

Determination Decision Support Systems Scholarship Recipients Using Analytic Process Hierarchy in STMIK Mura

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Abstract

Selection process in determining scholarship recipients are still having problems. On the ground are found to be less precise distribution of scholarships that causes the system is still conventional or manual. In addition to the decision-makers can not see the scholarship criteria together. In computer science there is a system which can help decision-makers to address issues that are semi-structured or unstructured is decision support systems. In a Decision Support System there are various methods one of which is the method of Analytical Hierarchy Process (AHP) which was discovered by Thomas L.Saaty. AHP can help in determining the priorities of several criteria by pairwise comparison analysis of each of the criteria specified. By looking at the problems that exist in decision making in the selection of scholarship recipients, a decision support system using AHP method is appropriate for use in aiding decision making to determine the scholarship recipients. Expected results in this study can help decision makers in determining scholarship recipients. The Decision Support System will be displayed in the form of desktop applications using Delphi.

Keywords : *Scholarship, Selection, Computer Science, Decision Support System, AHP Method, Delphi*

1 INTRODUCTION

Human resources is a factor that is important in an organization or institution in providing services to the public. Each institution requires human resources in managing the institution, so that the tasks given by the agency to be done with a good performance.

College of Management and Computer Science Musi Rawas Lubuklinggau (MURA STMIK Lubuklinggau) is one of the College of Science in Management and Computer Science. Standing since 2004 STMIK MURA has 3 departments of Computer Science, Computer Systems and Information Systems. Academic Services tasks ranging from the selection of new students, the semester fee payment, reimbursement plan of study, a confirmation class or course, the process of selecting awardees and others.

In the process of selecting awardees assessment requirements that would be pretty much the start of a cumulative grade index, salary slips, half of the parents and the number of

The screenshot shows a software interface titled 'Form Master' with a 'Proses' button and a 'Simpan' button. It contains four main data tables:

Matriks Berperangan				
	lqk	Penghasilan	Tanggungan	Semester
lqk	1	3	4	2
Penghasilan	0,33	1	1	2
Tanggungan	0,25	1,00	1	2
Semester	0,33	0,50	0,33	1
Jumlah	1,91	5,50	6,33	8,33

Matriks Nilai Kriteria						
	lqk	Penghasilan	Tanggungan	Semester	Jumlah	Prioritas
lqk	0,52	0,55	0,63	0,36	2,06	0,515
Penghasilan	0,17	0,38	0,36	0,24	0,91	0,228
Tanggungan	0,13	0,28	0,16	0,36	0,83	0,209
Semester	0,17	0,09	0,05	0,12	0,43	0,108

Matriks Perbandingan Setiap Basis					
	lqk	Penghasilan	Tanggungan	Semester	Jumlah
lqk	0,52	1,59	2,06	0,59	5,68
Penghasilan	0,08	0,23	0,23	0,46	1,00
Tanggungan	0,05	0,21	0,21	0,62	1,09
Semester	0,04	0,05	0,04	0,11	0,24

Rasio Konsistensi			
	Jumlah	Prioritas	Jumlah
lqk	5,68	0,515	6,195
Penghasilan	1,00	0,228	1,228
Tanggungan	1,09	0,209	1,299
Semester	0,24	0,108	0,348
Jumlah	8,01	1,06	9,07

At the bottom right, there are input fields for 'λ Maks' (value: 2,368), 'CI' (value: 0,433), and 'CR' (value: 0,481).

Figure 1: Management Knowledge Base

dependents and the time required in the selection is very limited to only 14 days. As a result, the screening process can not be done well and properly, frequent delays in decision-making, the process is quite long and the difficulty of determining the priority of selecting scholarship recipients.

1.1 Problem Formulation

How to create a Decision Support system Fellows Determination Method Using Analytic Process Hierarchy?

1.2 Research Objectives

The purpose of this study is:

1. Improving the quality of academic services in the process of selecting awardees
2. Decision Making Support System Determination Scholarship Hierarchy Process Using Analytic Methods.

1.3 Benefits of Research

1. Can improve the quality of academic services in grantee selection process,
2. Can accelerate the decision-making capability to process data or information to the wearer,
3. Assist decision-making in terms of saving the time needed to solve a variety of problems, especially problems that are complex and unstructured.

1.4 Limitations

The scope STMIK MURA, the criteria used are half, cumulative grade index, parental income, parental status, number of dependents of parents and other criteria that will be determined during the study.

Table 1: pairwise comparison of assessment scales

intensity of Interest	information
1	Both elements are equally important
3	Elements that one a little more important than other elements
5	One element is more important than any other element
7	One obvious element is absolutely more important than any other element
9	One element is absolutely important than other elements
2,4,6,8	Values between two adjacent values considerations
reverse	If activity i got one point compared with activity j, then j has the opposite value compared to i

2 DECISION SUPPORT SYSTEMS

According to Herman (2005) Decision Support System (DSS) or Decision Support System (DSS) is defined as a system that is capable of providing both the ability and the ability of problem-solving ability of communicating to the problem of semi-structured.

3 ANALYTIC PROCESS HIRARCHY

According to Kusriani (2007) Process Analytic Methods Hirarchy is a functional hierarchy with the main input of human perception. The existence of a hierarchy allows to solve complex problems in a structured or hierarchical sub-problems.

In a settlement with Analytic Methods Hirarchy there are several principles that must be understood, including:

1. Creating hierarchy

Complex system can be understood by breaking it down into the supporting elements, arrange the elements in the hierarchy, and incorporate them.

