

# Decision Support System for the Selection of the Best Political Figure through social media using the Analytical Hierarchy Process (AHP) Method

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**Abstract**—Political communication can be interpreted as a way of influencing power, policy, ideology with the aim of establishing a dialogue between political actors and citizens. Social media can be used to build more effective political communication. In political campaigns social media can also influence community groups. The problem that occurs today is that political figures often create political content on social media to seek political support. But his supporters find it difficult to determine which political figures he is popular with and interested in. This research provides solutions to provide an overview of the selection of the best political figures. The purpose of this study is to determine the criteria for selecting the best political figures in Indonesia in the decision support system. The method used in this decision support system is the AHP (Analytical Hierarchy Process) method. The result of this study is the application of a decision support system to help political supporters determine the best political actors based on the criteria and weight of each political actor.

**Index Terms**—Political communication, decision support system, analytical hierarchy process (AHP), political actor.

## INTRODUCTION

Based on observations from several social media applications, it turns out that nowadays people often carry out communication and discussions that are not limited by space and time. Several online media are often an option for communication. Social media is an online media used by the public to support social interaction [1].

Social media is also useful for supporting the

dissemination of information and communication, and can create social networks. from various sectors of interest. With the dissemination of information on social media, the more data is stored. Data stored on social media can be in the form of text, images, videos and others [2].

Characteristics of social media are divided into several forms, the first character is the character of users who show interest in using social media and provide feedback. The second character is openness in terms of feedback from user participation in the matter of a vote, in the form of comments [14]. The third character is an interactive two-way conversation. The fourth character is the interconnectedness of social media with one another that has the ability to serve relationships between social media users through a link to the website for information sources and for other users. A person can be very different in character between the real world and the virtual world, this can be seen in the way they use social media, especially those that are looking for friends or social networks.

Based on KOMINFO data, active social media users in Indonesia have reached more than 170 million or around 68,1% of the total population of Indonesia. This proves that today's society uses social media for various purposes.

From observations on social media such as Twitter, Instagram, and Facebook through user conversations, that social media can be a place of promotion or campaign for the selected candidates.

One of the interesting things about campaigns on social media is how social media users can provide opinions or

comments on a particular topic. Searching for opinions on social media is becoming an increasingly popular way to share information. Opinions of social media users can contain judgments or views on a particular topic, so it is necessary to analyze the opinions of social media users, of course, it will be useful to find out whether the judgments contained in the opinions are good or bad, not even both.

Exclusively campaigns on social media can also affect the social aspects of society. The campaign is basically the delivery of messages from the sender to the audience. Barack Obama's 2008 US presidential campaign has often been described as the first election campaign in which the use of social media had a decisive impact. The essence of the campaign is to design a website well, flexible and dynamic through the website, "my.barackobama.com"(social media – The New Power Of Political Influence Version 1.0 Ari-Matti AuvinenCenter for European Studies) [15].



Figure-1: Social media users in Indonesia in 2022 (KOMINFO official website, 2022)

## LITERATURE REVIEW

### I. Decision Support System

Decision Support System can be defined as the process of selecting the best alternative from several alternatives systematically in order to be followed up as a way to solve problems [4] A decision support system is a computer-based system consisting of three interacting components, including a language system, a knowledge system and a problem processing system [6].

The decision support system is part of a computer-based system used for decision making in an organization or company. This system will process the data into information on the choice of a specific decision [9].

### II. Political Communication

Political communication is communication through

information technology networks, and as an effective means of establishing dialogue between various social groups, and communities changes policy and requires further reflection and description of aspects of the theory. Such a perception of the communication process not only aroused scientific interest in communication but also made communication tools used in different fields. The growth in the number and quality of communication flows through the use of cellular information technology can lead to increased competition between communicators and the emergence of new communication spaces. This can be a subject of special interest from the point of view of conflict interactions and their means of control and regulation [13].

