

Decision Support System for Selecting Social Media Platforms for Gen Z Personal Branding Using the TOPSIS Method

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Abstract. The development of social media has encouraged Generation Z to utilize it as a primary means of building personal branding. However, the large number of social media platforms creates difficulties in determining the most appropriate and effective platform. This study aims to determine the best social media platform to support Generation Z's personal branding using a Decision Support System (DSS) approach with the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. This study used a quantitative design with primary data obtained through questionnaires. The research respondents were Generation Z who actively use social media. The alternatives analyzed included five social media platforms evaluated based on seven assessment criteria relevant to personal branding needs. Data were analyzed using the TOPSIS method through the stages of compiling a decision matrix, normalization, weighting, determining positive and negative ideal solutions, calculating Euclidean distance, and determining preference values. The results showed that Instagram obtained the highest preference value of 0.5726 and was ranked first, followed by LinkedIn, TikTok, and YouTube. Meanwhile, alternative X (Twitter) had the lowest preference value, namely 0.2046. These findings demonstrate that the TOPSIS method is capable of providing an objective and systematic ranking of alternatives. This research contributes to providing a decision-making model that can be used as a practical reference for Generation Z in selecting optimal social media platforms for personal branding.

Keywords: Decision Support System; TOPSIS; Social Media; Personal Branding; Generation Z

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INTRODUCTION

The development of digital technology and social media over the past two decades has transformed the way individuals construct their identities, interact, and present their personal image in public spaces. Globally, social media is no longer merely a means of communication but has become a strategic medium for building personal branding, especially for the younger generation growing up in the digital native era. Generation Z, born and raised in the digital technology ecosystem, utilizes various social media platforms such as Instagram, TikTok, YouTube, and LinkedIn to express themselves, build their reputations, and enhance their social and professional opportunities [1].

In a national context, a similar phenomenon also occurs in Indonesia. Various reports and research results indicate that Generation Z is the most active group of social media users, with high usage intensity and emotional attachment to certain digital platforms. Empirical studies show that the choice of social media platform is not only based on popularity alone, but also takes into account audience aspects, content type, interactivity, platform algorithms, and suitability with the self-image one wishes to build [2]. Field findings from previous observations indicate that many Gen Z individuals experience confusion in determining the most appropriate platform for building personal branding consistently and strategically, especially when faced with many alternative platforms with different characteristics [3].

This problem is further complicated by the fact that the decision-making process for selecting a social media platform is often subjective, intuitive, and influenced by current trends. Several studies based on decision support systems (DSS) have proposed the use of multi-criteria methods, such as TOPSIS, to facilitate a rational and structured platform selection process [4]. However, most of these studies still focus on, quantitative approaches and emphasize the results of alternative rankings, without delving deeply into the meaning, experiences, and decision-making processes experienced by users, especially Generation Z, in the

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context of personal branding [5]. From a social and cultural perspective, personal branding on social media has broad implications, ranging from the formation of self-identity and social relationships to economic and professional opportunities. Social media is not only a space for self-representation but also an arena for negotiating social values, norms, and expectations. Therefore, it is important to understand how Generation Z interprets the use of social media platforms and how they assess certain criteria in selecting the platforms that best support their personal branding [6]. The qualitative approach is relevant because it can explore subjective experiences, perceptions, and social dynamics that cannot be fully explained through numbers and mathematical models alone.

Although research related to DSS and TOPSIS methods in social media selection has grown, there is still a significant research gap (literature gap), especially in studies that integrate decision support system approaches with qualitative exploration of Generation Z experiences and considerations. Previous studies tend to ignore the interpretive and contextual aspects that influence how criteria are understood and given meaning by users [7]. Thus, research is needed that not only assesses the effectiveness of the method but also understands the social and cognitive processes behind such decision-making.

