MANAGEMENT INFORMATION SYSTEM OF HUMAN RESOURCE AT CV. KARYA MEKAR

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ABSTRACT

CV. Karya Mekar is a company that produce CaO (Calcium Oxide) and CaCO3 (Calcium Carbonate). CV. Karya Mekar was founded in 1990, with number of employee around 25 people and continue to increase about 100 people in 2017.

Based on the results of interviews with Mr. Rojali as General Manager, he stated that general managers found a difficulty to choose the right candidate for fill the blank position because the number of applicants and the capacity of the position is not balance. Other problems is general manager difficult to take a decision to determine the employees who got promotions, bonus, or fired. It caused general manager doing an evalution based on list of attendees and personal assessment without clear indicators. Moreover, general manager also find a difficulty to determine permit a vacation and retired because of does not a monitoring system.

The management of information system model that used is POAC (Planning, Organizing, Actuating, Controlling). While selection of new employee candidates using SAW (Simple Additive Weight) method and employees work evaluation using AHP (Analytical Hierarchy Process) method which the result can be used as an option in the determination of employees promotion, bonus, and retired.

Based on the results of blackbox testing, UAT (User Acceptance Test) and end-user testing in this study, it can be concluded that this system is enough to assist companies in making decisions acceptance of prospective employees, take decisions promotions positions, bonuses and dismissal work through performance evaluation, Decision on leave permits and retirement monitoring.

Keywords : AHP Method, Decission Making System, Management Information System, Management of Human Resources, POAC Models, SAW Method.

1. INTRODUCTION

CV. Karya Mekar was founded in 1990, with number of employee around 25 people and continue to increase about 100 people in 2017.

Based on the results of interviews with Mr. Rojali as General Manager, there was 2 kinds of recruitment in the company. First, recruitment when there was blank space on 1 or more position, last recruitment when the company has a big project that can't handled by the of employees of the company.
On this phase, manager found a difficulty to choose the right candidate for fill the blank position because the number of applicants and the capacity of the position is not balance. The candidates of permanent employee who passed selection stage will get training around 2 weeks – 1 months, while the candidates of contract employee will just get training around 1-3 days.

Other problems is general manager difficult to take a decision to determine the employees who got promotions, bonus, or fired. It caused general manager doing an evalution based on list of attendees and personal assessment without clear indicators. This may causing promotion, bonus and fired given to wrong employees.

General manager also find a difficulty to determine permit a vacation. /The company has 4 kinds of vacation, first monthly vacation, marriage vacation for the family who died, and vacation for religions big days. It caused the company doesn't have any monitoring system for the vacation, so the manager hard to take decision for allow or deny vacation submission because it may has an effect to company performance.

Moreover, the company has rules that the employees must be retired on 60 years old. The employees also can apply early retirement, but they need have a strong reason for doing that and the submission must be applied 1 months before. But, because caused the company doesn't have any monitoring system for retirement it may caused employees who more than 60 years old still working.

Mean of this research is to build management information system of human resources at CV. Karya Mekar.

Goals of this research is :

a. Helping the general manager to determine the right candidates of new employees that fit with the blank position in the company.
b. Helping the general manager to take a decision for giving a promotion, bonus and retired the right candidates using the indicator that has been designed before and result of work evaluation.
c. Helping the general manager to take a decision for allow or deny vacation submission and do monitoring for the employees retirement.

2. CONTENT OF RESEARCH

2.1 Management Information System

Management information system is a system that usually applied in an organization to support decision making and the information result was required by all levels of management. [2]

Management information systems (MIS) can also be defined as a computer-based system that used to present information for support the operations, management, and decision making in an organization. Normally a MIS resulting many information to monitor performance, maintain coordination, and provide information for organizational operations. The reporting information generated by MIS is available in the form of periodic reports, overview reports, and comparison reports.

2.2 Management of Human Resources

Management of Human Resources is a management field that specializes in studying human relationships and roles in corporate organizations. [3]

Management of Human Resources more focused on setting the human role in realizing more optimal goals. The setting is about planning, organizing, briefing, controlling, procurement, maintenance, and fired the employees for help realizing the company, employees and society goals.

