PEMBANGUNAN SISTEM INFORMASI MANAJEMEN KEPEGAWAIAN CV. BINTANG TIGA JAYA KANTOR PUSAT KABUPATEN CIREBON

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ABSTRACT

Employee CV. Bintang Tiga Jaya has a total of 127 employees. The SAW (Simple Additive Weighting) method is used for the determination of new Employee Candidates by weighting the rating rating on each alternative on all attributes. WP (Weighted Product) method is used to determine the rating of employee performance appraisal. Meant to give weighting value on each employee performance rating. Employee leave control is based on the type of leave employed by employee as decision making using PDCA Cycle (Plan, Do, Check, Act) Aims to determine the type of employee leave of priority. This study can be concluded that this system helps companies perform employee recruitment and performance appraisal.

Keywords: Personnel Management Information System, PDCA Management, Simple Additive Weighting Method, Weighted Product Method

1. INTRODUCTION

CV Bintang Tiga Jaya is engaged in Advertising which was established on January 01, 2010, has its head office located at Jalan Sultan Ageng Tirtayasa No 40 Kedung Jaya Village Kecawatan Kedawung, Cirebon Regency. Currently CV Bintang Tiga Jaya has 3 branches in the region of Cirebon Regency.
Based on interviews with Division Manager Mrs. Astri Priastuti and Mr. Didi Junaedi as HRD CV. Bintang Tiga Jaya, the company finds difficulty in choosing prospective employees, because the determination of prospective employees still not in accordance with the terms of the company's appointed positions. The number of employees who are not in accordance with the position of an impact on the performance of employees.
Division Manager in performing appraisal of employee performance still experiencing constraints due to the absence of indicators of performance appraisal of employees resulted in difficulty in providing decisions in promoting employee positions and dismissal of employees.
Mr. Didi Junaedi is constrained in determining the employees' leave control which is seen from the type of employee leave, the type of leave that is annual leave, sick leave, maternity leave and maternity leave. Based on the type of leave HRD gives the decision to leave the prioritized employee leave.

2. RESEARCH CONTENTS

2.1 Simple Additive Weigthing

This method is often also known as the term weighted summing method. The basic concept of the SAW method is to find the weighted sum of performance ratings on each alternative on all attributes [1] .
The SAW method requires the process of normalizing the decision matrix (X) to a scale comparable to all existing alternative ratings.

Simple Additive Weighting equation is another:

$$r_{ij} = \begin{cases} \frac{X_{ij}}{Max\, X_{ij}} \\ \frac{Min\, X_{ij}}{X_{ij}} \end{cases} \quad (1)$$

Where
If j is a benefit attribute (*benefit*)
If j is a cost attribute (*cost*)

Normalization Simple Additive Weighting As follows:
Where rij is the normalized performance rating of Ai alternatives
on attribute Cj; i = 1,2, ..., m and j = 1,2, ..., n. The preference value for each alternative (Vi) is given as follows:

$$vi = \sum_{j=1}^{n} w_j r_{ij} \quad (2)$$

Information:
Vi = preference value
Wj = weighting rank
Rij = performance rating is normalized

2.2 Weighted Product

The Weighted Product method uses multiplication techniques to attribute attribute ratings, where the rating of each attribute must be raised first with the corresponding attribute weights as well as the normalization process [2].

Preferences for alternative Ai are given as follows:

$$V_i = \frac{\prod_{j=1}^{n} = x_{ij}^{w_j}}{\prod_{j=1}^{n} = (x_{ij}*)^{w_j}} \quad i = 1,2,\ldots,m \qquad (3)$$

Information:

V = Declare alternative preferences analogous to vector V
X = Declare the criterion value
W = Declare the criteria weight
I = Declare an alternative
J = State criteria
N = State the number of criteria

2.3 Analysis of Personal Management At CV. Bintang Tiga Jaya

Analysis of Personnel Management at CV. Bintang Tiga Jaya will be depicted using PDCA model (Plan, Do, Check, Act) The following description of PDCA model [3].

