

INFORMATION SYSTEM OF EMPLOYEE RECRUITMENT MANAGEMENT YAYASAN CITA SEHAT

Nurfitriani¹, Gentisya Tri Mardiani²

^{1,2} Information Engineering - University Computer Indonesia

^{1,2} Jl. Dipatiukur 112-114 Bandung

E-mail: rianinurfit@gmail.com¹, gentisya.tri.mardiani@email.unikom.ac.id²

ABSTRACT

Yayasan Cita Sehat is a non-governmental organization that focuses on health care communities. At the foundation, there are two constraints in managing the recruitment of new employees. These constraints are Dept. Head difficulty in planning the required number of candidates as well as HCM Dept. Head difficulty in determining the recommendation candidates must be accepted by the Director. Then built Recruitment Management Information System Healthy Cita Foundation which aims to help Dept. Head in the planning as well as the number of new hires need help HCM Dept. Head determine recommended candidates must be accepted by the Director. Stages of this research is helpful in planning new hires need to adjust the number of empty slots that exist in every office, recommend new candidates with the help of a decision support method, namely TOPSIS and control the recruitment of new employees in accordance with the initial planning. The conclusion of this research can help Dept. Head in the planning of the required number of candidates and can help HCM Dept. Head determine recommended candidates must be accepted by the Director. Although there are deficiencies in determining the recommendation that is expected to have an alternative other recruitment criteria so that the system could recommend candidates to be accepted in accordance with the expected foundation.

Keywords : Information Systems, Information Systems Management, Recruitment, TOPSIS, weight, decision-making.

1. PRELIMINARY

1.1. Background

Yayasan Cita Sehat is a non-governmental organization from countries Indonesia focuses on health services. Bandung. The Foundation has 262 employees of which 172 permanent employees and 65 contract employees and 19 parttime employees. The position of employees divided into 2 parts, the first is non-medical and medical second is.

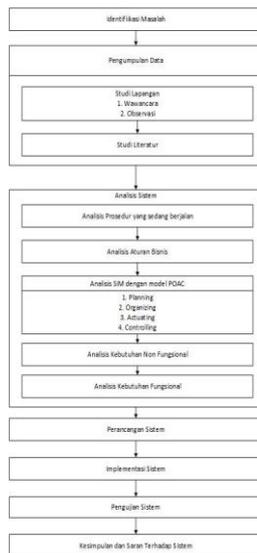
Based on interviews with HCM Dept. Head, there are some constraints, namely Dept. Head difficulty in planning the number of candidates in positions that have never been filled previously attributed only employee monitoring data held by HCM department, while HCM Dept. Head office only tells quota to each Dept. Head in the early years of verbal or text message, and HCM Dept. Head and Director adopt plans without checking the number of prospective employees employee monitoring data, which causes an excess of employees in certain positions. Based on data in 2016 there were 14.3% of employees in the Medical department and GM & PM department and in 2017 there were 18.2% of employees in the Medical department and GM &

Furthermore, the candidate who gets the category of excellent employees in one job so that HCM Dept. Head difficulty in deciding on which employees must be accepted due to the Foundation not yet have a weight rating of any recruitment criteria resulted in the number of employees who received depends Director for indirectly make a decision when the value of a prospective employee recap given that sometimes the number of employees who received does not match with the planning. In 2016 there were 35.7% of employees in the department Project, Partnership, Public Health and Medical then in 2017 there were 31.3% of employees in the department Project, GM & AM, Public Health and Medical that the number of candidates exceeds the amount received planning. In the search for decision-making support system solutions, this research refers to several journals written by Elyza Gustru Wahyuni, Ananto Tri Anggoro [6], Otto Fajarianto, Muchammad Iqbal, Jaka Tubagus Cahya [7], Bayu Rianto [8], Arif Harjanto [9], and Dian Eko Wahono, Muhammad Hasbi, Sri Hariyati Fitriasih [10] but the difference in this study uses management functions.

Based described above, the management information system is needed that can help HCM Dept. Head to determine recommended employees must be accepted, Dept. Head in the planning needs of the number of candidates to no longer an excess of employees with the title "Information Management System Recruitment Cita Foundation Healthy".