Component of management of Human Resources is :

a. Entrepreneur

The person who spent their capitals for getting income and the amount of income is not stabilized based on the benefit that company reach.

b. Employees

Employee is a seller of services (mind and power) and compensated the magnitude has been set in advance. They are obliged to work on a given pekerjaaan and the right to receive compensation in accordance with the agreement.

c. Leader / Manager

A leader is someone who uses authority and leadership to direct others and is responsible for pekerjaaan the person in achieving an objective.

2.3 Management Information System of Human Resources

Management Information System of Human Resources is a systematic procedure for collecting, storing, retaining, attracting and validate the data that is needed by a company to improve human resource decisions. [3]

2.4 Decision Support System

Decision support system as a computer-based system consists of three interacting components, namely: language system (mechanisms to provide communication between the user and other components of the decision support system), a system of knowledge (respositori knowledge of the problem domain in decision support systems or as data or as a procedure), and system processing problems (relationship between two other components, consisting of one or more general problem manipulation capabilities needed for decision making. [5]

2.5 POAC (Planning Organizing Actuating Controlling)

POAC stands for Planning (Planning), Organizing (Organizing), the Actuating (Implementation) and Controlling (Controlling) which is 4 basic management functions are continuous. [4]



Picture 1. POAC Management

a. Planning is voter identification all facts as well as the manufacture and use of guesses or assumptions for the future with the way described and formulated the activities necessary to achieve desired results.
b. Organizing is the determination, classification, and the preparation of the various activities necessary to achieve the objective, placement of people (employees), against these activities, the provision of the physical factors that are suitable for the purposes of work and the appointment of the authority relationship, assigned against any person in relation to the implementation of each activity is expected.
c. Actuating is evoked and encourage all members of the group in order to and strive hard to achieve the goal with a sincere and harmonious with the planning and

organizing efforts of the leadership. To achieve the goals, is not only depends on the planning and organizing of the good, but also depending on the action and control. Planning and organizing is simply a strong foundation for the existence of the action headers to the intended target. Implementation without planning will not be effective because in the planning that's specified objectives, budget, standards, work methods, procedures and programs.

d. Controlling can be formulated as a process of determining what needs to be achieved, namely standard, what is being done that is implementation, implementation, and when assessing the need to make improvements, so the implementation according to the plan, that is aligned with the standard (size).

Controlling is most important role on management, because controlling has a functions to test whether the regular work was right or not.

2.6 Simple Additive Weighting (SAW) Method

SAW method is often also known as the weighted sum method. The basic concept of the method is to find a weighted summation of the SAW of rating performance on any alternative on all attributes. [6]

The method of matrix the normalization process requires SAW decision (X) to a scale that can be compared with all the alternative rating. As for the formula of the SAW method is:

$$r_{ij} = \begin{cases} \dfrac{x_{ij}}{Max_i\, x_{ij}} & \text{Jika j adalah atribut keuntungan (benefit)} \\ \dfrac{Min_i x_{ij}}{x_{ij}} & \text{Jika j adalah atribut biaya (cost)} \end{cases}$$

Dimana:

r_{ij} = rating kinerja ternormalisasi. **(1)**

max_i = nilai maksimum dari setiap baris dan kolom.

min_i = nilai minimum dari setiap baris dan kolom.

x_{ij} = baris dan kolom dari matriks.

(r_{ij}) adalah rating kinerja ternormalisasi dari alternatif pada atribut i=1,2,..,m dan j=1,2,...,n.

Picture 2. SAW Method Formula

While the formula for the value of the preference for each alternative (Vi) are:

$$V_i = \sum_{j=i}^{n} w_i r_{ij}$$

Dimana :

V_i = Nilai akhir dari alternatif **(2)**

W_i = Bobot yang telah ditentukan

r_{ij} = Normalisasi matriks

Nilai V_i yang lebih besar mengindikasikan bahwa alternatif A_i lebih terpilih.

