Application of Weighted Sum Model (WSM) for Determining Development Priorities in Rural

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ARTICLE INFO	ABSTRACT
	Currently, the government has received special attention to advance the economy and human resources of the village community through the regulation of the village minister, development of disadvantaged areas and transmigration of the Republic of Indonesia number 19 of 2017 concerning the prioritization of using village funds, therefore attention to supervising development in villages is very necessary to ensure that the development in the village is right on target and takes into account the priority needs of the village, as stated in Permendes Number 19 of 2017 CHAPTER II Article 3 concerning the determination of priority for the use of funds. The purpose of this research is to carry out the government's appeal on increasing community participation in the implementation and development of the village in accordance with the government's appeal for supervision of village funds as stipulated in Permendes Number 19 of 2017 so that development in villages prioritizes more urgent community interests and justice for all villagers without distinction. -different, a decision support system is needed to support this activity to be better and more efficient.The stages of the method in the research are direct field visits, namely the village of Jati Baru, kecamatan merbau, Deli Serdang Regency, North Sumatra, conducting interviews with the village head, village officials and local villagers in order to obtain information related to this research then look for references and literature studies through research journals, laws, government regulations, and other matters relevant to this research, then apply the Weigthed Sum method. The model is a method of solving problems, designing systems, building systems, testing systems and implementing a decision support system for determining development priorities in Jati Baru Village, Pagar Merbau District, Deli Serdang Regency, North Sumatra. The results of this study are the decision support system for determining development priorities in the village and the system is proven to be able to solve the problem of determining development priorities in the village based on predetermined alternatives and criteria.

1. Introduction

The implementation of development in the Village is funded by the Village fund sourced from RAPBN which is transferred through the District / city Regional Revenue and Expenditure Budget. The Rural Development Division has certainly made many development plans in their respective villages but there must be development that is prioritized, Rural Development must consider justice, priority needs of village interests, village authority and village typology Therefore the community is required to participate for participate in monitoring the use of village funds for village development as stated inRegulation of the Minister of Villages of Remaining Regional Development and Transmigration Number 19 of 2017 on the Setting of Village Fund Priorities in 2018 in CHAPTER VII Article 18 on Community Participation which contains that: The community can participate in monitoring and monitoring the setting of priorities for the use of accountable and transparent Village Funds by: a. submit a complaint regarding the issue of setting priority for the use of the Village Fund; b. assist the Village in setting priorities for the use of the Village Fund in accordance with the provisions of the invitation legislation; and / or c. conducting studies and publications on the implementation of priority use of Village Funds.

The problem is that there is no decision support system to determine the priority of development in the village so it is very likely that development that is not prioritized will be done first and it is not clear the development criteria such as what will be the reference for development will be prioritized.

The specific purpose of this research in addition to training the skills and knowledge of researchers in terms of research as a beginner lecturer also contributes and participates in monitoring the use of village funds by conducting studies and publications on the implementation of priority use of village funds used for

rural development, case study in this study is in the village of Jati Baru, Pagar Merbau District, Deli Serdang Regency, North Sumatra Province.

This research is very necessary because of the importance of monitoring the village funds used for development in the village in order to create economic progress, human resources and quality of life in the village of Jati Baru, researchers are worried if this system is not made there will be development misplaced and mistakes development priorities in the village of Jati Baru, so that this activity runs as expected a decision support system is needed to determine the development priorities to be built in the village.

Decision Support System is a system that provides information, modeling, and data manipulation. The function of this system is to support and assist decision makers where the decision is not yet known what decisions should be made, With computer-based information system support, decision support systems can help find solutions and solve problems flexibly and interactively.

One of the methods of Decision Support System is The Weighted Sum Model method, this method is widely used, and applied to support the decision maker in making a decision. WSM is one of the simplest methods and its application is easy to understand. The Weighted Sum Model method is included in the MCDM Multi-Criteria Decison Making method to consider the value of each alternative [1].

2.   Literature Review

To underlie this research, the author has collected similar research to obtain information as a comparison material to better understand the problems that are studied and ensure the novelty and development of research and certainly not the result of duplication, state of the art research is presented in the following table.

Table 1
State Of The art

No	Researcher Name & Title	Method	data	Results	Research Relevance
1.	Mesran, et all (2017) Application of weighted sum model (wsm) In determining participants of public health insurance	Weighted Sum Model (WSM)	Data on these criteria and alternative research were obtained from Nelayan village villages for Determine the recipient of JamKesMas	WSM method can help decision makers make the best decision from several alternatives.	This study similarly uses the Weighted Sum Model (WSM) Method
2	D. Handoko (2017) Application Of Weight Sum Model (WSM) In Determining Special Allocation Funds Recipients	Weighted Sum Model (WSM)	selection of selected schools, North Sumatra Provincial Education Office to obtain Special Allocation Fund (DAK)	Implementation using the Weight Sum Model can generate rankings from schools that are alternative proposals, so the results can be used as recommendations in providing specific allocation funds. The implementation of the WSM method is relatively young and simple but the results are better.	This study similarly uses the Weighted Sum Model (WSM) Method
3	Martiningsih, Nining (2016) System Supporting the Decision of the Allocation of Proportional Village Funds Using Weighted Product Methods in Klaten Regency	Weighted Product	Criteria data on the calculation of the amount of village fund allocation amount obtained from Klaten Regency Government	In determining product evaluation there are 4 criteria, namely: Total Rural Population, Total Population Poor / Poverty Figures, Rural Areas and Geographic Difficulty Index, where to Where these criteria are applied using the Weighted Product (WP) Method The results of the test have been successfully performed in determining the validation of the system and obtained the accuracy value of the system and functionally the system is able to produce the appropriate output.	This study examines for the magnitude of the allocation of village funds whose proportionality is related to the same research for the village
4	Dwivedi, KD & Dwivedi, A. 2018 Application of MOORA and WSM method for supplier selection	MOORA & Weighted Sum	The data from this study is to select suppliers with the help of MOORA and WSM Methods for any	This research work proposes the application of the MOORA and WSM Methods for the selection of	This study similarly uses the Weighted Sum Model (WSM) Method

in manufacturing	Model WSM	company and for decision makers. In the proposed research work there are two methods adopted for supplier selection and with the help of these two methods the problem of supplier selection for each company can be eliminated.	suppliers in any industry to obtain better results and enhance the reputation of any company. After the application of this method gives satisfactory results and increases the productivity of an industry and solves the problem of supplier selection. And finally, it is the decision maker's choice to go with supplier 18, which is a superior and good choice from the supplier provided for the solution of the given problem