1.2. Research Methodology

Research methodologies include steps performed in the research stage. The methodology of this study can be seen in Figure 1.



Picture 1, Stages of research methodology

2. RESEARCH

2.1. TOPSIS (Technique For Order Performance by Similiarity To Ideal Solution)

TOPSIS is a method of multiple criteria decision making. TOPSIS using alternative assumes that elected must have the shortest distance from the negative solution to determine the best value of an alternative [4].

2.2. Analysis POAC Management Functions

Management functions to be performed to complete the recruitment management constraints that exist in the foundation of healthy ideals, namely planning (planning), organizing (organizing), actuating (implementation) and controlling (control) [1].

Details of the management function in this study can be seen in figure 2.

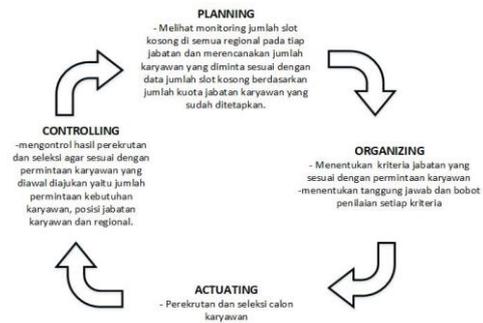


Figure 2. Management Functions Recruitment POAC In Cita Foundation Healthy

1. Planning

Each Dept. Head will see monitoring number of existing empty slots each post in each regional planning office required amount of requests in accordance with the number of empty slots available. The monitoring system is determining the performance of the functions of planning to achieve the goal [3].

Examples of Yogyakarta regional monitoring can be seen in Table 1.

Table 1, Data Monitoring employee

REG ION AL	POS ITI ON	DEPA RTME NT	QUO TA POSI TIO NS	QU OT A LO AD ED	EM PT Y SLO T	INFOR MATI ON
yogy akart a	Finan ce of Bran ch	Finan ce	1	1	0	-
	Mid wife	Medica l	4	5	-1	over quota
	Nurs e	Medica l	4	3	1	reporti ng require ments
	Gene ral Affai r of Bran ch	GM & PM	1	1	0	-

There are three types of information in Table 1 which exceeds the quota, stripe sign (-) and reporting needs of employees. Of the three types of information that has meaning beyond quota indicates that the amount of quota that is filled beyond quota existing positions, to sign stripe (-) indicates that the amount of quota that is charged together with Kouta existing positions, and reporting needs of employees indicates that the total quota less than the quota positions available so that each Dept. Head can report employees' needs in accordance with the number of empty slots.

After viewing the monitoring data in Table 1 and the Medical Dept. Head nurse reported regional office

employee needs Yogyakarta in HCM Dept. Head. Reporting can be seen in Table 2.

Table 2, Request new employees to be reported

office	Department	regional	quota Position	Number of employees	Empty slots	requests Employees
Nurse	Medical	Yogyakarta	4 people	3 people	1 person	1 person

2. Organizing

The results of the planning phase has been done in Table 2, hereinafter HCM Dept. Head office will determine the criteria which are in accordance with the request made by the Medical Department Head can be seen in Table 3.

Table 3, Criteria To Suit Planning Phase

POSITION	CRITERIA
NURSE	At least 20 years of age up to 28 years
	Minimal education D3 majoring in nursing
	Minimal work experience in the same field for 1 year
	To be responsible
	Able to communicate well
	Computer literate

Some of the responsibilities carried out at that stage of the recruitment process planning, controlling, actuating and could conform to the organizing stage created can be seen in Table 4.

Table 4, Candidate Recruitment Process Employee Conditions

Medical	non-medical	implementer	Company	
The first stage				
Test selection and administration a. Age b. Education c. Work experience	Test selection and administration a. Age b. Education c. Work experience	partners	partners	
writing test	writing test			
ability test	Test interview I			
Test interview I				
the second phase				
Tests interview II	Tests interview II	Dept. Head	Cita Foundation Health y	
The final stage				
Recap of the first and second stages of data	Recap of the first and second stages of data	HCM Dept. Head		
decision	decision	director		

Furthermore ditahap will also determine the terms weight rating criteria used for actuating stage.

