DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEM HUMAN RESOURCES IN PT SANDY GLOBALINDO

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ABSTRACT

The HR-GA section is the part that is responsible in terms of Human Resources (HR) in the company. When it is done the employee acceptance HR-GA manager difficulties in choosing the appropriate candidate qualified employees because many employees who passed during the administration. In addition, when employee performance appraisals are conducted, HR-GA managers find it difficult to provide performance appraisal decisions because of the similarity of results obtained in each section. Applying for Leave is also a problem with many employees who do not comply with company regulations.

Based on the problems that have been answered above, then needed a system to follow the problem of Human Resources at company that can assist HR-GA manager in giving recomendation of qualified employee, giving decision of employee performance appraisal and. Management functions used are POAC management (Planning, Organizing, Actuating, Controling). Employee recruitment and leave application using business rules defined by the company. For the performance results using AHP (Analiytical Hierarcy Process) method From the black box test and beta test, it can be concluded that this system can assist companies in performing recruitment process, employee performance and employee leave taking.

Keywords : Human Resources, Management Information System, POAC Management Function, Analiytical Hierarcy Process (AHP)

1. INTRODUCTION

Department / Section HR-GA is part of the company responsible for managing Human Resources (HR). Human Resource Management starts from the recruitment of new employees until the retirement of employees. The company has an employee recruitment procedure, but it can not be applied properly due to the need for employees to be obtained quickly. So when employee acceptance, pre-defined qualifications are ignored such as formal education qualifications. So when the administrative selection process of many employees passed to the stage of written selection and interview, this makes HR-GA manager difficult in determining who the candidate suitable employee to fill the vacancy required position. Employee performance appraisal is conducted once a year by filling out the assessment form conducted by the Manager of each section. Each employee will be judged one by one. Of the performance appraisal data each year, there are many similarity values from the assessment results, this makes HR-GA manager becomes difficult to decide which employees will get promotion, or mutation. Employee leave procedures are also not in accordance with the rules applied by the company

The purpose of this research, to build human resource management information system at PT. Sandy Globalindo. While the objectives in the study, are as follows:

1. Assist Manager HR-GA in recommending applicants in accordance with the required criteria.
2. Assist Manager HR-GA in taking decisions from employee performance appraisal results.
3. Assisting HR-Operations in supervising the taking of employee leave.

2. CONTENT OF RESEARCH

2.1 Management information System

Management information systems in general can be regarded as an integrated human and machine system in providing information to support the operations management functions and the determination of alternative actions within an organization of the system [1]. In its operation, management information systems use hardware, software, procedures, management models, and decisions and data terminals. Management information systems as a collection of people and sources of capital within an organization are responsible for the collection and processing of data while generating useful information for each management hierarchy in the planning and control of organizational activities.

2.2 POAC Management Function

a. Planning (planning) is as a rationale of the objectives and preparation of steps that will be used to achieve the goal.

b. Organizing (organization) is as a way to collect people and put them according to ability and expertise in work that has been planned.
c. Movement (actuating) is to move the organization to run in accordance with the division of labor and mobilize all existing resources in the organization for work or activities undertaken to run as planned and can achieve goals.
d. Supervision (controlling) is to monitor whether the movement of this organization is in accordance with the plan or not. And oversee the use of resources within the organization to be used effectively and efficiently without any deviation from the plan.

2.3 AHP *(Analytical Hierarcy Process) Method*

The AHP (Analytical Hierarchy Process) method is one of the multicriteria decision-making models that can help the human mindset where logic factors, experiences of knowledge, emotions and feelings are optimized into a systematic process. Basically, AHP is a method used to solve complex and unstructured problems into its groups, by organizing the group into a hierarchy, then entering numerical values instead of human perceptions in relative comparison. With a hypothesis it will be able to determine which element has the highest priority.

