Decision Support System of Family Karaoke Selection with Analytical Hierarchy Process Method using Super Decisions Software

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Abstract. The rise of new and qualified karaoke venues is a place that many people often visit. In this journal, the family karaoke to be analyzed for comparison is K2 family Karaoke, NAV family karaoke, and Milo Family Karaoke. In the process of data processing, the method used is the method of Analytical Hierarchy Process (AHP) with Super Decisions Software. Based on the priority weight calculation for the service attribute where the karaoke is obtained that the reliability element is the highest value element of 0.35580. Furthermore, based on the weighted result of level 3 priority is found that the conformity element of the payment system offered has the highest value of the other element of 0.19973. Based on level 4 priority weighting results are obtained that the weight value for NAV Karaoke is the highest value of the other family karaoke is 0.61197.

1. Introduction
Nowadays, busy work has become the usual thing. People work hard to meet the demands of a lifestyle that is constantly evolving every day. The development of lifestyle changes is what affects the growth of public interest in the needs of entertainment. The need for entertainment in Medan is very high. One of the karaoke entertainments that is now more and more interest. It is in the presence of several Family Karaoke brands in Medan and various cities. According to local community, karaoke Entertainment is a light entertainment and not exhausting mind.

This is what is the presence of karaoke places in Indonesia. The rise of a new, quality and qualified Karaoke venue is a place that many people often visit. To know the taste of market, can be done by comparing several family karaoke so that the family karaoke places that have the highest priority. In this paper, the family karaoke to be analyzed for comparison is K2 family Karaoke, NAV family karaoke, and Milo Family Karaoke.

2. Theoretical Background
The decision support system is an interaction computer-based information system that is designed to support solutions to decision problems. [1]. This system is used to help decision-making in a semi irrational situation and unstructured situations where nobody knows exactly how the decision should be made [2]. The structured process is routine, and is usually a common problem that is made up of a standard solution method. Unstructured process is a fuzzy, complex problem so there is no method of cut-and-dried solution [3]. On the off chance that the consequences of QC tests can't satisfy the
acknowledgment models, the aftereffects of examination of the entire arrangement of the estimations on that day must be eliminated or should be re-dissected, and an incomplete or full re-approval of the strategy considered [11]. In the process of data processing, the method used is the method of Analytical Hierarchy Process (AHP) with Super Decisions Software. AHP method is a technique of several criteria based on complex problems branching into the structure of specific profiles of elements whose goals, criteria (sub-criteria) and alternative criteria. [4]. The characteristic of the AHP method is that it simplifies the complex options by parsing the problem into the form of a hierarchy containing the criteria and the sub-problems to be analyzed each [5]. AHP method is a method used to determine priority selection of various criteria from the existing karaoke place. Meanwhile, Supe Decisions Software is a software that implements Analytic Hierarchy Process (AHP) by using a basic priority process based on priority derived by making assessments on the pairs of elements, or gaining priority by the normalization of direct measurements [6]. Super Decisions Software is used to make decisions with dependencies and feedback (implementing analytic network process with a variety of additions) that many happen to the company [7].

3. Research Methodology
AHP method is a method used to determine priority selection of various criteria from the existing Karaoke place. This AHP method helps solve complex problems by structuring a hierarchy of criteria, stakeholders, results and by attracting various considerations to develop weights or priorities [8, 12, 13]. The sample collection method used is purposive sampling, which is the sampling technique by specifying certain criteria [9]. Purposive Sample techniques are samples conducted by taking subjects not based on strata, random or area but are based on a certain purpose [10]. Data collection is conducted through the dissemination of questionnaires to 10 respondents who have used all three karaoke services that are being researched to determine the level of quality comparisons of K2 family Karaoke, NAV family karaoke, and MILO Family Karaoke.

The processing of the data is carried out on average calculation of AHP by using Super Decisions Software for each element and determining the priority for each alternative. After completion of data processing, it will be obtained the calculation result that gives assessment about the best quality of service.

4. Results and Discussion
Hierarchies are used to provide alternatives to family karaoke. The dimensions and attributes of the service hierarchy Karaoke can be seen in table 1.

| Table 1. Elements of family karaoke services |
|----------------|----------------|
| Element         | Elements                         |
| **Tangible**    | It Has Spacious Parking           |
|                 | Has Air Conditioning Facilities   |
|                 | Complete Karaoke Equipment        |
| **Assurance**   | Originality of The Song           |
|                 | Voice Clarity                     |
|                 | Fast and Precise Service          |
| **Empathy**     | Receive Criticism And Suggestions |
|                 | Helping Customers Who Are Struggling |
|                 | Promo Notices                     |
| **Responsiveness** | Employee Friendliness            |
|                 | Fast Response to Customer Requests |
|                 | Provision of Clear Information    |
| **Reliability** | Timeliness of Promised Service    |
|                 | Suitability of The Payment System Offered |
|                 | Price Suitability                 |
On Super Decisions Software, the Cluster is created consisting of Cluster Goals, Cluster Criterion, Cluster Sub-Criterion and Cluster Alternatives. Next, create Nodes and fill in the Names column according to the node name we want. The entire cluster and node view can be seen in Figure 1.

![Figure 1. Entire cluster and node view](image)

Next, create a relationship between Nodes. Next, create a relationship between Nodes. The hierarchy of the family karaoke service can be seen in Figure 2.
Figure 2. Hierarchy of the family karaoke service

The next step, calculated the partial weight and consistency of the level 2 matrix of family karaoke services with Super Decisions Software. Populated values on available columns with an element's weighted sum. The look can be seen in Figure 3.

Figure 3. Partial weight level 2
The partial weighted result and the Consistency Ratio value can be seen in Figure 4.

![Figure 4. Partial weighted result matrix consistency level 2](image1)

Then calculated the partial weight and consistency on each element matrix. Here is one example of the result of partial weight and consistency calculations on the Tangible element matrix.

![Figure 5. Partial weighted results and element matrix consistency tangible level 3](image2)
The next step is to calculate the partial weight and consistency of the level 4 matrix on each element. Here is one example of the result of partial weight and consistency calculations on the matrix level 4 element "It Has Spacious Parking".

![Image of partial weighted result and matrix element consistency has spacious parking level 4](image)

**Figure 6.** Partial weighted result and matrix element consistency has spacious parking level 4

After calculating the partial weight value and matrix consistency at each level. Thus, the next step is to determine the priority weight value with Super Decisions Software. The weighted priority of level 2 can be seen in Figure 7.

![Image of priority weighted result level 2](image)

**Figure 7.** Priority weighted result level 2

The weighted priority of level 3 can be seen in Figure 8.
The weighted priority of level 4 can be seen in Figure 9.

The final step, determining the total weight value with Super Decisions Software. Priority-weighted results can be seen in Figure 10.
5. Conclusion
Based on the results and discussion conducted above, it can be concluded that:

- Based on the calculation of priority weights for service attributes the family karaoke is obtained a priority weight value level 2 for element tangible 0.28114, assurance element 0.11006, empathy element 0.07452, responsiveness element 0.17484 and Reliability element 0.35580. Thus, the Reliability element is the highest value of the other elements.
- Based on the weighted result of level 3 priority is obtained that the conformity element of the payment system offered has the highest value of the other element of 0.19973.
- Based on priority weighting result level 4 obtained the weighted value for K2 Karaoke of 0.26480, MILO Family Karaoke 0.12323, and NAV Karaoke 0.61197. Thus, NAV Karaoke is the highest value of the services of other family karaoke.
- The total weight calculation results on each service where the karaoke shows that NAV Karaoke has the highest total weight value.

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