Picture 3. SAW Method Formula

Steps by steps in using the SAW method is :

a. Determine the criteria that will be used as reference in decision-making, that Ci.

b. Make decisions based on criteria matrix (Ci), then do the normalization based on matrix equations are tailored to the type of the attribute (attribute attribute or benefit cost) so that the matrix has obtained normalized R.

c. Final results retrieved from any process of ranking that is the summation of the normalized matrix multiplication R with the vector of weights so that obtained the greatest value that was chosen as the best alternative (Ai) as a solution.

2.7 Analytical Hierarchy Process (AHP) Method

AHP method developed by Thomas l. Saaty, a mathematician. This method is a framework for taking decisions with effective over a complex issue with simplify and speed up the decision making process by solving the issue into its parts, styling parts or variable in an order of hierarchy, give numerical values on subjective considerations about the importance of each variable and mensintetis a variety of these considerations to set variables which have the highest priority and act to influence the outcome in those situations.

The basic concept of AHP is the use of a matrix of pairwise comparison (matrix, paired comparison) to produce the relative weighting between the criteria as well as alternative. A criteria will be compared with other criteria in terms of how important towards the achievement of the objectives above it. [7]

Table 1. Scale Comparison Of Paired Base

Importance Level	Description
1	Both elements have the same influence.
3	Experience and judgement very favoring one element compared to his partner.
5	One element is highly preferred and practically its dominance is evident, as compared with a mate.
7	One of the elements proved to be very well liked and practically its dominance is evident, as compared with a mate.
9	One element proven absolute preferred compared to his partner, in the highest confidence.
2,4,6,8	Given if there is doubt as to the valuation of the two adjacent importance.

Scoring in comparing between one criteria with other criteria is free of each other, and this can cause a lack of consistency. Saaty (1990) has proved that

the consistency of the index matrix of order n ber can be obtained by the formula:

CI = (λ maks - n) / (n – 1)

Where:

CI = Consistency Index (Consistency Index)

Λ = Max value of the largest eigenvalues of matrix berordo n.

The value of the largest eigen values obtained by summing the results of the multiplication of the number of columns with eigen vector. The limit of konsistensian in size with use a ratio consistency (CR), i.e. the comparison index consistency (CI) with the value of the random generator (RI). This value is dependent on the order of the matrix n.

The ratio of consistency can be formulated:

CR = CI / RI

When the value of the CR is less than 10%, the consistency opinion still considered acceptable.

Table 2. List of random Index consistency (RI)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0,00	0,00	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,48	1,56	1,57	1,59

2.8 Analysis Of Recruitment Selection & Inaugurated

POAC model in the process of recruitment and selection of employees in the company that performed by the Manager is as follow s:

1. **Planning**

   POAC model in the process of recruitment and selection of employees in the company that performed by the Manager are as follows:

Table 3. Number Of The Administration Staff Office Needs

Nama Jabatan	Jumlah yang ditetapkan	Slot Kosong
Staff Administrasi	3 orang	2 orang

2. **Organizing**

   Manager will be checked back against the number and type of position required is already in compliance with the existing vacancy before sending a request form to the Director of labour production (General).

3. **Actuating**

   At this stage, the manager began to do recruitment and employee selection criteria based on the type of position that was already planned before. Furthermore, the manager shall determine the weighting of the criteria have been determined based on the required position.

Table 4. Alternative Candidate Data

Nama Kandidat	Pendidikan	Umur	Pengalaman Kerja	Nilai Komputer	Nilai Wawancara
Sri Devi	S1	24 thn	1,5 tahun	78	66
Riska Amalia	D3	21 thn	1 tahun	84	50
Ajeng Nurmala	SMK	26 thn	2 tahun	54	83
Dini Andriani	SMA	23 thn	1 tahun	67	89

Table 5. Criteria Weighting & Assessment

Alternatif	Kriteria	Bobot Penilaian
C1	Pendidikan	15 %
C2	Umur	15 %
C3	Pengalaman Kerja	20 %
C4	Nilai kemampuan menggunakan komputer	20 %
C5	Nilai Tes Wawancara	30 %

Next, manager will do the selection method using the SAW with the end result as follows:

Table 6. Ranking Result

Alternatif	Nama Kandidat	Hasil Perangkingan	Urutan Rangking
V_1	Sri Devi	0,71	2
V_2	Riska Amalia	0,51	3
V_3	Ajeng Nurmala	0,74	1
V_4	Dini Andriani	0,56	4

Based on the table above, among the alternative V1, V2, V3 and V4, an alternate who get the greatest value of the first is the second V3 and V1, so that the selected candidate that is V3 = V1 = Maya Nurmala and Sri Devi.