The AHP component is a functional hierarchy with the main input of human principles. AHP has many advantages one of which is graphically depicted so easily understood by all parties involved in a decision-making. Some principles when SPK issues use the AHP method to be understood, such as [2]:

1. Create a hierarchy

Complex systems can be understood by breaking them into supporting element elements, arranging elements hierarchically, and combining them or synthesizing them. Decomposition is a function to solve or divide the whole problem into elements and then become a hierarchical form of decision-making process, in which each element is interconnected with each other. The structure of AHP hierarchy can be seen in Figure 1 below:

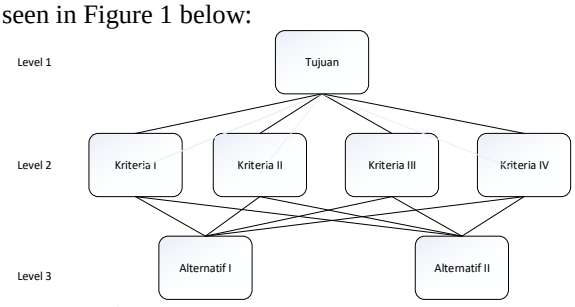


Figure 1 Hierarcy AHP Structure

Table 1 Scale Value Pairwise Comparison

Intensity Interest	**Information**
1	Both elements are the same
3	One element is slightly more important than the other elements
5	One element is more important than any other element
7	One clear element is more important than any other element
9	The angle of the element is absolutely essential from other elements
2,4,6,8	The values between him value adjacent considerations
The opposite	If activity I gets one number compared to activity j, then I has the opposite value compared with i

2. Systhesis of Priority

Every criterion and alternative needs pairwise comprasions. The values of all comparisons can be adjusted to the specified judgment to produce a weight and a priority. The weights and priorities are calculated by matrix manipulation or by mathematical equations.

3. Logical Consistency

Consistency has two meanings. First, the same objects can be grouped by uniformity and relevance. Second, concerning tungkat relationships between objects based on certain criteria.

AHP has procedures in processing the data to get the decision in accordance with the hierarchy that has been determined. The procedures in AHP are as follows:

a. Define the problem and determine the desired solution. After that just compile a hierarchy.
b. Define the priority of the element as the first step. Represents a pair of pairs matching the given criteria. Comparative matrices are filled with numbers in order to represent the relative importance of one element with other elements.
c. Create a comparison matrix according to criteria or subcriteria, then make an average of each criterion or subcriteria:

i. Determine pairwise comparison matrices

Table 2 Pairwise Comparison Matrices

	K1	K2	…	Kn
K1	Comparative scoring scale	K1/K2	…	…
K2	…	…	…	…
…	…	…	…	…
Kn	…	…	…	…
Amount				

ii. Specifies the criteria value matrix

The following is an overview of the matrix of criteria values in table form which can be seen in table 3

Table 2 Criteria Value Matrix

	K1	K2	…	Kn	Amount	Priority
K1	New column row value = (old column row value) / (number of rows)	…	…	…	∑K	∑K/n
K2	…	…	…	…		
…	…	…	…	…		
Kn	…	…	…	…		

iii. Create a matrix of the sum of each line
The following is an overview of the matrix of each row in the table form which can be seen in Table 4

Table 3 Matrix of Added Rows

	K1	K2	…	Kn	Amount
K1	(Comparative Value) x (Priority per Line)	…	…	…	∑K
K2	…	…	…	…	
…	…	…	…	…	
Kn	…	…	…	…	

iv Calculates the consistency ratio
In this stage we can know how well the consistency of a decision. Because it is impossible to determine a decision with a low level of consistency. In Table 5 is a description of the results of the calculation of each criterion to be tested consistency

Table 4 Calculation of Consistency Ratio

	Amount per Row	Priority	Result
K1	…	…	…
K2	…	…	…
…	…	…	…
Kn	…	…	…
Jumlah			

Before calculating a consistency, do the following stages:
Results (in Table 5) = Number per Row + Priority
Amount (in Table 5) = K1 + K2 + K3 + Kn
λ max = Amount (in Table 5) / Number of Criteria
Calculate Consistency Index (CI) with the formula:

$$\boldsymbol{CI = (\lambda\,maks - n)/n} \qquad \text{…….....(1)}$$

Where n = number of elements
Calculate Consistency Ratio (CR) with formula:

$$\boldsymbol{CR = CI/IR} \qquad \text{……(2)}$$

Where CR = *Consistency Ratio*
CI = *Consistency Index*
IR = *Index Random Concsitency*

Determine the consistency of a decision. If the value is more than 10% then the judgment assessment (assessment scale) should be improved, if a consistency ratio (CI / IR) of less than 10% is stated correctly.

2.4 Analysis of Determination of Amount and Criteria of Employees

1. Planning

This stage is the planning stage where the part manager determines the number and qualification of the employee based on the monitoring result done in each section

2. Organizing

This stage is done referring to Planning stage has been done where HR Operations will make FPTK form then submitted to manager of marketing section to be filled. And the Marketing Manager fill out the FPTK form.