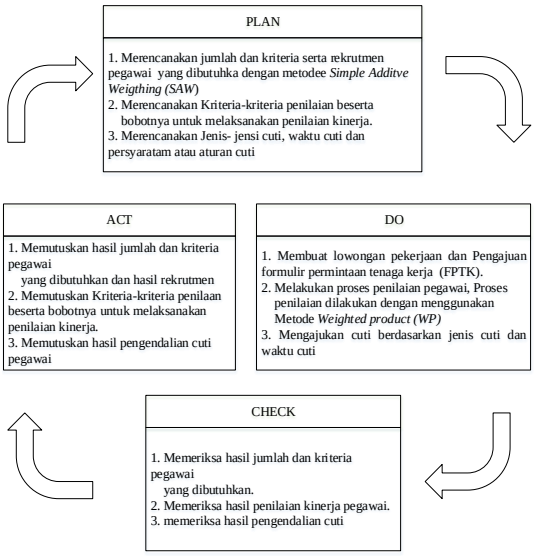


Image 1 Model PDCA

The Stages of PDCA Model in Human Resource Management Information System can be explained among others

2.4 Employee Recruitment and Selection Analysis

1. *Plan*

Determine how many vacancies in the workforce of employees that occurred in CV Bintang Tiga Jaya [4].

Table 1 Planning of the workforce

No	Employment	Number of Position	Filled	Empty
1	Manajer Marketting	1	1	0
2	Manajer Desain	1	1	0
3	Manajer Produksi	1	1	0
4	HRD	1	1	0
5	Kepala Gudang	1	1	0
6	Staff Marketting	11	11	0
7	Sales Supervisior	1	1	0
8	Staff Produksi	5	2	3
9	Staff Pembelanjaan	1	1	0
10	Teknisi	25	25	0
11	Desain	3	3	0
12	Editing	3	3	0
13	Finishing dan Cetak	3	3	0
14	Staff Administrasi	6	6	0
15	Staff Keuangan dan Pajak	4	4	0
16	Staff Gudang	8	8	0
17	Supir Gudang	17	17	0

Table 2 Number of production staff needs

Name of Employment	The Specified Amount	Slot Empty
Staff Produksi	5 orang	3 orang

Table 3 Syarat Terms of position of production staff

Employment	Cualification of Employment
Staff Produksi	1. Pria / Wanita berusia minimal 20 tahun.
	2. Pendidikan minimal SMA / SMK
	3.memiliki kemampuan mengendalikan proses produksi

	4. Memiliki pengalaman kerja minimal 1 tahun.

Table 4 Criteria and assessment weight

Criteria	Weighting Assessment
Pendidikan	0,15
Umur	0,15
Pengalaman Kerja	0,2
Nilai Tes Pelatihan	0,3
Nilai Tes tulis, psikotes dan wawancara	0,2

2. Do

at this stage if after the placement of promotion and dismissal can not meet the needs or vacancies in the head office, then HRD will perform the process of recruitment of new employees.

Tabel 5 Alternative data of candidates

Name Candidate	Education	Age	Work Experience	Value Training	Value Test, psychotest and Interview
Abuy Suherlan	D3	26 thn	1 tahun	79	62
Rusdianto	SMK	22 thn	3 tahun	80	72
Firmansyah	D3	25 thn	2 tahun	59	87
Bayu Sudrajat	D3	24 thn	1 tahun	80	58
Abbi Arrohman	S1	25 thn	1 tahun	59	60

Step two, determine the match rating

Table 6 Alternative data match rating

Alternatif	Criteria				
	C1	C2	C3	C4	C5
Abuy Suherlan	2	4	4	4	3
Rusdianto	1	4	5	5	4
Firmansyah	2	4	4	3	5
Bayu Sudrajat	2	4	4	5	2
Abbi Arrohman	2	4	4	3	3

Steep Three, Formation of decision matrix

$$x = \begin{pmatrix} 2 & 4 & 4 & 4 & 3 \\ 1 & 4 & 5 & 5 & 4 \\ 2 & 4 & 4 & 3 & 5 \\ 2 & 4 & 4 & 5 & 2 \\ 2 & 4 & 4 & 3 & 3 \end{pmatrix}$$

Image 2 Decision Matrixs

Where

$$x = \begin{pmatrix} r11 & r12 & r13 & r14 & r15 \\ r21 & r22 & r23 & r24 & r25 \\ r31 & r32 & r33 & r34 & r35 \\ r41 & r42 & r43 & r44 & r45 \\ r51 & r52 & r53 & r54 & r55 \end{pmatrix}$$

