DARUNNAJAH VOTE SYSTEM APPLICATION DESIGN USING PHP PROGRAMMING LANGUAGE

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ABSTRACT

Voting is the most important part of choosing leaders in an organization or institution, especially for those of us who use a democratic system. The election of organizational leaders in Darunnajah is still carried out conventionally, elections still use paper to select organizational leaders which is carried out by recording and counting the name or picture of one of the candidates. Creating the Darunnajah Vote System in the form of a web application for the election of organizational leaders in the Darunnajah environment can speed up the voting process. The web application is built using PHP and MySQL with features of user management, class management, candidate management, and E-Voting. This study aims to build an e-voting system that is expected to provide voting results quickly, and accurately and can be monitored in real-time during the implementation of the leader election. This system development method uses a web application-based SDLC Waterfall model. Testing using the black box method, every feature contained in the Darunnajah Vote System application, namely the Admin Login feature, User Login, User Voting, and User Data Processing features runs normally and functions properly.

Keywords: Darunnajah, Database, PHP, Vote System.

1. INTRODUCTION

Voting is a method that helps determine the decision-making process (Shrestha & Yang, 2019), (Pierce & Lau, 2019). From the small community level to the national level, they use their voices to gather global aspirations and then find solutions that they think can solve these problems (Zollinger et al., 2021). In democracies, voting is used as a decisive tool to make very important decisions and have a major impact on the country, such as regional elections or presidential elections (Gherghina & Silagadze, 2020). Therefore, voting requires rules and procedures that better ensure security and how to conduct the results of the vote count honestly and transparently (Haryati et al., 2014), (Chouhan & Arora, 2023).

The Industrial Revolution 4.0 has brought very rapid technological advances (Popkova et al., 2019). One of the technological media that is now widely used by the people of Indonesia is the use of smartphones (Ananto & Ningsih, 2020). One of the proofs is that in today's digital era, the influence and use of the internet has become a necessity, especially in Indonesia, internet users in Indonesia at the beginning of 2023 will reach 215.63 million people

(Panggabean et al., 2022), (Kadam et al., 2019). In current conditions, there are still many organizations that use conventional voting, which in the process takes a long time (Ananto & Ningsih, 2020). Meanwhile, if you have used electronic voting, the election can take place quickly and produce an accurate vote count (Widayanti et al., 2021). So this e-voting or vote system is very suitable for use in the current era (Kamil et al., 2021), (Lahane et al., 2020).

Referring to previous research: on Web-Based E-Voting Design at the Karang Taruna Organization of Kedurus Village (Nabilah & Amrozi, 2019), (Lopes et al., 2019). This research focuses on electronic voting applications in the election of the Regent of Karang Taruna Kedurus (Sensuse et al., 2020), (Agate et al., 2021), (Tacs & Tanriöver, 2020). The application uses PHP as the scripting language and MySQL as the database server without security credentials for data and potential voters (Aniche et al., 2021), (Sharma et al., 2020). It also creates opportunities to develop and implement electronic voting application systems using mobile devices/personal computers that run on the web and have better security. And electronic voting itself is expected to be an option in future elections (Rathee et al., 2021), (Dahanayake, 2023). The implementation of electronic voting itself has been implemented in many countries with different models (Krimmer & i Esteve, 2022), (Adeshina & Ojo, 2020). Models of implementing electronic voting vary, for example using personal data or smart cards (Oluwatobi et al., 2020), (Rikwith et al., 2021). Web applications built using PHP and MySQL with features of managing user management, class management, candidate management and voting results (Electronic voting) must provide accurate, fast and accurate voting results (Çabuk et al., 2020), (Zaghloul et al., 2021).

Some previous research on voting apps, related to this research is on Web-Based E-Voting Design at the Karang Taruna Organization of Kedurus Village, E-Voting Application Design for Mobile-Based Student Council President Election (Kurniawan, 2023), Fingerprint-Based E-Voting Application Design (Masnur et al., 2023), Design and Making E-Voting for the Election of Rt and RW Chairmen in Green View Regency Malang Housing (Wincoko; Anas Firman; Redy Trisantoso, 2023) and E-Voting Website Design Using Smart Contracts on Polygon Blockchain (Budi et al., 2023).

