DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEM HUMAN RESOURCES AT PT. SURYA BAHANA MAHKOTA

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ABSTRACT

PT. Surya Bahana Mahkota is a company engaged in the sale, repair and spare parts for cars suzuki product for Nusa Tenggara Timur. One way to achieve the company's goal is to have competent human resources, but the company is not easy to get a human resources (HR) that able to achieve the goal**.** Problems that occur at this time is in the recruitment process is still frequent discrepancy between the number of employees needed and criteria to that received by the company because the human resources planning is done in less effective causing the number of employees who received acceptance sometimes exceeds the number of employees needed and implementation of employee performance evaluation process conducted by the human resources department is still not quite right and very questionable results because the evaluation was done by the employer based on personal policies boss itself.

The recruitment process using the method of Weighted Product (WP). Weighted Product is a decision-making method by way of multiplication to connect rating attributes, where each attribute rating should be raised to the first with the corresponding attribute weights. The method used in employee performance evaluation process is a method in which a 360-degree performance appraisal method that allows employees to obtain ratings from all directions, from superiors, subordinates and colleagues.

Based on the results of the testing that has been done, the system is able to help Manager of the human resource department in determining human resource planning effective and appropriate in the process of recruiting new employees and makes it easy enough to determine the most appropriate employee decisions required by the company. Additionally the system can also help to organize the process of employee performance evaluation more objective and Managers facilitate in decision-making for compensation salary increase, promotion and termination of employment to employees.

Keyword : Recruitment, Performance Appraisal, Method 360 degrees, Weighted Product.

1. INTRODUCTION

PT. Surya Bahana Mahkota is a company engaged in the sale, repair and spare parts for cars suzuki products to the East Nusa Tenggara. PT. Surya Bahana Mahkota was established in order to expand the sales network, repairs and spare parts with the aim to improve services and meet the satisfaction of customers and potential customers to the fullest. One way to achieve the company's goal is to have competent human resources, but the company is not easy to get a human resources (HR) were able to achieve that goal.

Based on interviews that have been conducted by Mr. Theo Pareira as Manager of Human Resources Department (HRD) at PT. Surya Bahana Mahkota, that the problem at the moment is in the recruitment process conducted by HRD still frequent discrepancy between the number of employees needed and the criteria to that received by the company because of human resource planning is done is not effective as a lack of clear information on the needs and basic requirements of human resources that are needed is still based on an estimate - an estimate only causing the number of employees who received acceptance sometimes exceeds the number of employees needed. It is certainly difficult for managers to recruit employees in the decision making where the most appropriate to be placed at the required positions because sometimes employees accepted the terms have almost the same criteria that can cause problems overstaffing and resulting in a buildup of personnel and difficulties in implementing the process of placement service positions, and Also contrary employee received sometimes do not fit the criteria required, both from an educational background and expertise, so that if it happens will make employees feel uncomfortable at work, for example, there is an employee who is placed on the post of Service Manager but the employee can not perform his job well for the educational background and skills

possessed different skills for the job that impact on performance and can occur early termination of employment then the result would be a vacancy. This makes the company must return the recruitment process that takes a long time and cost a bit anyway, causing losses that would cause the company's goal is not achieved in the foreseeable future.

Another issue is the employee performance evaluation process that is still not quite right and very questionable results because the performance evaluation was conducted by the employer based on personal perceptions and policies boss itself. As a result the calculation of the performance evaluation process like this can certainly trigger the occurrence of irregularities like a boss personally not happy with certain employees that deliver value and make a negative decision even until termination of employment when the employee is performing quite well when assessed objectively, and so are otherwise employee performance and score less well when superiors happy with the employee could have been a good boss to give a decision to the employee. Employees never know the details of the calculation of the results of the evaluation of its performance so that this situation makes the fate of the employee depends on his superiors and not infrequently, it has also led to the relationship between superiors and employees become less harmonious because employees are not satisfied with the decision taken superiors because the results of the assessment is not clear. The results of the performance evaluation are not clear and doubtful calculation result certainly can impede the process of granting compensation for a raise, a promotion to employees and termination of employment.

