IMPLEMENTATION OF THE (MFEP) MULTIFACTOR EVALUATION PROCESS METHOD IN DETERMINING SCHOOL RENOVATION

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Abstract*: The Government of Indonesia has established National Education Standards relating to facilties and infrastructure with the aim that every school-age child can enjoy a proper and quality education. However, in Batu Bara District, educational problems cannot be handled optimally, especially in the suurbs, there are still many school buildings in unfit for use conditions which are quite apprehensive and no longer sufficient to accommodate the increasing number of students each year. Realizing the importance of education, the Government of Batu Bara Regency has provided a budget for school renovations which are considered to be inadequate. For policy making that is oriented towards equal rights to obtain quality and relevant education, to create a computer- based system and use the Multifactor Evaluation Process method which is implemented into the Sublime Text 3 programming language, and theb MySQL database, to assist policy makers in analyzing data school- school data that is noy suitable for renovation. This system is expected to be able to provide suggestions and provide the information needed to prioritized for enovation.

Keywords: decision support system; multifactor evaluation process; school renovation

Abstrak: Pemerintah Indonesia telah menetapkan Standar Nasional Pendidikan yang berkaitan dengan sarana dan prasarana dengan tujuan agar setiap anak usia sekolah dapat menikmati pendidikan yang layak dan bermutu. Namun di Kabupaten Batu Bara masalah pendidikan masih belum dapat ditangani secara optimal, terutama di daerah pinggiran masih banyak bangunan sekolah dengan kondisi yang tidak layak pakai dan cukup memprihatinkan dan tidak lagi memadai untuk menampung siswa yang bertambah setiap tahunnya. Sadar akan pentingnya pendidikan, Pemerintahan Kabupaten Batu Bara telah menyediakan anggaran untuk renovasi sekolah yang dinilai kurang layak. Untuk pengambilan kebijakan yang berorientasi pada kesamaan hak untuk memperoleh pendidikan yang bermutu dan relevan maka dibuat sistem berbasis computer dan menggunakan metode Multifactor Evaluation Process yang diimplementasikan kedalam bahasa pemrograman Sublime Text 3, dan database MySQL, untuk membantu para pemangku kebijakan dalam menganalisis data-data sekolah yang tidak layak untuk dilakukan renovasi. Sistem ini diharapkan dapat memberikan usulan dan menyediakan informasi yang dibutuhkan untuk memprioritaskan sekolah mana yang lebih didahulukan untuk dilakukan renovasi.

Kata Kunci : multifaktor evaluation process*; renovasi sekolah; sistem pendukung keputusan

INTRODUCTION

Entering the industrial revolution 4.0, which is completely integrated with the internet, of course, information technology is currently being used as something that is difficult to escape from the needs of some or even all of humanity in the world [1]. Currently, the trend of computerization is experiencing rapid development, including in the field of education which also follows developments that must be adjusted. Increasing the efficiency and quality of service will always be used as an important aspect to increase competitiveness in the world of education [2].

DSS are not only used in the field of technology but can be used in the field of education, such as determining school renovations [3].

School buildings/buildings and classrooms are an important part of educational facilities and infrastructure. The availability of comfortable school buildings and classrooms greatly influences the smooth running of the educational process itself [4]. The teaching and learning process will run well if students will feel safe and comfortable in participating in learning, and this will result in a better quality of education [5].

The problem is that elementary school renovations are not optimal and not on target, calculations for determining elementary school renovations are carried out using the Microsoft Excel application and have not been implemented into the database, so if there is an error in data input, the data must be checked and recalculated [6].

The purpose of this study is first, to find out the process of determining computerbased elementary school renovation. The second is to apply a decision support system with multifactor evaluation process method in the decision system for determining elementary school renovation. The latter is to assist the education office in determining the renovation of the selected primary schools.

Implementation of decision support systems: has been widely used in previous research with the title "implementation of the multi factor evaluation process for determining final disposal sites based on web applications", the results of this study aim to implement decision support systems in determining final disposal sites using the multi factor evaluation method process (MFEP) which is applied in the form of a web application using the prototype model [7].

The research with the title "Decision Support System for selection of Honorary Employes in Babura Village with the MFEP Method", the result of this study are that the MFEP Method can be used in determining prospective honorary employees in Babura Village [8].

The research with the title "A decision support system using the multifactor evaluation process method in identifying the right beneficiaries in the Family Hope Program", from the results of this study it aims to create a system that can assist PKH assistants in identifying the right beneficiaries in the PKH program quickly and with accurate results [9].