3. Actuating

This stage is done to determine the qualification of employees who become the needs to be done by the manager of the requesting section.

4. **Controlling**

This stage will be controlled whether the required employee needs and qualifications given are appropriate as in the Planning phase..

2.5 Employee Acceptance Analysis

1. Planning

This stage is done because of the need for a new workforce for the position of marketing staff that amounted to 2 people. This plan will be undertaken with the process of determining the value and qualification and the weight of each qualification specified.

2. Organizing

This stage describes the division of tasks performed according to the planning that is done:

3. Actuating

This stage is the stage of the recruitment of employees. It is assumed that the number of applicants

Table 6 Data of Candidate Employees

Employee Name	Formal education	age	Language and Computer Abilities	Experience Organization	Work experience	Written Test Scores	Value of Interview Test
Saiful Jaelani	SMA	30	Cukup	> 3	> 3 tahun	75	80

Employee Name	Formal education	age	Language and Computer Abilities	Experience Organization	Work experience	Written Test Scores	Value of Interview Test
				tahun			
Asep Dermawan	D3	24	Mahir	< 1 tahun	< 1 tahun	80	75
Didi Riayadi	SMK	28	Sangat Mahir	< 1 tahun	<1 tahun	85	75
Marsyawati	S1	24	Sangat Mahir	> 3 tahun	< 1 tahun	80	75

Table 7 Data Changed Weight

Employee Name	Formal education	age	Language and Computer Abilities	Experience Organization	Work experience	Written Test Scores	Value of Interview Test
Saiful Jaelani	10	20	20	40	30	75	80
Asep Dermawan	20	40	30	20	20	80	75
Didi Riayadi	10	30	40	20	20	85	75
Marsyawati	30	40	40	40	20	80	80

Table 8 End Result Data of Candidate Employee

Name of Candidate Employee	Total criteria value
Marsyawati	330
Didi Riayadi	300
Asep Dermawan	285
Saiful Jaelani	275

4. Controlling

This stage is the examination stage of the selection of the four candidates If there is a similarity in the final value will be seen again based on work experience and formal education.

2.6 Employee Performance Appraisal Analysis with AHP method

1. Planning

This stage of planning is to determine the criteria and subcriteria assessment and the weight of each. Previous HR-Operations will make a determination against the criteria and subcriteria what will be used as a reference in the process of employee performance appraisal

Table 9 Criteria analysis on the appraisal process Employee performance

No	Criteria	Subcriteria	Code
1	Tanggung Jawab	Kehadiran tepat waktu	TJ1
		Ketepatan waktu menyelesaikan pekerjaan	TJ2
		Inisiatif	TJ3
		Penerimaan terhadap tugas tambahan	TJ4
2	Sikap	Kerjasama Tim	S1
		Etika	S2
		Kemampuan Memimpin	S3
		Kemampuan bekerja dibawah tekanan	S4
3	Kompetensi	Kreatifitas	K1
		Produktivitas	K2
		Kemampuan dalam bekerja	K3
		Pengetahuan tentang pekerjaan	K4

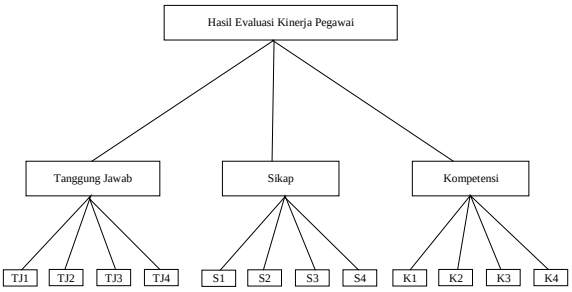


Figure 2. Hierarchy of Assessment Criteria

2. Organizing

This stage is the stage of organizing the results of prioritizing each of the criteria and subcriteria that have been done in the previous stage

Table 11 List of Priority Values At Each Subcriteria

No	Criteria	Code	Priority Value
1	Tanggung Jawab	TJ1	0.469047619
		TJ2	0.278571429
		TJ3	0.148412698
		TJ4	0.103968254
2	Sikap	S1	0.116658414
		S2	0.066160368
		S3	0.478250052
		S4	0.338931166
3	Kompetensi	K1	0.062554113
		K2	0.272077922