2. THEORY

Design is the drawing, planning, and sketching or arrangement of several separate elements into a whole and functioning unit (Rahmadani et al., 2020). So the definition of design is the activity of translating the results of the analysis into a software package then creating the system or improving the existing system (Dwi Lestari et al., 2020). An application is a program developed to meet the needs of users in carrying out certain jobs (Rahmanto et al., 2020), (Rauf & Prastowo, 2021). It's the same with the principle of algorithms. Algorithm is a step that is always used in everyday life. Unconsciously algorithms are also used in the daily routine from waking up to going back to sleep (Panggabean, 2021). Website or abbreviated as web, can be interpreted as a set of pages consisting of several pages that contain information in the form of digital data in the form of text, images, video, audio, and other animations provided through an internet connection line (Keselman et al., 2019).

XAMPP is an opensource-based PHP and MySOL package, which can be used as a PHP-based application development tool. XAMPP combines several different software packages into one package. XAMPP version 3.2.2 includes the following bundled packages: Apache HTTPD, mod autoindex color module, FileZilla FTP Server, Mercury Mail Transport Agent,OpenSSL, SOLite, The Webalizer, msmtp (a send mail compitable SMTP client), MySOL, PrimeBase XT Stprage Engine for MySOL, PHP, eAccelerator extension, Xdebug extension, Ming extension, PDFIib Lite extension, PEAR, phpMyAdmin, FPDF Library, ADOdb, Perl, CPAN, PPM, mod perl, Apache: ASP (Muhamad Abor, 2019).

HypertextPreprocessor or PHP for short is a programming language used to create dynamic webs, although it can also be used to create other programs. Of course, PHP programming language is different from HTML, in PHP Script or code that is created cannot be displayed on the page or website face just like that, but must be processed first by the webserver and then displayed in the form of a website page in a webbrowser. PHP scripts can also be inserted in HTML and PHP scripts always begin with < and end with >. Database management that is usually used for PHP programming such as MySOL, but there are also those who use Oracle, Microsoft Access, and others. PHP is also called a server-side scripting programming language, because PHP is processed on a server computer.

MySQL was first pioneered by a database programmer named Michael Widenius. MySQL database server is an RDBMS (Relational Database Anagement System) that can handle large volumes of data, however, it does not demand large resources (Nor Ramadha, 2022). MySQL is the most popular database among other databases. MySQL is a database program that is capable of sending and receiving data very quickly and multiuser. MySQL has 2 forms of licenses, namely freesoftware and shareware (Mubarok, 2010).

PhpMyAdmin is an application/free software (opensource) written in PHP programming language that is used to handle MySQL database administration over local networks and the internet. phpMyAdmin supports various MySQL operations, including managing databases, tables, fields, relations, indexes, users, permissions, and others. The difference between phpMyAdmin and MySQL lies in the function. PhpMyAdmin is a tool to make it easier to operate a MySQL database, while MySQL is a database where data is stored. PhpMyAdmin itself is used as a tool to process / manage data on MySQL (Hartiwati, 2022).

Unified Modeling Language or often abbreviated as UML is a method used in object-oriented analysis and object-oriented design (OOAD &; D) that emerged around the late 1980s and early 1990s. UML is a combination of the Booch, Rumbaugh (OMT) and Jacobson methods. However, UML can cover a wider range when compared to OOAD. In the course of UML development, process standardization was carried out with OMG (Object Management Group) to be able to make UML a standard modeling language in the future. We can see that currently many groups use this UML. So UML was created to make it easier for system developers to discuss with an easy-to-understand modeling language. UML is used to model systems and various types of software by using object-oriented concepts. And also to create a modeling language that can be understood and used by both humans and machines (Purnasari et al., 2022).

3. METHOD

In The method used in writing this is SDLC (System Development Life Cycle). The stages in research as shown in figure 1. consist of: first; Needs analysis, second; interface and database design, third; Website Development and Fourth Website Feature Testing.