Table 5, Criteria and Weights Test Interview I

Criteria	weight
Customer Service Orientation	4
Initiative	3
Team Work	4

religious	3
Achievement	4

From table 5 is used to select test results I interview prospective employees.

Table 6, Rating Foundation

Medical		Non-Medical	
criteria	Weight	criteria	Weight
education	3	education	3
work experience	3	work experience	3
writing test	2	writing test	2
test capability	4	I interview test	3
I interview test	3	test interview II	4
test interview II	4		

While at the table 6 is used to select the results of the first stage hiring process and the second stage so that helped HCM Dept. Head in determining a recommendation.

3. actuating

At this stage of selection of candidates will be done receipts TOPSIS method [6].

There are 6 Data prospective employees who will fill the post of Nurse with the requirements and criteria of each partner submitted by the HCM Dept. Head along with details of the value of the test interview I

Defining the value of and as well as determine the nature of each criterion. There are 6 candidates will fill the post of nurse ij (i) alternative:

- A1 = Mutaslimah
- A2 = Nurul Aida
- A3 = Revi Puspa
- A4 = Tania Saraswati
- A5 = Salsabila Wardani
- A6 = Suci Oktaviani

for the recruitment of the following criteria: (j)

- C1 = education
- C2 = work experience
- C3 = written test
- C4 = test capability
- C5 = test interview I
- C6 = test interview II

As for the interview I test criteria as follows: (j)

- C1 = Customer Service Orientation
- C2 = Initiative
- C3 = Team Work
- C4 = Religious
- C5 = Achievement

Table 7, Employee Recruitment and Selection Results of First Phase conducted by Partners

	C1	C2	C3	C4	C5	C6	Average
A1	23	S1	1 year	79	76	77	77.33
A2	25	D3	2 year	85	75	77	79

			rs				
A3	25	D3	>3 yea rs	77	75	81	77.6 7
A4	23	D3	1 yea r	74	75	77	75.3 3
A5	27	S1	>1 yea r	76	81	78	78.3 3
A6	28	S1	>3 yea rs	77	76	81	78

In Table 7 there are details of the value of the test I interview new candidates, the details of these values can be seen in Table 8.

Table 8, Details of Test Scores Interview I

Name	interview					Value
	C1	C2	C3	C4	C5	
A1	13	19	16	18	11	77
A2	19	17	17	10	14	77
A3	16	17	16	17	15	81
A4	18	14	17	12	16	77
A5	17	15	14	19	13	78
A6	16	15	14	19	17	81

The formulas used in TOPSIS method for calculating the values of the first stage and the second stage of prospective employees as follows: [5]

- Looking normalized value of each value of prospective employees

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

In order to obtain normalization value using equation (1) by means of values shared criteria roots perkriterianya rank results. $(r_{ij})(x_{ij})(\sum_{i=1}^m x_{ij}^2)$

- Looking for weight rating normalized value

$$y_{ij} = w_i r_{ij}; \quad (2)$$

Values normalized weighted matrix by multiplying the weight value criteria with the value of each criterion that has been normalized $(y_{ij})(w_i)(r_{ij})$

- Determining the ideal solution both positive and negative

$$y_j^+ = \left\{ \begin{array}{l} \max^i y_{ij}; \text{ jika } j \text{ is a profit attribute} \\ \min^i y_{ij}; \text{ jika } j \text{ is a cost attribute} \end{array} \right\} \quad (3)$$

$$y_j^- = \left\{ \begin{array}{l} \min^i y_{ij}; \text{ jika } j \text{ is a profit attribute} \\ \max^i y_{ij}; \text{ jika } j \text{ is a cost attribute} \end{array} \right\} \quad (4)$$

Calculating the ideal solution of each well was the ideal solution both positive and ideal solution negative by comparing the value of the criteria, if the search is = max then compare all grades alternatives have been sought value normalization terbototnya on the criteria which most large then there was his, and if the search is = min then compare all alternative values that have been searched on the value of the normalization terbototnya which criteria are most small then it is. $y_{ij}^+ y_{ij}^- y_{ij}^+ y_{ij}^-$