2.1 Definition of Decision Support System

Decision Support System is an information system that provides modeling to data manipulation, which is used to assist and support a decision maker in a semi-structured and structured situation. With computer-based information system support decision-making system can help find solutions and solve problems flexibly and interactively . By providing a simple and easy-to-understand User Interface that can clear the mind of decision making, Goal Support System Targets to help majors analyze semi-structured issues and unclear criteria to be used decision,

2.2 Decision Support System Architecture

Decision support system applications consist of several subsystems, namely:

A. Data Management Subsystem

It consists of data that is appropriate to the conditions and situation of the research and managed computerized through database management software (Data Base Management System) that can be interconnected with data available in a suitable company to support decision making

B. Model Base Management Subsystem

It is a software package that includes statistical models of management science, finance or other quantitative models that provide the ability to analyze and appropriate software management. Providing modeling to build custom models is also included. These components can be connected to the existing corporate or external storage of the model.

C. User interface subsystem

Users and systems interact, communicate and operate the system through this User Interface Subsystem. Intensive interactions between systems and decision makers according to researchers provide a unique contribution from decision-making systems.

D. Knowledge-based management subsystem

This subsystem supports other subsystems or allows it to act as an independent component that is optional. Through this subsystem decision makers can add and and increase knowledge for decisions to be taken because this subsystem can accommodate organizational knowledge [2].
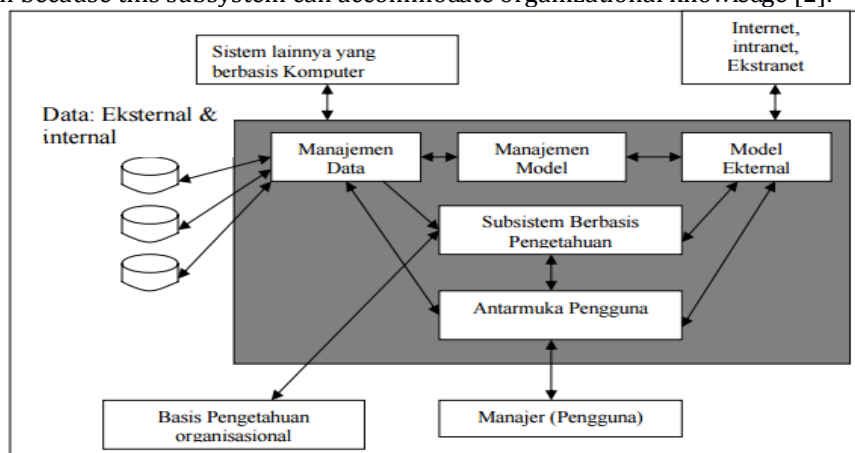

Fig. 1. Decision Support System Architecture

E.   Weighted Sum Model

Weight Sum Model (WSM) is the best known method and decision making. Simple multi-criteria to evaluate a number of alternatives in terms of a number of decision criteria. In general, consider that the given MCDA problem is defined in the alternative m and decision criteria n. Next, let us assume that all the criteria are benefits, the higher the value, the better. Further, assume that wj indicates the relative importance of the Cj criteria and aij is the alternative performance of Ai when evaluated in terms of the Cj criteria. Then, the total (i.e., when all criteria are considered simultaneously) the importance of the Ai alternative, denoted as the AiWSM-Score, is defined as follows:

$$????? ^{- ?????} = \sum ?? = 1 \; ????? \; ??? \; ? = 1,2,3...,? \; (1)$$

For maximization cases, the best alternative is to produce a maximum total performance value [4].

3.   Method

Research methods discuss the model stages of this research, including from the beginning of the research process, problem analysis, data collection, problem solving with WSM methods, System Design, and system development, System Testing and System Implementation to completion can be seen in more pictures following:
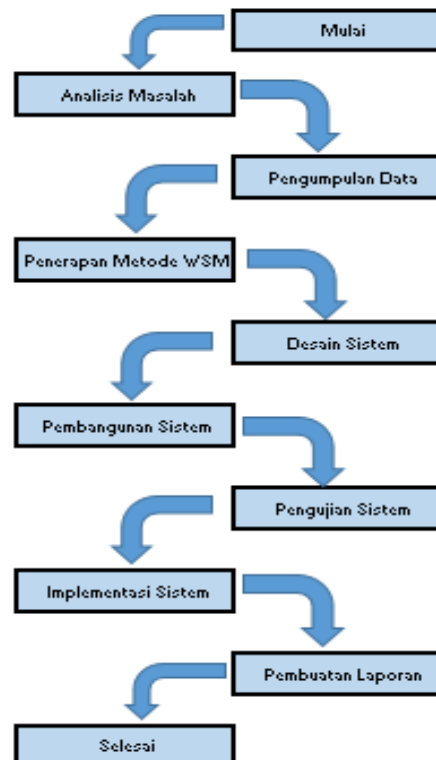

Fig. 2. Stages of Research Methods

3.1   Get started

This stage is the beginning of research starting from designing and making research proposals and uploading to SIMLITABMAS RISTEKDIKTI, to waiting for the results of the announcement and approval of the research

3.2   Problem Analysis

After the initial research was done through direct observation in the field and interviews with the Jati Baru village apparatus. The problems found will then be analyzed and formulated causes and possible solutions to be developed.