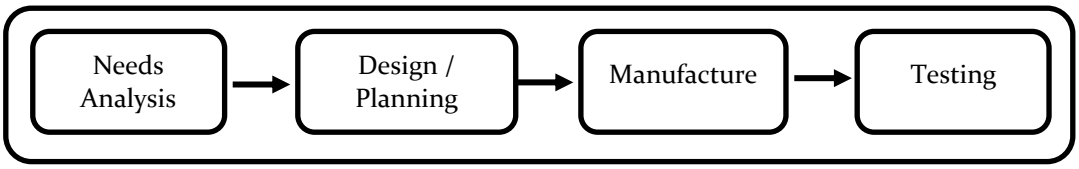

Figure 1. Stages of Making Darunnajah Vote System

3.1 Needs Analysis

The needs needed in making the website-based Darunnajah vote system application are divided into 2 parts, namely:

a) Functional Needs: Collect voting information, the leadership system of the Darunnajah Organization, and the processes contained therein. The information is obtained from articles, journals, news, websites and interviews of sources
b) Nonfunctional needs: hardware and software needs as a tool for making Darunnajah vote system application based on the website. The hardware used in creating the website is Notebook ASUSX540LJ and the software used is Microsoft Windows 10 Pro 64-bit, XAMPP, Visual Studio Code and Chrome Web Browser.

3.2 Design

The design stage uses the design of the structure or flow of the website-based Darunnajah vote system which is illustrated by designing the navigation structure, designing UML (Unified Modeling Language) diagrams and designing the appearance of the website-based Darunnajah vote system.

a) Navigation Structure Design

   Navigation structure is the structure or flow of a system that is designed from several different areas and can help organize all elements of website creation (Vu et al., 2021). The navigation structure in making an Darunnajah vote system website consists of; Admin navigation structure and user navigation structure. Figure 2, Admin navigation structure on the Darunnajah vote system website is intended for admins who access the Darunnajah vote system website who have an admin account on the Darunnajah vote system website. Admins can process user data, process group or class data, process candidate data and see the results of the election in quickcount.

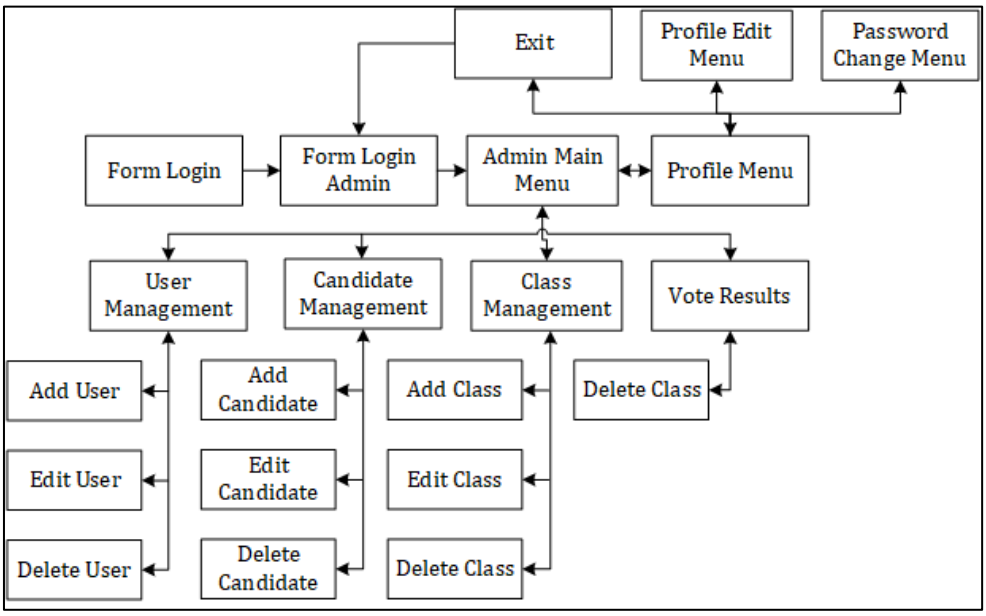

Figure 2. Admin Navigation Structure

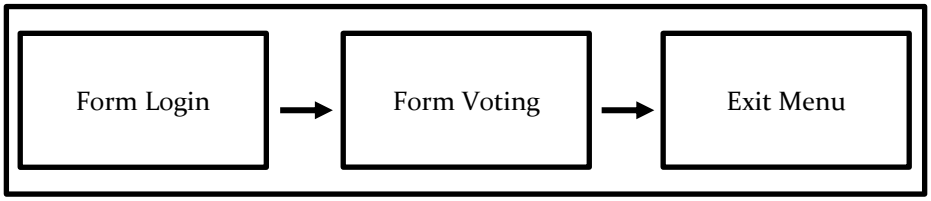

Figure 3. User Navigation Structure

User navigation structure on the Darunnajah vote system website as shown in figure 3. is intended for users who access the Darunnajah vote system website who already have an account or voter participants registered with the institution on the E-Voting website. The features of the daraunnajah vote system are Login Menu and Voting.