Image 3 Normalization of matrixs

Fourth step, calculate the normalization value of each alternative with the formula

$$r_{ij} = \begin{cases} \frac{X_{ij}}{Max\, X_{ij}} \\ \frac{Min\, X_{ij}}{X_{ij}} \end{cases} \quad (4)$$

If J an attribute of again (*benefit*)
If J is a cost attribute (*cost*)

Normalization results are as follows :

$$R = \begin{pmatrix} 1{,}00 & 2{,}00 & 0{,}80 & 0{,}80 & 0{,}60 \\ 0{,}50 & 1{,}00 & 1{,}00 & 1{,}00 & 0{,}80 \\ 1{,}00 & 1{,}00 & 0{,}80 & 0{,}60 & 1{,}00 \\ 1{,}00 & 1{,}00 & 0{,}80 & 1{,}00 & 0{,}40 \\ 1{,}00 & 1{,}00 & 0{,}80 & 0{,}60 & 0{,}60 \end{pmatrix}$$

Image 4 Normalized Value

The fifth step, determine the weights that will be used for the ranking process

$$w = \{0{,}10 \quad 0{,}15 \quad 0{,}20 \quad 0{,}25 \quad 0{,}30\} \qquad (5)$$

The sixth step of ranking search or best value by entering each given criterion by using the formula

$$vi = \sum_{j=1}^{n} w_j r_{ij} \qquad (6)$$

3. Check

Checking the results of the selection of alternative candidates if new employees V1, V2, and V3 which will be the best option to be selected and accepted by the company.

Table 7 Candidates Alternative Data

Alternatif	Criteria	Weighting Assessment
C1	Disiplin	0,2
C2	Motivasi Kerja	0,15
C3	Komunikasi dan Kerjasama	0,15
C4	Pemahaman dan penguasaan pekerjaan	0,15
C5	Pengembangan diri	0,15
C6	Pencapaian Target Kerja Personal	0,15
C7	Penghargaan dan sanksi	0,1

4. Act

Based on the above table, among the alternatives V1, V2, V3, V4 and V5 the alternatives that get the first largest value are V2 and the second V3, so that the selected candidate V2 = Rusdianto and V3 = Firmansyah will be chosen to be alternative.

Table 8 Rating Results

Alternatif	Candidate Name	Result of Ranking	Ranking Sort
V_1	Abuy Suherlan	0,76	4
V_2	Rusdianto	0,89	1
V_3	Firmansyah	0,86	2
V_4	Bayu Sudrajat	0,78	3
V_5	Abbi Arrohman	0,74	5

2.5 Performance Apprsial Analysis

1. *Plan*

Determining the weights and the assessment criteria. Employee performance evaluation conducted once a month and at this stage will be the determination of the range of values and indicators [4].

Table 9 Criteria And Assessment Weight

Criteria	Weighting
Disiplin	0,2
Sikap Kerja	0,3
Potensi dan Kemampuan	0,3
Hasil Kerja	0,2

2. *Do*

Determining the weights, criteria and time periods in accordance with the votes that have been determined, the next stage is to assess the performance of.

Table 10 Alternative Data

Alternatif	Criteria						
	C1	C2	C3	C4	C5	C6	C7
Robbi Darojat	3	2	2	3	3	2	1
Agung Permana	3	2	2	2	3	3	2
Imron Wahyudi	3	2	2	3	2	2	1
Indri Septiani	3	3	2	3	3	3	2
Ibnu Sanaji	2	2	2	3	2	2	1

