
SELECTION OF SCIENCE OLYMPIAN USING ANALYTICAL HIERARCHICAL PROCESS METHODS

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Decision Support System is an interactive system, which helps decision makers through the use of data and decision models to solve semi-structured and unstructured problems. Analytical Hierarchy Process (AHP) is a decision support model developed by Thomas L. Saaty, a mathematician. This decision support model will solve complex problems by structuring a hierarchy of criteria, stakeholders, results and by drawing various considerations to develop weights or priorities.

Keywords: Decision Support System, Selection Process, Analytical Hierarchy Process (AHP)

1. Introduction

A play tree is a binary search tree adapted to the additional property that new elements are accessed quickly for re-access. Splay performs basic operations such as insertion, look-up and deletion in amortized (logarithm n) time numbers. For many sequences of non-random operations, the expanding tree performs better than other search trees, even when the particular pattern of the sequence is unknown. The expanding tree was invented by Daniel Dominic Sleator and Robert Endre Tarjan in 1985. All normal operations in a binary search tree are combined with one basic operation, called splaying. Playing a tree for a particular element composes the tree so that the element is placed at the root of the tree. One way to do this is to first perform a standard binary tree search for single or combined elements as needed. If all three are used together, the consequence is that the network will be much safer than using only one security process, and then using a specific tree rotation to bring the elements up. Alternatively, a top-down algorithm can combine search and tree reorganization into a single phase. The methodology used in this research is Research & Development with data structure learning tutorials [1][2][3]. Non-linear data structures If all three are used together, the consequence is that the network will be much safer than using only one security process, and then using a specific tree rotation to bring the elements up. Alternatively, a top-down algorithm can combine search and tree reorganization into a single phase. The methodology used in this research is Research & Development with data structure learning tutorials [1][2][3]. Non-linear data structures If all three are used together, the consequence is that the network will be much safer than using only one security process, and then using a specific tree rotation to bring the elements up. Alternatively, a top-down algorithm can combine search and tree reorganization into a single phase. The methodology used in this research is Research & Development with data structure learning tutorials [1][2][3]. Non-linear data structures is an inconsistent system [4]. Innovative learning is learning that provides knowledge that produces an opportunity [5]. The algorithm based on this optimization play tree is proposed to reduce word grouping that accumulates by recording the data [6]. The experimental results show that the proposed method is effective in identifying various categories for searching [7]. The principle of very detailed data structure design to automatically synthesize new data structures [8]. There

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are many difficulties in the teaching and learning process of Algorithms and Data Structures [9]. Dynamic binary search tree is a fundamental class of dictionary data structure [10], which predicts that a display tree is a universally efficient form of binary search tree, for any access sequence [11].

2. Research Methods

The selection methods in the decision support system (Nitisemito, 1996, 36) are as follows:

1. *non scientific method*, namely the selection carried out not based on criteria, standards or specifications of real needs, but only based on estimates and experience. This selection is not guided by job descriptions and job specifications of the positions to be filled. The elements selected in this method are as follows:
 - a. Taken from the first rank even though you don't master the material
 - b. References or recommendations from trusted parties.
2. *Scientific method*, namely the development of non-scientific selection by conducting a careful analysis of the elements to be selected in order to obtain competent participants with the right placement. Scientific selection is carried out in the following ways:
 - a. An exam is conducted to determine the ability possessed regarding mastery of the material.
 - b. Participants are selected based on the criteria that are eligible to participate in the next Olympics.

The required device specifications are:

1. *Intel Pentium Processor IV 1.8 Ghz*
2. *Memory 512 Mb*
3. *Hard disk at least 80 Gb*
4. *VGA 128 Mb*
5. *Monitor with 800x600 . resolution*
6. *Keyboard and Mouse*
7. *Windows 7 Operating System*

3. Result And Discussion

Analytical Hierarchy Process is a decision search method that will produce rational decision results. A rational decision is defined as the best decision of the various objectives to be achieved by the decision maker. The main keys to rational decisions include alternatives and criteria that lead to the desired destination on existing sources to make it easier to calculate decision making using the Analytical Hierarchy Process method. In making this decision the author performs several stages, namely:

1. Stages of the selection process
 - a. Determining the Alternative Selection
In determining the alternatives, the school has determined, namely students who register to take part in the selection of science olympiad participants. The following are the participants who take part in the selection of science olympiad participants who will become an alternative selection using the Analytical Hierarchy Process method, as follows:

Table 1. Alternative Participants

No	NAME	NIS	CLASS
	Crystal	14612	PA-XI A
	Saturday	14345	PA-XI A
	Wilington	14634	PA-XI A
	Fernando	14876	PA-XI D
	Wilson	14869	PA-XI F
	Jackson	14867	PA-XI C
	Indra	14367	PA-XI B
	chrismanto	14861	PA-XI B
	Riris casa	14571	PA-XI A
	Andreas	14587	PA-XI A
	Veronica	14801	PA-XI G
	Donna	14681	PA-XI E
	Frisk	14860	PA-XI F
	Merry	14892	PA-XI D
	Handika	14896	PA-XI A

b. Determining Selection Criteria

The selection criteria for comparison are as follows:

- A. Criterion 1 : K1 = Personality
- B. Criterion 2 : K2 = Achievement
- C. Criterion 3 : K3 = Report Value
- D. Criterion 4 : K4 = Test Test

The percentage of assessment is as follows:

1. Personality : the weight of the criteria is 1
 - Craft : Percentage 20%
 - Discipline : Percentage 30 %
 - Responsibility : Percentage 50 %
2. Achievement : the weight of the criteria is 3
 - Overall ranking of each semester : Percentage 20%
 - Science Field Values in each semester : Percentage 30%
 - Overall score in each semester : Percentage 50%
3. Report Score : the weight of the criteria is 4
 - Skill Achievement : Percentage 20%
 - Organizational Achievements : Percentage 40%
 - Knowledge Achievement : Percentage 40%