b) UML diagram design

E-Voting website design using Unified Modeling Language (UML). UML used in E-Voting website design is usecase diagram, activity diagram and class diagram.

1) Use Case Diagram

Usecase diagrams serve to explain the sequence of activities carried out by actors and systems to achieve a certain goal (Beimel & Kedmi-Shahar, 2019), (Iqbal et al., 2020). Figure 4 is a usecasediagram of an admin actor. Admins can see the Login form contained in the layout of the Darunnajah vote system website, see the features on the admin homepage. The manage data feature can be accessed by logging in as a registered admin first.

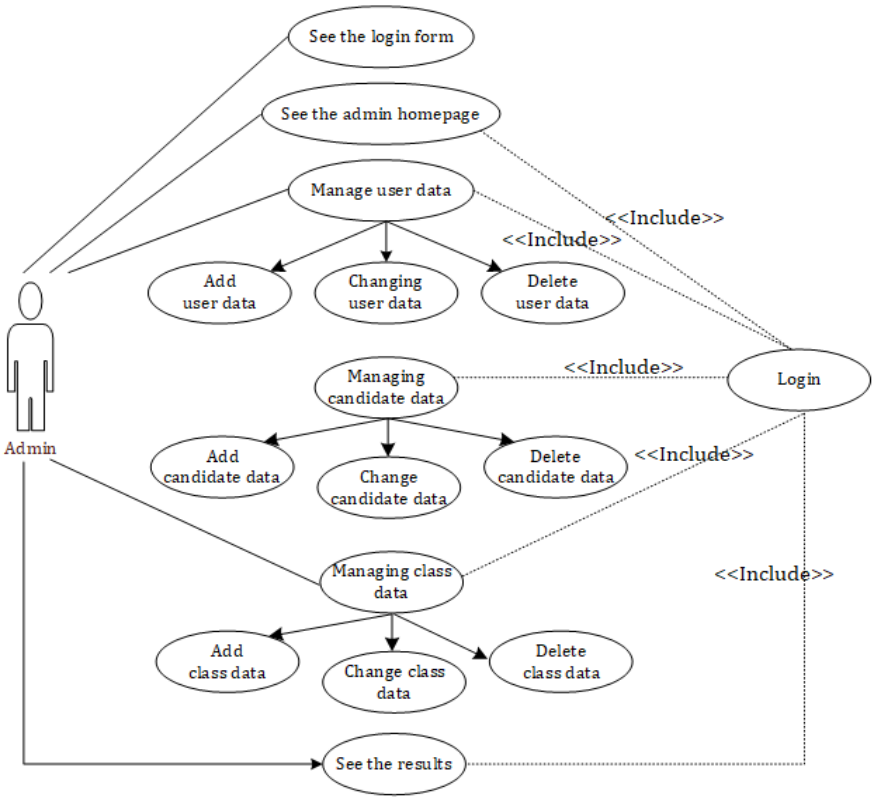

Figure 4. Use Case Diagram Admin

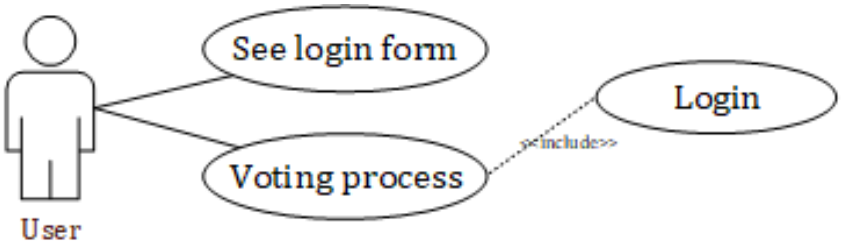

Figure 5. Use Case Diagram User

Figure 5 is a user usecasediagramactor. Users can see the Login form contained in the layout of the Darunnajah vote system website. The voting feature can be accessed by logging in as a registered user first.