4. **Controlling**

   It is the stage of the examination of the results of selection between alternative 4 prospective employees. At this stage of planning managers have planned number of employees required for the position of administrative staff is two people. Based on table 6, at the got results of selection of prospective employees is Maya Nurmala and Sri Devi because it has the greatest value between 2 other candidates so that those results have met the needs of the company to fill the 2 position of Administrative Staff.

   If it turns out that ranking did not match results, managers can start planning again how many employees that are needed by the office.

2.9 Analysis of Employees Work Evaluation

Analysis of the POAC in evaluation process work at a company that's done by the Manager are as follows :

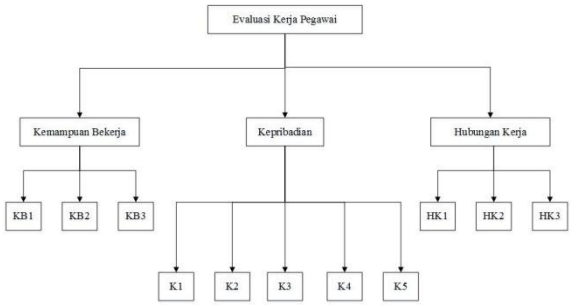
1. **Planning**

   Is the planning phase before the evaluation of the work done. At this stage, the Manager will determine the criteria-criteria along with sub message to do the evaluation work. The evaluation of the work done every 3 months.

   Is there any criteria and its evaluation work of subkriteria can be seen in the following table :

Table 7. Criteria & Subkriteria For The Evaluation Of Work Employees

No.	Kriteria	Subkriteria	Kode
1.	Kemampuan bekerja	Kecepatan menyelesaikan tugas	KB1
		Kualitas hasil kinerja	KB2
		Kerajinan	KB3
2.	Kepribadian	Kejujuran	K1
		Tanggung Jawab	K2
		Kedisplinan	K3
		Kemampuan memimpin	K4
		Absensi	K5
3.	Hubungan Kerja	Kepada atasan	HK1
		Kepada rekan satu jabatan	HK2
		Kepada bawahan	HK3



Picture 4. The Hierarchy Of Work Evaluation Criteria

2. Organizing

It is the result of the organized the stage of determination of the priority of each criterion that has been performed on stage before.

Following the results of the determination of priorities in the form of value:

Table 8. List of priority value on each subkriteria

No.	Kriteria	Kode	Nilai Prioritas	Nilai dalam bilangan bulat
1.	Kemampuan bekerja	KB1	0.6233	623
		KB2	0.2400	240
		KB3	0.1367	137
2.	Kepribadian	K1	0.4720	472
		K2	0.2760	276
		K3	0.1360	136
		K4	0.0620	62
		K5	0.0620	62
3.	Hubungan Kerja	HK1	0.6300	630
		HK2	0.2100	210
		HK3	0.1600	160

3. Actuating (Pelaksanaan)

It is the stage of the implementation of work evaluation on employees. The evaluation is carried out by providing value against an employee based on criteria you define. The results of the evaluation can affect promotions, bonuses and termination of employment.

