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APPLICATION OF TOPSIS METHOD OF DECISION SUPPORT SYSTEM FOR PROVIDING UNINHABITABLE HOUSING ASSISTANCE (CASE STUDY: MANGUNREJO VILLAGE)

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ABSTRACT

The decision support system in determining the provision of assistance funds for uninhabitable houses was used in Grobogan district with the pilot village of Mangunrejo Village, Pulokulon District, using the Topsis method and using the Waterfall system development method. This decision support system uses a decision-making method, namely the Topsis method with Cost parameters (Physical condition of the house, House area, Work of the head of the family, Transportation, Home ownership) and Benefit (Number of family members, Family income). The tools used in this Decision Support System use PHP (Hypertext Processor) and MySQL programming languages as databases. This system only helps in the process of determining prospective recipients of uninhabitable housing assistance with several criteria for building construction.

1. INTRODUCTION

The hope of a decent and clean house with adequate infrastructure is the dream of every citizen. The idea of creating a house deserves to be triggered specifically to accelerate the development of the country by strengthening each region (village) and becoming a government program to implement. This can be seen in Law Number 6 of 2014 concerning Village Law Number. The law states that the need for livable housing is the right of every citizen, and in this case the state will support the provision of housing and residential land. We consistently provide system development, housing management, housing management, maintenance/repair, financing and development. Several obstacles are often experienced by residents related to assistance in the restoration of uninhabitable houses. The first problem is that there are several inconsistencies in the data, making it difficult for related parties to be used as a reference in carrying out supportive home renovations. This is because each person in charge has a different opinion in determining the criteria for residents who do not meet the requirements. The second problem is that recovery standards and standards have not been well developed, so many officials still find different data. The need for diverse and environmentally unfriendly housing in Indonesia still has great potential. This can be seen in several areas such as Central Java that need repairs as many as 3,715 houses, including 4,444 uninhabitable houses. The repair of uninhabitable houses (RTLH) is focused on 15. districts that are categorized as red zones or have high poverty levels. Wonosobo, Kebumen, Brebes, Purbalinga, Lembang, Pemalang Regenshaften, Banjarnegara, Banyumas, Sragen, Demak, Klaten, Purworejo, Cilacap, Grobogan, Blora.

On this occasion, the author uses the decision support system approach as a solution to display non-residential housing data to find out how many non-residential housing units (RTLH) exist in the area, especially in Mangunrejo Village, Pulokulon District, Grobogan Regency, we plan to conduct an investigation. Utilizing residents who are suitable for use. Redevelop the data results so that they can be immediately tracked to provide support for self-help housing support (BSPS). The ultimate goal in this case is to help accelerate government programs in building livable housing for its citizens.

From the above problems, researchers are interested in designing and creating a decision support system that can solve these problems. The process of providing assistance for uninhabitable houses is still carried out without transparency and not on target. With this decision support system, the provision of uninhabitable houses (RTLH) can be done more easily, quickly and effectively. In designing and manufacturing this web-based uninhabitable house decision support system (RTLH), the researcher uses a waterfall model system development method, the waterfall development method is the oldest software development method because of its naturalness. Where in the research the author uses the Topsis method. The Topsis method is a multi-criteria decision-making method with the alternative basis chosen having the closest distance to the positive ideal solution and having the farthest distance from the negative ideal solution. The alternative that has the smallest distance from the positive

ideal solution does not have to have the largest distance from the negative ideal solution. Based on the previous discussion, the author is interested in conducting a research entitled "Application of Topsis Method of Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village)".

2. RESEARCH METHODOLOGY

(Setiawan Dwi Widodo, 2021) The study explained that the suboptimal distribution of aid funds during the COVID-19 pandemic presents its own challenges in handling the distribution of COVID-19 relief funds. Therefore, it is necessary to build a "Decision Support System for the Distribution of Corona Fund Support to Bangerang Village Residents with the TOPSIS Methodology". Problems arise in the process of providing assistance if the data collected is large but not computerized. In other words, there are still people who are not eligible to receive assistance, or the data does not meet the criteria, but still receive assistance. In addition, the provision of assistance in the sub-district sometimes causes controversy and is considered unfair by residents who are conveyed directly to the village apparatus.