- Determining the distance alternataf the ideal solution

$$D_i^+ = \sqrt{\sum_{j=1}^n (y_{ij}^+ - y_{ij})^2}; \quad (5)$$

$$D_i^- = \sqrt{\sum_{j=1}^n (y_{ij} - y_{ij}^-)^2}; \quad (6)$$

Calculating distance weighted value of each alternative () towards the ideal solution positive () and negative ideal solution by way of notice in advance the nature of the criteria if all the criteria are the same or not. Because the table 3:16 all the criteria are the same that benefit (the greater the value on a criterion, the better) then = max and = min and if there are criteria that are cost (the smaller the value on a criterion, the better) then = min and = max [4]. D_i^+ atau $D_i^- y_i^+ (y_i^-) y_1^+ y_1^- y_1^+ y_1^-$

- Determining the value of preference for each criterion

$$V_i = \frac{D_i^-}{D_i^- + D_i^+}; \quad (7)$$

Calculating the value of the preferences of each alternative () with the distance between the weighted value of each alternative against the negative ideal solution is divided by the result of the distance between the weighted value of each alternative against negatifditambah ideal solution to the distance between the weighted value of each alternative against the positive ideal solution. $V_i (D_i^-) (D_i^-) (D_i^+)$

The first phase will first do the screening results can be seen in Table 9.

Table 9, Preference Value Test Interview I

Alternative	Information	value preferences
V_1	N1	.463
V_2	N2	.448
V_3	N3	0.732
V_4	N4	0.576
V_5	N5	0.525
V_6	N6	0.633

After getting the preference value of the test interview I in table 9, that value will override the previous value of the first interview test in table 7 is a table of 10.

Table 10, Prospective Employee Data Content Preferences Value Test Interview With I

	C1	C2	C3	C4	C5	C6	C7
A1	23	S1	1 year	79	76	.463	80
A2	25	D3	2 years	85	75	.448	80
A3	25	D3	> 3 years	77	75	0.73 2	70
A4	23	D3	1 year	74	75	0.57 6	85
A5	27	S1	> 1 year	76	81	0.52 5	70

A6	28	S1	> 3 years	77	76	0.63 3	75
----	----	----	-----------	----	----	-----------	----

Furthermore, the calculation of the second stage using the same formula used in the first phase so as to produce a final value that can be seen in Table 11.

Table 11, Value Prospective Employee Preferences

Alternative	Name	value preferences	rank
V_6	Suci Oktaviani (N1)	0332	4
V_3	Revi puspa (N2)	0335	5
V_5	salsabila wardani (N3)	0630	2
V_1	Mutaslimah (N4)	0351	6
V_4	tania saraswati (N5)	0502	3
V_2	nurul aida (N6)	0730	1

4. controlling

HCM Dept. Head control outcomes data selection of candidates has been done at the stage Actuating on the table 11 by using TOPSIS method, where job candidates among alternatives and get the best value then it will be accepted by the selection on the foundation. $V_1, V_2, V_3, V_4, V_5, V_6$

Table 12, Final Result Candidate Selection Data New Employees

Alternative	Name	Rank	information
V_6	Suci Oktaviani	1	pass
V_3	Revi puspa	2	Not pass
V_5	salsabila wardani	3	Not pass
V_1	Mutaslimah	4	Not pass
V_4	tania saraswati	5	Not pass
V_2	nurul aida	6	Not pass

See Table 12 above on behalf of V_6 the Suci Oktaviani get the best value then the Suci Oktaviani alternative option would be the best recommendation for admission to fill empty slots regional nurse Yogyakarta.

Directors receive new candidates in accordance with the recommendation that has been determined by the HCM Dept. Head is 1 person in the number of requests in the planning stage is table 2.2. Acceptance of new candidates must be in accordance with the number of initial requests so it will not happen again the amount of revenue that does not correspond to the number of initial requests for new employees.