Based on the above issues we need an information system of human resource management that can help Manager HRD in determining human resource planning effective for the right to carry out the recruitment process and conduct the implementation of the evaluation of employee performance objectively and facilitate Manager in making decisions that are based on information is there with the title "Management Information System Human Resources at PT. SURYA BAHANA MAHKOTA".

Based on the problems studied, the purpose of this research is to develop Management Information System Human Resources at PT. Surya Bahana Mahkota.

While the objectives to be achieved in the research and development of management information systems are :

1. Assist HRD Managers in determining the effective planning of human resources for the right to carry out the recruitment process and facilitate in determining an employee's decision which is the most appropriate and competent to be recruited in order to achieve company objectives**.**
2. Assist HRD Managers to organize employee performance evaluation process is objective so the calculation produces a proper assessment and simplify the decision-making that is based on the results of the performance evaluation information for awarding compensation raise, promotion and termination of employment.

2. CONTENTS RESEARCH

2.1 Theoretical Basis

The theoretical basis in the development of management information systems as a reference. Contain theories that can be used as a basis and reference information system of human resource management at PT. Surya Bahana Mahkota. In the human resources information management system involves a variety of sources and studies such theories regarding method of *Weighted Product* (WP) as a method for hiring and the 360 degree method for employee performance evaluation process. The following will be discussed on the theory that became a source of scientific study of human resource management information system.

2.1.1 System

A system is needed in a company or government agency, because the system is to support the performance of the companies or government agencies, both small and large scale. In order to work well it needs cooperation between the element - related elements in the system. There is some argument that the purpose of defining the system, as shown below :

"*The system is a network of procedures that are interconnected, gathered together to perform an activity or to accomplish a certain goal*".[3]

The term system in general can be defined as the set of elements - elements that are interrelated and work together or are connected with certain ways so as to form a single unit to perform a function in order to achieve a goal. The system has the characteristics or properties - specific properties, that is : System Components, Limitation System, System of Environmental Affairs, Liaison System, System Input, Output System, Processing Systems and Target Systems.[3]

2.1.2 Information

Information is a collection of data that is processed into a form more useful and more meaningful for those who receive. Without information, the system will not run smoothly and can eventually die. An organization without any information then the organization can not operate. In other words, the source of information is data. Data describe an event that is happening, where the data

will be processed and applied in the system becomes a useful input in a system.[3]

The information is the result of processing data from one or multiple sources, which are then processed, thus giving the value, meaning and benefits. The usefulness of information is to reduce uncertainty in the decision making process about a situation. An information said to be worth more effective if its benefits compared with the costs of obtaining such information.[4]

2.1.3 Management

Management derived from the old French language, which means the art of management to implement and manage. In general, management is also seen as a discipline that teaches about the process for obtaining organizational goals through a joint effort by a number of people or resources belonging to the organization. In this case the management is divided into three characteristic shape, include : A process or a series of ongoing activities and related, Engaging and concentrate on getting the organization's goals, Getting these results by working with a number of people and utilize the resources owned by the organization.[6]

2.1.4 Management information System (MIS)

The management information system is a system that is usually applied in an organization to support decision-making and the resulting information is needed by all levels of management, or in other words the techniques of information management in an organization.[3]

Management Information Systems (MIS) can also be defined as a computer-based system that is used to provide information to support the operation, management, and decision-making in an organization. SIM typically produce information to monitor performance, maintain coordination, and provide information to the organization's operations. Information reports generated by the SIM provided in the form of periodic reports, summary reports, and comparison reports. In addition, sometimes the SIM also provides reports that can be requested at any time - and users can customize the layout of the required information.[5]

The stages in the management information system (MIS) using the PDCA cycle as in Figure 1.