Based on this description, this study aims to explore in-depth the experiences, perceptions, and considerations of Generation Z in choosing a social media platform for personal branding using a qualitative approach. The focus of the study is directed at how the selection criteria are interpreted, how the decision-making process occurs, and how decision support systems are perceived in real practice. Theoretically, this research is expected to enrich the study of decision support systems with an interpretive and contextual perspective. Practically, the results of this study are expected to contribute to system developers, educators, and personal branding practitioners in designing strategies and systems that are more humanistic, adaptive, and appropriate to the needs of Generation Z.

METHODS

Decision-Making Methods

This study uses the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method as an approach in a decision support system to determine the most appropriate social media platform in supporting Generation Z's personal branding. The TOPSIS method was chosen because it can evaluate several alternatives based on many criteria and produce an objective ranking of alternatives based on their proximity to the positive ideal solution and their distance from the negative ideal solution[2]. The use of the TOPSIS method in the context of social media selection and digital decision-making has been widely applied and proven effective in various decision support system studies [8], [9].

Alternatives and Assessment Criteria

The alternatives in this study are several social media platforms that are popular among Generation Z. The selection of alternatives is based on the intensity of social media use by Generation Z and its relevance in building personal branding in the digital space [1], [10]. Alternatives are evaluated using several criteria related to the effectiveness of personal branding, denoted by C1 to C7, where each criterion is weighted according to its level of importance in the decision-making process [3]. This research uses several alternatives and criteria that are established as a basis for the decision-making process.

Table 1. Alternative and Criteria

| Alternative | Criteria |
|-------------|----------------------------------|
| Instagram | Audience Reach |
| TikTok | Engagement Level |
| LinkedIn | Professional Credibility |
| YouTube | Ease of Content Creation |
| X | Platform Algorithm Consistency |
| | Alignment with Career Goals |
| | Content Production Time and Cost |

TOPSIS Method Stages

The stages of the TOPSIS method used in this study refer to the implementation of the TOPSIS method in decision support systems that have been applied to various domains, including social media selection, digital applications, and web-based recommendations.

a. Decision Matrix

The decision matrix is constructed to represent the performance value of each alternative against each criterion, which is formulated as:

$$X = [x_{ij}] \quad (1)$$

b. Decision Matrix Normalization

Normalization is carried out to equalize the assessment scale between criteria by using the vector normalization method

$$r_{ij} = x_{ij} / \sqrt{\sum_{i=1}^m x_{ij}^2} \quad (2)$$

c. Weighted Normalization

The normalized values are then multiplied by the weights of each criterion to obtain a weighted normalized matrix. This step aims to adjust for the influence of each criterion in the decision-making process

$$y_{ij} = w_j \times r_{ij} \quad (3)$$

d. Positive and Negative Ideal Solutions

The positive and negative ideal solutions are determined from the weighted normalized matrix as follows:

$$A^+ = \max(y_{ij}) | j \in \text{benefit}, \min(y_{ij}) | j \in \text{cost} \quad (4)$$

$$A^- = \min(y_{ij}) | j \in \text{benefit}, \max(y_{ij}) | j \in \text{cost} \quad (5)$$

e. Ideal Solution Distance and Preference Value

Mathematically, the distance of the i th alternative to the positive and negative ideal solutions is formulated as follows:

$$D_i^+ = \sqrt{\sum_{j=1}^n (y_{ij} - A_j^+)^2} \quad (6)$$

$$D_i^- = \sqrt{\sum_{j=1}^n (y_{ij} - A_j^-)^2} \quad (7)$$

f. Preference Value

Calculate the preference value of each alternative, which is used as a basis for determining the ranking of alternatives.

$$V_i = \frac{D_i^-}{D_i^- + D_i^+} \quad (8)$$

Research Stages

To clarify the research flow, the research stages are presented in the form of a flowchart. The flowchart systematically illustrates the research process, starting from problem identification, determining alternatives and criteria, collecting data, and analyzing and ranking alternatives using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method [11], [12].

