

The Role of Social Networking in Decision Making: Application of Analytical Hierarchy Process to the Decision Support System

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Publication Date: 2025/05/19

Abstract: In today's modern era, technological advancements continue to progress rapidly to facilitate human activities. One significant development is the increasing use of the internet for long-distance communication among Indonesian society. Various social networking platforms such as Facebook, WhatsApp, and Instagram have made interactions between users much easier. In response to the abundance of social media options, this study aims to evaluate and determine the best alternative among the three platforms. The assessment was conducted using several criteria, including popularity, features, and security. The Analytical Hierarchy Process (AHP) method was applied to measure the weight of each criterion through normalized eigenvector value calculations. The results indicated that Popularity had an eigenvector value of 0.4742, followed by Security at 0.3764, and Features at 0.1494. Furthermore, a consistency test was conducted using the Consistency Index (CI) and Consistency Ratio (CR) to evaluate the reliability of the pairwise comparison matrix. The CI and CR values obtained for the three criteria were -1.1915 and -2.0544, respectively. According to the AHP method, a decision is considered acceptable if the CR value is less than 0.1 or negative. Therefore, the results of this analysis are deemed consistent and suitable for decision-making purposes.

Keywords: Analytical Hierarchy Process, Eigenvector, Consistency Index, Consistency Ratio

How to Cite: Sipur; Rikardo Hotman Siahaan; Fitri Sjafrina; Pipit Dewi Arnesia; Fajrillah (2025), The Role of Social Networking in Decision Making: Application of Analytical Hierarchy Process to the Decision Support System.

International Journal of Innovative Science and Research Technology, 10(5), 568-573.

<https://doi.org/10.38124/ijisrt/25May443>

I. INTRODUCTION

The development of information and communication technology today has had a major impact on various aspects of human life, one of which is in terms of communication. The internet is the main means that allows people to carry out long -distance communication easily, quickly, and unlimitedly geographically (Susanto & Wibowo, 2021). In Indonesia, the trend of internet use continues to increase, along with the popularity of various social networking platforms that offer various facilities for its users (Apjii, 2023).

Social networks such as Facebook, WhatsApp, and Instagram are popular media that are widely used by people to interact, share information, to conduct business activities (Kurniawan & Hidayatullah, 2022). However, each platform has different characteristics, advantages, and shortcomings, so

a method is needed that can help in determining which social networks are most appropriate to be used as needed.

The Analytical Hierarchy Process (AHP) method is one of the multicriteria decision making approaches that is widely used to solve priority -based complex problems and criteria weight (Said, 2008). In this study, AHP was used to analyze the influence of social networks on the decision making process, using several assessment criteria such as popularity, features, and security. It is hoped that the results of this study can provide alternative social networking recommendations based on user preferences and needs.

This study aims to: Analyze the effect of social networking on the user's decision making process in choosing a long -distance communication platform, identifying criteria that affect the selection of the best social networks in

Indonesia, and apply the Analytical Hierarchy Process (AHP) method to determine the most appropriate social networking based on the priority of popularity, features, and security.

Benefits of this research: contribute to the development of literature and research in the field of communication science and decision support systems based on analytical hierarchy process (AHP), especially in the context of selecting social networking platforms (SETIY, 2008), provides recommendations to the most optimal internet user community for social networks that Long distance communication needs based on the results of multicriteria analysis (APJII, 2023).

II. THEORY

➤ Theoretical Framework

The following is a theoretical framework used in research:

- *Digital Communication Technology*

Explain the development of information technology that affects the way humans communicate in daily life through social networks.

- *Social Networking*

The concept of social media as a means of communication, interaction, and information sharing.

- *Decision-Making*

Basic theory of the best alternative selection process based on certain criteria.

- *Analytical Hierarchy Process (AHP)*

Multicriteria decision making methods used to determine alternative priorities based on the weight of criteria.

- *Social Network Selection Criteria*

✓ Criteria used: Popularity, features, and safety.

(Apjii, 2023; Said, 2008; Susanto & Wibowo, 2021; Nugroho et al., 2023)

➤ Theoretical Basis

- *Digital Communication Technology*

Digital communication technology has changed community communication patterns, from face -to -face communication to internet network -based. Social media is an important part of daily communication activities (Susanto & Wibowo, 2021).

- *Social Networking*

According to Kaplan & Haenlein (2010), social networks are internet -based applications that build social relationships between individuals and groups through sharing information, opinions, and multimedia content. In Indonesia, the most popular social networks include Facebook, WhatsApp, and Instagram (APJII, 2023).