3.3   Data Collection

The next step is to collect the data needed to support problem solving that arises based on the focus of the research. This stage is the stage of collecting all the necessary data, such as criteria and altermative data that will be used to determine Development Teknik in Sidoarjo Satu Jati Baru Village, the required data obtained using three methods, namely literature study, direct observation and interview with the Head Villages and related sections regarding the system for analyzing the Determination of Development Priorities in Villages.

3.4 Library Studies

Library studies are conducted to expand the insight and knowledge of the problems being studied and determine appropriate methods to solve the problem. Literature studies can be traced through literature in the form of guidebooks, journals, research results of others, as well as Psearch for information over the internet.

3.5 Observation

That is by conducting research into the field and making direct observations of the development system in the village of Jati Baru

3.6 Interview

That is by collecting information by asking directly to the Village Apparatus and the Village Head

3.7 Application of WSM Method

Once the problem analysis is complete and the data has been collected, then apply the weighted sum model method to solve the problem of Determining Development Priorities in the Village

3.8 System Design

At this system design step is system design, starting with system design with UML, database creation in the form of criteria, input interface design, and creation
output interface.

A. System Development

Build a support system for determining the priority of development in the village with the method of weighted sum model according to the design that has been made.

B. System Testing

System testing with blackbox testing method is to observe the results of the system output and check the function of the system whether it is in accordance with its function.

C. System Implementation

Once the testing has been done and the results of the system functionality are valid then the system is ready to be implemented and implemented to help make decisions on Development Priorities in Jati Baru Village

3.9 Problem Analysis

In accordance with the results of interviews conducted with village heads and new teak village government staff that development priorities in the village refer to PermendesaPDTT No. 11 of 2019 on the Priority of the Use of Rural Funds in 2020 on social services in article 8 which reads

A. Basic social service activities as referred to in article 6 paragraph (1) include:

1) procurement, development, development, and maintenance of basic facilities and infrastructure to meet the needs:
    a) residential environment;
    b) transportation;
    c) energy;
    d) information and communication; and
    e) social.

2) procurement, development, development, and maintenance of basic social service facilities and infrastructure for fulfillment, recovery and quality improvement:
    a) public health and nutrition; and
    b) education and culture.

3) procurement, development, development, and maintenance of economic facilities and infrastructure of the village community include:
    a) agricultural farming (on farm / off farm) and / or fisheries for food security;
    b) small industrial and / or home-based enterprises, and post-harvest processing; and
    c) economic efforts of agricultural cultivation (on farm / off farm) and / or productive scale fisheries include aspects of production, distribution and marketing focused on the formation and development of rural products and / or rural products.

4) procurement, development, development, and maintenance of natural environment facilities and infrastructure for:
    a) preparedness for natural disasters;
    b) natural disaster management; and
    c) environmental protection.

5) procurement, development, development, and maintenance of social environment facilities and infrastructure for:
    a) social conflict; and

b)   social disasters [9].

B. Procurement, development, development, and maintenance, facilities and infrastructure other than as referred to in paragraph (1) shall be carried out in accordance with the authority of the Village and decided through the Village Deliberation.

Therefore, the new teak village government is consulting on the article, and the author suggests that there should be a system to determine the development priorities efficiently, appropriately and in accordance with the rules so that there are no development priority mistakes in the village.

3.10 Data Collection

From the results of the analysis, obtained criteria to determine the priority of development in the village with the agreed weight, Weight Sum Model Method is a simple but accurate method in the following decisions are Criteria and weight for determining development priorities in the New Jati Village.

The development priority in the new teak village should be able to provide great benefits to similar communities

A. improved quality of life;
B. improved well-being;
C. poverty alleviation; and
D. increased public service.
E. Urgent need
F. Local labor absorption

Furthermore, the above criteria are made a weight scale as in the table below

Table 2.
Criteria and weight of development priorities in the village

Code	Criteria	Weight
K1	improved quality of life	0.15
K2	improved well-being	0.2
K3	poverty alleviation	0.2
K4	increased public service	0.15
K5	Urgent need	0.2
K6	Local labor absorption	0.1
		1

After that, a scale of interest is created for each criterion, the scale of interest is based on five fuzzy numbers, namely: Very Low, Low, Fair, High, and Very High
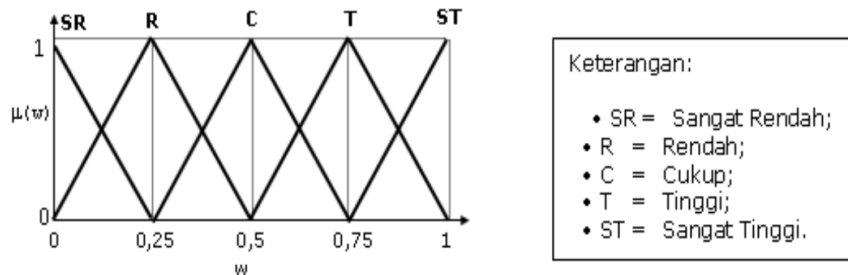

Fig. 3. Number of fuzzy Determining Weight of Interest

From Figure 3 there is a conversion for the number of crisp presented in table 2 below.

Table 4.
Value of Interest Weight

Fuzzy numbers	Value
Very Low	0
Low	0.25
Enough	0.50
High	0.75
Very High	1

As for village development alternatives that refer to PermendesaPDTT No. 11 of 2019 on the Priority of the Use of Rural Funds in 2020 on social services in article 8 then processed Types of development alternatives as in the following table.

