UTILIZATION OF ANALYTICAL HIERARCHY PROCESS (AHP) AS A DECISION SUPPORT SYSTEMFOR STUDENT ORGANIZATIONS DEVELOPMENT PRIORITY (CASE STUDY AT JKMK SANATA DHARMA UNIVERSITY)

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ABSTRACT

The COVID-19 pandemic has presented significant challenges for organizations worldwide, urging them to undertake post-pandemic development. These changes are also profoundly felt by student organizations (ORMAWA). With the limited resources available in such small organizations, it is challenging for ORMAWA to carry out organizational development in response to these changes. This article focuses on the Jalinan Kasih Mahasiswa Katolik (JKMK) organization at Sanata Dharma University as the research object. This paper will attempt to explore organizational development by determining development priorities through the Analytical Hierarchy Process (AHP) method, referencing interviews with parties directly involved with JKMK such as administrators, JKMK members, and also JKMK's patron organizations. It also involves four development criteria: member involvement, organizational culture, organizational reciprocity, and organizational reputation. Thus, a decision support system for JKMK development priorities will be produced from the AHP priority synthesis.

Keywords: *post-pandemic development, student organizations, JKMK, analytical hierarchy process (AHP), Decision Support System.*

1. Introduction

The COVID-19 pandemic has presented significant challenges for organizations worldwide. Changes in the situation that require organizations to evolve can backfire when organizations are deemed unprepared to face a change. Weick (1969:243) defines an organization not only about formal structure, but also about interactions between individuals and daily communication activities. Thus, communication becomes a major issue for an organization when a pandemic occurs, where when a pandemic occurs, very significant changes then occur in the way humans communicate. According to previous research (Bachrir, Achdan, and Zelfia 2020), this shift also affects social relations among students. In their research, it was found that the COVID-19 pandemic has changed student social relations that were previously face-to-face into relations that involve more communication technology. This massive change in communication behavior among students then brings challenges for student organizations.

Jalinan Kasih Mahasiswa Katolik (JKMK) is a student organization based on social and religious concerns at Sanata Dharma University. This organization is under the Campus Ministry, which supports the operational activities of Sanata Dharma University. In addition, JKMK is also a Faculty Activity Unit (UKF) of the Faculty of Pharmacy at Sanata Dharma

University. JKMK has at least 358 members who are part of the organization. JKMK has two regular activities, namely Koor and Kamisan. Koor or choir is JKMK's responsibility in service tasks under the Campus Ministry, this choir activity is held every month in the Drost room of campus 3 of Sanata Dharma University.

Kamisan is an abbreviation for "Sanata Dharma Catholic Student Gathering" which is intended to carry out the recreational and spiritual functions of JKMK. The requirements for JKMK membership are quite easy, which is only by filling out the Google Drive membership link on the JKMK Instagram link, the prerequisites are only being Catholic, willing to participate in JKMK activities and being a student of Sanata Dharma University.

Decision-making plays an important role in responding to changes in an organization. In a dynamic and uncertain context, such as the COVID-19 pandemic, the ability to make accurate and effective decisions becomes very important (Sharma, 2023). According to Springer (2021), good decision-making can facilitate successful adaptation to change, allowing organizations to remain relevant and effective in achieving their goals.

From the changes that occurred in JKMK, the urgency of change and relevant development in this organization occurred due to the shift in social interaction behavior. Social interaction behavior among students has been an important research subject during the transition from the COVID-19 era to the post-pandemic era. A study (Frontiers,2022) shows that the pandemic has disrupted patterns and opportunities for social interaction, increasing the level of loneliness among students. In this context, it is important for organizations like JKMK to understand these changes and adjust their activities and interactions to support the social needs of students.

The Analytical Hierarchy Process (AHP) method is one of the multi-criteria decision-making methods developed by Saaty (2008). This method helps decision-makers in solving complex and unstructured problems. AHP uses a mathematical approach to break down problems into simpler sub-problems in the form of a hierarchy. Each element in the hierarchy is evaluated based on its relative priority to other elements in the same hierarchy. This method has been widely used to solve decision-making problems.

Bourgeois (2005) states that AHP is typically applied to determine the priority order of various complex and multi-criteria options. Broadly speaking, the use of AHP results in priorities that are consistent with theory, logical, transparent, and involve participation. With the increasing demand for transparency and participation, AHP is a very suitable method for setting priorities in public policies that require transparency and participation.