(Muhamad Awiet Wiedanto Prasetyo, 2022) In this study, by using the Simple Additive Weighting method, the village government can easily identify the recipients of village social assistance funds. This is because the distribution process carried out by the government is not on track. Based on all available data, 8% of aid recipients from local governments to the central government receive return assistance paid from village funds. The assistance program is no longer in accordance with the previous government's plan and needs to be re-evaluated to be more targeted.

(Rahmah, 2020) Based on existing research, this method uses the TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method, which is calculated based on the highest priority criteria of No kk and other types of work and criteria such as the amount of income, the number of dependents of parents, living conditions, and medical ability that can be used to solve the problem of selecting Raskin data. Criteria such as total income, number of dependents, life situation, and ability to receive treatment. Based on these criteria, we calculate the rankings and solutions for raskin aid recipients and select poor rice recipients (Raskin). The hope is that this can reduce the mistakes that occurred before this decision support system existed.

(Rissa Nurfitriana Handayani, 2022) Based on a study conducted by the author in North Cimahi Regency, it can be concluded that this system was made as a decision support system regarding the feasibility of providing BLT in North Cimahi Regency using the Topsis method. This allows organizers to more quickly and accurately determine the eligibility of BLT recipients. This is because the North Cimahi Regency apparatus must get approval from the district government to ensure which residents are entitled to receive BLT. This approval takes time, because as a recipient you must know the terms and conditions. Decision making in North Cimahi Regency.

(Muzakkir, 2017) Based on the study carried out, the author explained that there is a problem in determining poor families because poverty is a problem that is difficult to handle. For this reason, criteria are needed to determine whether a family is poor or not. Furthermore, the determination of poor families is an important reference in the provision of various kinds of assistance such as Raskin assistance, Smart Indonesia Card, Healthy Indonesia Card and other assistance. Providing assistance that is not on target makes poor people will become very poor. Therefore, it is necessary to design a Decision Support System for the Determination of Poor Families in Panca Karsa II Village. This is intended to prevent mistakes and frauds committed by certain parties, in this case a decision support system (SPK) is used.

2.1 Data Collection Methods

To obtain accurate, relevant, valid, and reliable data, the author collects data sources by:

a. Primary Data Sources
   Primary Data Sources are data obtained directly from agencies either through direct observation or recording of research objects, using the interview method. Interviews were conducted with data sources or interested parties, namely the Mangunrejo village head agency, Pulokulon District, which will be the object of research.
b. Secondary Data Sources
   Secondary Data Sources are data taken from books, documentation, and literature, including:
   1. Literature Study
      The literature study method is one of the methods of collecting data by searching for information in books such as software engineering books, related reports and can be used as a theoretical basis and can be used as a comparative material in research that will be carried out by looking at references to pre-existing thesis reports.
   2. Documentation Studies
      The documentation study method is the collection of data from literature and documentation from the internet, books or other sources of information. In this study, the data collection that will be used is to request data from research objects such as family card data in Mangunrejo village, Pulokulon District. This is done so that the information and data obtained are really valid.

2.2 System Development Methods

The system development method is one of the most important processes in system analysis. The system development method used in system design is to use the Waterfall method. According to (Sukamto & Shalahuddin, 2018) in his book Structured and object-oriented software engineering, a waterfall model provides a sequential or sequential approach to the software lifecycle starting from the analysis, design, coding, testing and supporting stages.

2.3 System Analysis

Actors are anyone who describes the users of the system. The actors in the Application of the Topsis Method of the Decision Support System for Providing Uninhabitable Housing Assistance (Mangunrejo Village Case Study) are as follows:

a. Village head
   The Village Head is the actor who is tasked with verifying and managing reports.
b. Secretary

The secretary is an actor who is tasked with managing the data of aid recipients and managing the confirmation of aid recipient data.

c. Hamlet Head
The Hamlet Head is an actor who is tasked with managing and selecting the data of aid recipients

d. Chairman of RT
The head of RT is an actor who is tasked with managing and selecting the data of aid recipients

These actors perform some of the ones shown in Table 1.