Table 5
Alternative Types and Alternative Sub Types

No	Types of Development Alternatives	Sub Types of Development Alternatives
1	Meet the Needs	Settlement Environment
		Transportation
		Energy
		Information and Communication
		Social
2	basic social services for fulfillment, recovery and quality improvement	Health
		Community Nutrition
3	facilities and economic infrastructure of the village community	Agriculture / Fisheries / Food security
		Small / Home Industry
		Village Featured Products
4	natural environment	Preparedness for natural disasters
		Natural Disaster Management
		Environmental Preservation
5	Social Environment	Social Conflict
		Social Disasters

The existing development plans for the new teak village in 2021 are as follows:

Table 6
Development Plan in the new teak village

Code	Type of Development	Sub Types of Development	Development Plan
A1	Meet the Needs	Transportation	Pupling Block Road
A2	Meet the Needs	Transportation	Cast Concrete Road
A3	Meet the Needs	Settlement Environment	Sports Infrastructure Facilities
A4	Meet the Needs	Settlement Environment	Waste Lining
A5	facilities and economic infrastructure of the village community	Agriculture / Fisheries / Food security	Rice Drenase
A6	Meet the Needs	Social	Village Office Reconstruction

Determination of Development Type and sub development type in table 3 refers to Permendesa PDTT No. 11 of 2019 on the Priority of the Use of Rural Funds in 2020.

3.11 Application of WSM Method

After obtaining the criteria and sub-criteria for development alternatives, the values of the alternatives and criteria are made as in table 7

Table 7
Alternative assessment

Code	Improving the Quality of Life	Improving Welfare	Poverty Prevention	Improved public service	Urgent need	Local Labor Absorption
A1	High	High	Low	Very High	Medium	High
A2	Medium	Medium	Low	High	Medium	High
A3	High	High	Medium	Very High	Medium	High
A4	High	Medium	Low	Very High	High	High
A5	High	Very High	High	Medium	High	Very High
A6	Medium	Medium	Medium	High	Medium	High

The above data are alternative types of development and sub-types of alternatives for development in new teak villages, while the weight is determined by the village device deliberation with consideration based Permendes Number 19 of 2017 CHAPTER II Article 3 on the principles:
1) Justice, which prioritizes rights and interests all villagers without exception;
2) The need for priority, by putting the interests of the Village more urgent;
3) Village Authority;
4) Participatory, by prioritizing the initiative and creativity of the Society;
5) prioritize the energy, mind and skills of the villagers and local wisdom; and
6) Village Typology, taking into account the circumstances and realities of the distinctive geographical, sociological, economic, and ecological characteristics of the Village, as well as changes or development and progress of the Village

The criteria data in table 8 are then converted to the weight values of the interest scale as in the following table

Table 8
Conversion of the weight value of the scale of interest

Code	Improving the Quality of Life	Improving Welfare	Poverty Prevention	Improved public service	Urgent need	Local Labor Absorption
A1	0.75	0.75	0.25	1	0.50	0.75
A2	0.50	0.50	0.25	0.75	0.50	0.75
A3	0.75	0.75	0.50	1	0.50	0.75
A4	0.75	0.50	0.25	1	0.75	0.75
A5	0.75	1	0.75	0.50	0.75	1
A6	0.50	0.50	0.50	0.75	0.50	0.75

From the above data obtained matrix

$$
x = \begin{pmatrix}
0{,}75 & 0{,}75 & 0{,}25 & 1 & 0{,}50 & 0{,}75 \\
0{,}50 & 0{,}50 & 0{,}25 & 0{,}75 & 0{,}50 & 0{,}75 \\
0{,}75 & 0{,}75 & 0{,}50 & 1 & 0{,}50 & 0{,}75 \\
0{,}75 & 0{,}50 & 0{,}25 & 1 & 0{,}75 & 0{,}75 \\
0{,}75 & 1 & 0{,}75 & 0{,}50 & 0{,}75 & 1 \\
0{,}50 & 0{,}50 & 0{,}50 & 0{,}75 & 0{,}50 & 0{,}75
\end{pmatrix}
\qquad
w = \begin{pmatrix}
0{,}15 \\
0{,}2 \\
0{,}2 \\
0{,}15 \\
0{,}2 \\
0{,}1
\end{pmatrix}
$$

A1 = (0.75 x 0.15) + (0.75 x 0.2) + (0.25 x 0.2) + (1 x 0.15) + (0.50 x 0.2) + (0.75 x 0.1) = 0.6375
A2 = (0.50 x 0.15) + (0.50 x 0.2) + (0.25 x 0.2) + (0.75 x 0.15) + (0.50 x 0.2) + (0.75 x 0.1) = 0.5125
A3 = (0.75 x 0.15) + (0.75 x 0.2) + (0.50 x 0.2) + (1 x 0.15) + (0.50 x 0.2) + (0.75 x 0.1) = 0.6875
A4 = (0.75 x 0.15) + (0.75 x 0.2) + (0.25 x 0.2) + (1 x 0.15) + (0.75 x 0.2) + (0.75 x 0.1) = 0.6375
A5 = (0.75 x 0.15) + (1 x 0.2) + (0.75 x 0.2) + (0.50 x 0.15) + (0.75 x 0.2) + (1 x 0.1) = 0.7875
A6 = (0.50 x 0.15) + (0.50 x 0.2) + (0.50 x 0.2) + (0.75 x 0.15) + (0.50 x 0.2) + (0.75 x 0.1) = 0.5625

From the above data obtained the final value for the priority of the greater the value then it will be more worthy to be the main priority and the main priority in the alternative of village development is A5 that is paddy field drainage with a value of 0.7875, the results of priority order based on the above calculations in the following table

Table 9
Sort Priority Order from highest to lowest

Code	Sewerage Plan	Value
A5	Rice Drenase	0.7875
A3	Sports Infrastructure Facilities	0.6875
A1	Pupling Block Road	0.6375
A4	Waste Lining	0.6375
A6	Village Office Reconstruction	0.5625
A2	Cast Concrete Road	0.5125

3.12 System Design

System design is done to get a clearer picture of what objects will interact with the system, as well as what things a system needs to do so that the system can function properly according to its uses. In this study, UML (Unified Modeling Language) is used as the modeling language to design and design a Support System for Development Priority Development in the village with Analytical Hierarchy Process Method. Model. UML models used include case diagram, activity diagram, and class diagram.