If there is a selection of prospective employee assessment results are the same then will diliat alternative other criteria, namely a younger age to be received by the foundation.

2.3. Analysis of User Needs

User needs analysis was conducted to determine who will be using the Management Information

System Recruitment Yayasan Cita Sehat. Users of this system has 6 user the Managing Director, Dept. Head, Dept. HCM Head, HR, partners and prospective employees.

Table 13, Proposed User Analysis

No.	User type	Access rights	The skill level
1.	director	a. Approve request a new employee who is in conformity with the empty slot data based on the recommendation	Able to operate a computer and use software
		b. Receive reports of new employees	
2.	Dept. Head	a. Doing demand for new employees in accordance with the empty slot positions	Able to operate a computer and use software
		b. Providing value to a prospective employee interviews II	
		c. Viewing data empty slot positions	
		d. Looking at the data monitoring the number of employees	
3.	HCM Dept. Head	a. Oversee the monitoring data of the number of employees	Able to operate a computer and use software
		b. Recruitment and merekap test prospective employees	
		c. Seeing the results of the first stage of selection of candidates	
		d. Determining recommendation of prospective employees based on best value obtained	
		e. Double check the results of the first phase test prospective employees	
4.	HR	a. Data processing employee	Able to operate a computer and use software
5.	partner	a. Downloading CV and application file submitted	Able to operate a computer and use software
		b. Sending the first stage of selection results	
6.	Prospective employees	a. Send CV and application file	Able to operate a computer and use software
		b. Receiving the result of selection of employees received	

2.4. Analysis Database

Analysis of the data on the basis of management information system recruitment Yayasan Cita Sehat will be built using Entity Relationship Diagram (ERD).

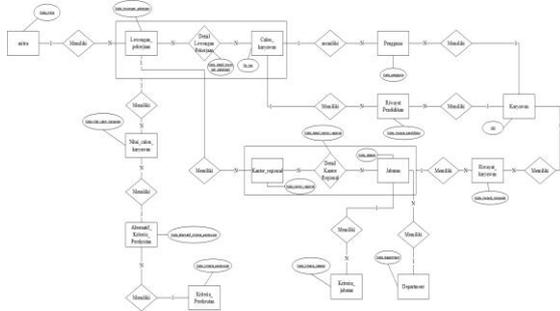


Figure 3. ERD recruitment management system foundation of healthy ideals

2.5. ERD Data Dictionary

The following table 14 is a data dictionary of ERD in the management information system of hiring employees in Yayasan Cita Sehat.

Table 14, ERD Data Dictionary

NO	name of Entity	Attribute name
1	Alternate criteria received	<u>code alternatif criteria purchase</u> , <u>code cost company</u> , <u>scale</u> , <u>criteria display</u> , <u>description</u> , <u>status</u>
2	Employee count count	<u>Code name calon employee</u> , <u>code alternative criteria company</u> , <u>code detail lowongan work</u> , <u>alternative_value</u> , <u>active value</u> , <u>actual_value</u>
3	Recruitment criteria	<u>Kode kriteria perekrutan</u> , <u>nama kriteria perekrutan</u> , <u>bobot kriteria perekrutan</u> , <u>kategori perekrutan</u> , <u>jenis jabatan</u> , <u>status</u>
4	Job Vacancy Details	<u>Code Job Vacancy Details</u> , <u>job_vacancy_code</u> , <u>id_number</u> , <u>announcements</u> , <u>grades</u> , <u>selection_status</u> , <u>assessment_status</u> , <u>assessment_results</u> , <u>stage_second</u> , <u>stage_dua</u> , <u>description_stage_satu</u> , <u>akuntansi_stage_dua</u>
5	Job vacancy	<u>Job following code</u> , <u>code detail tor regional</u> , <u>time report</u> , <u>time start</u> , <u>time finished</u> , <u>approval status</u> .
6	Prospective employees	<u>Id_name</u> , <u>Name</u> , <u>tempat lahir</u> , <u>tanggal lahir</u> , <u>address</u> , <u>no_telp</u> , <u>religion</u> , <u>jenis_kelamin</u> , <u>photo</u> , <u>file_cv</u> , <u>certificate</u> , <u>ID card</u> , <u>status</u>
7	users	<u>code user</u> , <u>nik</u> , <u>no_ktp</u> , <u>email</u> , <u>user name</u> , <u>password</u> , <u>authority</u> , <u>date update</u> , <u>status</u>
8	Educational background	<u>Kode histori education</u> , <u>id number</u> , <u>institute education</u> , <u>level departments</u> , <u>year include</u> , <u>year pass</u> , <u>final grade</u> , <u>diploma</u>
9	employee	<u>Nik</u> , <u>Name</u> , <u>tempat lahir</u> , <u>tanggal lahir</u> , <u>address</u> , <u>no_telp</u> , <u>religion</u> , <u>gender jenis_kelamin</u> , <u>status_employee</u> , <u>photo</u> , <u>status</u>
10	Employee history	<u>Code distributory worker</u> , <u>Nik</u> , <u>kode_detail_office_regional</u> , <u>start_posision</u> , <u>end_posision</u> , <u>description</u> , <u>status</u>

