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E-Voting Application Using RSA Algorithm Method Based Prototype Android

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ABSTRACT

Voting is a method of decision making. An example of the voting activity was the election of the Chair of the Communication and Information Technology Faculty (FTKI) Association at the National University which was still conducted conventionally. However, the obstacle that Occurs is that most students from each study program can not use Reviews their voting rights due to other activities. So we need a system that can Facilitate voting activities. The purpose of this research is to build an Android mobile application-based voting system to Facilitate students to be Able to vote only by using an Android smartphone connected to a particular Internet. For the data security, the RSA algorithm is used. From the system testing Carried out using the Android system version 9.0 (Pie) and the prototype method aims to produce a perfect prototype for use to the public.

1. Introduction

Votingis a method of decision-making by bringing together the aspiration to obtain the best way to solve a problem. Protest voting describes voting is not only used to support a candidate or party, but can be interpreted as a form of protest. But in this article, the protest is not delivered through voting but through signs, symbols, or voice mail messages in [1]. E-voting application is an application that is able to facilitate the course of elections [2]. The growing adoption of e-voting systems and the growing use of e-voting in the election in the network indicated that the community has been able to believe terhadapat implementation of e-voting, using information technology to improve the electoral process with e-voting [3]. However, implementation of e-voting considered still many shortcomings such as the number of logistical preparation on voting activity, the data transparanya not even to the students who could not give a vote due to lack of time [4]. According to Slamet Risnanto research and testing, E-Voting using SMS technology made simple and relatively low cost so that users can dipermudahkan both participants and implementing voting ballot [5]. Especially in a country that is a democracy, voting is used to take the decision of the State [6]. Based on the results of the implementation, e-voting has been running as expected on Android smarthphone, ranging from Android version 6.0 (marshmallow). to Android version 9.0 (Pie) [7]. Data transparanya not even to the students who could not give a vote due to lack of time [4]. According to Slamet Risnanto research and testing, E-Voting using SMS technology made simple and relatively low cost so that users can dipermudahkan both participants and implementing voting ballot [5]. Especially in a country that is a democracy, voting is used to take the decision of the State [6]. Based on the results of the implementation, e-voting has been running as expected on Android smarthphone, ranging from Android version 6.0 (marshmallow). to Android version 9.0 (Pie) [7]. Data transparanya not even to the students who could not give a vote due to lack of time [4]. According to Slamet Risnanto research and testing, E-Voting using SMS technology made simple and relatively low cost so that users can dipermudahkan both participants and implementing voting ballot [5]. Especially in a country that is a democracy, voting is used to take the decision of

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2. Method

A. Research methods

Methods used in the preparation of this research using a prototype method.

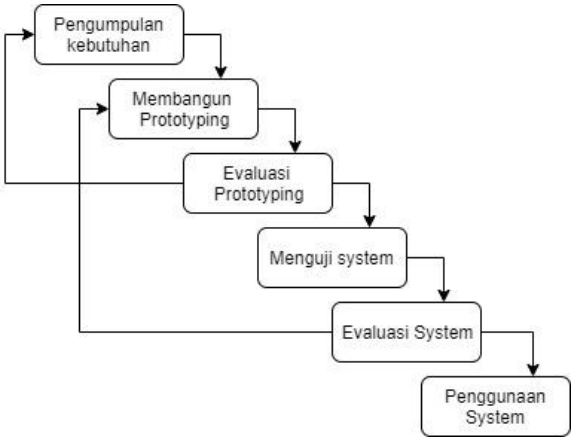

Fig 1. Flowchart Method Prototype

a) Collecting Supplies
Analyzing what needs to create a system that will be created.
b) build Prototyping
Creating a prototype design.
c) evaluation Prototyping
Evaluating the results of the prototype manufacture
d) System test
Testing the application the calculation results and look for bugs of the system.
e) evaluation System
Evaluating a system already tested whether it is ready for use.
f) Use of System
The system mengguanakan to the committee of selection of candidates kahim and coordination with the committee.

B. RSA algorithm

The use of public key cryptography algorithm ever made, the most popular algorithm is the RSA algorithm [9] It so if the implementation of the e-voting, publickey and private key is formed by a unique combination of key algorithms, automatic bit length will be greater, it will make RSA encryption will be stronger minimize the hackers to break into this algorithm [10].