Following the results of the evaluation and ranking with the help of the method of AHP :

Table 9. Work Evaluation Table

Pegawai / Kriteria	A	B	C
Kemampuan Bekerja			
Kecepatan menyelesaikan tugas	52955	51086	48594
Kualitas hasil kinerja	19920	18960	21360
Kerajinan	10960	10960	11508
Kepribadian			
Kejujuran	37760	37760	37760
Tanggung Jawab	24012	24288	20424
Kedisplinan	11832	10744	10472
Kemampuan memimpin	4650	5146	4030
Absensi	4960	5270	4650
Hubungan Kerja			
Kepada atasan	50400	50400	50400
Kepada rekan satu jabatan	16800	16800	16800
Kepada bawahan	12800	12800	12800
Nilai Akhir	247049	244214	238798

Table 10. Result of Work Evaluation

No	Nama	Nilai Akhir	Peringkat
1	Ajeng N.	247049	1
2	Sri Devi	244214	2
3	Selvi	238798	3

4. Controlling

It is the stage of the examination of the results of the evaluation of the work done. Whether it is in compliance with the provisions and the company needs at this stage of planning, managers had planned the subkriterianya along with the criteria in conducting performance assessment of employees. If it turns out these criteria conflict with company managers need to do planning.

Based on Table 10, Maya n. scored the highest end i.e. 247049 on the first rank whereas Selvi on number 3. The results of this evaluation can be used as one of the considerations for determining which employees get promotions, bonuses or termination of employment

2.10 Analysis Of The Employee vacation

1. Planning

The planning phase is the type of leave and time. At this stage, the Manager will determine the types of leave which applies at the company.

Table 11. Kind of Vacation

Jenis Cuti	Waktu	Keterangan
Cuti Bulanan	3 Hari	-
Cuti Hari Raya Agama	4 Hari	Cuti meliputi H-1, hari H dan H+2
Cuti Menikah	3 Hari	Cuti meliputi H-1, hari H dan H+1
Cuti karena keluarga / saudara meninggal	3 Hari	Cuti yang hanya berlaku untuk keluarga inti seperti : orang tua, suami/istri, anak, kakak / adik kandung.

2. Organizing

At is the stage of organizing/check the types of leave are already ditetukan before, whether in accordance with the rules that are there or not.

3. Actuating

At is the stage of implementation, i.e. the filing of a leave of absence approved/rejected by the employee with the employee leave of absence, and against the monitoring duration. Employees will choose the type of the old leave and on leave who would then be approved/rejected by the Manager of the appropriate rules of the company..

4. Controlling

Is the phase control by performing checks the employees vacation form. Managers can check whom, how long and how many employees take time off as a consideration to approve or deny the leave request.

2.11 Monitoring Employee Retirement Analysis

1. Planning

At this stage, the manager will merencankan age employees to retire, that is 60 years old.. Manager will also create a list that will be given severance to employees after retirement.

Table 12. Severance Pensions

Masa Kerja (Tahun)	Pesangon
< 1 thn	1 kali
1 - 2 thn	2 kali
3 - 4 thn	3 kali
> 5 thn	5 kali

2. Organizing

At this stage, the Manager's checking that the standard retirement and severance have been made in accordance with the rules of the company.

3. Actuating

Employees who have reached 60 years will soon be informed that he has reached the limit of his retirement.

Example: father of year-old Ajid, then the Manager will ask the administrative staff to contact Mr. Ajid to notify any files that need to be taken care of. Any employee who retires will get severance in accordance with salary and his tenure.

Table 13. The Amount Of Severance

Nama	Lama Kerja	Pesangon
Ajid	7 tahun	5x gaji

4. Controlling (Pengontrolan)

It is the stage of the examination of employees approaching retirement limit. Monitoring of retirement will help managers for new recruitment planning before the official retirement of employees stopped working.

2.12 Non-functional needs analysis

Analysis of non-functional requirements analysis is required to determine the need of specification of the system.

2.12.1 Hardware Analysis

The hardware used to run a website-based management information system.

A. Minimum hardware specifications that can be used are as follows:
   a. Processor : 2 GHz
   b. Memori : 1 GB.
   c. VGA Card : 512 Mb.
   d. Harddisk Capacity : 500 GB .
   e. Monitor : 14".

B. While the hardware specs on the CV. Karya Mekar is as follows:
   a. Processor : 2 GHz.
   b. Memori : 1 GB.
   c. VGA Card : 512 Mb.
   d. Harddisk Capacity : 500 GB .
   e. Monitor : 14".

Based on the analysis of the hardware that exists on the CV. Karya Mekar by looking at the hardware analysis is needed, then the hardware contained in the CV. Karya Mekar meets the specification analysis hardware needed to operate management information systems human resources.

