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Decision Support System for Determining Recipients of Subsidized Food Materials for Poor Families Using the AHP Method at the Melati II Village Office

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ABSTRACT

Food substance subsidize to represent one of most having an effect on matter for impecunious family, pursuant to perception result which have been conducted passing implementation and usage applying program Office of Countryside of Jasmine II which have address in Unnamed Rd, Bar Terap, Perbaungan, Regency of Serdang Bedagai, North Sumatra, inferential that in determining decision of acceptance of food substance subsidize is Office of Countryside of Jasmine II have to design the system of receiver of food substance subsidize for society of Chief of village Mango which indigent effectively and efficient, as well as have to apply the method of Analytical Hierarchy Process (AHP) at acceptance of food substance subsidize.Others need also system implementation of decision supporter by using method of Analytical Hierarchy Process (AHP) to determine the society which indigent in acceptance of food substance subsidize.

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1. INTRODUCTION

The development of Decision Support System (DSS) was first described in the early 1970s by Michael S. Scott Morton with the term Management Decision System. utilizing certain data and models to solve unstructured problems [1] [2] [3].

Decision support system is part of a computer-based information system that solves this problem [4]. This system can support the decision making of prospective recipients of subsidized food based on predetermined criteria. The way this system works includes all stages of problem making, selecting relevant data and determining the approach used in the decision-making process to problem solving and solution.

In order to make the calculations on this decision support system more accurate, a method is used, namely the Analytical Hierarchy Process (AHP) method. AHP is a comprehensive decision-making model that takes into account both qualitative and quantitative aspects. This is because the concept is simple and easy to understand, computationally efficient and has the ability to measure

the relative performance of decision alternatives [5] [6]. In this method the criteria used in acceptance are only limited to the condition of the house, home status, income, occupation, and number of dependents.

Basically the system is a framework of interrelated procedures, which are arranged according to a comprehensive scheme to carry out an activity or main function of the company produced by a certain process that aims to provide information to help make decisions about the company's operations management from day to day. day to day and provide appropriate information to parties outside the company [7] [8] [9].

Decision is the activity of choosing an action strategy in problem solving. Decision making is the act of choosing a strategy or action that the manager (decision maker) believes will provide the best solution for something [10][11].

Decision Support System (DSS) is part of a computer-based information system including a knowledge-based system or knowledge management that is used to support decision making in an organization or company [12] [13] [14]. It can also be said as a computer system that processes data into information for making decisions on specific semi-structured problems. Decision support systems are "combinations of individual intelligence resources with component capabilities to improve decision quality. Decision support system is also a computer-based information system for decision-making management that handles semi-structured problems [15] [16] [17]. With the above understanding, it can be taken a decision that the decision support system is not a decision-making tool, rather, it is a system that helps decision makers by equipping them with information from data that has been processed relevantly and needed to make decisions about a problem more quickly and accurately. So that this system is not intended to replace decision making in the decision making process.

According to Eko Darmanto, Noor Latifah, and Nanik Susanti (2014: 77) "AHP (Analytic Hierarchy Process) is a general theory of measurement used to find ratio scales, both from discrete and continuous pairwise comparisons. AHP breaks down complex multi-factor or multi-criteria problems into a hierarchy. Hierarchy is defined as a representation of a complex problem in a multi-level structure where the first level is the goal, followed by the level of factors, criteria, sub-criteria, and so on down to the last level of alternatives. With a hierarchy, a complex problem can be broken down into groups which are then arranged into a hierarchical form so that the problem will appear more structured and systematic" [18].

Programming Visual Basic 2010 is a computer programming language. Programming languages are commands or instructions that are understood by computers to perform certain tasks. Visual Basic besides being called Programming Language is also often referred to as a means or tool for producing Windows-based application programs [19].