This article aims to demonstrate the use of AHP in determining the decision support system (DSS) for the priority development of the JKMK organization. After this introduction section, the article will explain the basic concepts of AHP. Then, it will show how AHP is used to select development priority alternatives, with a case study in the Jalinan Kasih Mahasiswa Katolik (JKMK) Organization. The article then concludes with an argument as a consideration for the priority development of the JKMK organization.

2. Literature Review

The Literature Review chapter in this research presents a synthesis of various relevant scientific literature related to the research topic, namely 'Application of AHP as a Decision Support System for Student Organization Development Priorities'. This chapter includes an in-depth exploration of the AHP method, including its origins, previous applications, and its use in decision support systems. Furthermore, this chapter also discusses the concept of student organization development and how it is relevant to the context of this research. A critical

analysis of relevant previous research is also presented, focusing on identifying gaps in the existing literature and how this research seeks to fill those gaps. Thus, this chapter provides a strong theoretical framework for this research and shows how this research contributes to existing knowledge.

2.1 Decision-Making System

A decision-making system is an important process in company management. It is a computer-based information system aimed at assisting certain parties in handling problems using data and models. In an article titled "Decision Making: a Theoretical Review" published in November 2021, Morelli, Casagrande, and Forte explain that decision-making is an essential skill needed to adapt to the environment and autonomy (Morelli, Casagrande, & Forte, 2021). Decision-making refers to the deliberate process of evaluating various alternatives and choosing the most adaptive one to achieve one or more goals, based on an individual's abilities, values, preferences, and beliefs (Morelli et al., 2021). This article reviews various theoretical models of decision-making and identifies application areas, the significance of decision support systems, and the methods, approaches, frameworks, or algorithms used to solve complex problems (Morelli et al., 2021).

2.2 Decision Support System (DSS)

DSS is a concept of the role of computers in the decision-making process (García-Alcaraz et al., 2022). DSS is used to assist the decision-making process in various fields, including health (Ali et al., 2023). Developing an effective DSS is a challenging task that can benefit from previous evaluations of the most promising theories, techniques, and methods currently available (Ali et al., 2023). One method often used in DSS is the Analytic Hierarchy Process (AHP). AHP is used to integrate scientific knowledge and expert knowledge in the decision-making process, and to explicitly include several criteria (e.g., social impact) that are highly relevant during crises but often difficult to consider in the most commonly used methods and tools (Pagano et al., 2021).

2.3 Organizational Development

Organizational development is an important and widely researched field. In an article titled "Research in Organizational Change and Development," published by Emerald Insight (2020), the authors review various aspects of organizational development, including organizational change, organizational dynamics, and organizational development itself. Organizational development is defined as a deliberate and planned process to improve organizational effectiveness and employee well-being through deliberate changes in procedures, structures, and work processes. The article also discusses how social media influences organizational development and how professional identities are formed in the context of organizational change.

2.4 Analytical Hierarchy Process (AHP)

As previously explained, the Analytical Hierarchy Process (AHP) is a method that assists in setting priorities from various options by considering multiple criteria. Due to its ability to handle multi-criteria, AHP is often used in the priority determination process. Susila and Munadi (2007) explain that there are four basic principles in the AHP method used to solve problems, namely:

Decomposition of the problem;
Data collection;
Assessment to compare the elements resulting from decomposition; and
Synthesis of priorities.

3.   Research Methods

The research method used in this study is a combination of quantitative and qualitative methods. The quantitative method is used to collect and analyze numerical data, while the qualitative method is used to understand phenomena from the subjective perspective of participants. In the context of this research, the quantitative method is applied in the implementation of the Analytic Hierarchy Process (AHP) as a decision support system. The numerical data obtained through AHP is then qualitatively analyzed to determine the development priorities of the Jalinan Kasih Catholic Student Association at Sanata Dharma University. With this approach, this research aims to provide deep and holistic insights into the topic being studied.

