



Decision Recommended Food Aid Recipients Citizens Noncash In the Neighborhood Using TOPSIS Method Based Mobile

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ABSTRACT

Non-cash Providing Food Assistance (BPNT) to the community from the government is a form of effort to Strengthen household food security, especially for poor Households. Determination of the criteria for the beneficiaries of aid is Often a complex problem, for that we need a tool to be Able to Facilitate decision making recommends that the reception of food aid the which certainly adheres to Several criteria. In the calculation for the consideration of taking a decision to receive food aid, this application uses the Technique for Others Reference by Similarity to Ideal Solution (TOPSIS) method of ranking Several alternatives from Several criteria. The results of testing the application using the TOPSIS method Obtained the highest value of 1 with the name Yusran while the manual calculation with the SAW method Obtained the highest value of 100 with the same name.

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1. Introduction

Poverty is a state problem associated with deficiencies in various aspects of life sufficient. Causes of poverty itself is very diverse, making it difficult to improve the level of poverty in a country [1]. One of the government's efforts to tackle poverty in this country is the Food Aid Noncash (BPNT) for people who are considered disadvantaged. On implementation, Rock Food Noncash given government still has not targeted a few people who really need does not obtain such assistance.

BPNT programs provided by the government require the collection of data of citizens, where citizens have the data of different criteria. Determination of criteria for poor families is required for consideration decision on this application. In mobile-based decision support applications of this method for Others Reference Technique by Similarity to Ideal Solution (TOPSIS) to perbandingan against eight criteria and alternatives determined citizens. Making these applications using Android Studio, XAMPP v3.2.3 and MySql database. Selection of mobile-based applications is intended to recommend people receiving BPNT accordance with the quota inputted, and facilitate citizen survey in the field.

The existence of previous studies for comparison in this study is the first journal discussed the recommendations of poor rice recipient using SAW and TOPSIS method with 4 criteria [2]. In the second journal discusses the determination of beneficiaries of social assistance programs using TOPSIS method with 4 criteria [3]. In the third journal discusses the determination of beneficiaries of poor rice using TOPSIS method with 14 criteria [4]. In the fourth journal discusses the implementation method for recipients TOPSIS poor rice with 6 criteria [5]. and the fifth journal discusses the determination of acceptance of poor rice using TOPSIS method with 7 criteria [6].





2. Method

A. Research methods

Methods used in the manufacturing process of this application is the System Development Lyfe Cycle (SDLC) with the waterfall approach is performed sequentially.

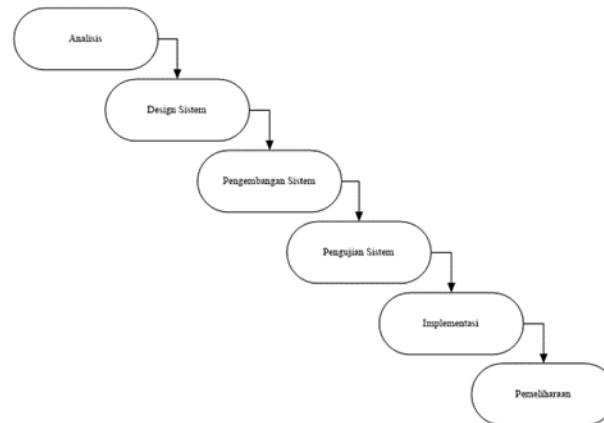


Fig 1. Flowchart SDLC

1) analysis

Analyzing each of the weights and sub-weights that will be used as a parameter in the calculation of decision making penerma BPNT.

2) System design

Creating database design and design application users.

3) development System

Creating a web application for admin and android application to the Chairman of RT and Officer / Surveyor.

4) testing Systems

Testing the application the calculation results with the test results of manual calculations.

5) Implementation

Planning for implementation of applications in RW 03, Village Cijati to use survey BPNT next period.

6) Maintenance

Maintain the application to coordinate with the Chairman of RT and Officer / Surveyor when an error occurs or renewal.

B. Use Case Diagram

Use Case Diagram in this application uses three users who have access rights to each are:

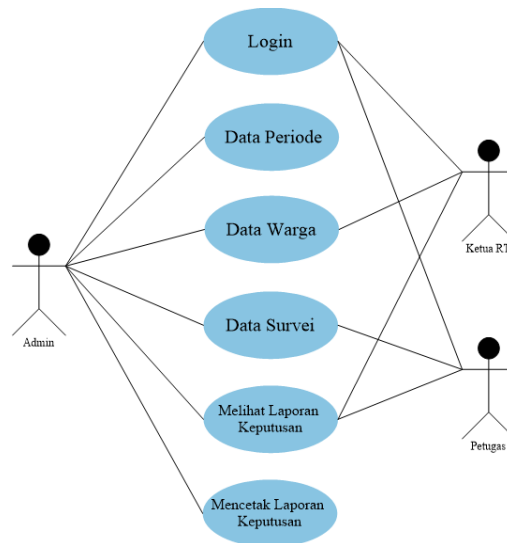


Fig 2. Use Case Diagram

1) Admin

Admin is the user who can log on the web to access all of the applications.