Table 1. Business processes used in the system

No	Business Process	Actor	Business Use Case
1.	Residents complete the aid file	Citizen	Complete the help file
2.	RT checks the required document file	RT	Check the requirements document file
3.	Kadus selects according to the criteria	Kadus	Selecting according to the criteria
4.	Kadus conducts village deliberations	Kadus	Conduct village deliberations
5.	The secretary makes a notification letter	Secretary	Create a notification letter
6.	The village head approves the recipients of the assistance	Village head	Approve beneficiaries

3 RESULTS AND DISCUSSION

3.1 System Design

After the analysis process that has been carried out, then the use case system diagram is a diagram that explains who is involved in the system (actors) and what the system does (use case). From the business use case process that has been made, a use case diagram of the aid delivery system can be described as shown in the figure.

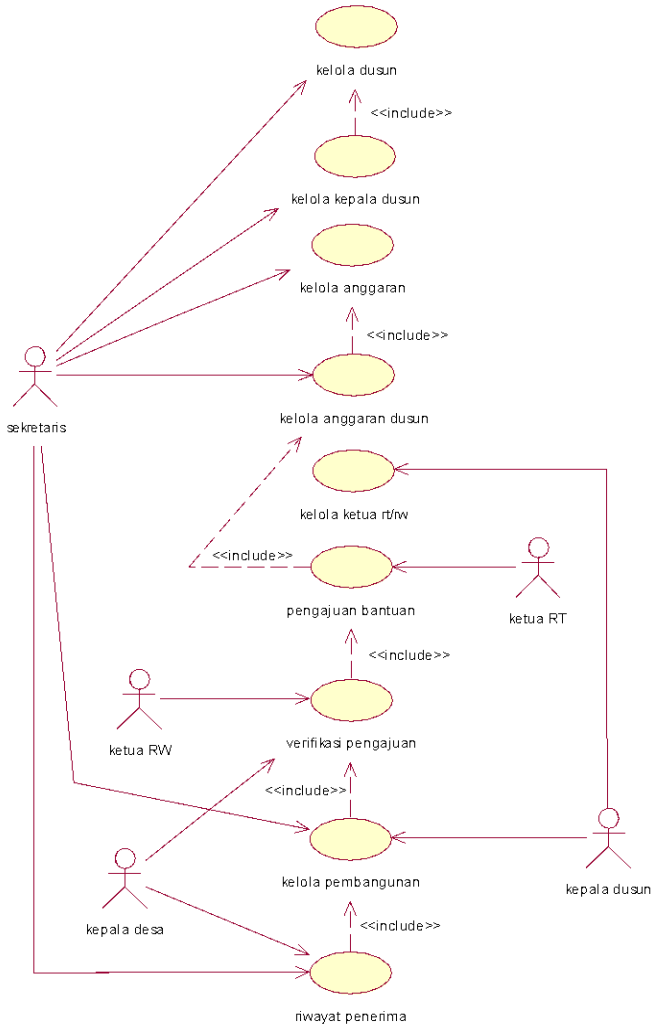

Figure 1. Usecase Application of Topsis Method of Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village)

Class diagrams are used to illustrate the objects used in the Web-Based Customer Relationship Management (CRM) Implementation system in Increasing Sales in Almazone Companies which can be seen in Class Diagram is a Diagram used in displaying several Classes in the system/software to be developed. Class Diagram provides an overview of the system/software and the relationships that are formed. The following is a Class Diagram formed on the Application of the Topsis Method of the Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village) in Figure 2.

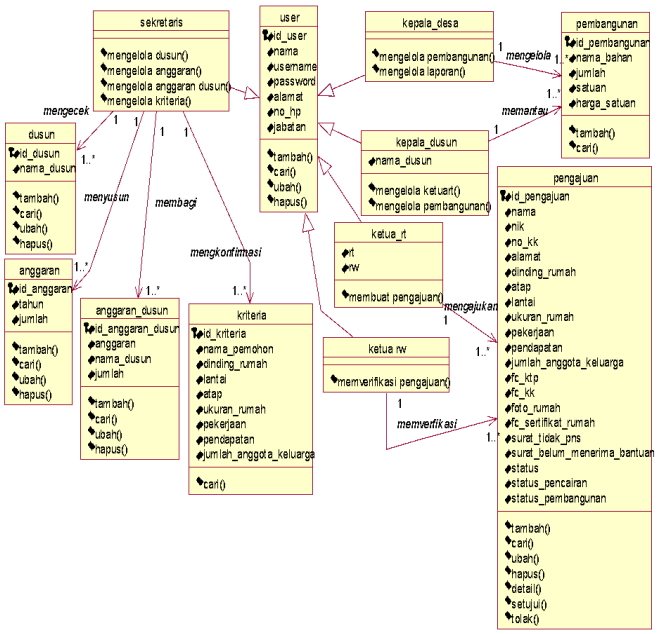

Figure 2. Class diagram of the application of the Topsis Method of the Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village)

3.2 Database Design

The table relationships formed in the database for this quick calculation system can be seen in Figure 3.