Figure 1. PDCA cycle

PDCA cycle is a systematic method for process improvement continues - again based on the principle that we need to understand the situation or process before fixing it. Based on Figure 1 PDCA cycle above are four activities, namely the Plan, Do, Check and Action. Here is an explanation of each - each PDCA cycle activities :

1. Plan, plan stage is the stage to set targets or goals to be achieved in process improvement or problem to be solved, then determine the method to be used to reach the target or targets.
2. Do, do stage is the stage of the application or execute all that has been planned in phase plan including its running processes, as well as collecting data (data collection) which will then be used to check and act.
3. Check, check stage is the stage of the examination and review and study the results of the implementation in stages do. Doing a comparison between the actual results have been achieved with the targets set and also the accuracy of the specified schedule.
4. Act, act stage is the stage to take the action necessary to the outcome of the check phase. There are two types of actions to be taken based on the results achieved, between :
   a. Corrective actions, which can be a solution to the problems encountered in achieving the targets, corrective actions need to be taken if the results did not achieve what had been targeted.
   b. Standardization Action, action to standardize the way nor the best practices that have been carried out, the action is performed if the result Standardization achieve the set targets.

The cycle will return to the stage plan to carry out further process improvements resulting in a cycle of continuous process improvement.[6]

2.1.5 Human Resource Management

Human resource management is often called resources management has undergone various developments in line with the development of science and technology. Human resource management is one of the areas of general management that includes aspects of planning, organizing, implementing, and controlling. Human resources (HR) is considered an increasingly important role in the achievement of corporate objectives, the various experiences and research results in the field of human resources systematically collected in what is called human resource management.[6]

In order for an understanding of the human resource management become more apparent, the author will give some definitions of some experts as follows :

According Flippo "Human resources management is planning, organizing, directing and controlling the procurement, development, compensation administration, integration, maintenance and disposal of human resources, in order to achieve the target of individuals, organizations and society".

According Dessler "Personnel management is the management process in planning, organizing, filling staff, direction and supervision to carry out management tasks in the human aspect or employee".

According Hasibuan "Human resource management is the science and art of regulating the relations and the role of labor in order to effectively and efficiently assist the realization of objectives of the company, employees and the community".

According Simamora "Management of human resources is the utilization, development, assessment, administration and management remuneration of individual members of the organization or group of employees".

2.1.6 Management Information Systems Human Resources

Definition of an information system of human resource management, a term commonly known is a system of human / machine integrated (intregeted) to provide information to support the operations function, management, and decision-making in an organization. The system uses hardware (hardware) and software (software) computer, procedure guidelines, models and decision management, and a "database".

Information Systems Human Resource Management is a systematic procedure for collecting, storing, retaining, engaging and validate the data that is needed by a company to improve human resource decisions. In other words, human resources management information system has the ability to obtain the necessary information or choice of many people who are more in touch with the activity of HR planning.[6] Stages can be seen on the SIM HR in Figure 2.

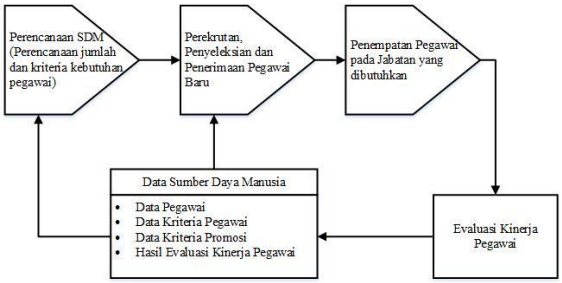


Figure 2. Stages SIM HR

Explanations on the image above SDM SIM stages are as follows :

1. Human resources planning.

   Planning is the first function of the function - management functions. The goal is to reduce uncertainty in the management of human resources to achieve corporate objectives. Human resource planning is a process of analysis and identification of needs and the availability of human resources, so that the company can determine what steps to take such decisions and the criteria for determining the amount of human resources required to fill in the gaps of existing jobs in the company.[6]
2. Recruitment, selection and hiring employees.