Visual Basic allows the creation of Graphical User Interface (GUI) applications or programming that uses a graphical display as a means of communication with the user. "Basic" denotes the BASIC (beginner all-purpose symbolic instruction code) programming language. Visual Basic was developed from the BASIC language plus hundreds of additional commands, functions, keywords, and many directly related to the Windows GUI. In Visual Basic, creating a user interface is relatively easy to do because you only need to put graphic objects into a form that has been provided by Visual Basic [20].

2. RESEARCH METHODS

2.1. Research Framework

Basically the steps of the AHP method in the form of a flowchart are:

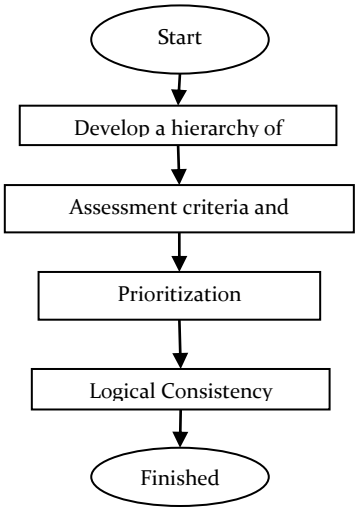

Figure 1. Research Framework

2.2. Description of the Framework

The description of the framework is a further explanation regarding the description of the process of the research framework carried out, along with the explanation:

a. Develop a hierarchy of problems encountered.
   The problem to be solved is broken down into its elements, namely criteria and alternatives, then arranged into a hierarchical structure.
b. Assessment criteria and alternatives
   Criteria and alternatives were assessed through pairwise comparisons. For many problems, a scale of 1 to 9 is the best scale for expressing opinions.
c. Prioritization
   For each criterion and alternative, it is necessary to do pairwise comparisons. The relative comparison values are then processed to determine the ranking of alternatives from all alternatives. Both qualitative criteria, as well as quantitative criteria, can be compared according to a predetermined assessment to produce weights and priorities.
d. Logical Consistency
   All elements are logically grouped and ranked consistently according to a logical criterion.

2.3 System planning

The system design is carried out after the system analysis stage is completed. The design of the application for learning mathematical formulas is made object oriented (object-oriented) by using the Unified Modeling Language (UML) as the modeling language. The design of the application for learning mathematical formulas is made object oriented (object-oriented) by using the Unified Modeling Language (UML) as the modeling language. Using the application design for learning mathematical formulas is made object oriented (object-oriented) by using the Unified Modeling Language (UML) as a modeling language. Use; Use Case Diagrams, Activity Diagrams, Sequence Diagrams.

3. RESULTS AND DISCUSSION

3.1 System Implementation

At the system implementation stage, researchers use hardware and software specifications for system implementation, because this application is still being tested in the author's momputer.

a. Login Form

The login page is the first page that appears when running the application. This page is for security so that no one can use this application.

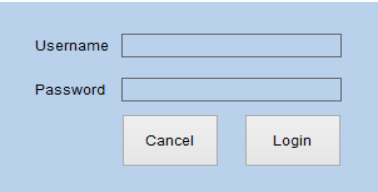

Figure 2. Login Form

b. Main Menu Form

This main page is the page where all the features to run the program are provided.

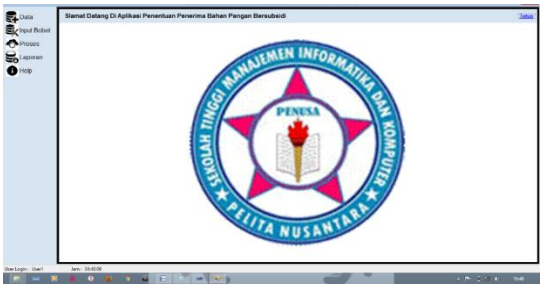

Figure 3. Main Form

c. Criteria Data Input Form

The criteria data input page is a page for inputting criteria data for subsidized food materials recipients, on this page criteria can be added, edited, or deleted.