2.12.2 Software Analysis

Analysis of software needs is used to support the operation of the system.sistem.

A. Minimum software specifications that can be used are as follows:
   a. OS Windows 7
   b. Web Browser Google Chrome, Mozila Firefox.
   c. WAMP Server / XAMPP.
   d. Adobe reader.

B. While the software specs on the CV. Karya Mekar is as follows:
   a. OS Windows 7
   b. Web Browser Google Chrome, Mozila Firefox.
   c. WAMP Server / XAMPP.
   d. Adobe reader.

Based on the analysis of existing software on the CV. Karya Mekar by looking at the hardware analysis is needed, then the hardware contained in the CV. Karya Mekar meets the specification analysis software that is required

to operate management information systems human resources.

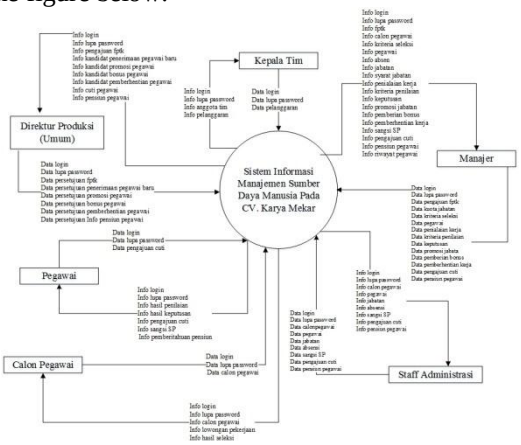
2.13 Analysis of Functional Needs

A functional needs analysis is an analysis that explains the flow of data or information that includes depictions of, planning, and production sketches or settings of some separate elements into a unified whole and functioning in the process of making software that will be built.

2.13.1 Diagram Context

Context diagram is a simple diagram that describes the relationship between the entity itself, the input and output of the system. Context diagram is represented with a single circle represent the whole system.

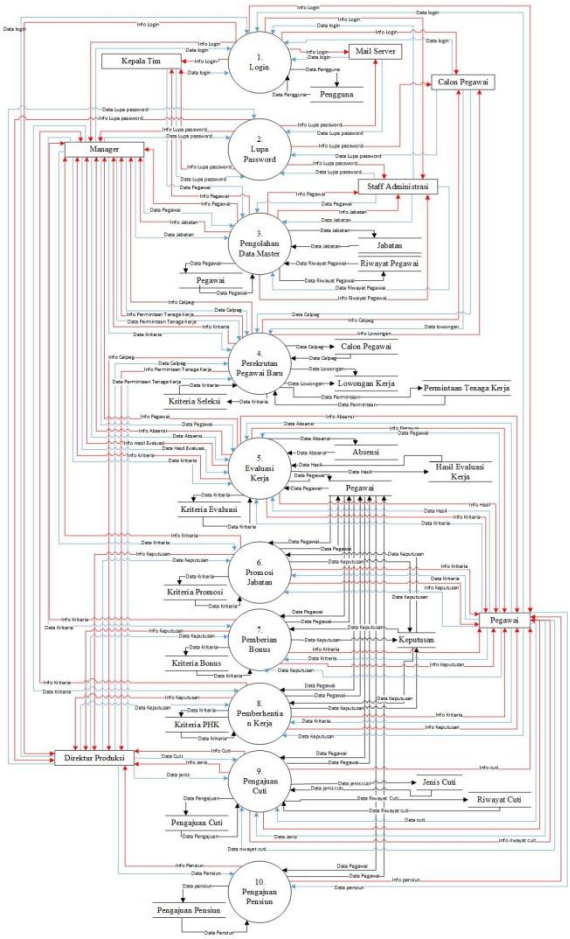
A context diagram of the management information system of human resources can be seen in the figure below.



Picture 5. Context Diagram

2.9.2 DFD Level 1

DFD level 1 SIM human resources CV Mekar Works can be seen in the following image:



Picture 6. DFD Level 1

2.14 Implementation dan Testing

Implementation is the stage of translating the results of the design at this stage of the analysis. The goal is to ensure the implementation of programs that have been created to function in accordance with the design requested by the users of the system.