   Recruitment is the process of finding prospective employees who are qualified in the number and type required. Effective recruitment will bring employment opportunities to the attention of people who are capable and skills meet job specifications. Results obtained from the recruitment process is the number of employees who will enter the selection process, which is a process to determine which candidates are most worthy to fill certain positions available in the company.[6]
3. Placement of employees.

   Placement is the process of placing an employee in accordance with the knowledge, skills, and abilities to job requirements. Placement of the adjustment related to the capabilities and skills of a person with a job that is going to implement. [6]
4. Evaluation of employee performance.

   The performance evaluation is a process of assessment and implementation of the tasks someone in a company in accordance with performance standards and goals set. performance assessment can be reviewed in the amount and quality of work completed employee at a certain period. The results of the performance evaluation is typically used by companies to determine what the decision will be given to employees that their performance is

evaluated based on the terms set by the Vendor.[6]

If the result is not in accordance with the initial planning is based on the performance of employees, action may be taken for improvement through employee performance evaluation results of the performance evaluation will be made back to the terms and conditions in the planning and placement of HR.

2.1.7 Weighted Product Methods (WP)

WP method is a method of decision-making by way of multiplication to connect rating attributes, where each attribute rating should be raised to the first with the corresponding attribute weights.[7]

WP is one of the multi-criteria decision analysis (multi-criteria decision analysis / MCDA) is very popular. Methods of multi-criteria decision making multi-criteria decision making (MCDM). MCDA method, which granted is a limited set of decision alternatives described in terms of a number of decision criteria. Any alternative compared to other decisions by multiplying the number of ratios, one for each decision criteria. Each ratio is raised to the power equivalent to the relative weight of the matching criteria.[7]

The concept of product weighted calculation method :

1. Determining the value of vector S.

The preference for alternative given the following formula :

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

with i = 1,2,…,m and j = 1, 2, …n.

Where :
S : Alternative Preferences analogy as vector S
X : value criteria
W : Weights criteria / sub-criteria
i : Alternatife
j : Criteria
n : The number of criteria

2. Make improvements weights first. The initial weight fixed in advance by the formula :

$$W_j = \frac{w_j}{\sum w_j} \text{ so that } \sum W_j = 1 \quad (2)$$

3. Then proceed to determine the value of the vector to be used calculating the referrers (Vi) to perangkingan / search the best alternative to the following formula :

$$V_i = \frac{\prod_{j=1}^{n} x_{ij}^{w_j}}{\prod_{j=1}^{n} (x_{ij}^{*}) w_j} \quad (3)$$

Information :
V_i = the largest value of the alternative selected
Π = product
X_{ij} = Value attribute alternative i to j
w_j = The weight of each attribute

Put simply like this :

$$V_i = \frac{s_i}{s_1 + s_2 + \cdots s_n} \quad (4)$$

4. After performing the calculations preferences (vi) above and then will get the best selection and the best alternative worthy of being the best choice in decision-making.

2.1.8 Methods 360 Degree

360 degree method is a method of performance assessment that allows employees to obtain ratings from all directions, from superiors, subordinates and colleagues. The workings of assessment methods 360 degrees is the assessment of an employee is not only taken from the assessment of the immediate supervisor or boss a second on it, but also considered by colleagues one level or from the subordinate or percentage of votes largest still come from the immediate supervisor and the supervisor both on.[9]

The benefits to be gained if the organization in Indonesia implement a 360-degree assessment is all the ratings given by the leadership, subordinates, colleagues and yourself can give results that are very accurate and objective regarding the performance of the parties assessed. All information is obtained from various sources (leaders and colleagues) can increase accuracy and objectivity in assessing performance. Various performance assessment is :

1. Appraisal Head.
   The term refers to the leadership of superiors who direct and two levels of subordinates being evaluated. Many companies who think jobs and the boss knows better than anyone else and subordinate performance because it gives organizations all responsibilities to superiors ratings.
2. Appraisal itself.
   Self-assessment will be felt most effective when combined with other assessment. With this assessment, the employee will assess itself and improve the active role of the employee in the assessment process. Strengths, weaknesses, achievements and performance assessment of yourself becomes essential material from this section.
3. Appraisal colleagues or team members.
   The assessment was performed by employees who have the same level with employees being assessed. It will be able to

work effectively on employees working in a team but can cause controversy on the dynamics of the team in the future.