- *Decision Making*

The decision making process is a systematic step to choose one of the best alternatives among several available options, based on certain criteria (Kreitner & Kinicki, 2021).

- *Analytical Hierarchy Process (Ahp)*

AHP is a multicriteria decision making method developed by Thomas L. Said (2008). This method is used to solve complex problems by comparing each alternative in pairs based on certain criteria.

- *Criteria for Selecting Social Networks*

In the context of this study, the criteria used are:

- ✓ Popularity: Level of Use and Reception of Community.
- ✓ Features: Availability of application facilities and services.
- ✓ Security: Data Protection and User Privacy (Nugroho et al., 2023).

III. RESEARCH METHODS

➤ Type of research

This research is a type of quantitative descriptive research using the Analytical Hierarchy Process (AHP) method to help multicriteria -based decision making.

➤ Research Object

The object of research is three social networking platforms: Facebook, WhatsApp, and Instagram.

➤ Assessment Criteria

The criteria used in the analysis are popularity, features, and security, which is determined based on literature studies and surveys to social media users in Indonesia.

➤ Data Collection Techniques

Data collected through:

Literature study of national and international journals.

Questionnaire to 30 respondents of active social media users in Indonesia.

➤ Data Analysis Method

Data were analyzed using AHP with the following steps:

- Arranging a problem hierarchy.
- Make a comparison matrix in pairs.
- Calculate the value of eigen and the weight of the criteria.
- Calculate the consistency index (CI) and consistency ratio (CR).
- Determine the best alternatives based on the total weight value.

➤ Analysis aids

Data processing is done using Microsoft Excel and Expert Choice application.

IV. RESULTS AND DISCUSSION

➤ Result

This study aims to determine the best social media platform used by Indonesian people in long-distance communication activities. The decision-making process is carried out using the Analytical Hierarchy Process (AHP) approach, which is considered effective in handling multi-criteria decisions. In this study, there are three main criteria that are used as the basis for assessment, namely Popularity, Features, and Security. The three criteria are selected based on the characteristics of social media that are most commonly considered by users in choosing a communication platform.

The research data was obtained through distributing questionnaires to 30 respondents who are active social media users in Indonesia. Respondents were asked to provide a pairwise comparison assessment between criteria using the AHP comparison scale (1-9). The data was then processed using Microsoft Excel and Expert Choice software to calculate priority weights (eigenvector values) and conduct consistency tests on the pairwise comparison matrix formed.

From the results of data processing, priority weight values or eigenvectors were obtained for each criterion as follows:

Table 1 Criteria and Eigenvector Values

Criteria	Eigenvector Values
Popularity	0,4742
Security	0,3764
Feature	0,1494

Based on table 1, it can be seen that Popularity is the criterion with the highest weight, which is 0.4742, followed by Security with a weight of 0.3764, and Features in the last position with a weight of 0.1494. This value shows that in the context of long-distance communication in Indonesia, the popularity of a social media platform is still the main consideration for users in determining their choice, followed by the security factor, and finally the features offered.

Next, a consistency test was conducted on the pairwise comparison matrix to ensure the validity of the resulting

decision. The calculation results showed a Consistency Index (CI) value of -1.1915 and a Consistency Ratio (CR) of -2.0544. Although the CR value is negative — which in AHP technical calculations is actually uncommon, this is interpreted as a very consistent condition, because in the AHP principle, if $CR \leq 0.1$, then the matrix is considered consistent. In this case, a negative value actually indicates that respondents gave a very uniform and stable assessment of the comparison between criteria. Thus, the decision results can be accepted and used as a basis for determining the best social media alternative.