Table 11 Alternative Data Of Candidates

Candidate Name	Education	Age	Work Experience	Value of Training	Value writing, psychotest and interview
Abuy Suherlan	D3	26 thn	1 tahun	79	62
Rusdianto	SMK	22 thn	3 tahun	80	72
Firmansyah	D3	25 thn	2 tahun	59	87
Bayu Sudrajat	D3	24 thn	1 tahun	80	58
Abbi Arrohman	S1	25 thn	1 tahun	59	60

steps of the process of employee performance evaluation method is as follows *Weighted Product*:

a. The initial weight of each criteria set W = (1, 2, 2, 1)
b. Then do repairs weight by using the formula:

$$Wj = \frac{Wj}{\sum Wj} \quad (7)$$

So again

∑Wj = 0,125 + 0,176+ 0,2 + 0,105+ 0,214+ 0,153+ 0,071 = 1,044

c. The next step is to determine the value of vector S

$$Si = \prod_{j=1}^{n} X_{ij} w_j \quad (8)$$

Simplify is as follows:

$$Si = C1^{W1} + C2^{W2} + C3^{W3} + C4^{W4} + C5^{W5} + C6^{W6} + C7^{W7} \quad (9)$$

above calculation values obtained for the vector S is

Table 7 Value Factor S

Employes Name	Value Vektor S
Robbi Darojat	7,922
Agung Permana	7,971
Imron Wahyudi	7,816
Indri Septiani	8,008
Ibnu Sanaji	7,759

d. Determining the value of the vector V are used to calculate an alternative option by using the following equation:

$$V_i = \frac{\prod_{j=1}^{n} = X_{ij}{}^{W_j}}{\prod_{j=1}^{n} = (X_{ij*})^{W_j}} \quad (10)$$

Simply :

$$V1 = \frac{Si}{S1 + S2 + \cdots Sn} \quad (11)$$

The results of calculation of the obtained values for the vector V is as follows:

Table 8 Vector Calculation Results

Employes	Value Vektor V
Robbi Darojat	0,144
Agung Permana	0,145
Imron Wahyudi	0,142
Indri Septiani	0,146
Ibnu Sanaji	0,141

3. *Check*

Evaluation of the results of employee assessment done by examining the results of the ranking of each.

Table 9 Results Ranking of Employees

Alternatif	Employes	Value	Ranking
V1	Robbi Darojat	0,144	III
V2	Agung Permana	0,145	II
V3	Imron Wahyudi	0,142	IV
V4	Indri Septiani	0,146	I
V5	Ibnu Sanaji	0,141	V

4. *Act*

Alternatives employee V1, V2, V3, V4 and V5 with the greatest value is V3, the second is V2, the third is V1, V3 and the fourth is the last one is V5. Then V4 = "Indri Septiani", and V2 = "Agung Permana" will be selected to be an alternative.

2.6 Analysis Of Employee Leave Control

1. *Plan*

Steps to Determine the types of leave, leave time and leave requirements or leave rules.

Table 10 Type Of Leave And Leave Rules

Name of Leave	Code	Time	Information
Cuti Tahunan	CT	6 Hari	Cuti diambil jika akan melaksanakan kepentingan kelaurga. pengajuan cuti harus di ajukan minimal 2 bulan sebelum cuti
Cuti Sakit	CS	14 Hari	Cuti diambil dikarenakan sakit pegawai berhak mengajukan permintaan tertulis dengan melampirkan surat keterangan dokter
Cuti Bersalin	CB	60 hari	lamanya cuti persalinan 30 hari sebelum dan 30 hari sesudah persalinan Pengajuan permohonan cuti bersalin secara tertulis dengan melampirkan surat keterangan dokter/bidan.
Cuti Nikah	CN	3 hari	Cuti diambil terdapat keperluan penting yang harus dilakukan

2. *Do*

Stages taking annual leave, maternity leave, sick leave and marriage leave, the employee will select in advance the type of leave.

Table 11 Employee Leave Application

Employes Name	Type of Leave	Long of Leave	Date of Leave	Date of Start
Asri Priastuti	CB	60 Hari	10/05/2017 – 08/07/2017	06/05/2017
Indri Septiani	CN	3 Hari	03/05/2017 – 06/05/2017	30/04/2017
Novi Tresna	CT	15 Hari	29/04/2017 – 15/05/2017	26/04/2017
Kelvin Prayoga	CT	20 Hari	22/04/2017 – 11/05/2017	19/04/2017
Alit Susanto	CS	14 Hari	06/04/2017 – 19/04/2017	03/04/2017

Where scheduling will see the number of employees who took time off per day.