3.13 Use Case Diagram

Use Case Diagram is a diagram that can represent the interaction that occurs between the user and the function on the system and can be seen in Figure 4.
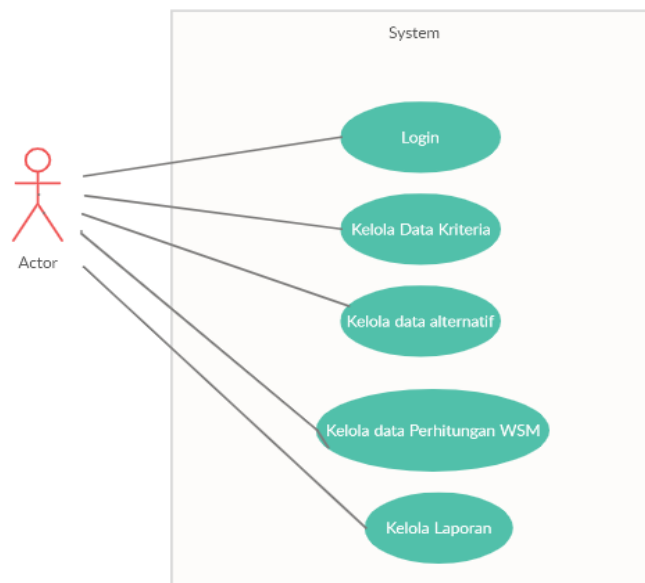
Fig. 4. Use Case Diagram development priorities in the village

In the process of use case Development priority in the village WSM Method, can be stated in the following Table.

Table 8

Process table actor development priority system in the village

No.	Actor	Description
1.	*User*	*User* which has the right to perform all the processes that occur on the system.

Table 9

Use Case Table development priority system in the village

No.	Case	Description
1.	*Login*	The system displays the login form, the user processes the login to the system and the system will verify it.
2.	Manage Criteria Data	The system displays the Criteria form, User can modify, add, and delete criteria.
3.	Manage Criteria Analysis data	The system displays the Criteria analysis form, User can add, and delete the criteria analysis.
4.	Manage Alternative Analysis data	The system displays an Alternative analysis form, User Can add, and delete Alternative analysis.
5.	Manage Calculation Reports	System Displays the form of analysis results and Calculation results

3.14 Activity Diagram

For the priority process of development in the village with WSM, can be seen Activity Diagram in figure 5 below.
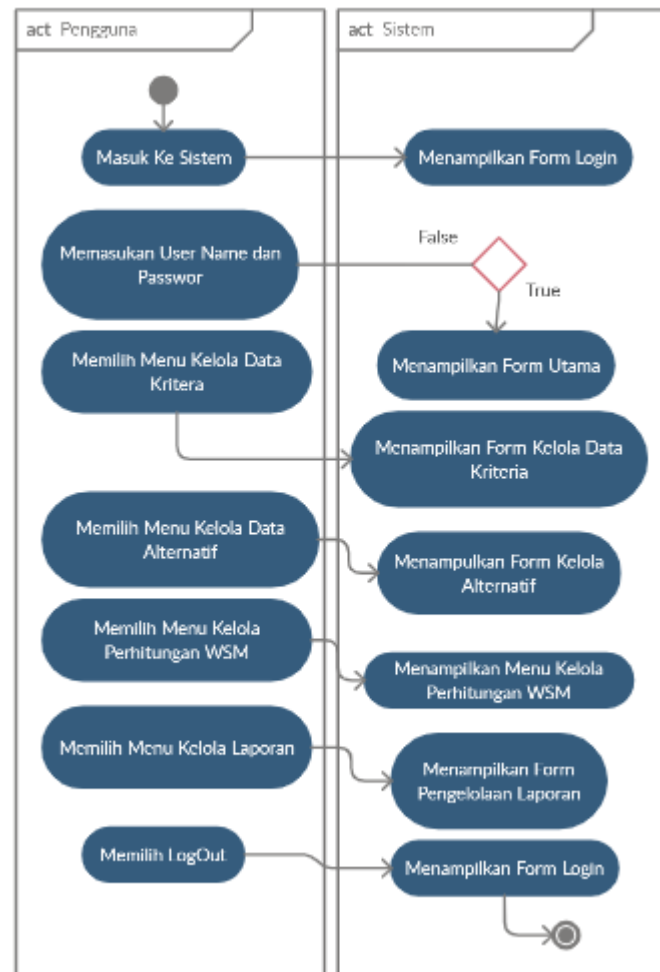
Fig. 5. *Activity Diagram* for Priority Process of development in the village by WSM Method