2) Activity Diagram

Activity Diagram is a diagram that shows the flow from one activity to another in a system (Jacobson & Booch, 2021). Activity Diagram is also used to define or group the view flow of the system (Kossiakoff et al., 2020). The activities described are data processing as admin and voting. Figure 6. Is an admin activity that starts from admin must log in first. If the admin is logged in, the admin will be directed to the admin homepage which contains data management menus such as user management, candidate management, class management to process data in the website database and can also see the results of voting results.

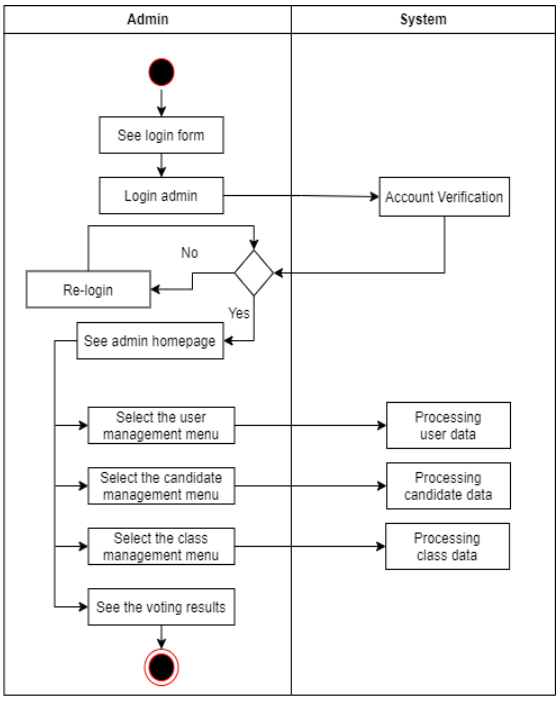

Figure 6. Activity Diagram Admin

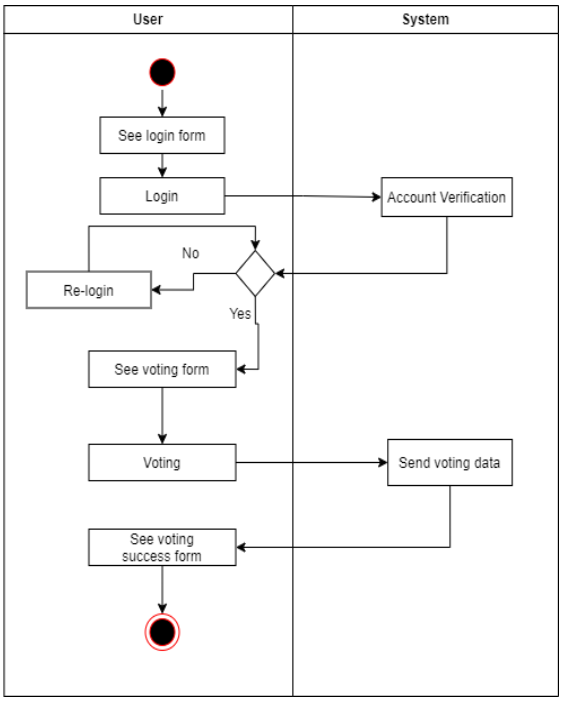

Figure 7. Activity Diagram Voting

Figure 6 is an admin activity that starts from the admin must log in first. If the admin has logged in, the admin will be directed to the admin homepage which contains data management menus such as user management, candidate management, class management to process data in the website database and can also see the results of voting results. Figure 7 is a voting activity that starts from the user who accesses the login start page, then if the client has logged in, then the user can access the voting page to vote. To log in, users only need an identity number and date of birth as personal credentials that only that person should know as a condition of login.

3.3 Manufacture

The design of the website-based Darunnajah Vote System application is implemented into the native PHP programming language and the database used is MySQL (Odighi et al., 2020), (Kumar et al., 2021). Creating the Front End of the E-Voting website uses the Visual Studio Code text editor to produce various displays according to the form and page.