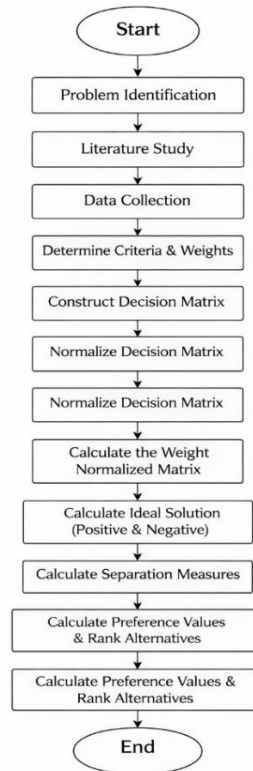


Figure 1. Flowchart of data analysis techniques

RESULT AND DISCUSSION

Calculation Using the TOPSIS Method

This section presents the results of the TOPSIS method calculations based on the stages described in the research methods section. The results are presented in tabular form for each stage of the analysis, starting with the decision matrix, matrix normalization, weighted normalization, positive and negative ideal solutions, and finally, the calculation of preference values and alternative rankings [4], [11].

Decision Matrix

The initial stage of a TOPSIS analysis is the development of a decision matrix containing the values of each alternative social media platform against predetermined criteria. This decision matrix serves as the basis for all subsequent calculations.

Table 2. Decision matrix

| Alternative | Criteria | | | | | | |
|-------------|----------|-----|-----|-----|-----|-----|-----|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
| Instagram | 4,4 | 4,3 | 3,8 | 4,2 | 3,9 | 4,1 | 3,6 |
| TikTok | 4,5 | 4,7 | 3,2 | 4,5 | 3,5 | 3,9 | 3,8 |
| LinkedIn | 3,7 | 3,4 | 4,8 | 3,6 | 4,1 | 4,6 | 3,2 |
| YouTube | 4,2 | 4 | 4,2 | 3,4 | 4 | 4,3 | 4,1 |
| X | 4,4 | 4,3 | 3,8 | 4,2 | 3,9 | 4,1 | 3,6 |

The first table shows that each platform has different characteristics and values for each criterion, so a multi-criteria decision-making method is needed to determine the best alternative objectively.

Normalization Matrix

To eliminate scale differences between criteria, the decision matrix was normalized using vector normalization. The normalization results are shown in Table 3.

Table 3. Normalized Decision Matrix

| Alternative | Criteria | | | | | | |
|-------------|----------|--------|--------|--------|--------|--------|--------|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
| Instagram | 0,4803 | 0,4816 | 0,4370 | 0,4791 | 0,4557 | 0,4437 | 0,4497 |
| TikTok | 0,4912 | 0,5264 | 0,3680 | 0,5133 | 0,4090 | 0,4221 | 0,4747 |
| LinkedIn | 0,4039 | 0,3808 | 0,5520 | 0,4106 | 0,4791 | 0,4978 | 0,3998 |
| YouTube | 0,4585 | 0,4480 | 0,4830 | 0,3878 | 0,4674 | 0,4654 | 0,5122 |
| X | 0,3930 | 0,3808 | 0,368 | 0,4334 | 0,4206 | 0,4004 | 0,3873 |

This normalization ensures that all scores are on a comparable scale, so that each criterion makes a fair contribution to the evaluation process.

Weighted Normalization Matrix

The normalized results are then multiplied by the weight of each criterion to obtain a weighted normalized matrix, as shown in Table 4.

Table 4. Weighted Normalization Matrix

| Alternative | Criteria | | | | | | |
|-------------|----------|--------|--------|--------|--------|--------|--------|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
| Instagram | 0,0864 | 0,0818 | 0,0699 | 0,0670 | 0,0592 | 0,0621 | 0,0359 |
| TikTok | 0,0884 | 0,0894 | 0,0588 | 0,0718 | 0,0531 | 0,0590 | 0,0379 |
| LinkedIn | 0,0727 | 0,0647 | 0,0883 | 0,0574 | 0,0622 | 0,0697 | 0,0319 |
| YouTube | 0,0825 | 0,0761 | 0,0772 | 0,0542 | 0,0607 | 0,0651 | 0,0409 |
| X | 0,0707 | 0,0647 | 0,0588 | 0,0606 | 0,0546 | 0,0560 | 0,0309 |

Table four shows the relative contribution of each criterion to the final alternative score. Criteria with higher weights have a more significant impact on the ranking results.