3.15 Class Diagram

The diagram used to display some of the classes and packages in the system / software we are developing. Class Diagrams provide a static picture of the system and the relationships between attributes. Typically, multiple class diagrams are created for a single system. Some diagrams will show a subset of the classes and their relationships, in determining which teachers are eligible to apply for certification then create a class diagram as in the image below:
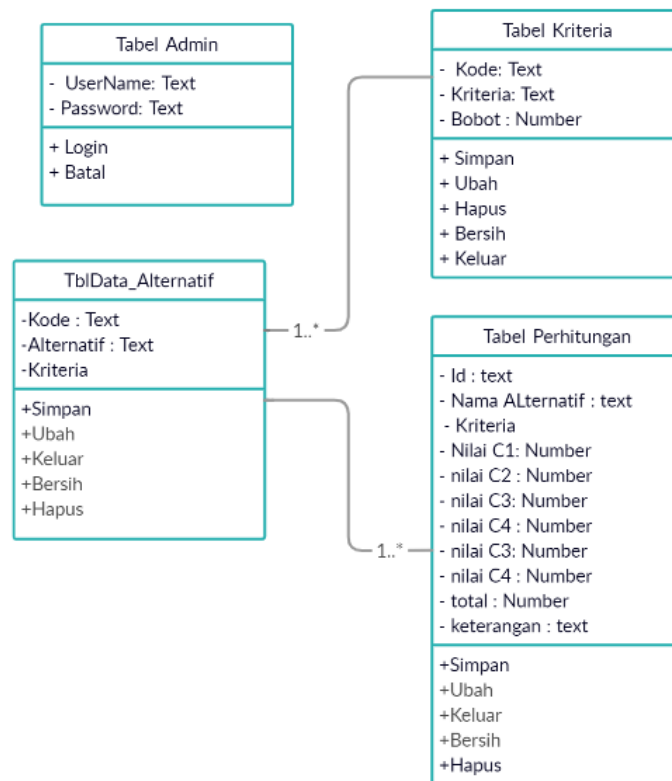
Fig. 6. Class Diagram of Development Priorities in the Village

3.16 System Testing

After designing and building the system, testing is done to check and ensure that the system that has been created is in accordance with the expected, Testing System of this system using the Black Box Testing Method

Table 10
Admin Login Form Test Results

No.	Testing Scenario	Expected Results	Test Results	Conclusion
1	*Username* and Password is left blank and then press the login button	The system will fail to login and display an error message "username and password are missing"	As expected	Valid
2	Fill in the Username, and the password is blank then press the Login button	The system will reject and display the message "You have not filled in the password"	As expected	Valid
3	Type the Password, and the username is blank then click the Login button	The system will reject and displays messages "Your username has not been filled in"	As expected	Valid
4	Type the inappropriate Username and / or password, then click the Login button	The system will fail to login and displays an error message "The username or password you entered is incorrect"	As expected	Valid
5	Typing Username and password (correct) then click the Login button	The system receives login access and then displays the Admin homepage	As expected	Valid

Table 11
Main Menu Form Test Results

No.	Testing Scenario	Expected Results	Test Results	Conclusion
1	The view in the main menu displays the navigation bar, and there is information about Development Planning Data and Development plan Assessment	There is a navigation bar for the development plan input form, Development Priority Assessment and Report. As well as information on development plans and assessment of development plans	As expected	Valid
2	Click the Development Plan Bar Navigation	The system will display the development plan input form.	As expected	Valid
3	Click the Development Plan	The system will display the development	As expected	Valid

No.	Testing Scenario	Expected Results	Test Results	Conclusion
	Evaluation Bar Navigation	priority assessment input form		
4	Click the Report Navigation Bar	The system will display the Development Plan report and development plan priority assessment report and when clicked the report will appear according to the selected report	As expected	Valid

Table 12
Development Plan Form Test Result

No	Testing Scenario	Expected Results	Test Results	Conclusion
1	Pressing the Add Button	The rating code will be filled in automatically and the Fillbox text will be disabled to enable for filling	As expected	Valid
2	Do not fill in any textboxes and then press the Process button	The system will reject and display the error message "data is incomplete Please Review the data you are processing	As expected	Valid
3	In the Combo box Alternative type of development select the option "Fulfillment of Needs"	When the combo box type of development alternative is selected "Fulfillment of Needs" then there are 5 options in the combo box sub type of development plan namely Settlement, Transportation, Energy, Information and Communication and social	As expected	Valid
4	In the Combo box Alternative type of development selects the option "basic social services for fulfillment, recovery and quality improvement"	When the combo box alternative type of development is selected "basic social services for fulfillment, recovery and quality improvement" then there are 2 options in the combo box sub type development plan is "Health, Community Nutrition".	As expected	Valid
5	In the Combo box Alternative type of development selects the option "facilities and economic infrastructure of the Rural community"	When the combo box alternative type of development is selected "facilities and economic infrastructure of the rural community" then there are 3 options in the combo box sub type development plan namely "Agriculture / Fisheries / Food security, Small Industry / Home, Village Featured Products".	As expected	Valid
6	In the Combo box Alternative type of development selects options "natural environment"	When the combo box alternative type of development is selected "natural environment" then there are 3 options in the combo box sub type of development plan namely "Preparedness for natural disasters, Natural Disaster Management, Environmental Preservation".	As expected	Valid
7	In the Combo box Alternative type of development selects options " Social Environment "	When the combo box of the alternative type of development is selected "natural environment" then there are 2 options in the combo box sub type of development plan that is "Social conflict, Social Disaster".	As expected	Valid
8	Fill in All data and press the Process button	The system will display the message "Data successfully in Process" and the resulting data will appear	As expected	Valid
9	press the save button after the process is complete	The system will display the message "data saved successfully" and the data in the field will appear in the listview and stored in the database	As expected	Valid
10	Pressing the change button without selecting the data to be changed	The system will reject and displays messages "first select the data to be changed "	As expected	Valid
11	Selects the data in the list view and presses tomol change	The system will display the message "data changed successfully" and the data in the field was changed in the listview and in the database also changed	As expected	Valid
12	Press the delete button without selecting the data to be deleted	The system will reject and displays messages "first select the data to be deleted "	As expected	Valid
13	Select the data in the list view and press delete tomol	The system will display the message "Data successfully deleted" and the data in the field was lost in the listview and in the database also deleted	As expected	Valid
14	Pressing the Exit Button	The system will exit the development plan form and will return to the main page	As expected	Valid
15	Pressing the Clear Button	The data in the textbox will be clean of text	As expected	Valid

Table 13
Testing Repor

No.	Testing Scenario	Expected Results	Test Results	Conclusion
1	Pressing Navbar Development Plan Report	The system will display the Development Plan Report which can be saved in pdf and print	As expected	Valid
2	Pressing Navbar Development Plan Report	The system will display the Development Priority Assessment Report which can be saved in pdf and print	As expected	Valid