C. Use Case Diagram

Use Case Diagram in this application uses three users who have access rights to each are:

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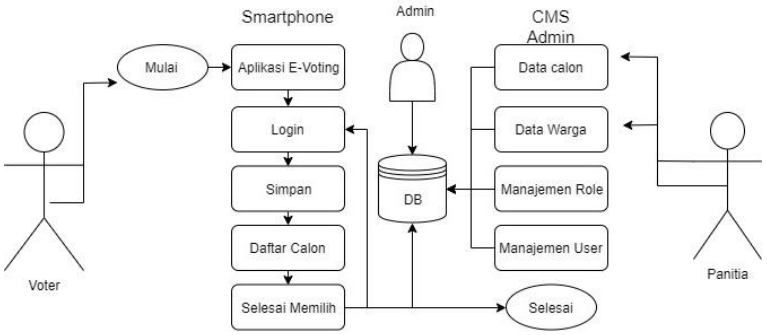

Fig 2. Use Case Diagram

a) Admin
Admin is the user who can log on the web to access all of the applications.
b) Committee
The committee is that users can only access the data of candidates and citizens to input the data of candidates and voters.
c) voter
The voter is a voter who will use the access via smartphones.

3. Results and Discussion

A. analysis Software

In this study, the authors use a smartphone device, software and hardware, as follows:

Table 1.
Smartphone specifications

Andorid smartphone
Redmi Xiaomi Note 8 Pro
screen 6.53
6 Gb Ram
Internal 64 GB
Android Pie 9

Table 2.
Specifications Software and Hardware

Software	Hardware
Android Studio	Lenovo Z50
php MySql	AMD FX-7500
Xampp	AMD Radeon R7
	Ram 8 Gb
	Windows 10 Pro 64 bit

B. Design Process Design Applications

At this stage the creativity of the author to specify the desired destination is in need, because in this process is the design process to form the e-voting system. Designing the system by referring to the documentation needs of voters. The output of this stage is the application design follows the design:

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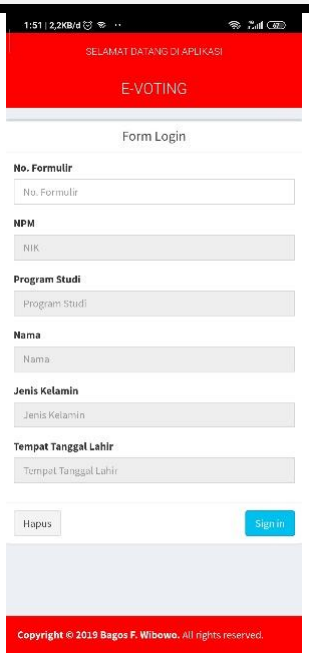

Fig 3. Display Menu Login

1) menu Login

From Figure 3 is described to fill form number to the voters to be at a later stage.

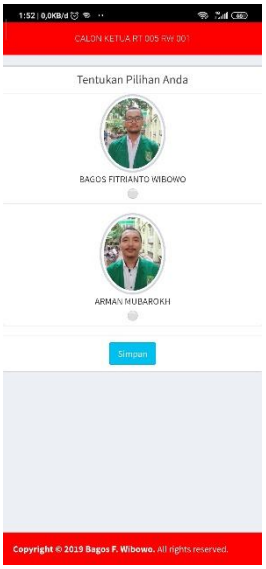

Fig 4. Display Candidates

2) Candidates display

In Figure 4 is a display application on the session in accordance with the selection of candidates for courses that are already registered as calonya.

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Fig 5. Done Display Voting

3) Voting finished

Figure 5 addressed after the voting process and then shows the display as shown on the last session of the application process of e-voting.

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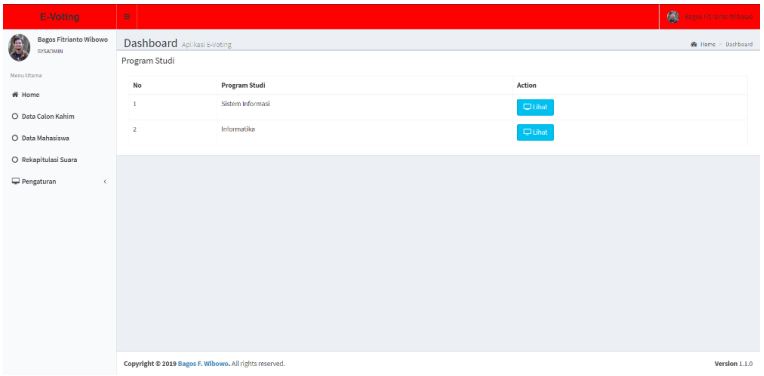

Fig 6. Display Web Home

4) web Home

Home web page E-Voting, featuring two courses that have been registered for the election of candidates kahim.