11	Detail_office_e_regional	<u>code_detail_office_regional</u> , <u>code_posision</u> , <u>code_office_regional</u> , <u>status</u>
12	office_regional	<u>code_office_regional</u> , <u>name_office_regional</u> , <u>city</u> , <u>status</u>
13	office	<u>code_posision</u> , <u>kode_department</u> , <u>rank_posision</u> , <u>name_posision</u> , <u>type_of_posision</u> , <u>level_posision</u> , <u>min_education</u> , <u>num_min_education</u> , <u>quota_posision</u> , <u>status</u>
14	Position_criteria	<u>criteria_posision</u> , <u>Code category jakarta</u> , <u>kode jabatan</u> , <u>name_category_japan</u> , <u>status</u>
15	Department	<u>code_department</u> , <u>name_department</u> , <u>status</u> .
16	partner	<u>code_partner</u> , <u>name_partner</u> , <u>address_partner</u> , <u>partner_contact_no</u> , <u>email_mitra</u> , <u>username</u> , <u>password</u> , <u>date_update</u> , <u>status</u>

2.6. Analysis of Non-Functional Requirements

Analysis of functional requirements describe and explain about the flow data or information. Functional requirements are designed on this system has 6 user the Managing Director, Dept. Head, HCM Dept. Head, HR, Partner and Prospective Employees where each user has the right to information and data that is different.

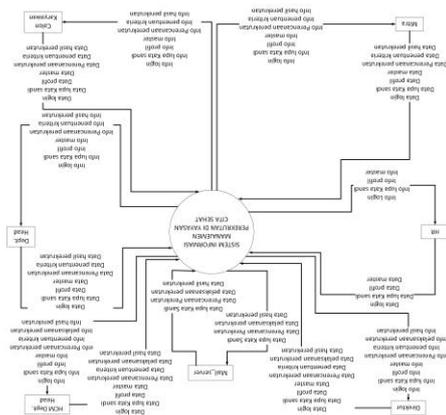


Figure 4. Diagram Context

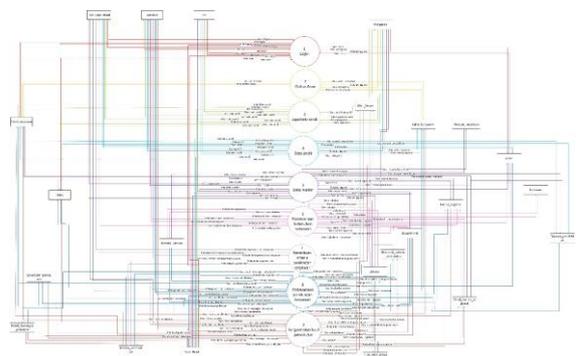


Figure 5. DFD Level 1

2.7. System planning

The system design is done after the analysis phase is completed. The system design is also known as planning or making sketches images into one element.



Figure 6. Relation Scheme

2.8. implementation of the system

Implementation has been designed and manufactured for the Management information system Yayasan Cita Sehat can be seen in Figure 7.