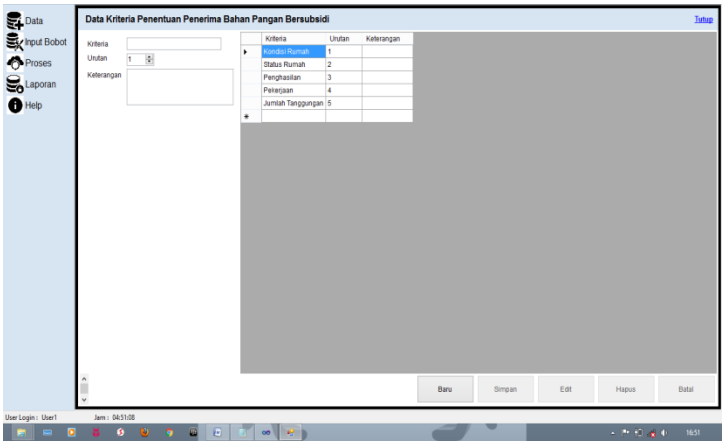

Figure 4. Criteria Data Input Form

d. Sub Criteria Data Input Form

Sub-criteria data input page is a page for inputting sub-criteria data for recipients of subsidized food, on this page criteria can be added, edited, or deleted.

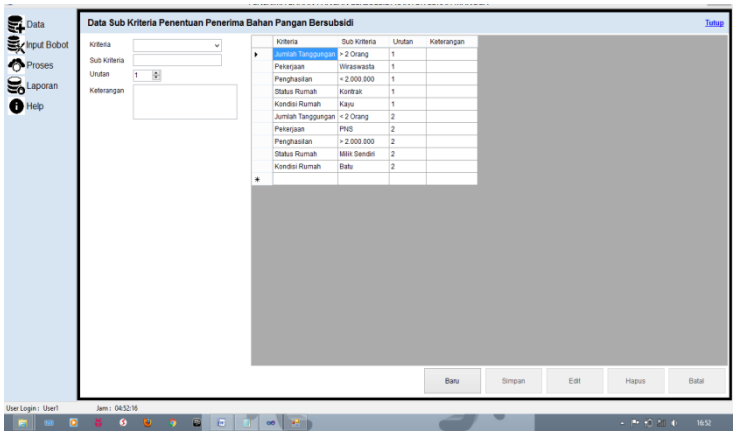

Figure 5. Sub Criteria Data Input Page

e. Family Data Input Form

The family data input page is a page for inputting family data for subsidized food recipients, on this page family data can be added, edited, or deleted

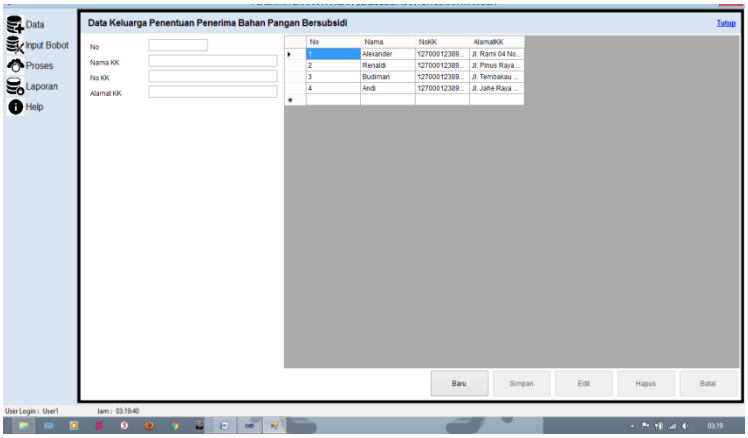

Figure 6. Family Data Input Form

f. Criteria Weight Input Form

The criteria weight input page is a page for inputting data on the criteria for receiving subsidized food, on this page the criteria weights can be entered in the pairwise comparison matrix table to calculate the comparison of each criterion.

