Decision Support System for Thesis Session Pass Recommendation Using AHP (Analytic Hierarchy Process) Method

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Abstract

The background this time is how the scoring system is still objective in the thesis trial system, therefore with this decision support system, the objective assessment will become a definite scoring system, and will be able to help examiners provide the best advice to take decisions to be taken during the student thesis trial. The method used in this research is to use quantitative methods, by conducting a librarian study and then combined with data taken from student participants in the thesis examination, with the library study method, it will be possible to explore this research and data processing will also be maximized. Many systems use the AHP algorithm method to make decisions that are difficult to make, using the AHP method can be taken into consideration in making decisions, because data processing using the AHP method will provide the best advice for making an important decision. This research will produce a system proposal and how the data is obtained, then how the data is processed to produce a system proposal, which is best for making decisions about students who are currently passing their thesis exams or not, with the proposed system will greatly help the examiner take decisions that were previously objective.

Keywords: Decision Support System, Thesis Session, Pass, AHP.

I. INTRODUCTION

In making a decision, sometimes humans can make objective decisions according to humans, sometimes the decisions are in favor of one part, with this, by making a system this can be eliminated, by taking absolute decisions, it cannot be changed through any process[1], definite decision-making is needed because it can provide confirmation of a decision taken, in this case a graduation decision from a thesis trial that students do, with a definite decision, graduation can be ascertained if all elements are sufficiently fulfilled. The current system is using a manual system, namely by collecting direct scores from the examiners based on the assessment of each examiner, with this manual system the assessment is still objective, with the system, this assessment can be firmer against all existing assessments[2].

The problem raised in this research is how to make a decision support system in making student thesis graduation decisions, with this system it is hoped that it will be able to help students get maximum results, because the system is no longer objective in making a decision[3]. The method used in this research is to conduct a literature study. by referring to previous studies. thus producing a new study. and this study uses existing data in a university to be processed and converted into a decision support system, which can maximize decisions in determining student thesis trial graduation[4].
This research will produce a proposed system that can assist student thesis examiners in making graduation decisions, with this system it will greatly assist universities in making graduation decisions for students who have conducted a thesis trial[5].

II. METHODS

This section will discuss how the research was carried out and what methods were carried out in this research, with the research method, the direction of the research will not be biased and will be able to focus on doing research that is right on target, as for the pictures and explanations of the research methods[6]. will be seen below:

![Research Method Diagram]

Based on the image of the research method above, the explanation will be given below:

A. Literature Study
The first part of this research method is to conduct a study in the library, by conducting a review of previous research studies in order to find new research directions, and also to determine the issues that can be raised in this research[7].

B. Problem
In the second part of the research method this time is to find a problem that will be raised in this research, the problem is found based on a review of previous studies, by conducting a review, the problem raised in this research can be a problem that did not exist before so it can be a basis future research[8].

C. Research
In the third part of the research method this time is to conduct research, by carrying out data collection and data processing using the AHP algorithm method, with the data, the problem solving process raised in this research will be maximized, by finding the results it can be seen the use of the method. AHP maximized[9].

D. Application
The last part of the research method this time is implementing a system in a decision support system, which will help in deciding the graduation of a student's thesis trial, with this system the results will be known more quickly and conclusions from graduation are not objective[10].

AHP algorithm is a method used to make a difficult decision, because a decision is influenced by several things, with this, the decision support system must be absolute and cannot be influenced by anything, with a definite system this system will be very help those in need[11].

III. RESULT AND DISCUSSION
This section will discuss how the data is obtained and how the data processing takes place, and the flow of a research that will be carried out in this research[12], the explanations and pictures will be explained below:
Based on the picture of the research direction above, the explanation will be given below:

A. Student
Students are the object of this research because students are people who conduct a thesis trial, with the presence of students, data will be obtained from these students, the data is obtained based on the results of thesis research conducted by students, with testing, the conclusions will be known\[13\].