2) Chairman of RT

Chairman of RT is that users can log on to access the CRUD android citizen data, see the reports decisions, and print the reports decisions.

3) Officers / Surveyor

Officers / Surveyor is that users can log on to access the CRUD android survey data, see the reports decisions, and print the reports decisions. Residents can be surveyed if the Chairman of RT already enter the data of citizens.

C. TOPSIS method

TOPSIS method is a method used in decision support. TOPSIS method will produce an alternative to the distance the nearest positive ideal solution and negative ideal solution longest distance as a recommendation for decision making at the most optimal solution.

Positive ideal solution is the best value obtained by an alternative for each criterion, while the negative ideal solution is the worst value obtained by an alternative for each criterion. TOPSIS method based on the distance alternatif considering any positive ideal solution and negative ideal solution distance and on this application will automatically merankingkan each alternative based on the final weights obtained. This ranking aims to recommend the people who needed to get assistance [7]. The process of manual counting methods TOPSIS as follows:

- 1) Determine the normalized matrix for each of the criteria maupu alternative sub-criteria [8].

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}} \quad (1)$$

- 2) Determining the positive ideal solution A^+ and A^- negative ideal solution of a matrix that has been normalized [8].

$$A^+ = (Y_1^+, Y_2^+, \dots, Y_n^+); \quad (2)$$

$$A^- = (Y_1^-, Y_2^-, \dots, Y_n^-);$$

- 3) Determining the ideal solution alternatives within the positive and negative ideal solution on the normalized matrix, with a positive ideal solution distance as follows [8]:





$$D_i^+ = \sqrt{\sum_{j=1}^n (Y_i^+ - Y_{ij})^2}; \quad (3)$$

As for the negative ideal solution distance as follows [8]:

$$D_i^- = \sqrt{\sum_{j=1}^n (Y_{ij} - Y_i^-)^2}; \quad (4)$$

4) Determining the reference value for each alternative (V_i) is given as [8]:

$$V_i = \frac{D_i^-}{D_i^- + D_i^+}; \quad (5)$$

5) V_i larger value indicates that the preferred alternative A_i [8].

3. Results and Discussion

A. Weights Criteria and Sub Criteria

Weights Criteria and Sub Criteria In any assessment of the feasibility of the residents receive food aid is determined by several criteria and sub-criteria that have their respective weights. Here the weight of each criterion determined.

Table 1.
Weight Criteria

Criteria	variables	Weight
Building area	C1	10%
Status of residence	C2	5%
type Floor	C3	10%
Wall type	C4	10%
type roof	C5	10%
Profession	C6	20%
Income	C7	20%
Total ART	C8	15%

Table 2.
Weight Sub Criteria

Criteria	sub Criteria	Weight
Building area	≤ 40 m2	0.4
	41 m2 - 80 m2	0.3
	81 m2 - 120 m2	0.2
	> 120 m2	0.1
Status of residence	lease	0.6
	Private property	0.4
type Floor	Bamboo	0.4
	Wood	0.3
	Tile	0.2
	ceramics	0.1
Wall type	Bamboo	0.5
	Wood	0.4
	Wall	0.1
type roof	roof tile	0.4
	Asbestos	0.6
Profession	labor	0.4
	Farmers / planters	0.3
	entrepreneur	0.2





Criteria	sub Criteria	Weight
	employee	0.1
Income	<500K	0.4
	500K - 1M	0.3
	1M - 2M	0.2
	> 2M	0.1
Total ART	> 3 people	0.4
	3 people	0.3
	2 persons	0.2
	1 person	0.1

B. display Applications

In this application there Login to see the Main Menu, Input Menu, and ranking results as follows:

1) menu Login

On android application login is only used by the Chairman of RT and Officer / Surveyor, while the Admin will only log on the web.

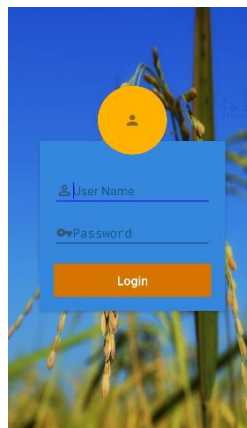


Fig 3. Display Menu Login

2) Main course

Differences after login between the Chairman of RT and Officer / Surveyor is to perform commands CRUD (Create, Read, Upload, and Delete) of data resident on the menu of RT, while in the main menu Officer / Surveyor can perform commands CRUD survey data and survey results ,

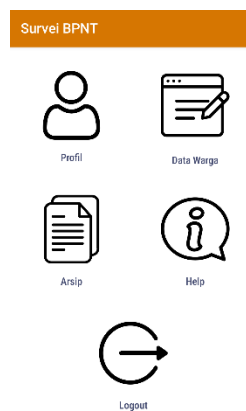


Fig 4. Display Main Menu Chairman of RT



Fig 5. Main Menu Display Officer / Surveyor

3) input menu

On the input menu of RT can enter the data in advance of people being surveyed by Officer / Surveyor.