3.1 Problem Decomposition

In the process of setting priorities, the problem must be broken down into the objectives of the activity, identification of various existing options, and the establishment of criteria for selecting priorities (Susila & Munadi, 2007). This article will take criteria based on the results of random interviews with active JKMK members representing each routine activity and JKMK administrators. After that, from the many criteria that are the result of the interview, criteria relevant in the context of "changes in the way students communicate" will be selected. The result of the criteria will then be considered as a problem solution or solution. The results of these criteria will be elaborated again through several alternative choices that can be used as answers to the changes that occur in JKMK (Figure 1).
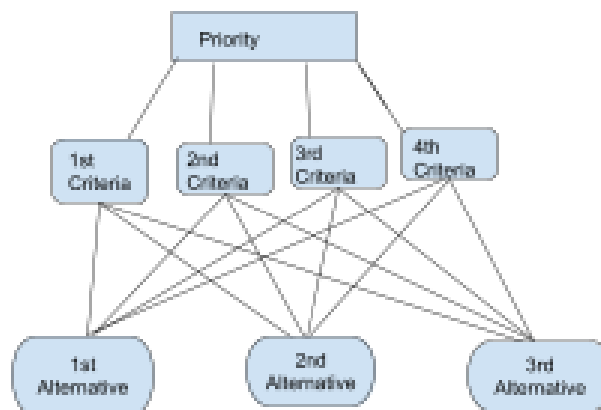

Figure 1. AHP Modeling

3.2 Data Collecting

The data to be used in this research will be taken from interviews with several samples from 3 categories, namely the JKMK organization committee, active members of JKMK, and also stakeholders from the JKMK organization. The previous samples will be informed about the scope of the research and various interview procedures.

3.3 Assessment to Compare the Elements Resulting from Decomposition

The comparative assessment of the elements resulting from the criteria will be compared through a scale of comparison choices, which is intended to determine the weight of a criterion to be selected (Saaty, 2008). The pairwise criteria comparison is then used to fill an AHP matrix. Each matrix will be tested for its consistency through 3 indices, namely:

3.5 Consistency Index

The Consistency Index (CI) is a metric in the Analytical Hierarchy Process (AHP) method used to measure the extent of consistent assessment. CI is calculated with the formula:

$$CI = \frac{\lambda max - n}{n - 1}$$

3.6 Random Index

In the Analytical Hierarchy Process (AHP), the Random Index (RI) or Random Index (IR) is a value used to evaluate the consistency of the assessment. RI is the average value of the random consistency index for an n x n pairwise comparison matrix. The Random Index value is a stipulation as follows (Table 1):

Table 1. Random Index Condition

Random Index	
Amount of Matrix Variable	Value
1	0
2	0
3	0,58
4	0,90
5	1,12
6	1,24

3.7 Consistency Ratio

Consistency Ratio The Consistency Ratio (CR) is a metric in the Analytical Hierarchy Process (AHP) method used to evaluate the consistency of the assessment. CR is calculated with the formula:

$$CR = \frac{CI}{RI}$$

where CI is the Consistency Index and RI is the Random Index. The CR value is used to determine the extent to which the assessment is consistent. If CR is less than or equal to 0.1, then the assessment is considered consistent. Conversely, if CR is more than 0.1, then the assessment may not be consistent and needs to be reviewed. After the weight for each variable

is known, then the criteria will be made a context to compare the alternatives that will be used. This assessment process will be carried out on all choices of criteria and alternatives.

3.8 Priority Synthesis

Priority synthesis is the final stage of the AHP method. This process aims to determine the relative weights for the elements in decision-making. Priority synthesis is obtained from the sum of the weights obtained from each choice (alternative) from each criterion then multiplied by the weight of the criterion. In other words, it can be described as follows:

$$\text{Assessment} = \sum_{i=1}^{n} (w_{ij} \times w_j)$$

w_{ij} = The weight of an alternative with respect to a criterion

w_j = The weight of a criterion

Next, the assessment results will be sorted according to their rank as a consideration for decision-making

4. Research Findings and Discussion

The Results and Discussion in this research focus on the interpretation and analysis of the data that has been collected through the research methods previously explained. This section includes the presentation of research results, including the main findings obtained through the application of the AHP method as a decision support system. Furthermore, these results are discussed in depth to show how they contribute to our understanding of Student Organization development priorities. This discussion includes the interpretation of findings, explanations of how these findings align or differ from previous research, and implications of these findings for future practice and research. Thus, this chapter provides valuable insights into the research topic and shows how this research contributes to existing knowledge.