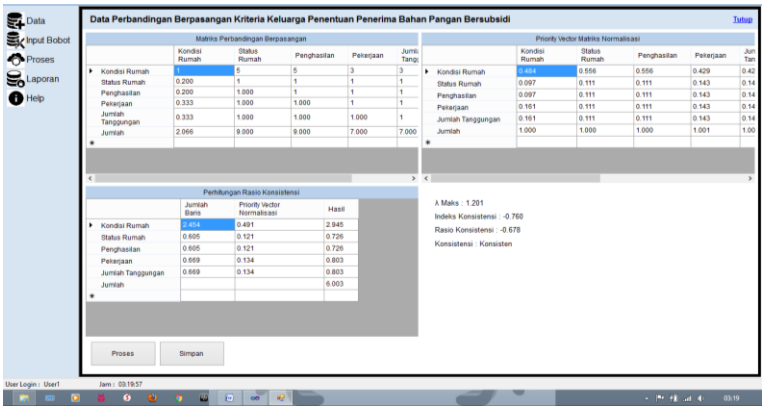

Figure 7.Criteria Weight Form

g. Sub Criteria Weight Input Page

The sub-criteria weight input page is a page for inputting sub-criteria weight data for subsidized food ingredients, on this page the sub-criteria weights can be entered in the pairwise comparison matrix table to calculate the comparison of each sub-criteria

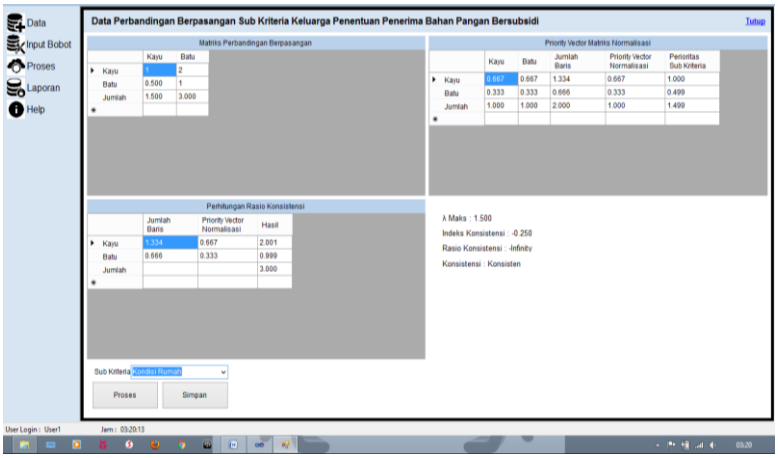

Figure 8.Sub Criteria Weight Input Form

h. Family Assessment Data Input Form

The family assessment data input page is a page for inputting family data that has been recorded and the priority of families that can receive subsidized food will be sought.

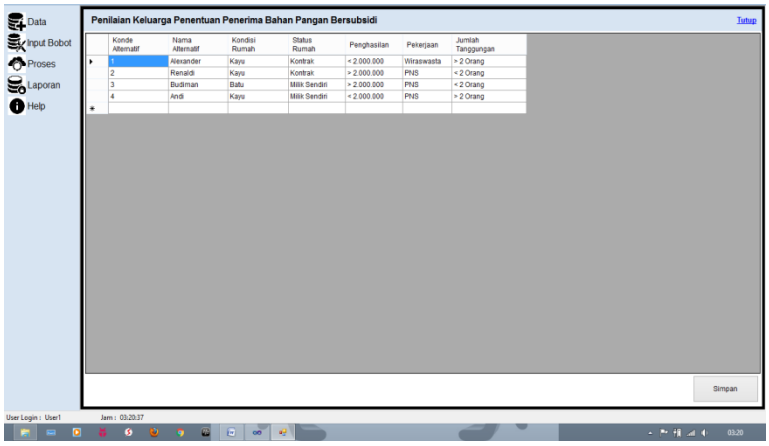

Figure 9. Family Data Input Form

i. Criteria Weight Input Form

The criteria weight input page is a page for inputting data on the criteria for receiving subsidized food, on this page the criteria weights can be entered in the pairwise comparison matrix table to calculate the comparison of each criterion.