No	Criteria	Code	Priority Value
		K3	0.299025974
		K4	0.366341991

3. Actuating

This stage is the stage of implementation of employee performance appraisal activities conducted by each part manager. This performance appraisal is conducted once a year at the beginning of December. The following is an example of employee performance appraisal using AHP method which can be seen in table 11

Table 11 Employee Performance Appraisal Table

Pegawai / Kriteria	Ade Nurdin	Deny Marsita	Akhmad Nidaudin	Ari Pangestu
Tanggung Jawab				
Kehadiran tepat waktu	80*0.469 = 37.52	80*0.469 = 37.52	80*0.469 = 37.52	80*0.469 = 37.52
Ketepatan waktu menyelesaikan pekerjaan	20.895	22.288	22.288	22.288
Inisiatif	11.13	11.13	11.13	11.13
Penerimaan terhadap tugas tambahan	8.32	8.32	7.80	8.32
Sikap				
Kerjasama Tim	93.36	991.95	875.25	991.95
Etika	56.27	5.296	5.296	5.296
Kemampuan Memimpin	38.264	38.264	33.481	38.264
Kemampuan bekerja dibawah tekanan	25.4175	25.4175	27.112	25.4175
Kompetensi				
Kreatifitas	4.695	5.008	4.695	5.008
Produktivitas	21.768	21.768	21.768	21.768
Kemampuan dalam bekerja	23.92	22.425	23.92	22.425
Pengetahuan tentang pekerjaan	29.304	31.1355	29.304	31.1355
Nilai Akhir	236.1965	238.4915	230.7215	238.4915

4. Controlling

This stage is the stage of examination related to performance appraisal results of employees with the total final value that can be seen in table 13

Table 12 Employee performance appraisal results based on employee rank

No	Name	The final result	Ranking
1	Ade Nurdin	236.19	II
2	Deny Marsita	238.49	I
3	Akhmad Nidaudin	230.72	III
4	Ari Pangestu	238.49	I

From the table above there is a final result that has the same value. Then the same value will be compared with the length of work that has been done by each employee. Here is the final assessment based on the priority of work that can be seen in table 13

Tabel 13 Employee Assessment Result Based on Priority

No	Nama	Hasil Akhir	Perin gkat	Bagian	Keputusan
1	Ari Pangestu	238.49	I	HR-GA	Bonus 20% gaji + dipertimbangakan Promosi
2	Deny Marsita	238.49	II	HR-GA	Bonus 20% gaji + dipertimbangakan Promosi
3	Akhmad Nidaudin	236.19	III	HR-GA	Bonus 10 % gaji
4	Ade Nurdin	230.72	IV	HR-GA	Bonus 10 % gaji

PROMOTION POSITION

Promotion is done when there is one position that is HR-GA manager position that experiencing vacancy from employee performance appraisal got result of employee who have long working more hence will get promotion of position

Table 14 Employee Promotion in the HR-GA section

No	Name	The Final Result	length of working
1	Ari Pangestu	238.49	9 tahun
2	Deny Marsita	238.49	5 tahun

2.7 Employee Leave Leave Analysis

1. Planning

This stage is the planning stage of taking leave where HR-GA manager will determine the types of leave and the basic rules that will be used in the company along with the time of taking the leave.

2. Organizing

This stage is the stage of checking the types of leave and time whether it is in accordance with the rules and provisions with the Act. Employment No.13 year 2003 article 79 At this stage will also be assigned to each party.

3. Actuating

This stage is the stage of execution of taking leave. Here are the employees who took leave in 2016 which can be seen in table 15.

Tabel 15 Details of Taking Leave

No	Employee Name	Type of Leave	Length of Leave	Date of filing
1	Iwan	Cuti Tahunan	2	12-Jan-16
2	Arman	Cuti Tahunan	2	20-Jan-16
3	Pian	Cuti Tahunan	12	14-Jan-16
4.	Hendang	Cuti Tahunan	2	10-Jan-16
5	Mistun	Cuti Tahunan	3	24-Jan-16