3.16 System Implementation

The following is the implementation of the development priority determination system in the village with the Weighted Sum Model method

A.   Login Form View

*Login form*serves to unlock the system and provide security to the System so that not everyone can access it. To open this system an admin must know his username and password, if he does not know his username and password this system will not work. For more details can be seen in the Figure

Fig. 7. Login Form View

In Figure 7 there are 2 textboxes for User Name and Password input and there are also 2 buttons for Login and Cancel

B.   Main Menu Form View

Upon successful login the next system will display main page there is a navigation bar for home development plan development priority assessment and report on this main page there is also information about development plan data and development plan assessment:
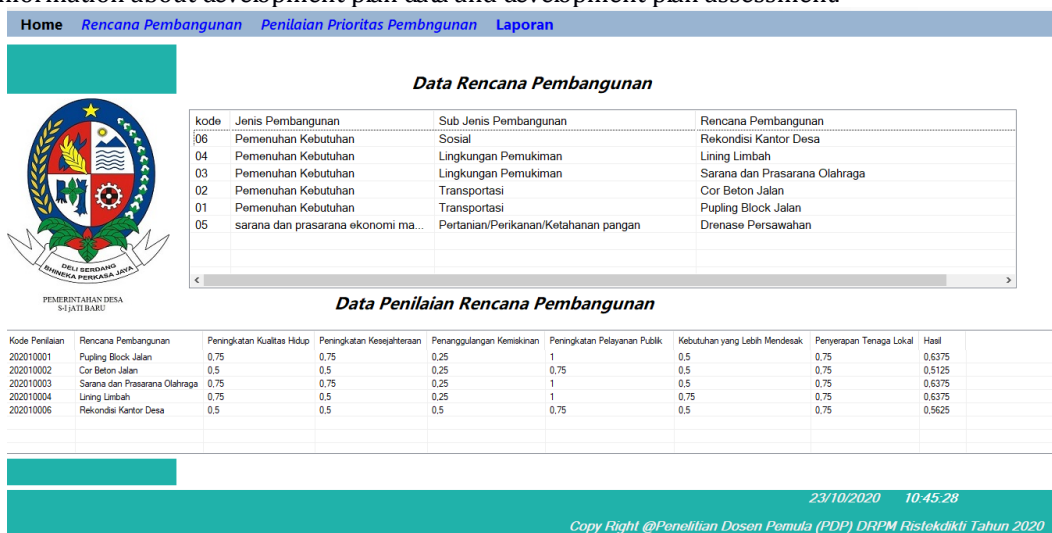

Fig. 8. Main Menu Form View

C.   Development Plan Data Input Form Display

*Form*This Development Plan data input serves to input the development plan data to be developed. For more details see Figure 8 display of the development plan data input form as follows:
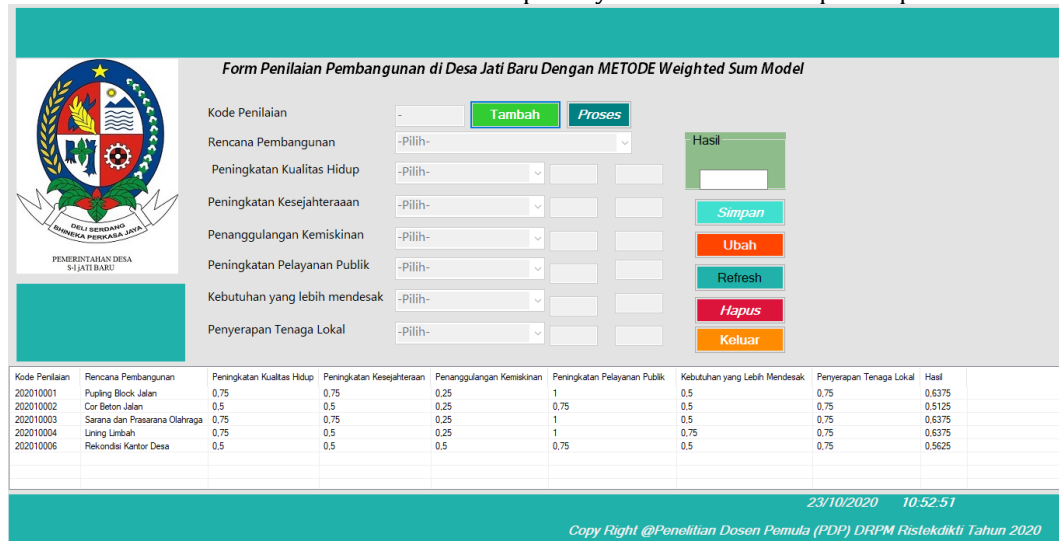

Fig. 9. Customer Data Input Form View

D.   Development Plan Evaluation Data Form View

Form This development plan priority assessment serves to calculate and evaluate the development plan with the WSM method to determine how much priority value of the development plan is:

Fig. 10. Display of Development Priority Assessment input form

E.   Development Plan report form view

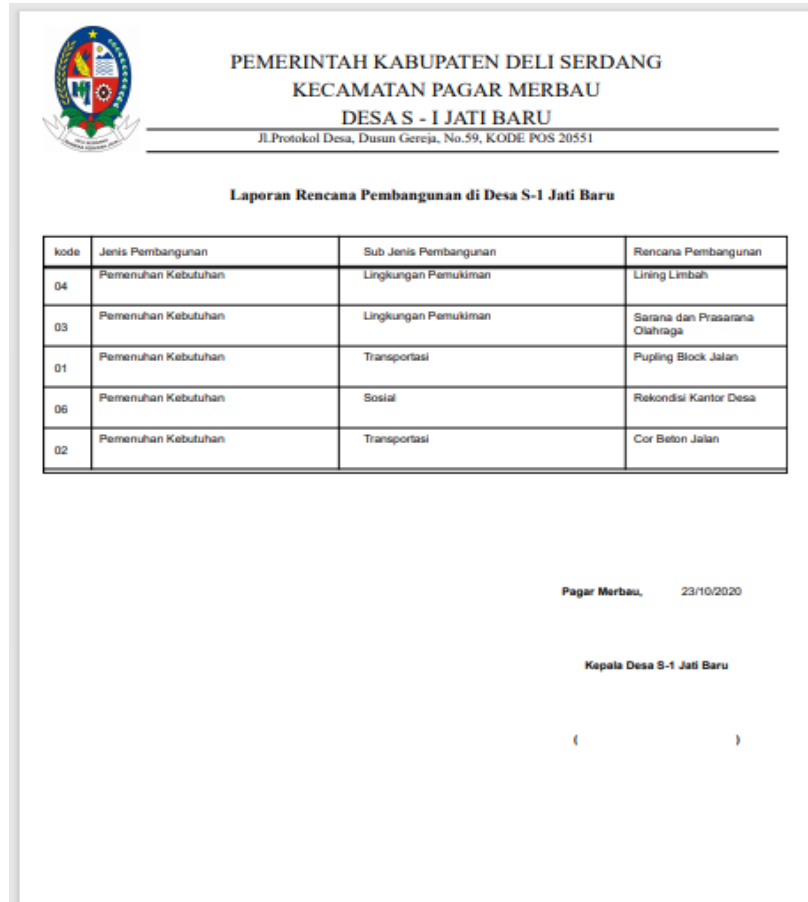The following is an overview of the development plans in the village

PEMERINTAH KABUPATEN DELI SERDANG
KECAMATAN PAGAR MERBAU
DESA S - I JATI BARU
Jl.Protokol Desa, Dusun Gereja, No.59, KODE POS 20551

Laporan Rencana Pembangunan di Desa S-1 Jati Baru

kode	Jenis Pembangunan	Sub Jenis Pembangunan	Rencana Pembangunan
04	Pemenuhan Kebutuhan	Lingkungan Pemukiman	Lining Limbah
03	Pemenuhan Kebutuhan	Lingkungan Pemukiman	Sarana dan Prasarana Olahraga
01	Pemenuhan Kebutuhan	Transportasi	Pupling Block Jalan
06	Pemenuhan Kebutuhan	Sosial	Rekondisi Kantor Desa
02	Pemenuhan Kebutuhan	Transportasi	Cor Beton Jalan

Pagar Merbau,   23/10/2020

Kepala Desa S-1 Jati Baru

(   )

Fig. 11. Development Plan report form view

F. **Display of development plan priority assessment report form**
The following is an overview of the priority assessment plan for development plans in the village
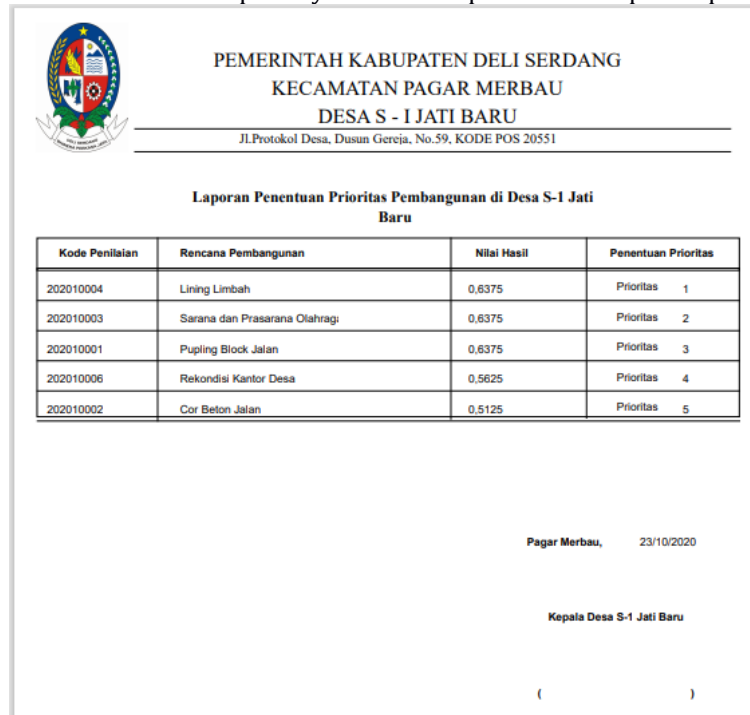

PEMERINTAH KABUPATEN DELI SERDANG
KECAMATAN PAGAR MERBAU
DESA S - I JATI BARU
Jl.Protokol Desa, Dusun Gereja, No.59, KODE POS 20551

Laporan Penentuan Prioritas Pembangunan di Desa S-1 Jati Baru

Kode Penilaian	Rencana Pembangunan	Nilai Hasil	Penentuan Prioritas
202010004	Lining Limbah	0,6375	Prioritas 1
202010003	Sarana dan Prasarana Olahraga	0,6375	Prioritas 2
202010001	Pupling Block Jalan	0,6375	Prioritas 3
202010006	Rekondisi Kantor Desa	0,5625	Prioritas 4
202010002	Cor Beton Jalan	0,5125	Prioritas 5

Pagar Merbau,   23/10/2020

Kepala Desa S-1 Jati Baru

(   )

Fig. 12. Display of development plan priority assessment report form

4.   Conclusion

The following is the conclusion of the research determining the priority of development in the village by the method of Weighted Sum Model:

a)   The system to determine the priority of development in the village with the method of Weighted Sum Modes (WSM) has been successful and created with the existing criteria and alternative conditions.

b)   The system is proven to be able to determine the priority of development plans in the village by means of simple calculations but produce accurate output on development priorities in the village

Thank You

5.   References

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