4.1 Problem Decomposition

In this research, the Analytical Hierarchy Process (AHP) method is used as a decision support system in the development of the Jalinan Kasih Mahasiswa Katolik (JKMK) organization at Sanata Dharma University. Four main criteria have been identified as important factors in organizational development, namely: 1) Member Involvement in the Organization, 2) Organizational Culture, 3) Reciprocity, and 4) Organizational Reputation. These criteria are then decomposed into four alternatives that become the steps of organizational development, namely: 1) Event Procurement, 2) Changes in Meeting Format, 3) Collaboration with other organizations, and 4) Procurement of new divisions.

4.2 Data Collection

Data collection using the interview method was conducted in the period of April 29-30, 2024 with 4 informants. Before data collection, the informants were explained about the abstract of the paper to fully capture the research overview. Then, the informants were given open and closed questions so that the results can later be used as a reference. The statements obtained from the interview will then be assessed based on the pairwise comparison scale (Table 2).

4.3 Assessment to Compare the Elements Resulting from Decomposition

The interview statements that have been evaluated for their comparisons are then processed through the AHP method by comparing and assessing each criterion pairwise in a matrix. This matrix is then normalized, and the value of a criterion within the group of criteria is determined. The results of the assessment are as follows (Table 3):

Criterion	Value	Alternative	Value
Member Involvement	0.5710	Event Procurement	0.5579
		Changes in Meeting Format	0.2633
		Collaboration with other organizations	0.0569
		Organizational Reputation	0.1219
Organizational Culture	0.2655	Event Procurement	0.4065
		Changes in Meeting Format	0.1950
		Collaboration with other organizations	0.2307
		Organizational Reputation	0.1678
Reciprocity	0.1152	Event Procurement	0.3889
		Changes in Meeting Format	0.0687
		Collaboration with other organizations	0.3889
		Organizational Reputation	0.1535
Organizational Reputation.	0.0482	Event Procurement	0.3829
		Changes in Meeting Format	0.1423
		Collaboration with other organizations	0.1276
		Organizational Reputation	0.3472

4.4 Priority Synthesis

The assessment of each criterion obtained is then calculated and sorted according to the hierarchy based on the pairwise comparison assessment. The hierarchy obtained with the AHP method is as follows (Table 4):

Table 4. Hierarchy based on the AHP method

Priority Synthesis		
Alternative	**Synthesis**	**Hierarchy**
Event Procurement	0.4897	1
Changes in Meeting Format	0.2169	2
Collaboration with other organizations	0.1447	4
Organizational Reputation	0.1486	3

5. Conclusion

In this research, problem decomposition was carried out by considering four main criteria in the development of the Jalinan Kasih Mahasiswa Katolik (JKMK) organization at Sanata Dharma University, namely: Member Involvement, Organizational Culture, Organizational Reciprocity, and Organizational Reputation. Member Involvement and Organizational Culture are key in building internal commitment and cohesion, while Organizational Reciprocity and

Organizational Reputation play an important role in building relationships and a positive image outside the organization. Through the Analytical Hierarchy Process (AHP) approach, this research has successfully identified priorities and strategic steps in responding to post-pandemic challenges.

In this research as well, the results show that Member Involvement has the highest synthesis point of 0.5710, indicating that this is the most important criterion in the development of the Jalinan Kasih Mahasiswa Katolik (JKMK) organization at Sanata Dharma University. This is followed by Organizational Culture with a synthesis point of 0.2655, indicating the importance of a strong culture in the organization. Meanwhile, Organizational Reciprocity and Organizational Reputation have lower synthesis points, each at 0.1152 and 0.0482, indicating that although these two criteria are important, they do not have the urgency of Member Involvement and Organizational Culture. These results provide valuable insights into the priorities and focus in the development of the JKMK organization.

The results show that the priority synthesis for the Jalinan Kasih Mahasiswa Katolik (JKMK) organization at Sanata Dharma University lies in the Event Procurement alternative, which has the highest value, namely 0.4897. This value indicates that Event Procurement is considered the most important organizational development step. Meanwhile, other alternatives such as Changing Meeting Format, Collaboration with Other Organizations, and New Management Division have lower values, namely 0.2169, 0.1447, and 0.1486 respectively. Nevertheless, all four alternatives are still important and need to be considered in the JKMK organizational development strategy. This conclusion provides valuable insights into the priorities and focus in the development of the JKMK organization.

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