Nama Warga

NIK

Nomer KK

RT

O2

Wilayah

Status

Aktif Tidak Aktif

Keterangan

Fig 6. Display Data Input Residents

Pilih Periode : 4

Januari 2019

Data Warga : WRG1911005

Casmimah

Luas Bangunan

Status Tempat Tinggal

Milik Pribadi Sewa

Jenis Lantai

Keramik

Jenis Dinding

Tembok

Jenis Atap

Genteng

Pekerjaan

Karyawan

Penghasilan

Kurangnya dari Rp. 500.000

Fig 7. Input Data Survey

4) Results ranking

After the citizens' data and survey data has been inputted it will generate more ranking citizens are entitled to help with the weight of each that have been assessed based on the quota in the period.



Data Survei Periode : Januari 2019

No	Hasil Survei Warga	Ranking	Hasil
1	Yusran (WRG1911047) RT : 02 , RW : 03 Luas Bangunan : 35 m2, Status Tempat : Milik Pribadi , Jenis Lantai : Bambu , Jenis Dinding : Bambu , Jenis Atap : Genteng , Pekerjaan : Buruh , Penghasilan : 500 rb - 1 jt , Jumlah ART : Lebih dari 3 orang Perhitungan : $11.481209945741 / (11.481209945741 + 0) = 1$ Keterangan :	1	Diterima
2	Soma (WRG1911035) RT : 02 , RW : 03 Luas Bangunan : 35 m2, Status Tempat : Milik Pribadi , Jenis Lantai : Keramik , Jenis Dinding : Tembok , Jenis Atap : Genteng , Pekerjaan : Buruh , Penghasilan : 500 rb - 1 jt , Jumlah ART : 3 orang Perhitungan : $9.1494328355435 / (9.1494328355435 + 6.4255644723152) = 0.587444$ Keterangan :	2	Diterima
3	Casminah (WRG1911005) RT : 02 , RW : 03 Luas Bangunan : 60 m2, Status Tempat : Milik Pribadi , Jenis Lantai : Keramik , Jenis Dinding : Tembok , Jenis Atap : Genteng , Pekerjaan : Petani/Pekebun , Penghasilan : 500 rb - 1 jt , Jumlah ART : 3 orang Perhitungan : $7.2037448173807 / (7.2037448173807 + 6.9902529541953) = 0.50752$ Keterangan :	3	Diterima
4	Emen (WRG1911012) RT : 02 , RW : 03 Luas Bangunan : 35 m2, Status Tempat : Milik Pribadi , Jenis Lantai : Keramik , Jenis Dinding : Tembok , Jenis Atap : Genteng , Pekerjaan : Wiraswasta , Penghasilan : 1 jt - 2 jt , Jumlah ART : 2 orang Perhitungan : $3.69274472938 / (3.69274472938 + 9.0453403373329) = 0.289898$ Keterangan :	4	Ditolak
5	Sapta (WRG1911034) RT : 02 , RW : 03 Luas Bangunan : 68 m2, Status Tempat : Milik Pribadi , Jenis Lantai : Keramik , Jenis Dinding : Tembok , Jenis Atap : Genteng , Pekerjaan : Karyawan , Penghasilan : Lebih dari 2 jt , Jumlah ART : Lebih dari 3 orang Perhitungan : $3.69274472938 / (3.69274472938 + 10.871146130092) = 0.253555$ Keterangan :	5	Ditolak

Fig 8. Display Results ranking

C. Comparison of methods TOPSIS method SAW

On testing the result of the calculation methods TOPSIS using an application by SAW method using manual calculation with the data sample tested 5 villagers as follows:

Table 3.
ranking TOPSIS

Name	Results Weight	Ranking
Yusran	1	1
Soma	0.587444	2
Casminah	0.50752	3
Emen	0.289898	4
Sapta	0.253555	5

Table 4.
ranking SAW

Name	Results Weight	Ranking
Yusran	100	1
Soma	80.75	2
Casminah	73.25	3
Emen	59	4
Sapta	53	5

Based on Table 3 and Table 4 is a comparison of the results of the rankings weighted TOPSIS method with SAW method, produced results different weights but recommends the same ranking citizens are Yusran at rank 1 followed Soma, Casminah, Emen, and Sapta.

4. Conclusion

Based on research that has been done, it can be concluded that:

- 1) The output of this application is in the form of people receiving the report's recommendations BPNT.
- 2) Results of testing the application with the data sample 5 villagers using TOPSIS method with a quota of 3 citizens Yusran beneficiaries to produce recommendations in the first rank with a weight of 1 results,





- 3) The test results with a manual calculation sample data 5 villagers using SAW method with a quota of 3 citizens Yusran beneficiaries to produce recommendations in the first rank with a weight of 100 results.
- 4) Calculation methods TOPSIS and SAW have different weights result but result in recommendations BPNT ranking people receiving the same.

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