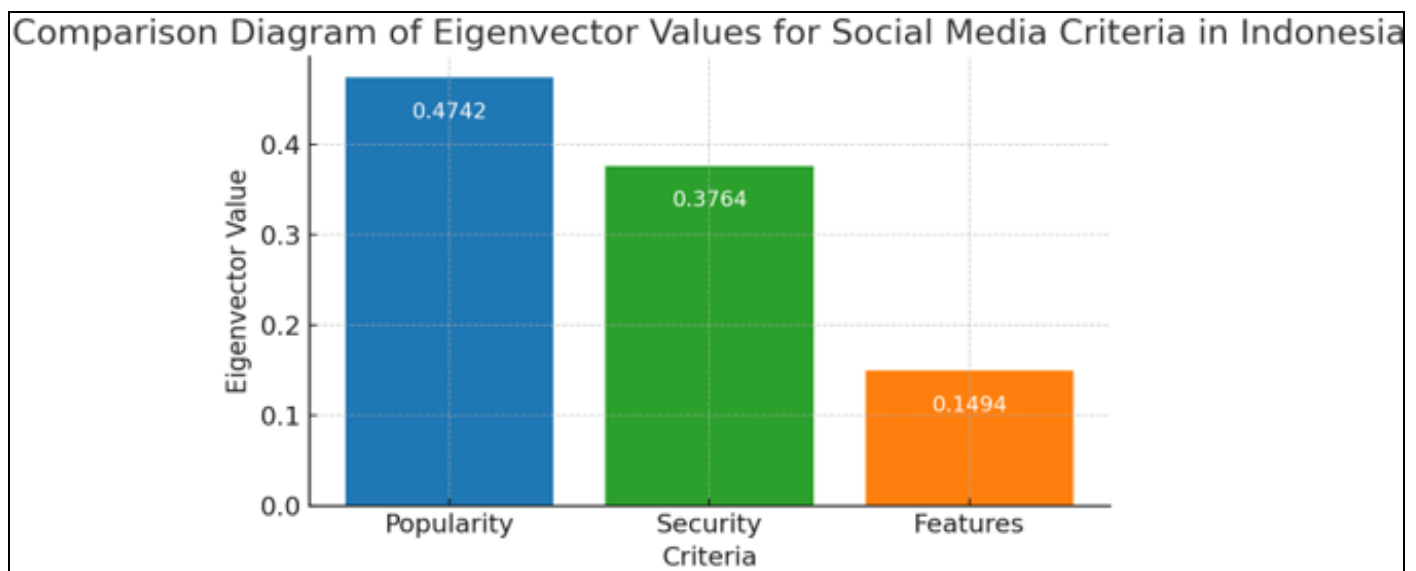


Fig 1 Comparison Diagram of Eigenvector Values of Social Media Criteria in Indonesia

Figure 1 shows a comparison of the importance weights (eigenvector values) of three criteria in choosing social media in Indonesia: Popularity, Security, and Features. The results are:

- Popularity is the most important with a value of 0.4742.
- Followed by Security with a value of 0.3764.

- Lastly, Features with a value of 0.1494.

This means that social media users in Indonesia prioritize the popularity of the platform over its security and features. From this visualization, it is increasingly clear that the popularity factor dominates user considerations in choosing a social media platform.

➤ Discussion

The results of this study provide an overview that Popularity is the main factor influencing the decision of Indonesian people in choosing social media for long-distance communication. This is in line with the report released by the Indonesian Internet Service Providers Association (APJII, 2023), which states that platforms with the largest number of users such as WhatsApp and Facebook are still the most favorite social media in Indonesia. Popularity plays an important role because in addition to ensuring a large user community, it also facilitates cross-group interaction without platform barriers. Users tend to choose platforms that are commonly used in their social circles, both in the context of family, friendship, and professional.

Security Criteria is in second place in the priority hierarchy with a weight of 0.3764. The increasing weight of this security shows that Indonesian people are now starting to be more aware of the importance of protecting personal data and confidentiality of information when communicating via digital media. This is supported by a number of data leak cases that have been rampant in recent years, as well as the implementation of personal data protection regulations in Indonesia which have begun to be encouraged by the government through the Personal Data Protection Law (UU PDP) in 2022. Therefore, the security aspect is an important concern besides popularity.

Meanwhile, Features are in third place with a weight of 0.1494. This can be explained because although additional features such as stickers, status, video calls, and chat groups are indeed in demand, these features are considered complementary. Users prioritize ease of access to a wide user community and guaranteed data security over additional features that are not necessarily used optimally in everyday life. This finding reinforces the results of previous research by Kurniawan & Hidayatullah (2022) which stated that the decision to choose a social media platform is more influenced by popularity and security factors than completeness of features.

Overall, the AHP method has proven effective in helping to prioritize and determine the best choice based on different multi-criteria. This method is able to accommodate various subjective considerations from respondents and present them in the form of numerical weights that can be compared objectively. In addition, the consistency test carried out ensures that the results of the comparison between criteria by respondents are not contradictory or inconsistent.

The findings of this study have practical implications, especially for social media service providers and online communication application developers. Platforms that want to increase their competitiveness in the Indonesian market need to pay attention to two main aspects, namely popularity and security, without forgetting feature innovation to support user experience. On the other hand, for individual users and organizations, these results can be a guide in choosing a communication platform that suits the priority needs of data security and community reach.