Table 12 Employee Leave History

No	Date of Leave	Employes Name	Type of Leave	Long of Leave
1	03/01/2017	Asri Priastuti	CS	3 hari
2	20/02/2017	Indri Septiani	CT	13 Hari
3	16/03/2017	Novi Tresna	CN	3 hari

No	Tanggal Cuti	Nama Pegawai	Jenis Cuti	Lama Cuti
4	29/12/2016	Kelvin Prayoga	CS	14 hari
5	07/01/2017	Alit Susanto	CN	3 Hari

3. *Check*

Inspection and review stage of results for leave decision submitted by the employee.

Table 13 Leave Filing Results

Employes Name	Type of Leave	Long of Leave	Approval	Information
Asri Priastuti	CB	60 Hari	DiSetujui	Syarat Lengkap
Indri Septiani	CN	3 Hari	DiSetujui	Syarat Lengkap
Novi Tresna	CT	15 Hari	Ditolak	penjadwalan ulang
Kelvin Prayoga	CT	20 Hari	Ditolak	penjadwalan ulang
Alit Susanto	CS	14 Hari	DiSetujui	Syarat Lengkap

4. *Act*

leave application is successful then the employee will be given priority for employees who have never filed a leave of absence.

Table 14 Leave Filing Approved

Employes Name	Type of Leave	Long of Leave	Approval	Information
Asri Priastuti	CB	60 Hari	DiSetujui	Syarat Lengkap
Alit Susanto	CS	14 Hari	DiSetujui	Syarat Lengkap
Indri Septiani	CN	3 Hari	DiSetujui	Syarat Lengkap

2.7 Non Fungsional Needs Analysis

Analysis of non-functional requirements are covering the components needed for the system to be built until the system is implemented.

A. Hardware Analysis

Table 15 Hardware Proposed

No	Rank	Specific
1.	Prosesor	Speed, 2,5 *Ghz*
2.	Memory	4 GB
3.	VGA Card	1 GB
4.	Harddisk	750 GB
5.	Monitor	Monitor 19 inch

B. Software Analysis

Table 16 Software Proposed

No	Rank	Specific
1.	Sistem Operasi	Windows 7
2.	Browser	Mozilla Firefox, Chrome
3.	Database Server	*Apache*
4.	Aplikasi	*Adobe Reader*

2.8 Functional Needs Analysis

A. Database Analysis

Personnel management information system on the CV. Bintang Tiga Jaya will be built using *Entity Relationship Diagram* (ERD) [4].

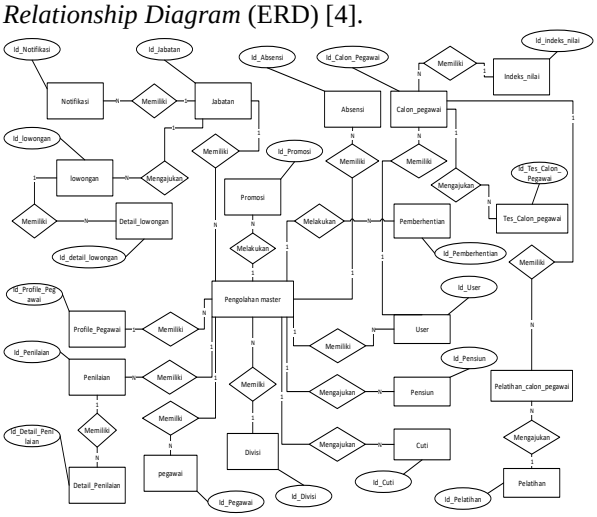


Image 5 ERD

B. Context Diagram

There are 6 user context diagram that play a role in this system is the main director, manager, HR, Administration Staff, Employees and Prospective Employees.