Next will be seen history of each employee leave that can be seen in table 16

Tabel 16 Riwayat Cuti Pegawai

Iwan			
No	**Date of Leave**	**Type of Leave**	**Length of Leave**
1	25-09-2016	Cuti Tahunan	2
2	02-11-2016	Cuti Tahunan	3
Sisa Cuti Tahunan			7
Arman			
No	**Date of Leave**	**Type of Leave**	**Length of Leave**
1	12-04-2016	Cuti Tahunan	4
Sisa Cuti Tahunan			8
Pian			
No	**Date of Leave**	**Type of Leave**	**Length of Leave**
1	12-03-2016	Cuti Tahunan	2
2	02-05-2016	Cuti Tahunan	3
3	04-06-2016	Cuti Tahunan	4
4	26-11-2016	Cuti Tahunan	2
Sisa Cuti Tahunan			1
Hendang			
No	**Date of Leave**	**Type of Leave**	**Length of Leave**
1	12-08-2016	Cuti Tahunan	3
2	06-11-2016	Cuti Tahunan	3
Sisa Cuti Tahunan			6
Mistun			
No	**Date of Leave**	**Type of Leave**	**Lama Cuti**
1	23-03-2016	Cuti Tahunan	2
2	17-10-2016	Cuti Tahunan	3
3	19-12-2016	Cuti Tahunan	2
Sisa Cuti Tahunan			5

4. Controlling

This stage is the monitoring stage of the employee leave application. Here HR-Operations will see the number of leave taken by the employee. Approval of taking leave will be seen from the leave history of each employee.

2.8 Employee Retirement Analysis

1. Planning

This stage is the planning stage by determining the provision of pensions in which HR-Operations will determine the granting of gratuity rewards to employees who have reached the retirement age of 55 years.

2. Organizing

This stage is the stage of checking every employee who has entered retirement age and review pension plan plan under the Act. No. 13 of 2003.

3. *Actuating* (Pelaksanaan)

This stage is the stage of employee retirement.

4. Controlling

This stage is the stage of monitoring and evaluation related to employee pensions.

2.9 Entitiy Relationship Diagram

Entity Relationship Diagram (ERD) is a graphical notation in conceptual data modeling that describes the relationship between storage. ERD is used to model data structures and relationships between data, as this is relatively complex [12].

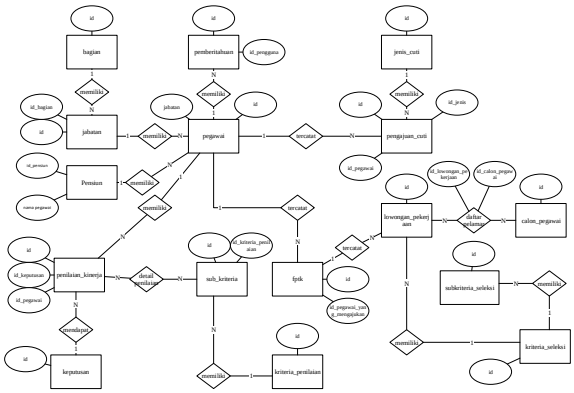


Figure 3 *Entity Relationship Diagram*

2.10. Non-Functional Needs Analysis

Non-functional requirements analysis is the analysis needed to determine the system requirement specification

2.10.1 Hardware Analysis

Hardware requirement analysis is done to find out what hardware can support the running of website based management information system

1. Hardware specifications contained in the company of PT. Sandy Globalindo is as follows
   a. Processor with speed 1.8 GHz
   b. RAM used for 2 GB
   c. 500 GB Hard Drive Capacity
   d. Internet access uses LAN and WAN networks
2. Minimum hardware requirements required to run this system are as follows
   a. Processor with speed 1.8 GHz
   b. RAM is used at least 512 MB
   c. Hard drive capacity of at least 20 GB
   d. Network to access the internet
3. Conclusion The result of hardware analysis is at PT. Sandy Globalindo hardware requirements used have been declared qualified to use the system to be built

2.10.2 Software Analysis

Software requirements analysis is done to find out what software can support the running of information management system based on website

1. Software specifications contained in the company of PT. Sandy Globalindo is as follows:
   a. Windows 7 Professional Operating System
   b. WAMP Server / XAMP
   c. Adobe Dreamweaver CS6
   d.Google Chrome Web Browser, Mozilla Firefox, Internet Explorer
   e. Adobe Reader to view PDF form reports
   f. Microsoft Office 2010
2. The software requirements used to run this system are as follows
   a. OS (Operating System): in this case to run the system to be built at least the operating system used is Windows XP Operating System professional with SP3.
   b. WAMP Server / XAMP
   c. Adobe Dreamweaver CS5
   d.Web browser (Mozilla Firefox, Google Chrome)
   e. Adobe Reader to view PDF form reports
3. Conclusion The results of software analysis is at PT. Sandy Globalindo needs the software used to meet the qualifications to use the system to be built