3.4 Testing

Testing focuses on software in a logical and functional way and ensures that all parts are tested. This is done to minimize errors and ensure the output produced as desired.

4. RESULTS AND DISCUSSION

4.1 Front End Voting Display (User)

The front end display of Darunnajah Vote System consists of; Front End Login View, Candidate for Chairman view, and Successful voting display as shown in figure 9.

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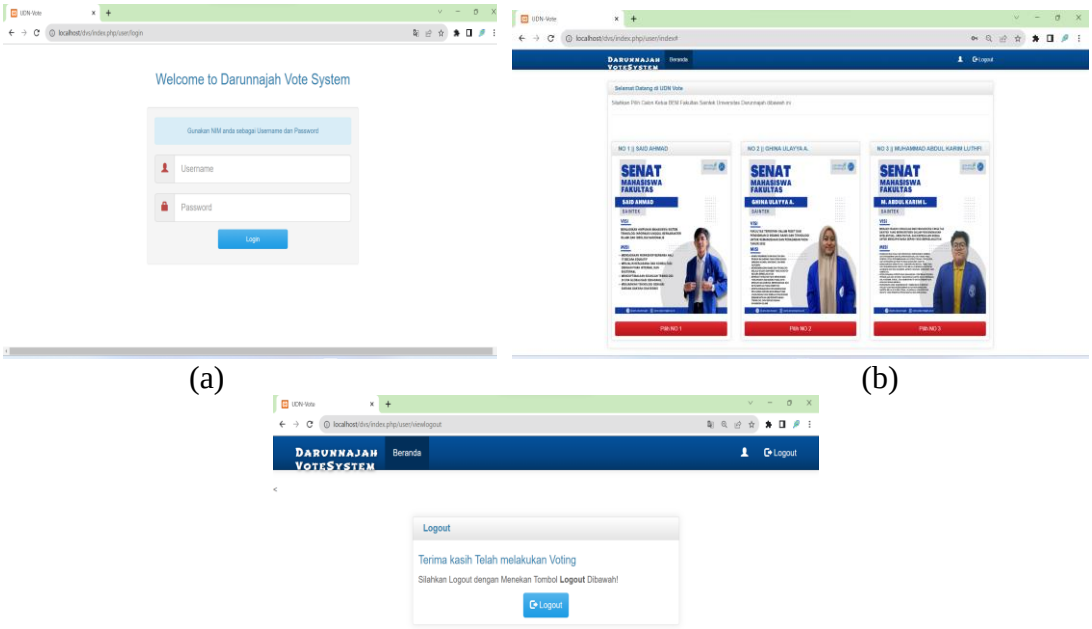


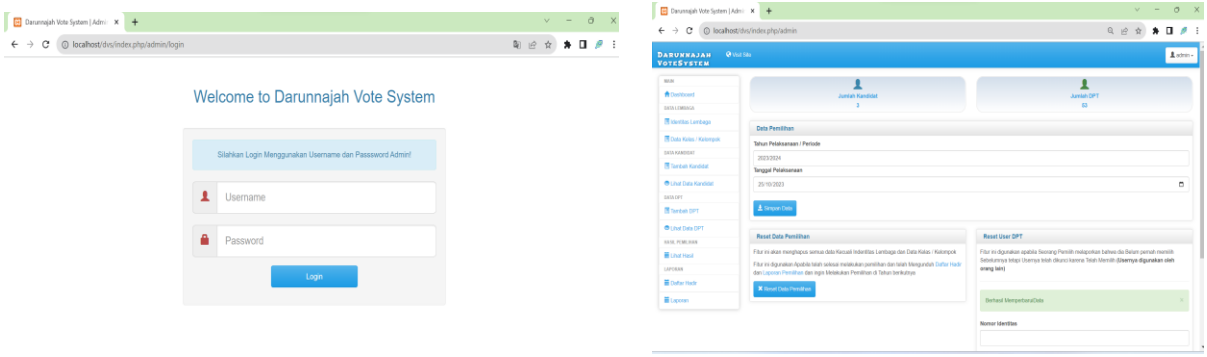
(a) (b)

(c)

Figure 9. Front End User View (a) Login, (b) Display of candidates for chairman, (c) Successful voting display

4.2 Front End Admin View

The Front End Admin view consists of; Login page as the user's login gateway as an admin. Admin requires a Username and Password that has been registered on the Darunnajah Vote System application. After successfully logging in as an admin, the admin home page will appear as below which contains menus for processing management data and menus that display the results of votes that have been submitted by users who vote. The admin front end view can be seen in figure 10.