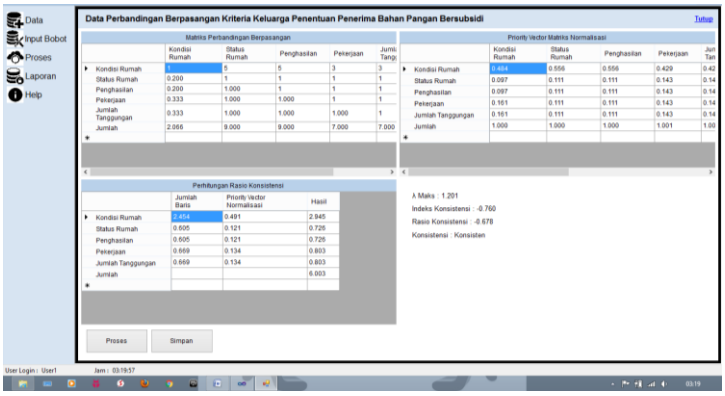

Figure 10.Criteria Weight Input Form

j. Value Information Page Weight

The Weight Value Information page is a page to display the weight results that have been processed according to the comparison matrix table.

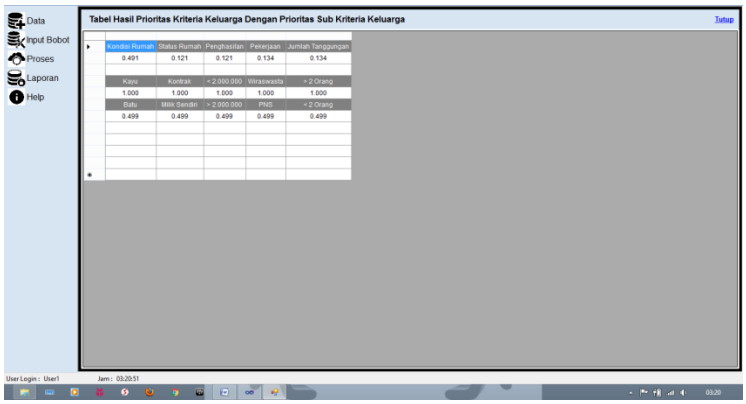

Figure 11.Weight Value Information Form

k. AHP Process Result Form

The result page of the AHP process for families receiving subsidized food is a page to display the data results that have been inputted and the results that have been inputted will display the weight value.

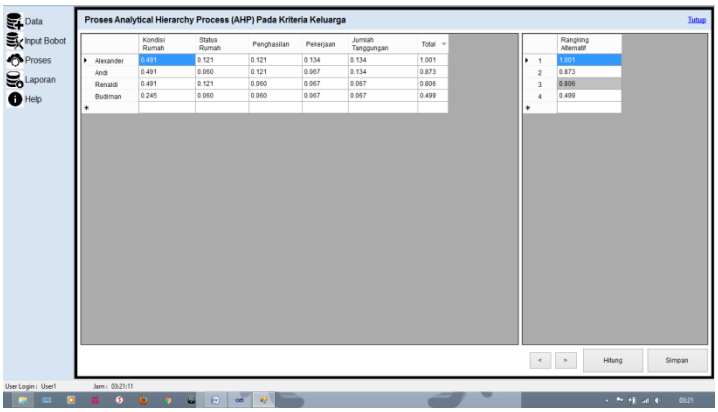

Figure 12.Criteria Weight Form

l. Data Print Page

The Print Data page is a page for printing the results of the AHP data on the subsidy recipient families that have been inputted and will be printed in the form of a report.

