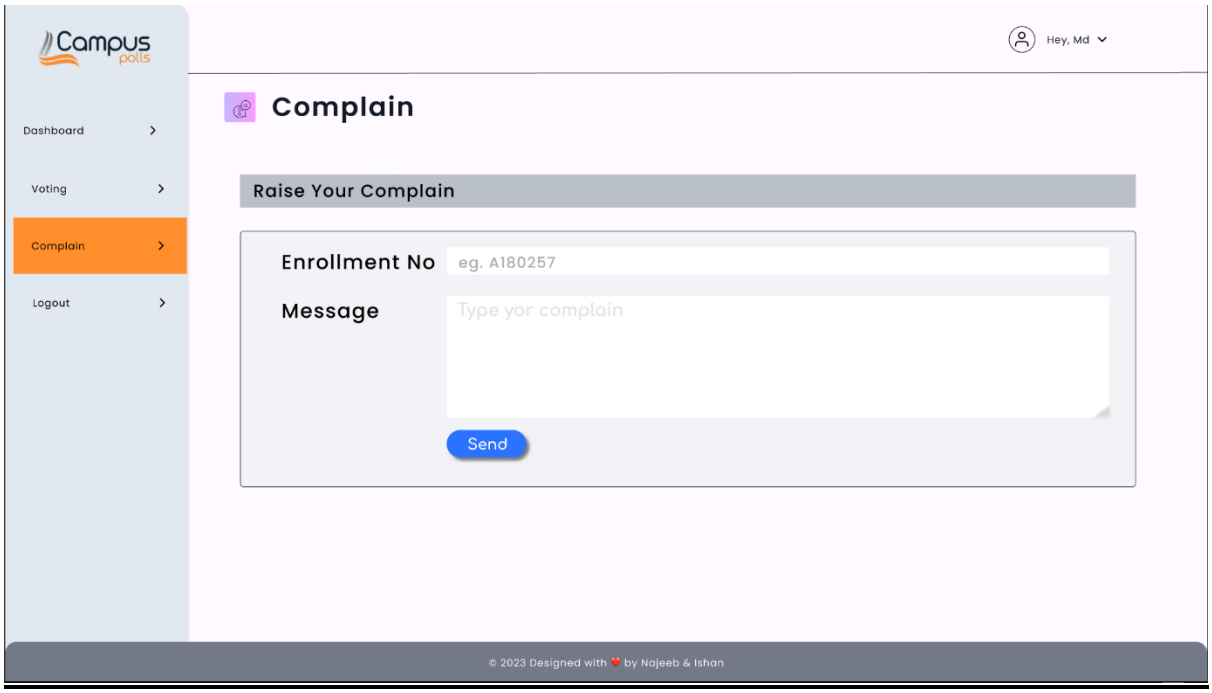

Campus polls
Hey, Md
Dashboard
Voting
Complain
Logout
Voting Panel
Please blink your eyes like this
Click
© 2023 Designed with ❤ by Najeeb & Ishan

Pic - 19

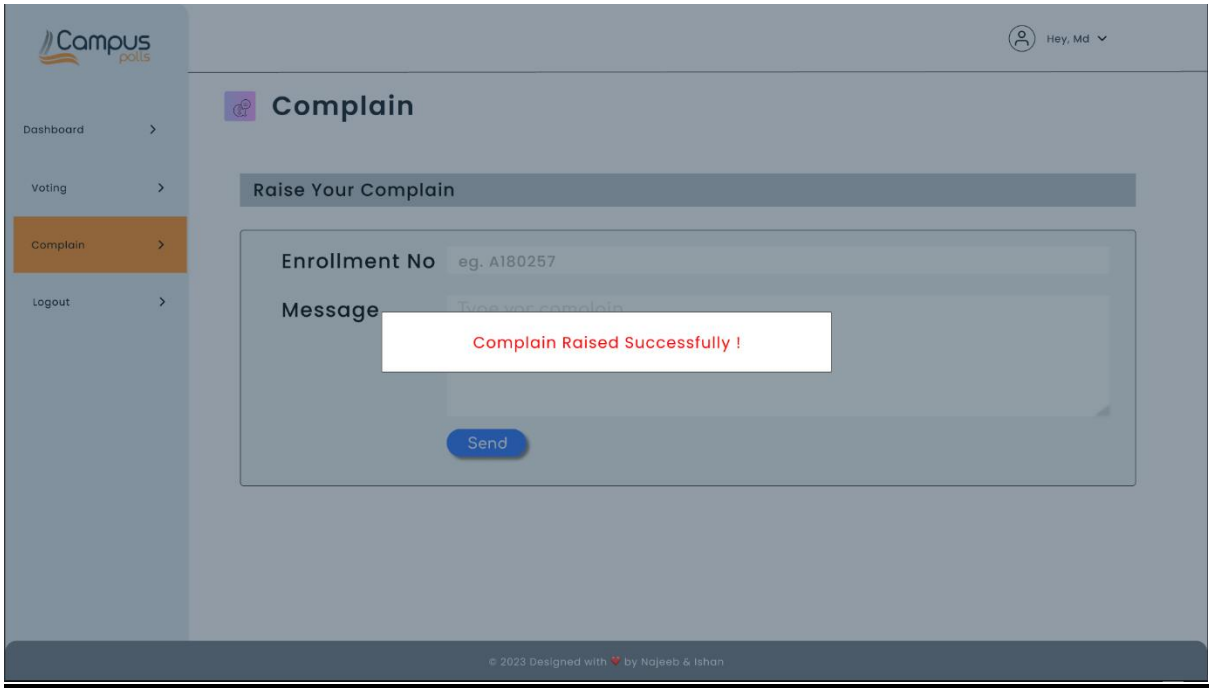


Pic - 20

- **Complain** – User can raise their complain here.



Pic - 21


Campus polls
Hey, Md
Dashboard
Voting
Complain
Logout
Complain
Raise Your Complain
Enrollment No
eg. A180257
Message
Complain Raised Successfully !
Send
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Pic - 22

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SUMMARY

An online voting system is a digital platform that has the capability to revolutionize the way people participate in elections and enhance the democratic process. By providing a convenient and accessible means of voting, it can potentially increase voter turnout and engage a wider range of citizens in the decision-making process. However, the implementation of such a system must tackle numerous challenges to guarantee the security, privacy, and integrity of the voting process. Robust measures, such as encryption, authentication, and secure data storage, would be necessary to prevent unauthorized access and tampering. Additionally, comprehensive user verification mechanisms and auditing systems would need to be implemented to ensure the accuracy and legitimacy of the votes. Striking a balance between convenience and security would be crucial to build trust in an online voting system and ensure its successful adoption.

Overall, an online voting system has the potential to increase voter participation and make the democratic process more inclusive.