The research with the title "Decision support system for determining majors using the multifactor evaluation process (MFEP) method (case study: Cibening Vocational High School)", the final results of the study found that the

decision support system with the Multifactor Evaluation Process method (MFEP) was able to overcome problems in the process of determining majors at SMK Cibening [10].

The system created is expected to provide suggestions and provide the information needed to prioritize which schools are prioritized for renovation.

METHOD

Methodology is a theoritical analysis of a method procedure.

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┌─────────────────────────┐
│ Problem Identification  │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   Study of Literature   │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│    Data Collection      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│    System Analysis      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│     System Design       │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│      System test        │
└─────────────────────────┘
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┌─────────────────────────┐
│   Implementation of     │
│    system results       │
└─────────────────────────┘
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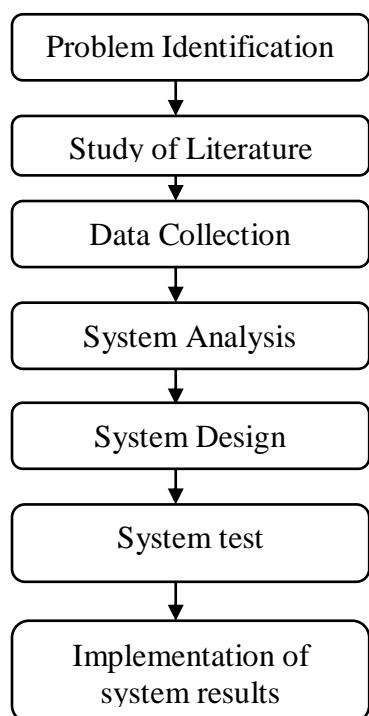
Image 1. Research Framework

This is an explanation of the first frame of mind, problem identification is the first step in research that explains what problems were found, the second conducts literature studies by searching for theoretical foundations obtained from various sources to complement concepts and theories, the third data collection is carried out in order to obtain the information needed in order to archieve, the next research objective system analysis aims to determine the decision support system for determining school, the next system design is an activity to design and determine how to process information systems from the results of system analysis so that they can meet the needs of users, furthermore after makin the system design the system is first tested to find out whether the designed decision support system is in accordance with the calculation method used, finally after the system trial is carried out, the next stage is the system implementation stage where this stage is the system implementation stage which will later help in reducing existing problems.

Multifactor Evaluation Process

The Multifactor Evaluation Process is an appropriate decision making method when group or organization faces a number of factors in decision making. With MFEP, decision makers provide a weighting system for each factor. The factor weights are multiplied by each of the alternative factor evaluations given and summed up. The alternative with the highest overall score is chosen.

The use of the multifactor evaluation process model can be realizied as follows**,** The calculation of the evaluation weight value is indicated in the equation**:**

$$WE = FW \times E \quad (1)$$

Information :
We = weighted evaluation
Fw = weight factor

E = evaluation

The calculation of the total valuation value is indicated in equation.

$$i=1nWE_{i} = WE_1 + WE_2 \dots (2)$$

Information :
$i=1nWE_i$ = total evaluation weight value
Wei   = evaluation weight value i

Criteria needed to determine School Renovation is room capacity, room damage, building age, student support facilities and toilet. From each of these criteria, a formula will be determined to find the criterion value:

Table 1. Weight Value

Weight Value	
Category	Value
Very Not Important	1
Not Important	2
Doubtful	3
Important	4
Very Important	5

The first room capacity is the capacity of the room, namely each class for teaching and learning rooms in the class.

Table 2. Weighting of Room Capacity Criteria

Criteria	Scale (Student)	Value
Room Capacity	< 20	1
	21– 23	2
	24– 26	3
	27– 29	4
	> 30	5

The second damage to the room is damage to the classroom or teacher's room in the elementary school.

Table 3. Weighting of Room Damage Criteria

Criteria	Skale	Value
Room Damage	Not Serious	1
	Underweight	2
	Underweight	3
	Weight	4
	Very Heavy	5

The third age of buildings is the age of school buildings as of when the school was built, such as classrooms, libraries etc.

Table 4. Weighting of Building Age Criteria

Criteria	Skale	Value
Of Building Age	<= 10	1
	11 – 15	2
	16 – 20	3
	21 – 25	4
	=>25	5

The fourth facilities and infrastructure are elementary school facilities provided to students as support for student learning.

Table 5. Weighting of Student Support Facilities Criteria

Criteria	Skale	Value
Student Support Facilities	Very Worth it	1
	Worthy	2
	Enough	3
	Less Eligible	4
	Not Feasible	5

And last toilets are vital facilities in various places, especially in schools. Toilets are provided by the school for

students or teachers to dispose of water and other purposes.