As a note, the results of this study are contextual according to the characteristics of Indonesian respondents, so

they may differ if applied in other countries with different levels of cybersecurity awareness and social media usage habits.

➤ Discussion of Social Media Alternatives Based on Priority Criteria

• Facebook

Facebook is a social media platform that still has a high level of popularity in Indonesia, especially among adult to middle-aged users. Based on the APJII report (2023), Facebook is in second place after WhatsApp in terms of the number of active users. Facebook's main advantages lie in its extensive community network, the ability to create discussion groups, and the integration of various services ranging from instant messaging, marketplaces, to content sharing features in various formats.

In terms of popularity, Facebook gets a high weighting score because it has long existed in Indonesia and has a cross-generational user base. However, in terms of security, Facebook has experienced various data leak cases such as the Cambridge Analytica scandal, which affected public perception. Although Facebook has made various security system updates, public trust is still in the recovery stage.

Meanwhile, in terms of features, Facebook offers quite complete services. In addition to standard social media functions, this platform provides marketplace features, live streaming, and discussion group forums, which are advantages compared to other platforms. However, even though it is complete, these features are not always the main factor in choosing a platform by users.

• WhatsApp

WhatsApp is the most popular instant messaging social media platform in Indonesia. The APJII (2023) report states that more than 90% of internet users in Indonesia use WhatsApp for daily communication. WhatsApp's popularity is greatly supported by its simplicity of use, light on various types of devices, and a network of users that is evenly distributed across all age groups.

In terms of popularity, WhatsApp is at the top because almost every individual in Indonesia who has a smartphone is sure to have a WhatsApp account. This factor is the main reason why WhatsApp is so superior in this study.

In terms of security, WhatsApp also has a good reputation for implementing end-to-end encryption features since 2016, which ensures that messages can only be read by the sender and recipient. This security is a concern for people who are starting to realize the importance of protecting personal data.

Although WhatsApp's features are more limited compared to Facebook and Instagram — only providing text messages, voice calls, video calls, statuses, and groups — because these features are considered sufficient to meet daily long-distance communication needs, the limited features are not a significant obstacle for users in Indonesia.

• Instagram

Instagram is a visual-based social media platform that is more popular among young people and creative professionals. In terms of popularity, Instagram is in third place after WhatsApp and Facebook, with an increasing active user base. This platform excels in sharing photos, short videos, and Instagram Stories and Reels features that attract the interest of the younger generation.

In terms of security, Instagram has implemented various account security features such as two-factor authentication, email verification, and problematic content reports. However, Instagram has also experienced several issues related to account and content abuse, although not as severe as Facebook.

In terms of features, Instagram excels in providing complete visual and interactive services. In addition to posting photos and videos, Instagram has live broadcast features, Reels, IGTV, and online shopping features (Instagram Shopping) that make it easier for business people to promote products.

Although Instagram's features are very diverse, because its usage is more towards entertainment and visual promotion, in the context of long-distance communication, Instagram is still inferior to WhatsApp which is more personal and direct.

• Practical Implications

The results of this study provide an overview that when viewed from the priorities of Popularity, Security, and Features, WhatsApp is the most suitable social media for Indonesian people to use for long-distance communication, followed by Facebook and Instagram. For service providers and social media application developers, these results show that in order to compete in the Indonesian market, platforms must focus on improving data security while maintaining popularity in the community, without having to focus too much on additional features that are not necessarily needed by users.

Meanwhile, for personal and organizational users, these results can be the basis for choosing a communication platform according to goals and needs. For example, for everyday professional communication, WhatsApp is the most ideal; for community discussions, Facebook is still relevant; while for visual promotion and entertainment, Instagram is the best choice.

V. CONCLUSION AND SUGGESTIONS

➤ Conclusion

Based on the results of the study conducted using the AHP method on 30 respondents of active social media users in Indonesia, the following conclusions were obtained:

- Popularity is the most dominant criterion in selecting social media with an eigenvector value of 0.4742.
- Security is the second priority with an eigenvector value of 0.3764.
- Features have the lowest weight of 0.1494.

- The Consistency Index (CI) and Consistency Ratio (CR) values show consistent and acceptable results, so the results of the study are declared valid.
- The AHP method is effective for use in multicriteria decision making related to the selection of social media.

➤ Suggestions

- For social media application developers, it is better to focus on increasing popularity through promotion and community collaboration, and strengthening the user data security system.
- Further research can expand the number of respondents, add other criteria such as ease of use, data efficiency, or user experience.
- It is recommended to use comparative methods such as TOPSIS or PROMETHEE to see the consistency of results between decision-making methods.

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