Communication Today's politics is not only a story about rhetoric, but also discusses political symbols, politicians' body language, images of political support or vice versa about protests, boycotts or demonstrations that are outlined in the form of banners, posters, billboards. Political communication ultimately has implications for the activities or actions of a group of people who convey messages but are politically charged [15].

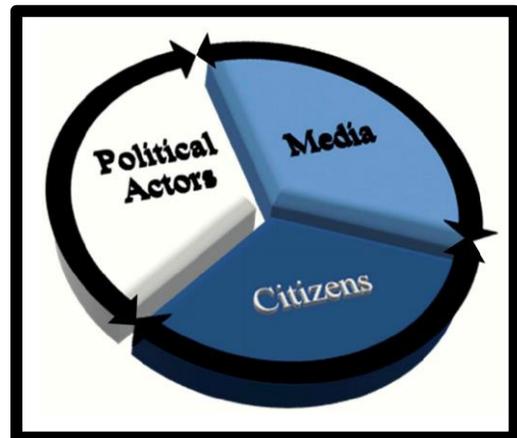


Figure-2 Political Communication Model [17]

### III. Analytical Hierarchy Process

The AHP (Analytical Hierarchy Process) method is a way to represent a complex problem in a multi-level structure of choice. These levels start from level 1 is the goal, level 2 causal factors, criteria, sub-criteria and so on until the last level of the alternative choice [10].

A decision support system (DSS) with the Analytical Hierarchy Process (AHP) method can be the solution of choice in evaluating popular and ideal political actors based on certain criteria [12].

## METHODS

AHP is a decision to describe a complex multi-factor or multi-criteria problem into a hierarchy. The working

principle of AHP is to simplify an unstructured, strategic and dynamic complex problem into parts and organize them in a hierarchy [5].

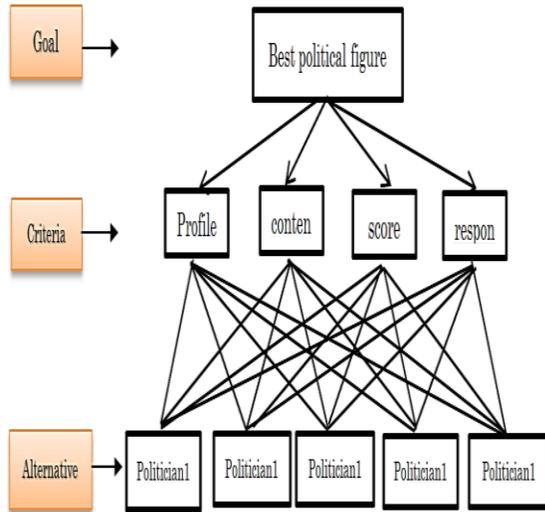


Figure-3: AHP Hierarchical Structure

Figure-3 describes the AHP Hierarchical Structure. The AHP method was chosen to build a program that can help solve problems to determine outstanding students according to established criteria [1]. The AHP is a method that is able to select to determine criteria based on predetermined criteria (Rosiska, 2018). AHP has the ability to solve multi-objective and multi-criteria problems based on a comparison of the preferences of each element in the hierarchy [9].

After creating the hierarchical structure, then displaying the sample data for the criteria for the PDIP, GOLKAR, PKS, and Democrat parties. To determine the comparison matrix, a number scale from 0-9 is used.

Figure-1 shows the number of social media users in Indonesia in 2022. This data is taken from the KOMINFO official website, 2022. Social media has also become very important in people's communication today. The presence of social media has become a new arena of public space for citizens as citizens, members of the council and also parties. A dialogical and communicative process is needed between the DPRD, the parties and the citizens they represent, so that it is hoped that critical communication will be created on the phenomenon and share issues that are developing at this time [7]. Social media can also identify users in the form of a new display model in terms of status updates, data delivery, sound and video. New things that users have not known before can be seen on social media. This is a consideration, why today, many people always use social media for personal and public interests.