Positive and Negative Ideal Solutions

Based on the weighted normalization matrix, positive and negative ideal solutions are determined as a reference for the closeness of each alternative.

Table 5. Positive and Negative Ideal Solutions

| Criteria | Positive Ideal Solution (A+) | Negative Ideal Solution (A-) |
|----------|------------------------------|------------------------------|
| C1 | 0.0884 | 0.0707 |
| C2 | 0.0894 | 0.0647 |
| C3 | 0.0883 | 0.0588 |
| C4 | 0.0718 | 0.0542 |
| C5 | 0.0622 | 0.0531 |
| C6 | 0.0697 | 0.0560 |
| C7 | 0.0309 | 0.0409 |

The positive ideal solution represents the most optimal condition, while the negative ideal solution reflects the worst condition of all alternatives.

Calculation of Ideal Solution Distance and Preference Value

The distance of each alternative to the positive ideal solution and the negative ideal solution is calculated using Euclidean distance. This calculation aims to measure how close each alternative is to the ideal conditions determined in the previous step.

The results of calculating the distance of each alternative to the positive and negative ideal solutions are presented in Table 6.

Table 6. Distance of Alternatives to the Positive and Negative Ideal Solution

| Alternative | $Di+$ | $Di-$ |
|-------------|--------|--------|
| Instagram | 0,0226 | 0,0304 |
| TikTok | 0,0333 | 0,0353 |
| LinkedIn | 0,0326 | 0,0350 |
| YouTube | 0,0276 | 0,0273 |
| X | 0,0464 | 0,0119 |

Table six shows that the alternative with the smallest $Di+$ value and the largest $Di-$ value has the highest proximity to the ideal solution. This indicates that this alternative is superior compared to the other alternatives based on the criteria used.

Ranking

The next step is to calculate the preference value for each alternative, which is used as the basis for determining the alternative ranking. The preference value Vi ranges from 0 to 1. The higher the Vi value, the higher the priority level of the alternative. The results of the calculation of preference values and alternative rankings are presented in Table 7.

Table 7. Preference Values and Alternative Rankings

| Alternative | Vi | Ranking |
|-------------|--------|---------|
| Instagram | 0,5726 | 1 |
| LinkedIn | 0,5177 | 2 |
| TikTok | 0,5149 | 3 |
| YouTube | 0,4971 | 4 |
| X | 0,2046 | 5 |

Based on Table 7, the **Instagram** platform obtained the highest preference value of 0.5726, making it the best alternative in supporting Generation Z's personal branding. This result shows that Instagram has a combination of criteria that is closest to the ideal solution compared to other social media platforms.

CONCLUSION

This study aims to determine the most suitable social media platform to support Generation Z's personal branding using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method as a decision support system approach. Based on the results of the calculations and analyses that have been carried out, it can be concluded that the TOPSIS method is able to provide an objective ranking of alternatives by considering various relevant criteria. The results show that **Instagram** obtained the highest preference value compared to other social media platforms with a final result of $Vi = 0.5726$. This indicates that Instagram has the highest level of closeness to the positive ideal solution and the furthest distance from the negative ideal solution, so it is considered the most optimal in supporting Generation Z's personal branding activities. These advantages reflect the balance between audience reach, level of interaction, ease of use, and the suitability of the platform's character to the needs of expression and self-image formation of the younger generation.

The application of the TOPSIS method in this study provides a practical contribution in the form of a systematic and measurable decision-making model for selecting social media platforms. This model can be utilized by Generation Z individuals and related parties as a tool in determining more effective, data-driven personal branding strategies. However, this study is limited by the number of respondents and the subjective weighting of criteria. Therefore, further research is recommended to expand the scope of respondents, add other relevant variables or criteria, and combine the TOPSIS method with other multi-criteria decision-making methods to obtain more comprehensive and robust results.

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