2.11 Context Diagram

Context diagram or also called the fundamental system model represents all elements of the system as a single bubble with input - output data shown by the incoming and outgoing arrows in sequence. Here is the information flow of human resource management information system at PT.Sandy Globalindo which can be seen in the figure 5

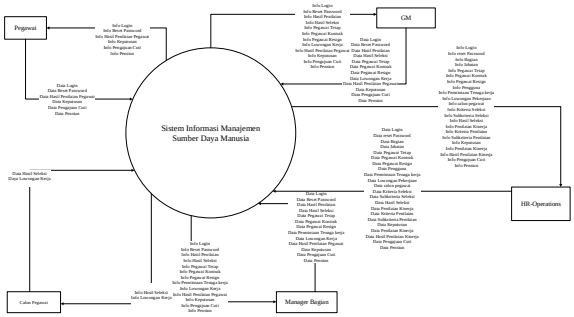
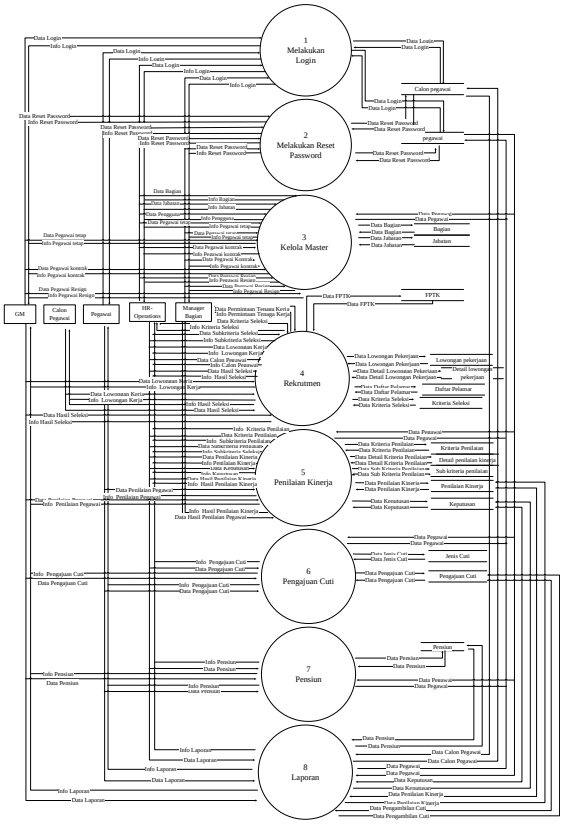


Figure 4 Context Diagram

2.11 Data Flow Diagram Level 1

Data Flow Diagram level 1 human resource management information system at PT. Sandy Globalindo is as follows



Gambar 5 DFD Level 1

2.12 Implementation and Testing System

Testing the system is an important thing that aims to find errors or deficiencies in human resources information systems at PT Sandy Globalindo to be tested.

2.12.1 Functional Testing

The test used to test the new system is the black box testing method. Black box testing focused on testing the functional requirements of information systems. Based on the results of tests that have been done on the human resource management information system, it can be concluded that the functional system has been able to produce the system needs as expected

2.12.2 Beta Testing

This beta test is done by conducting direct testing at the research site by using interview technique and questionnaire which is addressed to the end user of the system. Based on the results of beta testing, it can be concluded that Human Resource Management Information System at PT. Sandy Globalindo is in terms of functionality has been meeting the needs of Manager Section, HR-Operations and employees in terms of functionality in this case managing human resources data in the company from monitoring procedures the number of employee needs, employee recruitment, employee performance, take leave until retirement procedures have Has gone well

3. CLOSING

In this section, describes the conclusions that contain the results obtained after the research. The results are bikan is a thing that is standard but used as a reference and reference in the improvement of the system going forward.

3.1 Conclusion

Based on the description of the analysis and testing that has been done, it can be concluded on the Human Resource Management Information System At PT. Sandy Globalindo is as follows:

1. Human Resource Information System is enough to help provide decisions on prospective employees in accordance with the qualifications of the company.
2. Human Resource Information System is enough to provide convenience to determine decisions for employees of the performance appraisal results.
3. Human Resource Information System is already able to help limit employees in taking annual leave.

3.2 Suggestion

Based on the test results and conclusions above, the suggestion from the author for the development of Human Resource Management Information System at PT. Sandy Globalindo is: Human Resource Information System has not handled the management of training, promotion process, mutation and demotion related to employee development in company

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