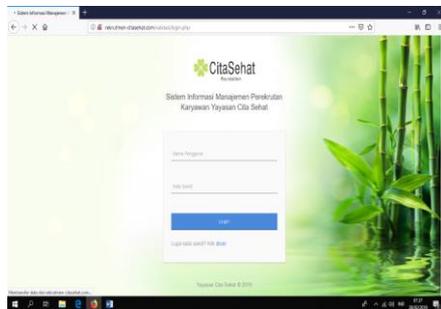


Figure 7. Implementation of the system

2.9. testing Systems

Dilakukan system testing in this system is blackbox testing and beta testing. BlackBox testing results on this test that every process contained in the system are in accordance with what is expected and if there is an error entered data will display information or messages to the user.

While testing the Beta is a test performed by the end user where each user performs testing on the system to determine kesesuaian system that has been created with the expected [2]. Beta testing for the conclusions on this system are as follows:

1. This recruitment management information system can assist the Director in making penyetujuan planning a new employee needs preplanned by Dept. Head and help in making decisions on admission of new employees according to the number at the beginning of planning.
2. The management information system can help HCM Dept to recommend a prospective employee, the employee needs planning approval, the process of recruitment and selection of candidates.
3. The management information system can help Dept. Head in the planning needs of employees and hiring.

4. This management information system can help HR employee data management activities, department and regional offices.
5. The management information system to assist Partners in the data management activities of candidates to the Foundation for Healthy Cita.

3. COVER

3.1. Conclusion

The conclusion is this system can help Dept. Head in the planning of the needs of employees, help HCM Dept. Head in determining the recommendation of candidates to be received as well as helping the director determines that a decision based on the amount received in accordance with the amount of planning.

3.2. Suggestion

Based on the results achieved in this study then obtained some suggestions are expected in the future in the development of Management Information Systems Perekrutan Employee Foundation Cita Health is expected to have an alternative recruitment criteria other so that the system could recommend candidates deserve as expected the Foundation and partners based on the best value of the test results of prospective employees, the need for comprehensive development to other areas if there is a possibility of a change of data relating to employees so it's easier Foundation in running the entire data management of its employees, and is expected to provide information on the number of employees of each type. In the hardware implementation will dijelas any hardware that is implemented for the development needs of the system.

BIBLIOGRAPHY

- [1] Hasibuan, Malay SP, Management: The Basics, Understanding and Troubleshooting, Earth Literacy, Jakarta, in 2011.
- [2] Ph.D. Roger S. Pressman, Software Engineering: A Practitioner's Approach 7th edition, 2010.
- [3] Susanto, R. and Andriana, AD, "Waterfall Model Comparison And Prototyping for the Development of Information Systems." UNIKOM Scientific Magazine, 14 (1), 2016.
- [4] Pratiwi, Heny., Textbook of Decision Support Systems, Yogyakarta, Deepublish, 2016.
- [5] Nofriansyah, Dicky, Multi-Criteria Decision Making (MCDM) on Decision Support Systems, Yogyakarta, Deepublish, 2017.
- [6] Wahyuni, EG, Anggoro, AT, "Decision Support System Recruitment TOPSIS Method." Journal of Science, Technology and Industry, Vol. 14, No. 2, June 2017, pp.108 - 116, 2017.
- [7] Fajarianto, O., Iqbal, M. and Cahya, JT, "Decision Support System Selection Recruitment Methods Weighted Product."

- SISFOTEK GLOBAL JOURNAL, 7 (1), 2017.
- [8] Rianto, B., "Decision Support System Recruitment Method Using Analytical Hierarchy Process (AHP) Case Study: RB. Nilam Sari Tembilihan. "Riau Journal of Computer Science, 2 (2), pp.29-38, 2016.
- [9] Harjanto, A., "Decision Support System Selection of Employees Based on Personality Psychology Test results using AHP (Case Study In Kalimasada)." Journal of Information Technology, 14 (1), pp.50-60, 2015.
- [10] <https://p3m.sinus.ac.id/jurnal/index.php/TIKomSiN/article/view/316> accessed in October 2018