(a) (b)

Figure 10. Front End Admin View (a) Login, (b) Dashboard

4.3 View of management data and sound results

The management data view consists of; User management, classroom management, candidate management and vote results. On the user management menu, the admin can add participants or users to give permission to participate in the election, in this case if the user is not in the E-Voting database then the user cannot log in to vote. The management data processing page is shown in figure 11.

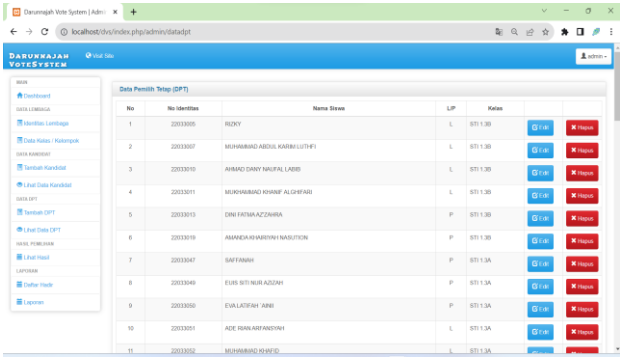
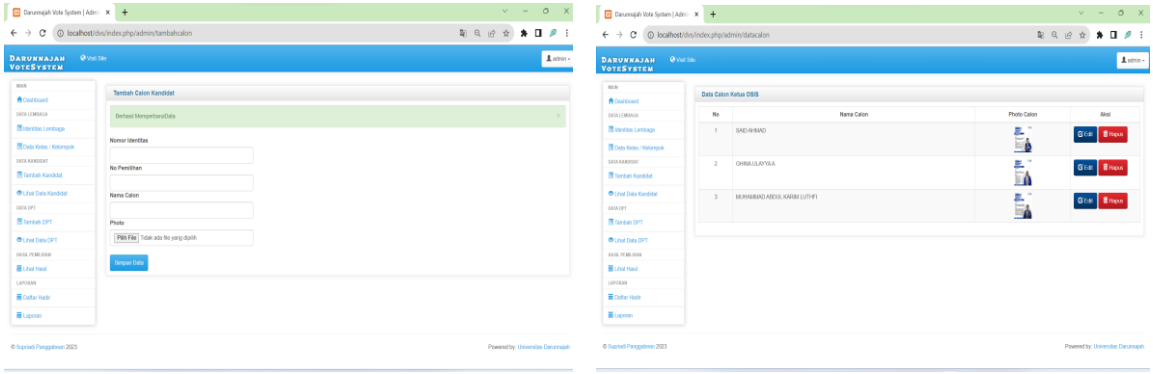


Figure 11. View of management data

On the candidate management menu, admins can add candidates who are running for organizational leaders. Figure 12 presents candidate management.



(a) (b)

Figure 12. Presents Candidate Management (a) Input Candidate, (b) View and edit Candidate

Class management menu, admins can add classes according to existing classes or groupings and put participants or users into those classes. Figure 13 presents classroom management.

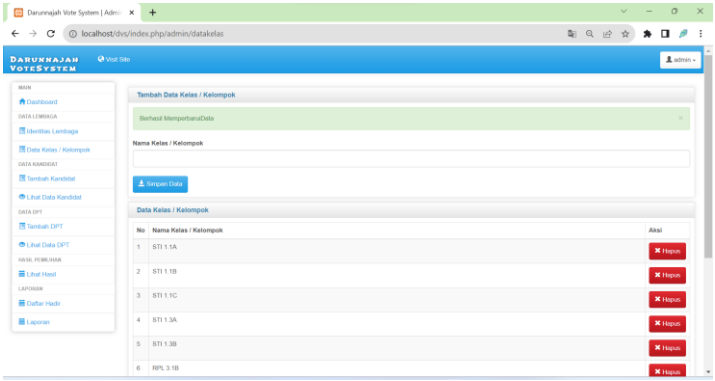


Figure 13. View of Presents Classroom Management

The vote acquisition page will display the vote data stored in the database after a user has voted. Figure 14 presents the results of the votes.