We can find political figures in Indonesia on their social media accounts. Social media that are often used for political purposes are Twitter, Facebook and Instagram. Political figures often provide comments or express their opinions on

social media. People often give messages like, dislike, follow or provide reply comments. Thus, it is rather difficult for us to determine who is a political figure in Indonesia who is popular and in great demand by many people.

The purpose of this study is to determine several criteria for selecting the best political figures in Indonesia in a decision support system. The method used in designing this decision support system is the AHP (Analytical Hierarchy Process) method. The result of this research is a decision support system platform.

The research method for designing this decision support system is the SDLC (System Development Life Cycle) method. SDLC is a phased or phased approach to analyzing and building a system design using a cycle that is specific to user activities. SDLC is also a pattern taken to develop a software system, which consists of stages: analysis (analysis), design (design), implementation (implementation), and testing [8].

While the search method for selecting the best political figures uses the AHP (Analytical Hierarchy Process) method. The AHP stages are determining the hierarchical structure, determining the pair comparison matrix, determining the eigenvalues, determining the consistency value, determining the criteria value against the alternatives and calculating the Final Value matrix.

The SDLC design method is carried out in several stages, namely requirements analysis, system design, testing & implementation testing, namely conducting a feasibility test on the system to be made from system design to the function of each of its features. This feasibility test will be done with blackbox testing.

TABLE-1  
COMPARISON MATRIX

	Profile	Content	Score	Respon
PDIP	9.00	8.50	8.75	7.00
Golkar	8.75	8.40	9,00	8.50
PKS	8.60	9.00	8.50	8.00
Demokrat	8.40	8.75	8.00	8.25
	34.75	34.65	34.25	31.75

From the explanation above, it can be described again the system to be designed, can be seen in Figure 2:

1. The assessment of political figures is taken from 4 aspects, namely profile, content, score and response.
2. Political Figures as Alternatives who will later be determined as the best figures from the weights held by several political figures.
3. Determination of the best character can be determined through the Decision Support System process with the Analytical Hierarchy Process (AHP) method.

The best political figures are determined based on the

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accumulated weighting of values from highest to lowest. Outstanding students are determined based on the accumulated weighted scores from the highest to the lowest.

**TABLE-2**  
Eigenvalues

	Profile	Content	Score	Respon	Eigen value				Total	Average
Profile	5	4	3	4	0.33	0.26	0.26	0.27	1.12	0.28
Content	4	3.5	3.5	4	0.27	0.23	0.30	0.27	1.06	0.27
Score	2	3	2	3	0.50	0.19	0.17	0.20	1.07	0.27
Respon	4	5	3	4	0.27	0.32	0.26	0.27	1.12	0.28
	15	15.5	11.5	15	1.37	1.00	1.00	1.00	4.37	1.09

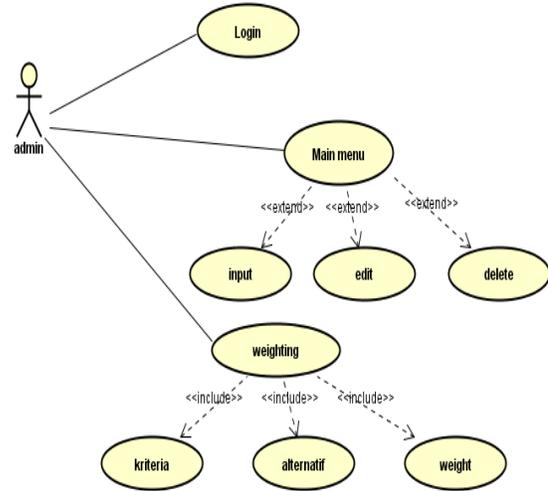
*Determining the Eigenvalues*

In table-2 above it is explained about the Eigen value that can be obtained by calculating the average value for each row. This can be seen in Table-2. In this table it is used, to obtain eigenvalues.