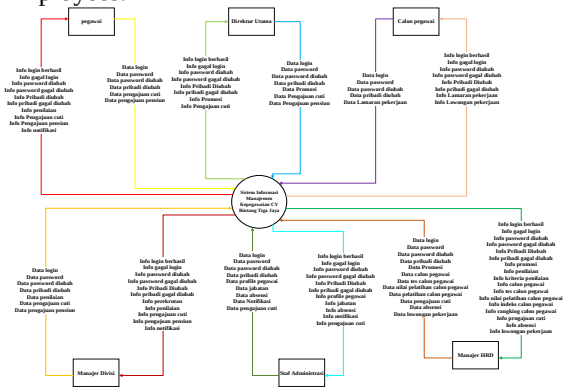


Image 6 Context Diagram

C. DFD Level 1

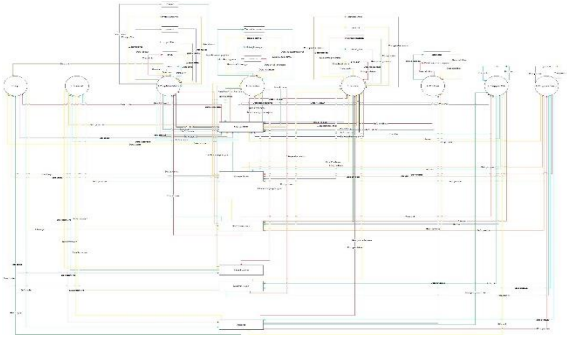


Image 7 DFD Level 1

D. Testing System

System testing is the most important point for any application making aims to find out the errors and had sesuaikah system created to meet the needs of.

E. Alpha Testing

System testing is the most important point for any application making aims to find out the errors and had sesuaikah system created to meet the needs of

Tests are used to test the new system is a black box testing. Black box testing focused on testing the functional requirements of information systems.

If from the given input produces an output corresponding to the functional requirements, the application in question was correct, but if the output produced does not match the functional needs, then there is still an error in the application program[5].

Based on the results of system testing has been done on the whole it can be concluded that the process in this system is functionally ready to use and produce the expected output.

F. Beta Testing

Beta test is a test that is directly actual environment. Users make an assessment of the system by interview. The results of the interview may be used as the conclusion the system to be built in accordance with the purpose or does not match [5].

Interviews conducted for the system consisting of the Director, Division Manager, HRD, Employees and prospective employees.

The research was carried out in CV Bintang Tiga Jaya Cirebon District Central Office in order to determine the extent to which the system is built.

3. CLOSING

3.1. Conclusion

Based on the results obtained in the research and preparation of this paper, it can be concluded as follows:

1. Personnel management information system has been made and will assist the HRD in determining the number of employees based on the appropriate job requirements on the needs or vacancy of existing positions.
2. his personnel management information system has been created and will assist the Division Manager in evaluating the performance appraisal that can assist in determining the promotion, and the dismissal of the criteria available to the employee.
3. Personnel management information system has been created and can assist HRD in the control of taking leave of employees from the type of leave submitted by employees

3.2. Recomendation

Based on all the processes in personnel management information system building, following the suggestions given in the further development of the system is:

1. Improving and developing the system more broadly for the needs of interested parties in the management of the company from the top to operational in order to produce better results for the company CV. Bintang Tiga Jaya.
2. The system added an online test feature in the next study to make it easier for prospective employees away from the site.

BIBLIOGRAPHY

[1] R. Cibro, *Sistem Pendukung Keputusan Penyeleksian Calon Siswa Baru Dengan Metode Simpel Additive Weighting (SAW) Pada SMA Negeri 1 Singkil*, vol. 1, no. 2502-6968, p. 2, 2016.

[2] M. I. J. T. C. Otto Fajarianto, "Dosen STMIK Bina Sarana Global, Mahasiswa STMIK Bina Sarana Global," *Sistem Penunjang Keputusan Seleksi Penerimaan Karyawan Dengan Metode Weighted Product* , vol. 7, no. 2088-1762, p. 1, 2017.

[3] H. Tati and D. W. Utami, "MODEL SISTEM INFORMASI MANAJEMEN KEPEGAWAIAN DI PT.XYZ," *Seminar Nasional Teknologi Informasi dan Multimedia 2017*, no. 2302-3805, 2017.

[4] E. M. Intan Nur Farida, *IMPLEMENTASI METODE WEIGHTED PRODUCT DALAM SISTEM PENDUKUNG KEPUTUSAN PENERIMAAN PESERTA DIDIK BARU DI UPTD SMA NEGERI 1 GONDANG*, vol. 1, no. 2302-3805, pp. 6-7, 2016.

[5] A. Nugroho, Konsep pengembangan Sistem Basis data, Bandung: Informatika, 2004.

[6] E. Sutanta, Sistem Basis Data, Yogyakarta: Graha Ilmu, 2004.