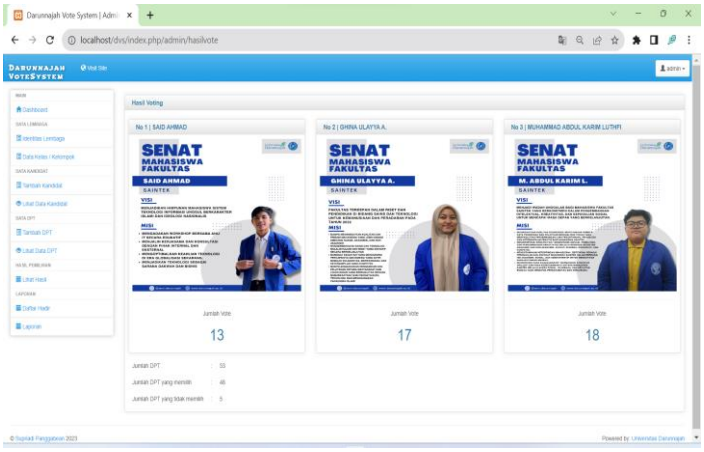


Figure 14. View of Presents Classroom Management

4.4 Test Results

The results of testing website Darunnajah Vote System application features using blackboxes are shown in Table 1.

Table 1. Test Result

Input Data User	Expected Result	Result	Conclusion
NIM : 2303030006 Pasword : ********	Can sign in on the login page	Can sign in on the login page	succeed
2303030006 Vote	Candidate A's Votes Increase	Candidate A's Votes Increase	succeed
NIM data, student name, gender, class filled in completely	Data increments to the Database and appears on the User Management page	Data increments to the Database and appears on the User Management page	succeed
NIS Data, Student Name, Gender, Class Not filled in completely	A notification appears "All Forms Must Be Filled" and data is not saved	A notification appears "All Forms Must Be Filled" and data is not saved	succeed
Delete 1 User data	Data is deleted from the database and does not appear on the User Management page	Data is deleted from the database and does not appear on the User Management page	succeed
Earned Data entered from the voting process	The data is saved into a database and displays the number of votes, the number of voters, the number of unowned and the total voters	The data is saved into a database and displays the number of votes, the number of voters, the number of unowned and the total voters	succeed

To avoid double vote fraud, the Darunnajah Vote System application also makes arrangements that one user can only vote for candidates once. After testing the user enters the system twice, a display or notification will appear that cannot enter as shown in the following figure 15.

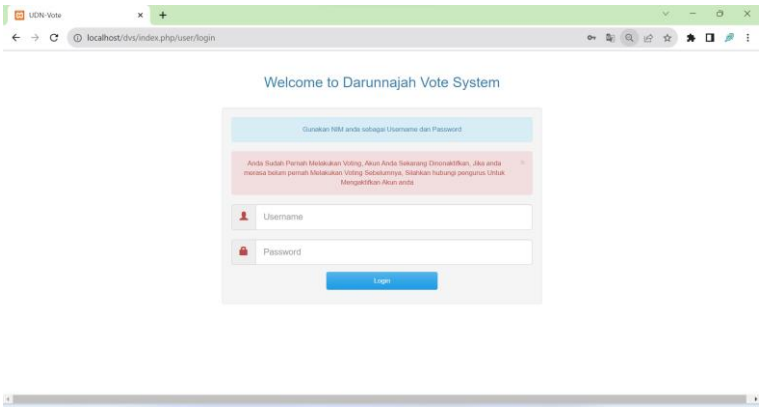


Figure 15. View of Notification of Voted

2. CONCLUSIONS AND SUGGESTIONS

The website-based Darunnajah Vote System application has been successfully created so that it can be used and assist the leadership election process in the Darunnajah organizational institution. This application can also be used for the public for those in need. Based on the test results using the blackbox method, every feature contained in the website-based Darunnajah Vote System application, namely the User Login feature, Admin Login, User Voting, and User Data Processing features functions properly. The development of the E-Voting application can be done by adding a real count feature in the calculation of vote election results and a print report menu for documentation needs.

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