2.14.1 Software Implementation

Software implementation describes the software used for the implementation of the management information system of human resources in CV. Karya Mekar. As for the device used can be seen in the table below:

Table 14. Software Implementation

No.	Perangkat Lunak	Spesifikasi
1.	Sistem Operasi	Windows 8
2.	Web Server	Xampp
3.	Web Browser	Google Chrome
4.	Database Server	MySQL
5.	Code Editor	Adobe Dreamweaver CS5

2.14.2 Hardware Implementation

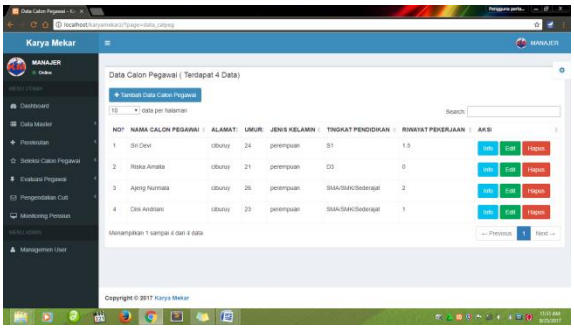
Hardware implementation describes the hardware that was used for the implementation of the management information system of human resources in CV. Karya Mekar. As for the device used can be seen in the table below:

Table 15. Hardware Implementation

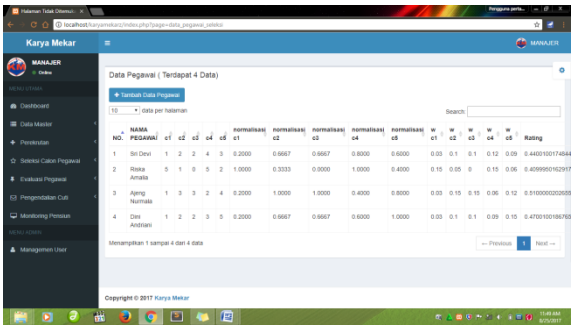
No.	Perangkat Keras	Spesifikasi
1.	Processor	1.50 Ghz
2.	RAM	2 GB
3.	Harddisk	500 GB
4.	Monitor	14"
5.	Mouse & Keyboard	Standard

2.14.3 Interface Implementation

Interface implementation is done on every page that have code in the form of a program. The following implementations of the interface based on the user:



Picture 7. New Employees Candidates Interface



Picture 8. Criteria & Ranking Result

2.14.2 Black Box Testing

Black box testing is testing that demonstrates the functionality of the software that operate, with data input check if it could've been well received, and the resulting output according to what to expect. Based on the test results it can be concluded that the black box almost on every process in the system built errors still has possibilities to happen, but is functionally the system can deliver the expected output results.

2.14.3 Beta Testing

Beta testing is done with the purpose to knows the extent to which the quality of software that is built, is already in compliance with the expectations or not. For it's in beta testing done by giving research questions on the prospective users of the software.

Based on the results of beta testing it can be concluded that the system to be built considerable help the managers in managing human resources.

3. CLOSING

In this section, describes the conclusions contains the results obtained after the research is done. The result is not a thing that is raw but made a reference and a reference in the future system improvements.

3.1 Conclusion

Based on the analysis and discussion of description of testing has been done, then it can be taken a conclusion against information systems human resources management on the CV. Karya Mekar is as follows:

a. The system quite helpful General Manager in determining the amount of the employee's needs according the existing vacancy.
b. The system quite helpful in taking the General Manager Office of promotion decisions, the granting of bonuses and termination of employment through the implementation of the evaluation of the work of employees.
c. The system quite helpful General Manager in giving the approval decision on leave monitoring employees and retired employees.

3.2 Suggestion

Based on the conclusions already outlined above, it is expected that future is so that information systems human resources management in CV. Karya Mekar, it can be developed further by heading to the next stage, namely the ERP (Enterprise Resource Planning) to optimize the management of the company from the top level to operations to produce better results for all parties concerned.

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