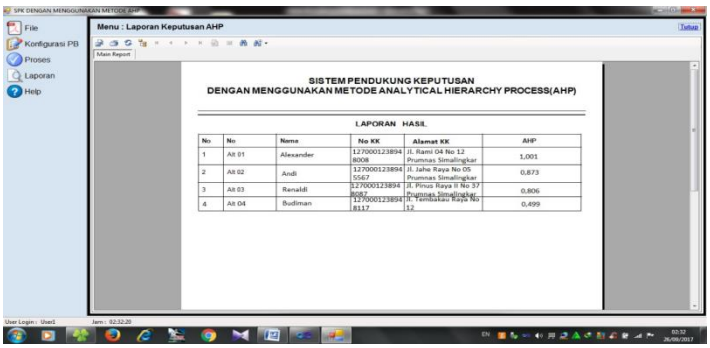

Figure 13.Data Print Page

The results of testing the application for determining recipients of subsidized food with the AHP method can be seen in table 1 below.

Table 1. Test results using the AHP method

No	Functions that Tested	Test Method	Expected results	Test result
1.	Home Menu	In the application system for receiving subsidized food for poor families with the AHP method	Provides a menu of criteria data, sub criteria, and family data.	Works fine
2.	Weight Input Menu	In the application system for receiving subsidized food for poor families with the AHP method	Displays the Input criteria and sub-criteria weighting menu.	Works fine
3.	Process Menu	In the application system for	Displays the menu for	Works fine

No	Functions that Tested	Test Method	Expected results	Test result
		receiving subsidized food for poor families with the AHP method	determining the sub-criteria for family data, the menu for weight information, and the menu for the results of the list of inputted family weights.	
4.	Report Menu	In the application system for receiving subsidized food for poor families with the AHP method	Displays the results of the ahp process on family data and will be printed in hardcopy form.	Works fine

4. CONCLUSION

Based on the results of observations that have been made through the implementation and application of the program at the Melati II Village Office, which is located at Unnamed Rd, Batang Terap, Perbaungan, Serdang Bedagai Regency, North Sumatra, it can be concluded that; Designing a system for receiving subsidized food for the underprivileged people of Mangga Village effectively and efficiently. Applying the Analytical Hierarchy Process (AHP) method to the receipt of subsidized food in Mangga Village. Implementing a decision support system using the Analytical Hierarchy Process (AHP) method to determine the poor in receiving Subsidized Foodstuffs.

REFERENCES

[1] G. Gusrianty, D. Oktarina, and W. J. Kurniawan, "Sistem Pendukung Keputusan Dengan Metode Promethee Untuk Menentukan Kepuasan Pelanggan Penjualan Sepeda Motor Bekas," *Sist. J. Sist. Inf.*, vol. 8, no. 1, pp. 62–69, 2019.

[2] R. Rizaldi, "Penentuan Operator Kartu Seluler Terbaik Menggunakan Metode Ahp (Analitycal Hierarchy Process)," *JurTI (Jurnal Teknol. Informasi)*, vol. 1, no. 1, pp. 61–67, 2017.

[3] Y. Djamain, "Sistem pendukung keputusan penerimaan pegawai baru pt. pln (persero) kantor pusat dengan menggunakan metode simple additive weighting (saw)," *J. Tek. Inform.*, vol. 8, no. 1, 2015.

[4] H. Rohayani, "Analisis sistem pendukung keputusan dalam memilih program studi menggunakan metode logika fuzzy," *JSI J. Sist. Inf.*, vol. 5, no. 1, 2013.

[5] R. M. Simanjorang, H. D. Hutahaean, and H. T. Sihotang, "Sistem Pendukung Keputusan Penentuan Penerima Bahan Pangan Bersubsidi Untuk Keluarga Miskin Dengan Metode AHP Pada Kantor Kelurahan Mangga," *J. Inform. Pelita Nusant.*, vol. 2, no. 1, 2017.

[6] F. Sawitri, "Integrasi SIG dan Metode MCDM untuk Evaluasi Penentuan Lokasi PLTS, Studi Kasus di Kabupaten Kupang, Nusa Tenggara Timur." Institut Technology Sepuluh Nopember, 2016.

[7] N. Wahyuni, M. I. A. Jasticia, and F. M. Nugraha, "Analisis Perbandingan Sistem Data Pokok Pendidikan (Dapodik) Tingkat SMK," *j-Sim J. Sist. Inf.*, vol. 1, no. 2, pp. 87–95, 2018.