2. Assessment criteria and alternative

Criteria and alternatives is done by pairwise comparison. For many problems, a scale of 1 to 9 is the best scale for expressing opinions. Values and opinions qualitative definition of scale can be measured using the Saaty comparison table 1.

3. Determine priorities

For each criteria and alternatives, pairwise comparisons need to be done. Comparison of the relative values of all the criteria can be adjusted relative to the judgment which has been determined to produce weight and priority.

4. Logical consistency

Consistency has two meanings. First, similar objects can be grouped according to the uniformity and relevance. Second, regarding the level of relations between objects which are based on certain criteria.

5. Research methodology

Table 2: Income Parents

Penghasilan Orang Tua (X)	Nilai
$X \leq \text{Rp } 1.000.000$	1.75
$X = \text{Rp } 1.000.000 - 5.000.000$	1.5
$X = \text{Rp } 5.000.000 - 10.000.000$	1.25
$X \geq \text{Rp } 10.000.000$	0.1

Table 3: Dependent Parent

Tanggungans Orang Tua	Nilai
1 anak	0.1
2 anak	1.25
3 anak	1.5
4 anak	1.27
≥ 5 anak	2

In this study, the type of exploratory research. Exploratory research is usually done as a preliminary study of a study. This study is an exploratory study to clarify and define the issues to be raised in the research.

4 RESULTS AND DISCUSSION

Design of Decision Support System is built based on the results of data retrieval and analysis of software requirements. Software-based DSS can serve storage, presentation, collection, sharing, processing, and use of information.

4.1 Management Knowledge Base

In the Knowledge Base Subsystem, AHP modeling requires an assessment matrix pairs, calculating Value Criteria Matrix, Matrix calculate the sum of each row and the calculation of Consistency Ratio. Show in Figure 1.

4.2 Data management

Sources of data used in this study is a data allowance for eligible recipients criteria as secondary data, the data matrix pairs, calculate the value criteria matrix, calculate the sum of each row matrix and consistency ratio calculation as the primary data.

1. Variable income parents

Table 4: Semester

Semester (X)	Nilai
$X \leq 3$	0.1
$X = 4-5$	1.25
$X = 6$	1.5
$X \geq 7$	1.75

Table 5: cumulative grade point

IPK (X)	Nilai
$X \leq 2.5$	0.1
$X = 2.5-2.9$	1.25
$X = 3.0-3.5$	1.5
$X \geq 3.6$	1.75

(Show in Table 2)

2. Dependent Variable parents

(Show in Table 3)

3. variable Semester

(Show in Table 4)

4. Variabel cumulative grade point

(Show in Table 5)

4.2.1 INTERFACE

1. Form Master

Master form used to enter Matrix value pairs, calculate the value criteria matrix, calculate the sum of each row and matrix calculations Consistency Ratio.

2. Form Student Value

Students value this form is used to complete an assessment of the student. Examples of inputting the results of scholarship applicants. Where data are included in accordance with the actual data and in accordance with the criteria specified.

Figure 2: Form Master

id	nim	nama	ipk	penghasilan	tanggungan	semester
1	010103	ai	0	1,75	2	1,25
2	010307	suzdi	1,5	1,5	1,25	1,25
3	010206	aan	1,75	0	1,25	1,5

Figure 3: Form Student Value

3. Output

Output page is used to view reports scholarship recipients.

4.3 Validation testing

In validation testing to know whether the system is built is correct as required. Validation testing using Black Box testing method. The results of the validation testing of the system is 100% valid. This suggests that the functionality of the system can be run in accordance with system requirements list.

5 CONCLUSION

From the results, analysis and discussion that has been done in this study, it can be concluded as follows:

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No	Nim	Nama	ipk	penghasilan	jumlah	semester	jumlah	Ket
1	011.01.002	Ratna Sari	0,016	0,008	0,009	0,004	0,035	
2	011.01.048	Riyanto	0,019	0,007	0,008	0,004	0,037	
3	011.01.053	Acci Oktaviani	0,019	0,01	0,009	0,005	0,042	
4	011.01.131	Dopri Zuarsyah	0,016	0,008	0,006	0,003	0,034	

Figure 4: Output

1. Software of Excellence

- (a) With the Decision Support System Determination Method Using Analytic Scholarship Hierarchy The process as a medium to help executives make decisions in the selection of scholarship recipients.
- (b) Determination decision recipients are determined based on GPA, parental income, dependents of parents and half of these assessments can be justified with the support of the calculations performed by the method of Analycal Hierarchy Process.
- (c) This application can help and provide an alternative to the admin part in the process of selecting eligible recipients using AHP (Analycal Hierarchy Process).

2. Disadvantages Software

- (a) Determination of Decision Support Systems Scholarship has many shortcomings, hopefully next can proceed to the next study as a form of improvements over existing deficiencies.
- (b) Further development is expected to be sub-criteria in the assessment of not only the form of the final score.

5.1 SUGGESTION

Based on the conclusions described above, then there is some suggestion that the author wants to convey, among other:

1. With the Decision Support System Determination Method Using Analytic Scholarship Hierarchy The process as a medium to help executives make decisions. Necessary follow-up and testing the MURA STMIK Lubuklinggau, so it can later be perfected in the next study.
2. To maximize the employment of Decision Support Systems Scholarship Determination Method Using Analytic Hierarchy The process is, in the hope of Higher Education DSS training and socialization is to authorized employees.
3. In keeping with the era of communication and information at this time, with the expected SPK College of Management and Computer Science MURA Lubuklinggau can continue to follow the developments of information technology which is currently being developed rapidly.

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