To obtain a value of 0.300 on the eigenvalues, which is obtained from the calculation between: Value / Accumulation of Each Row, Value = 1.00. The accumulation of each row = 1.87, then 1.00 / 1.87 the result is 0.300. The calculation method is as follows: To get a value of 0.300 on eigenvalues, obtained from calculations between: Value / Accumulation of Each Line, Value = 1.00. The accumulation of each line = 1.87, then 1.00 / 1.87 the result is 0.300.

**UML MODEL DESIGN**

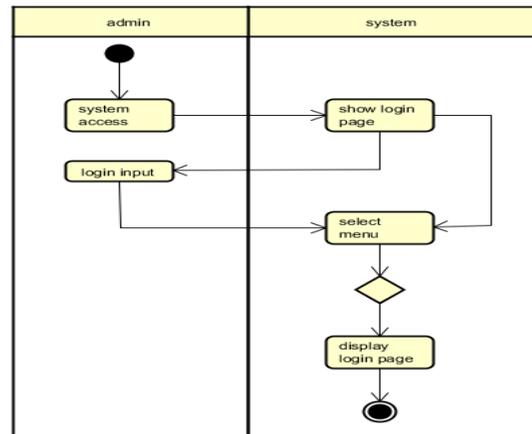
A visual data modeling diagram that describes the abstraction of an object-based system. UML(Unified Modeling Language) can be used to facilitate continuous application development [18].



**Figure-4** Use case diagram

In figure-4 it is explained how the admin actor performs the process:

1. Login
2. The main menu developed into a process:
  - a. Input
  - b. Edit
  - c. Delete
3. Weighting consists of:
  - a. Criteria
  - b. Alternative
  - c. Value weigh



**Figure-5** Activity diagram

Activity diagram is a UML diagram to model system processes sequentially and vertically. The purpose of making activity diagrams is to describe the process activities and control flow of the system in outline.

RESULTS AND DISCUSSION

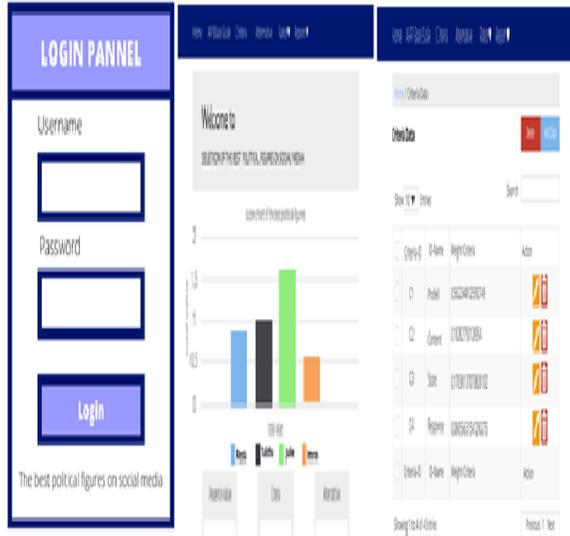


Figure-6 Interface Menu

Figure-6 is a menu display on the support system for the selection of the best political figures consisting of a login menu, a menu of criteria and a menu of pretension value data.

TABLE-3 Testcase

No	Test scenario	Expected results	Test result	Conclusion
1	Theadmin enters the username password on the login page correctly	Users who enter their username, password correctly will enter themain page of the application	The user has successful entered the main page after entering the correct username and password.	Success
2	The user who entered the wrong username and password	Unable to enter the system and anotification appears wrong username& password	Cannot login and the wrong username or password notification appears.	Success

CONCLUSION

This decision support system will help in completing the selection of the best political actor based on criteria and alternatives. Calculation of AHP weight from 4 criteria namely profile, score content and response. Meanwhile, the sub-criteria are calculated from the names of political actors called political-1, 2,3 and 4. The results of calculations have been obtained by the final weight of each alternative with the value obtained higher value weight as the determination of the best political figure. What has not been done in this study is that there has been a monitoring system of results obtained, so it is difficult to detect if there is a miscalculation of weights.

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