[8] R. Melasari, "Pengaruh Sistem Informasi Akuntansi Terhadap Kinerja Karyawan Dengan Integritas Karyawansebagai Variabel Pemoderasi Pada Perbankan Di Tembilahan," *J. Akunt. dan Keuang.*, vol. 6, no. 1, 2017.

[9] S. Anwar, "Peranan Sistem Informasi Akuntansi Dalam Pengambilan Keputusan Manajemen Pada PT. BPR Budisetia," *J. KBP*, vol. 1, no. 2, pp. 254–273, 2013.

[10] N. Hadinata, "Implementasi Metode Multi Attribute Utility Theory (MAUT) Pada sistem pendukung keputusan dalam menentukan penerima kredit," *J. Sisfokom (Sistem Inf. dan Komputer)*, vol. 7, no. 2, pp. 87–92, 2018.

[11] E. A. Riyanto and T. Haryanti, "Sistem Pendukung Keputusan Pemilihan Teller Pooling Terbaik Pada PT. BCA Tbk. Dengan Metode SAW (Simple Additive Weighting)," *J. Pilar Nusa Mandiri*, vol. 13, no. 1, pp. 128–135, 2017.

[12] A. Muharsyah, S. R. Hayati, M. I. Setiawan, H. Nurdiyanto, and Y. Yuhandri, "Sistem Pendukung Keputusan Penerimaan Jurnalis Menerapkan Multi-Objective Optimization On The Basis Of Ratio Analysis (MOORA)," *JURIKOM (Jurnal Ris. Komputer)*, vol. 5, no. 1, pp. 19–23, 2018.

[13] R. Ahmad, "Penggunaan Sistem Pendukung Keputusan Dengan Menggunakan Metode Analytical

Hirarchy Process (AHP) Dalam Menyeleksi Kelayakan Penerima Beasiswa," *METIK J.*, vol. 2, no. 1, pp. 28–33, 2018.

[14] K. Safitri, F. T. Waruwu, and M. Mesran, "Sistem pendukung keputusan pemilihan karyawan berprestasi dengan menggunakan metode analytical hiearachy process (studi kasus: Pt. capella dinamik nusantara takengon)," *J. Media Inform. Budidarma*, vol. 1, no. 1, 2017.

[15] M. Angeline, "Sistem Pendukung Keputusan Pemilihan Karyawan Terbaik Menggunakan Metode Profile Matching," *J. Ilm. Smart*, vol. 2, no. 2, pp. 45–51, 2018.

[16] R. Yunitarini, "Sistem Pendukung Keputusan Pemilihan Penyiar Radio Terbaik," *J. Mikrotek*, vol. 1, no. 1, pp. 43–52, 2013.

[17] S. Nurhalimah, T. Tampubolon, W. B. Berutu, J. Simarmata, and M. Mesran, "Sistem Pendukung Keputusan Penerimaan Beasiswa Pada AMIK STIEKOM Sumatera Utara Menggunakan Metode VIKOR," in *Seminar Nasional Sains dan Teknologi Informasi (SENSASI)*, 2018, vol. 1, no. 1.

[18] E. Darmanto, N. Latifah, and N. Susanti, "Penerapan metode AHP (Analythic Hierarchy Process) untuk menentukan kualitas gula tumbu," *Simetris J. Tek. Mesin, Elektro Dan Ilmu Komput.*, vol. 5, no. 1, pp. 75–82, 2014.

[19] L. Yulianti, H. L. Sari, and B. H. Haryadi, "Sistem Pendukung Keputusan Peserta KB Teladan di BKKBN Bengkulu Menggunakan Pemrograman Visual Basic 6.0," *J. Media Infotama*, vol. 8, no. 2, 2012.

[20] N. Suarna, "APLIKASI KAS KECIL MENGGUNAKAN MICROSOFT VISUAL BASIC GUNA MENINGKATKAN AKUNTANBILITAS PERUSAHAAN," 2011.