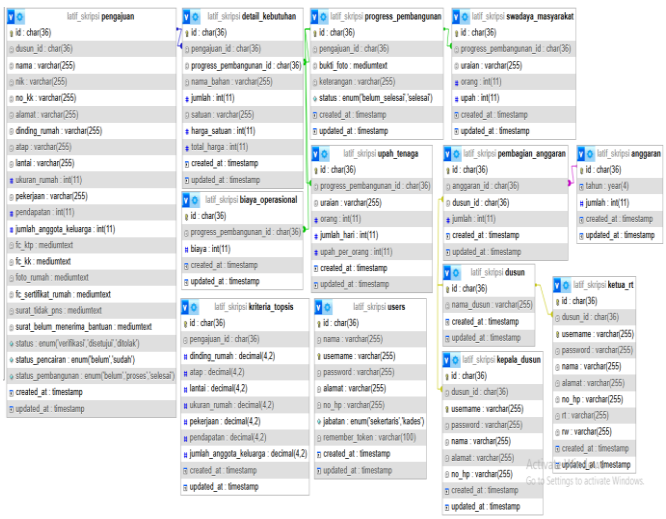

Figure 3. Database Table Relationship Application of Topsis Method of Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village)

3.3 System Results

Implementation of the interface screen on the Application of the Topsis Method of the Decision Support System for Providing Uninhabitable Housing Assistance (Case Study of Mangunrejo Village) using PHP (Hypertext Preprocessor) programming language and MySQL database. Supported by a text editor visual studio code and browser to run the app.

1) View of Hamlet Courtyard

Hamlet data pages are used to manage hamlet data by the secretary such as add, search, change and delete hamlet data. The add hamlet data button is used to add hamlet data. In the action, there is a change action and a delete action, the change action is used to change the hamlet data, and the delete action is used to delete the hamlet data. The display of the hamlet data can be seen in Figure 4.

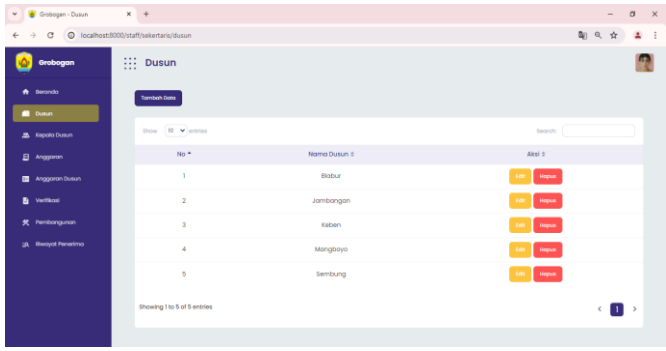

Figure 4. View of Hamlet Courtyard

2) Hamlet Head Data Page Display

The hamlet head data page is used to manage hamlet head data by the secretary such as add, search, change and delete hamlet head data. The add hamlet head data button is used to add hamlet head data. In the action, there is a change action and a delete action, the change action is used to change the hamlet head data, and the delete action is used to delete the hamlet head data. The display of the data of the hamlet head can be seen in Figure 5.

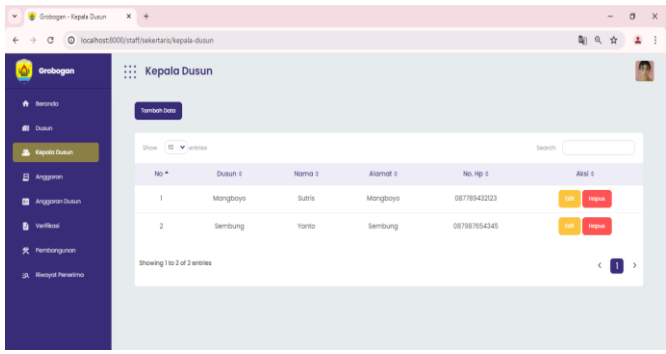

Figure 5. Hamlet Head Data Page Display

3) Budget Data Page View

The budget data page is used to manage budget data by the secretary such as add, search, change and delete budget data. The add budget data button is used to add budget data. In the action there is a change action and a delete action, the change action is used to change the budget data, and the delete action is used to delete the budget data. The display of the budget data can be seen in Figure 6.