4. Test Test Value : the weight of the criteria is 4
 Value of Practice in the Field of Science : Percentage 20%
 Oral Test Score : Percentage 40%
 Written Test Score : Percentage 40%

c. Determining the Weight of Selection Criteria

The criteria in the selection of science olympiad participants owned by students. Based on the Pair Comparison Rating Scale, they must determine the weight of the assessment as follows:

Table 2. Criteria Weight Requirements

Level of Interest	Value Weight
Very good	5
Good	4
Enough	3
Bad	2
Very bad	1

2. Selection Stage

Based on the above provisions, three selected participants were obtained and can be seen in the following table:

Table 3. Three Selected Participants

No	NAMA	NIS	KELAS	Nilai Penyeleksian	Nilai Bobot	Keterangan
1	Riris casa	14571	IPA-XI A	81.75	4	Baik
2	Krismanto	14861	IPA-XI B	79.25	4	Baik
3	Handika	14896	IPA-XI A	79.25	4	Baik

Implementation

Implementation is the process of implementing the new system created. In order to run perfectly implementation requires an explanation of how the system works from start to finish. In addition, implementation is also a step for testing a system whether the system has deficiencies, from which suggestions will emerge to improve the system for the better.

The following is a decision support system report that aims to save a printed file from the decision support system process. There are 3 reports in the decision support system, namely alternative reports, criteria reports and AHP reports, all of which can be processed by clicking on the report menu.

a. Alternative Report

The alternative report display can be seen in Figure 1 below:

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Menu : Laporan Alternatif Tutup

Main Report

**SISTEM PENDUKUNG KEPUTUSAN PEMBERIAN PINJAMAN
PADA PUSAT KOPERASI KEPOLISIAN DAERAH SUMATRA UTARA
DENGAN MENGGUNAKAN METODE ANALYTICAL HIERARCHY PROCESS(AHP)**

LAPORAN ALTERNATIF

No	No Peminjam	Nama	No KTP	Alamat	No Telp	Tempat Lahir	Tanqqal Lahir	Jenis Kel	Status	Nama Suami/Istri
1	0001	W. HERLABANG	1207261301	Jl. Budi Utomo	08216021	Klambir V Deli s	08/13/1965	Laki-laki	Kawin	HARIANI
2	0002	KAROLINA KABAN	1271184201	Jl. Masjid Taufik NO. 177 Medan	081263721	Namutrasi	08/02/1970	Perempus	Kawin	SIMON PASARIBU
3	0003	JULIANA SITUMORANG, SH	0201316501	Komp. Taman Tenera Indah	-	Medan	12/31/1995	Perempus	Kawin	GUNUNG SEMBIRI
4	0004	BERTHA BERNIKE ARITONANG	1271206811	Jl. Gg. Krakatau NO.64 Medan	081370301	Medan	12/28/1964	Perempus	Kawin	MARIHOT PASARIE

Figure 1. Alternative Report

b. Criteria Report

The appearance of the criteria report can be seen in Figure 2 below:

Menu : Laporan Kriteria Tutup

Main Report

**SISTEM PENDUKUNG KEPUTUSAN PEMBERIAN PINJAMAN
PADA PUSAT KOPERASI KEPOLISIAN DAERAH SUMATRA UTARA
DENGAN MENGGUNAKAN METODE ANALYTICAL HIERARCHY PROCESS(AHP)**

LAPORAN KRITERIA

No	Kriteria	Keterangan
1	Pendapatan	Kriteria ke 1
2	Pekerjaan	Kriteria ke 2
3	Jaminan	Kriteria ke 3
4	Status Kredit	Kriteria ke 4

Figure 2. Criteria Report

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c. AHP Report

The display of the AHP report can be seen in Figure 3 below:

SISTEM PENDUKUNG KEPUTUSAN PEMBERIAN PINJAMAN PADA PUSAT KOPERASI KEPOLISIAN DAERAH SUMATRA UTARA DENGAN MENGGUNAKAN METODE ANALYTICAL HIERARCHY PROCESS(AHP)						
LAPORAN HASIL						
No	No Peminjam	Nama	No KTP	Alamat	No Telp	AHP
1	0003	JULIANA SITUMORA	020131650761C	Komp. Taman Tenera Ir	-	0.98
2	0001	W. HERLABANG	120726130865C	Jl. Budi Utomo	082160217000	0.71
3	0002	KAROLINA KABAN	127118420870C	Jl. Mesjid Taufik N0.17	081263725550	0.56
4	0004	BERTHA BERNIKE AI	127120681264C	Jl. Gg. Krakatau N0.64	081370306744	0.52

Figure 3. AHP Report

4. Conclusion

Based on the results of the discussions that have been carried out previously, it can be concluded as follows:

1. The selection of participants in the science olympiad at SMA Negeri 1 Lubuk was conducted by selecting using a written test and then selecting using a decision support system using the Analytical Hierararchy Process (AHP) method for selection assessment.
2. The selection of science olympiad participants using the Analytical Hierararchy Process (AHP) method is carried out by the selection process by determining the selection alternative, determining the Selection Criteria, namely Personality, Achievement, Report Values, Test Tests. Then determine the weight of the criteria, namely the weight values are very good, good, enough, bad, very bad.
3. Design The selection of science olympiad participants is carried out using the Microsoft Visual Studio 2008 programming language, Mysql database, and with a system design that uses use cases, activity diagrams and flowcharts to describe the process flow.

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