Table 6. Weighting of Toilet Criteria

Criteria	Skale	Value
Toilet	Very Worth it	1
	Worthy	2
	Enough	3
	Less Eligible	4
	Not Feasible	5

RESULT AND DISCUSSION

Form Criteria Data

The criteria data form is inputting, editing, canceling and deleting criteria data.
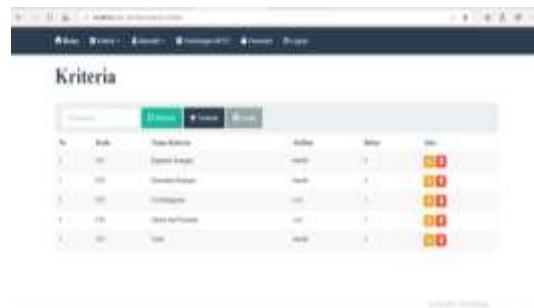
Image 2. Criteria Data Form

Form Input Value Weight Criteria

The criteria weight value input form is inputting, editing, canceling and deleting the criteria weight value.
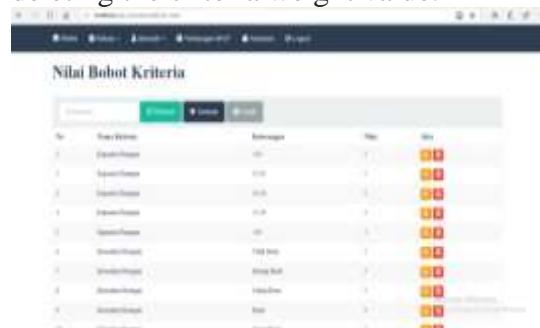
Image 3. Input Value Weight Criteria Form

Alternative Data Form

Alternative data form is inputting, editing, canceling and deleting alternative data.
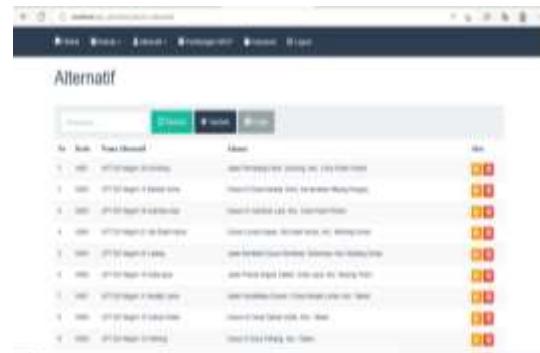
Image 4. Alternative Data Form

Form Input Alternative weight value

The alternative weight value input form is an alternative weight value editing.
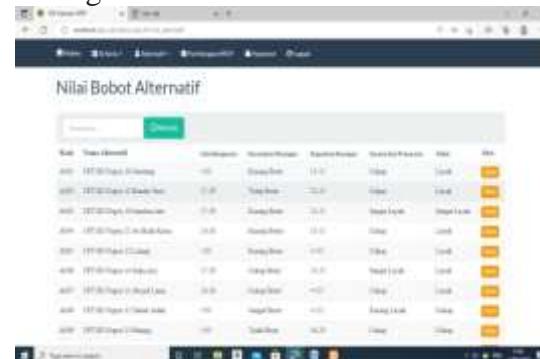

Image 5. Input Alternative Weight Value Form

Calculation Result

The results of data processing can be seen in table 7.

Table 7. Calculation Result

Alternative code	Criteria					Amount	Rank
	C1	C2	C3	C4	C5		
A01	1.176	0.353	0.471	0.529	0.353	2.887	6
A02	0.941	0.176	0.941	0.529	0.353	2.943	4
A03	0.941	0.353	0.941	0.176	0.176	2.587	8
A04	0.706	0.353	0.471	0.529	0.353	2.412	9
A05	0.235	0.353	1.176	0.529	0.353	2.646	7
A06	0.941	0.529	0.941	0.176	0.353	2.941	5
A07	0.706	0.529	1.176	0.529	0.353	3.293	2
A08	1.176	0.882	1.176	0.706	0.529	4.469	1
A09	1.176	0.176	0.706	0.529	0.529	3.116	3
A10	0.235	0.353	0.471	0.353	0.529	1.887	10

From MFEP Method Calculation

The MFEP calculation form is a display of the results of the criteria and alternative values.

Image 6. MFEP Method Calculation Form

MFEP Method Calculation Result Form

The calculation results form of the MFEP method is a display of the results of the criteria and alternative values.

Image 7. MFEP Method Calculation Result Form

CONCLUSION

With the existence of a DSS for determining renovation of elementary schools Using the MFEP method without having to carry out manual assessments and helping to select, decision support system can help speed up determining which elementary school to renovate and analyze selected school renovations based on alternative criteria and assessments.

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