B. Thesis Session
A thesis trial is a process that a student must go through if he wants to graduate from his education, with this trial, the education taken will be tested and the research carried out by students can be justified, with the AHP algorithm, the decision to pass a student thesis trial can be more absolute, and not influenced by objective decisions\[14\].

C. Decision
The decision taken in this research is the result of data processing carried out by the AHP algorithm, with this decision it will ensure that the decision is not influenced by things that can influence the decision, so the decision is certain and cannot be changed anymore because it is already carried out the analysis process based on the system\[15\].

Participants in the thesis trial will be tested by 5 examiners and the results of the data from the examiner's assessment will produce a data that will be processed by the AHP algorithm method, with this data it will produce a decision in the form of passing or not passing, with the AHP algorithm method the decision will be certain and cannot in the fox again\[14\].
Fig 4. Data Processing Flowchart

Based on the flowchart image above, the explanation will be given below:

Students as research objects in this research conduct a thesis trial in front of the examiners, and data processing will be carried out through the AHP algorithm method, with the test results given by the examiner will produce data, and the data will be processed to determine the best decision for students, this decision can make students graduate and can make students fail, student graduation has been determined based on the system so that the examiner cannot change the system that has been set[14].

**D. Data Processing**

| No | Examiner 1 | Examiner Parameters | Code |
|----|------------|---------------------|------|
| 1  | Examiner 1 | Chapter Writing     | A1   |
| 2  | Examiner 2 | Neatness            | A2   |
| 3  | Examiner 3 | Manners             | A3   |
| 4  | Examiner 4 | Delivery of Materials | A4 |
| 5  | Examiner 5 | Mastery of Materials | A5 |

Based on the table above, the following explanation will be given, there are 5 examiners, and the test parameters are 5 types of hours consisting of chapters of writing, tidiness, manners, delivery of materials and mastery of materials, each of which is given the code A1 A2 A3 A4 and A5.

| No | Parameter                  | Code | Scale   |
|----|----------------------------|------|---------|
| 1  | Chapter Writing            | A1   | 10 - 100|
| 2  | Neatness                   | A2   | 10 - 100|
| 3  | Manners                    | A3   | 10 - 100|
| 4  | Delivery of Materials      | A4   | 10 - 100|
| 5  | Mastery of Materials       | A5   | 10 - 100|

Based on the parameter table above, the following explanation will be given, the parameters will be given a scale of 10 to 100, with this scale, a score will be given from each examiner who tests the student's thesis.

| No | Graduation Session Scale Value | Session Graduation Letter | Decision |
|----|--------------------------------|--------------------------|----------|
| 1  | 1 - 100                        | E                        | Not Pass |
| 2  | 101 - 200                      | D                        | Not Pass |
| 3  | 201 - 300                      | C                        | Not Pass |
| 4  | 301 - 400                      | B                        | Pass     |
| 5  | 401 - 500                      | A                        | Pass     |

Based on the decision table above, an explanation will be given as follows, the value of the 1-100 graduation scale will be given an E value and the decision does not pass, 101-200 letters of trial graduation are D and are declared not passed, 201-300 letters of trial graduation are C and are declared no passed, the grade of 301-400 letters of graduation at the trial was B and passed, 401-500 letters of the entire trial were A and passed.

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Table 4. Table of Thesis Examination Participants

| No | Name of Participants at the Session |
|----|-------------------------------------|
| 1  | Jamal Arifin Putra                  |
| 2  | Rama Sayartin                      |
| 3  | Iranto Jamaludin                    |
| 4  | Syamsir Alam                       |
| 5  | Tomi Abdullah                       |
| 6  | Sari Puspita Ningsih                |
| 7  | Lia Amalia                          |
| 8  | Eko Nurmahdin                       |
| 9  | Nur Syah Dana                       |
| 10 | Awal Sinaga                         |

Based on the exam participant table above, it contains the names of the participants who took the thesis trial, while the list of trial participants can be seen in the table above.