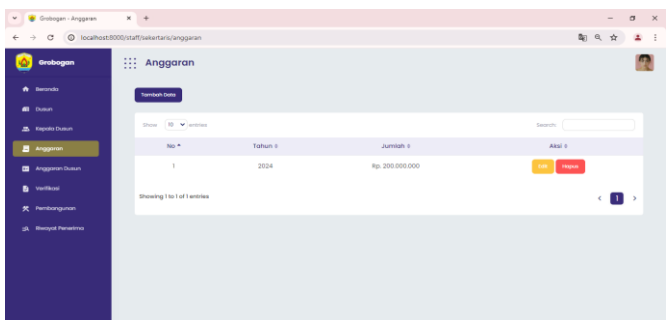

Figure 6. Budget Data Page View

4) Hamlet Budget Data Page Display

The hamlet budget data page is used to manage hamlet budget data by the secretary such as add, search, change and delete hamlet budget data. The add hamlet budget data button is used to add hamlet budget data. In the action, there is a change action and a delete action, the change action is used to change the hamlet budget data, and the delete action is used to delete the hamlet budget data. The display of the hamlet budget data can be seen in Figure 7.

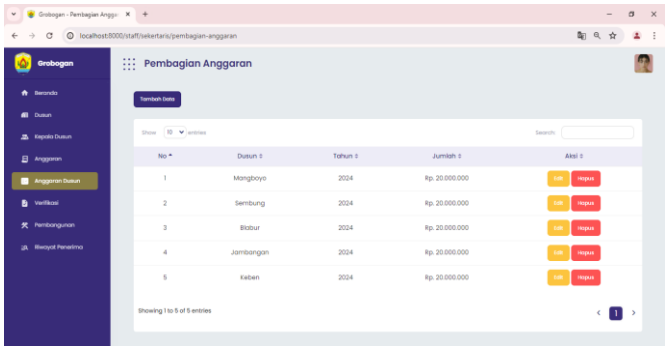

Figure 7. Hamlet Budget Data Page Display

5) Submission Verification Page Display

This submission verification menu page is created based on the sequence of submission verification diagrams and submission verification activities at the design stage. The submission verification data page is used to verify submissions by the Village Head such as search and verification. The display of the submission verification data can be seen in Figure 8.

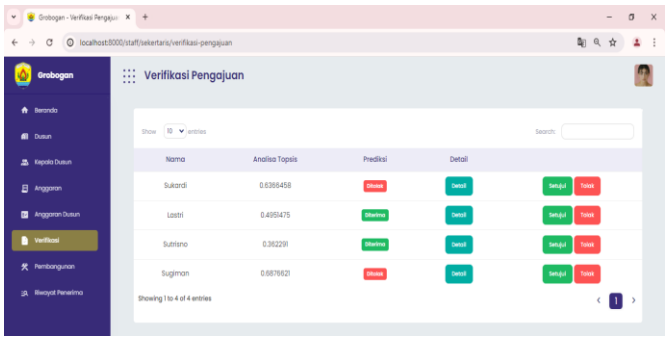

Figure 8. Submission Verification Page Display

6) Development Data Page View

This development menu page is created based on the sequence of development diagrams and development activities at the design stage. The development data page is used to manage development by the Village Head such as search. The display of the development data can be seen in Figure 9.

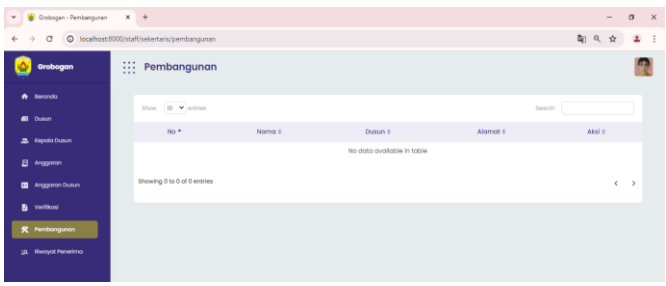

Figure 9. Development Data Page View

7) Request a Help Page View

The help request data page is used to manage the data of assistance requests by the rt head such as adding, searching, changing and deleting help request data. The Add help request data button is used to add help request data. In the action, there is a change action and a delete action, the change action is used to change the help request data, and the delete action is used to delete the help request data. The display of the assistance application data can be seen in Figure 10.