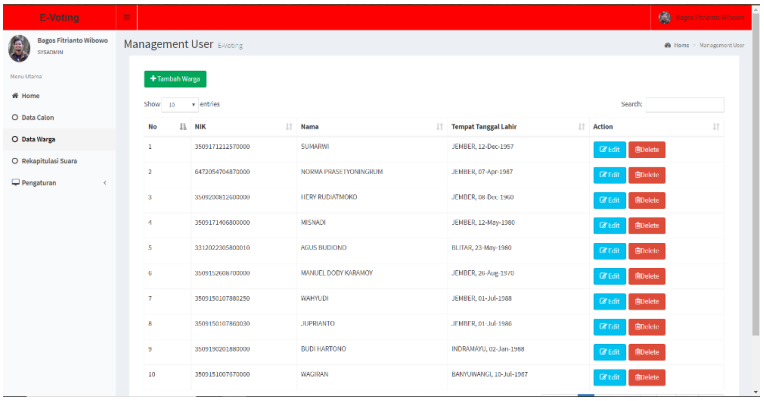

Fig 7. Data web display Students

5) Student Data

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Residents Data page displays the data as a voter or voter student.

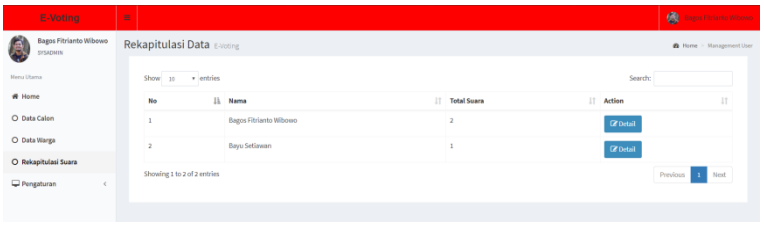

Fig 8. Vote Summary of Views

6) recapitulation Vote

Sounds recapitulation page displays the results of the voter who had receipts of its voting rights.

C. Results Testing Web Applications and E-Voting

1) application compatibility
   - Xiaomi redmi note 8 pro with a screen of 6.53 inches screen android version 9.0 (Pie) feature runs as a function to display the appropriate icon and a successful outcome.
   - Asus Zenfone Maxpro m1 with screen 6:25 inches android version 9.0 (Pie) feature runs as a function to display the appropriate icon and a successful outcome.
   - Xiaomi redmi 5A with 5.0 inches screen android version 7.0 (nougat) feature runs as a function icon display disproportionate but a successful outcome.
   - Xiaomi redmi note 7 with 6.0 inches screen android version 8.0 (Oreo) feature runs as a function icon display is quite proportional and successful outcome.
2) Data Number of Students

   For the student data as a voter of the Faculty of Information and Communication Technology (FTKI) used totaling 1766 students divided from 1035 of 731 courses of informatics and information systems courses.
3) Testing Results E-Voting

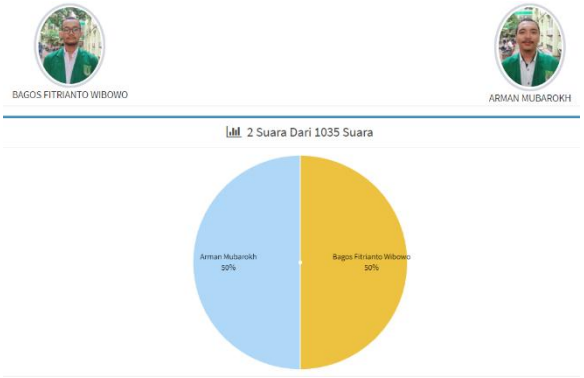

Fig 9. Display voting results Prodi Informatics

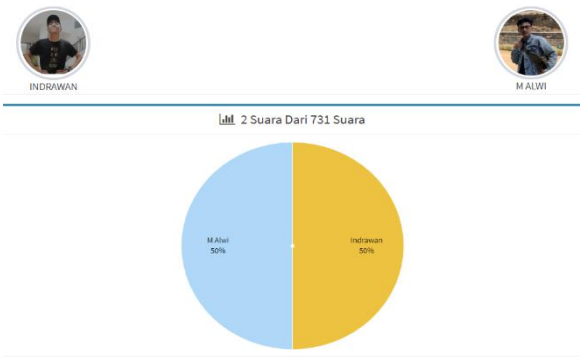

Fig 10. Display Information System Prodi voting results

From Figure 9 and 10 are the results of voting 4 students are divided on two students of informatics and 2 student information system.

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4. Conclusion

Based on the results of research and testing this it can be concluded:

a. By implementing E-Voting will accelerate the process of voting in the election of Chairman of the Association.
b. E-voting application, it is slightly reduce paper usage.
c. Eliminating abstentions.
d. The accuracy of the results of the E-Voting is to make students more confidence in the system's E-Voting.

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