Table 5. Table of Thesis Examination Results

| No | Name of Participants at the Session | A1  | A2  | A3  | A4  | A5  | Total |
|----|-------------------------------------|-----|-----|-----|-----|-----|-------|
| 1  | Jamal Arifin Putra                  | 80  | 85  | 89  | 80  | 87  | 421   |
| 2  | Rama Sayartin                      | 90  | 89  | 86  | 87  | 83  | 435   |
| 3  | Iranto Jamaludin                    | 86  | 87  | 85  | 86  | 87  | 431   |
| 4  | Syamsir Alam                       | 85  | 89  | 80  | 85  | 89  | 428   |
| 5  | Tomi Abdullah                       | 80  | 89  | 86  | 80  | 89  | 424   |
| 6  | Sari Puspita Ningsih                | 86  | 85  | 86  | 86  | 87  | 430   |
| 7  | Lia Amalia                          | 85  | 80  | 85  | 85  | 86  | 421   |
| 8  | Eko Nurmahdin                       | 89  | 86  | 80  | 89  | 85  | 429   |
| 9  | Nur Syah Dana                       | 87  | 85  | 86  | 89  | 89  | 436   |
| 10 | Awal Sinaga                         | 86  | 89  | 85  | 80  | 87  | 427   |

Based on the thesis test results table above, the following explanation will be given, the trial participants have taken the thesis trial, then the examiners have given the values in columns A1, A2, A3, A4 and A5, the results of the thesis exam will be total, and total this will be able to produce a decision whether the student will graduate or not.

Table 6. Table of Session Decision Results

| No | Name of Participants at the Session | Total value | Session Graduation Letter | Decision |
|----|-------------------------------------|-------------|---------------------------|----------|
| 1  | Jamal Arifin Putra                  | 421         | A                         | Lulus    |
| 2  | Rama Sayartin                      | 435         | A                         | Lulus    |
| 3  | Iranto Jamaludin                    | 431         | A                         | Lulus    |
| 4  | Syamsir Alam                       | 428         | A                         | Lulus    |
| 5  | Tomi Abdullah                       | 424         | A                         | Lulus    |
| 6  | Sari Puspita Ningsih                | 430         | A                         | Lulus    |
| 7  | Lia Amalia                          | 421         | A                         | Lulus    |
| 8  | Eko Nurmahdin                       | 429         | A                         | Lulus    |
| 9  | Nur Syah Dana                       | 436         | A                         | Lulus    |
| 10 | Awal Sinaga                         | 427         | A                         | Lulus    |

Based on the table of trial decisions that have been followed by trial participants, with the total score obtained based on the examiners' assessment, the letter of passing the trial can be seen, and the court decision can also be known at that time, with the results of this trial decision, it is absolute and inviolable.

Table 7. Testing Table

| No | Parameters Tested | Test result |
|----|-------------------|-------------|
| 1  | Input Test Values | OK          |

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Based on the test table above, the test results are the maximum, from the input data processing value, to the output of the graduation decision, the results are positive and OK, so this test table is a checklist of the system created and shows good results.

IV. CONCLUSION

The use of the AHP method has been able to maximize decisions in student thesis sessions, with the existence of a decision support system based on the AHP method, the decision is absolute and cannot be contested and this decision is not objective based on the examiner. Based on the results of testing all systems can maximize decisions, the AHP method is a very appropriate method to be applied in making a decision to pass a student thesis trial.

Future research is how to combine several algorithms into one algorithm, which can support decisions in the student thesis trial, with comparisons it can be seen which method will be very effective in helping make decisions.

REFERENCES

[1] N. K. Dewi and A. S. Putra, "Perkembangan Gamification dan Dampak Game Online terhadap Jiwa Manusia di Kota Pintar DKI Jakarta," *Jurnal Informatika Universitas Pamulang*, vol. 5, no. 3, pp. 315-320, 2020.