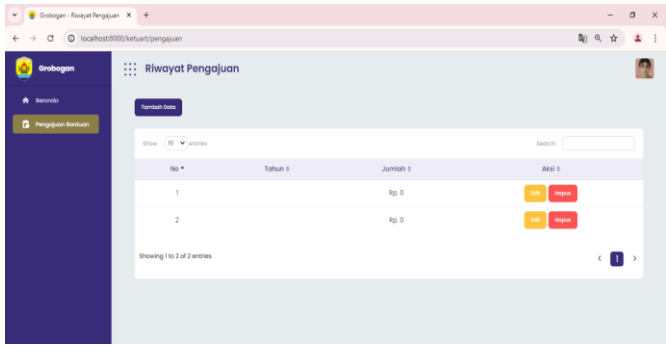

Figure 10. Request a Help Page View

3.3 Topsis Calculation Stages

In determining the criteria for recipients of uninhabitable housing assistance, the author conducted a direct interview with the village head to determine what criteria are needed in making a decision on farmers who are entitled to receive uninhabitable housing assistance. The following are the criteria for receiving assistance that have been determined as follows.

Table 2. Recipient Criteria

It	Criterion	Characteristic
C1	House Walls	Cost
C2	Roof	Cost
C3	Floor	Cost
C4	House size	Benefit
C5	Work	Benefit
C6	Income	Cost
C7	Jmlh Family Members	Cost

From the data of the sub-criteria that have been determined, the value of the weight of the level of importance in each criterion that has been determined is determined based on the results of the interview with the head of the village head regarding the assistance of uninhabitable houses, where to determine the low or high level of the criteria in making decisions. The results of the sub-criteria weighting values are presented in the following table:

Table 2. Weighting of Sub Criteria

No	Criterion	Weigh t	Sub Criteria	Valu e
C1	House Walls	0,2	Wall	0,2
			Board	0,4
			Plywood	0,6
			Bamboo	0,8

C2	Roof	Galvalum	0,2
		Asbestos	0,4
		Zinc	0,6
		Tile	0,8
C3	Floor	Granite	0,2
		Kramik	0,4
		Cement	0,6
		Soil	0,8
C4	House Size	26 - 30 m	0,2
		16 - 25 m	0,4
		10 - 15 m	0,6
		< 10 m	0,8
C5	Work	Farmer	0,8
		Factory Worker	0,6
		Self employed	0,4
		Civil servants	0,2
C6	Income	IDR 0 - IDR 1,500,0000	0,8
		IDR 1,500,000 - IDR 2,500,000	0,6
		IDR 2,500,000 - IDR 4,000,000	0,4
		> IDR 5,000,000	0,2
C7	Number of Family Members	Not having children	0,2
		1 child	0,4
		2 children	0,6
		>3 Children	0,8

4 CONCLUSION

4.1 Conclusion

From the results and description of the above discussion in the Application of the Topsis Method of the Decision Support System for the Provision of Uninhabitable Housing Assistance (Case Study of Mangunrejo Village) it is concluded that:

1 The decision support system in determining the provision of assistance funds for uninhabitable houses was used in Grobogan district with the pilot village of Mangunrejo Village, Pulokulon District, using the Topsis method and using the Waterfall system development method.

2 This system helps in the process of determining prospective recipients of uninhabitable housing assistance with several building construction criteria.

3 This decision support system uses a decision-making method, namely the Topsis method with the parameters of Cost (House Wall, Roof, Floor, Income, Number of Family Members) and Benefit (House Size, Job).

4 The tools used in this Decision Support System use PHP (Hypertext Processor) and MySQL programming languages as databases.

5 The testing method of this system uses the black box testing approach.

4.2 Advice

For future system development, it can be considered several times, namely:

1. It is hoped that it can be made Android-based which can make it easier to manage data on uninhabitable housing assistance.
2. Developed into several assistance in one application, not only assistance for uninhabitable houses.

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