[2] N. K. Dewi and A. S. Putra, "SISTEM PENUNJANG KEPUTUSAN PENERIMAAN KARYAWAN BARU DENGAN ALGORITMA GREEDY," *Jurnal Visualika*, vol. 6, no. 2, pp. 154-160, 2020.

[3] N. K. Dewi, I. Mulyana, A. S. Putra and F. R. Radita, "Konsep Robot Penjaga Toko Di Kombinasikan Dengan Pengendalian Virtual Reality (VR) Jarak Jauh," *IKRA-IITH INFORMATIKA: Jurnal Komputer dan Informatika*, vol. 5, no. 1, pp. 33-38, 2020.

[4] N. K. Dewi, B. H. Irawan, E. Fitry and A. S. Putra, "Konsep Aplikasi E-Dakwah Untuk Generasi Milenial Jakarta," *IKRA-IITH INFORMATIKA: Jurnal Komputer dan Informatika*, vol. 5, no. 2, pp. 26-33, 2020.

[5] M. S. Hartawan, A. S. Putra and A. Muktiono, "Smart City Concept for Integrated Citizen Information Smart Card or ICISC in DKI Jakarta," *International Journal of Science, Technology & Management*, pp. 364-370, 2020.

[6] A. S. Putra, "Konsep Kota Pintar Dalam Penerapan Sistem Pembayaran Menggunakan Kode QR Pada Pemesanan Tiket Elektronik," *TEKINFO Jurnal Ilmiah Teknik Informatika*, vol. 21, pp. 1-15, 2020.

[7] A. S. Putra, "Analisa Dan Perancangan Sistem Pembelian Makanan Di Restoran Pada Masa Pandemic Coronavirus Disease 2019 (Covid-19)," *Jurnal Esensi Komputasi (Jurnal Esensi Sistem Komputer dan Informasi)*, vol. 4, no. 2, pp. 10-15, 2020.

[8] A. S. Putra, "Efektifitas Sistem Jalan Underpass untuk Kota Pintar DKI Jakarta," *Jurnal Informatika Universitas Pamulang*, vol. 5, no. 3, pp. 220-227, 2020.
[9] A. S. Putra, "Teknologi Informasi (IT) Sebagai Alat Syiar Budaya Islam Di Bumi Nusantara Indonesia," *Seminar Nasional Universitas Indraprasta (SINASIS)*, pp. 200-215, 2020.

[10] A. S. Putra and L. H. S. W. Harco, "Intelligent Traffic Monitoring System (ITMS) for Smart City Based on IoT Monitoring," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, pp. 161-165, 2018.

[11] A. S. Putra, L. H. S. W. Harco, S. A. Bahtiar, T. Agung, S. Wayan and H. K. Chu, "Gamification in the e-Learning Process for children with Attention Deficit Hyperactivity Disorder (ADHD)," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, pp. 182-185, 2018.

[12] D. N. M. A. A. P. J. I. D. H. S. Y. C. Arman Syah Putra, "Examine Relationship of Soft Skills, Hard Skills, Innovation and Performance: the Mediation Effect of Organizational Le," *IJEMS*, pp. 27-43, 2020.

[13] A. S. Putra, L. H. S. W. Harco, L. G. Ford, S. Benfano and A. Edi, "A Proposed surveillance model in an Intelligent Transportation System (ITS)," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE*, pp. 156-160, 2018.

[14] M. Subani, I. Ramadhan, S. and A. S. Putra, "Perkembangan Internet of Think (IOT) dan Instalasi Komputer Terhadap Perkembangan Kota Pintar di Ibukota Dki Jakarta," *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, vol. 5, no. 1, pp. 88-93, 2020.

[15] I. Ramadhan, A. Kurniawan and A. S. Putra, "Penentuan Pola Penindakan Pelanggaran Lalu Lintas di DKI Jakarta Menggunakan Metode Analytic Network Process (ANP)," *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, vol. 5, no. 1, pp. 51-57, 2020.

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