4. Appraisal subordinate.

   Ratings by subordinates is an assessment of the most important and effective because of the assessment carried out by employees who have a lower level than the level of the employees were assessed. This assessment highlights the ability of communication and motivation. Delegating the work and leadership techniques are also included in this assessment.

The assessment process carried out by several stages. Here is a step - a step in the assessment process :

1. Determine what criteria will be assessed and weighed
2. Determine subcriteria
3. Determine the specific gravity of assessors
4. Determine the assessment period
5. Determine assessors and employees to be assessed

Method Calculation Formula 360 Degrees :

a. if there is only one assessor :

$$Nilai\ Kriteria_{\ i} = \sum_{j=1}^{n} (Nilai\ Subkriteria_{\ ij} * bobot_{\ ij}) \quad (5)$$

Where :
Value Criteria N = total value of sub-criteria kei
Value subcriteria subcriteria ij = value of the i-th criterion on the weight of the j-th
Weights ij = level of importance (weight) to the criterion-j
I = 1,2,3 ... n; n = number of criteria
j = 1,2,3 ... m; m = number of weights

b. If there are two assessors:

$$Nilai\ Kriteria_{\ i} = \sum_{j=0}^{m} \left\{ \sum_{k=1}^{n} (Nilai\ Subkriteria_{ik} * bobot_{\ ik}) \right\} * bobot\ penilai_{\ ij} \quad (6)$$

Information :
Value Criteria i = total value of the sub-criteria kei
Value subcriteria subcriteria ik = value of the i-th criterion on the weight of all k
Weights ik = level of importance (weight) to the criterion-k
Weights Assessor Assessor = interest rate on the j-th criteria
i = 1,2,3 ... n; n = number of criteria
j = 1,2,3 ... m; m = number of assessors weight
k = 1,2,3 ... m; m = number of weights

c. If judging subordinates lots :

$$Nilai\ Kriteria_{\ i} = \sum_{j=0}^{m} \left(\frac{\{\sum_{k=1}^{n} (Nilai\ Subkriteria_{ik} * bobot_{\ ik})\}}{jumlah\ penilai} * bobot\ penilai_{\ ij} \right) \quad (7)$$

Information :
Value Criteria i = total value of the sub-criteria kei
Value subcriteria subcriteria ik = value of the i-th criterion on the weight of all k
Weights ik = level of importance (weight) to the criterion-k
Weights Assessor Assessor = interest rate on the j-th criteria
i = 1,2,3 ... n; n = number of criteria
j = 1,2,3 ... m; m = number of assessors weight
k = 1,2,3 ... m; m = number of weights

For the end result use the formula :

$$Nilai\ Akhir\ Penilaian \quad = \sum_{i=1}^{n} Nilai\ Kriteria_{\ i} \quad (8)$$

Information :
Final Value Rate = total value of the criteria to-ii
Value Criteria i = the value of the criteria to-i
i = 1,2,3 ... n;
n = number of the criteria.

2.2. Problem Analysis

Based on interviews that have been conducted by Mr. Theo Pareira as Manager of Human Resource Department (HRD) at PT. Surya Bahana Mahkota stated that today the company still has obstacles like :

1. Often there is a discrepancy between the amount and the criteria employees needed to that received by the company in the recruitment process conducted by HRD because HR planning is done in less effective, causing the reception number of employees who received sometimes exceeds the number of employees needed and makes it difficult to determine the decision to recruit employees which is most appropriate and competent.
2. The process for conducting employee performance evaluations conducted by the HRD is less precise and highly questionable results because the evaluation was done by the employer based on the employer's own personal policy.

2.3 Stages SIM HR

Stages SIM SDM is used to provide an overview of the existing processes in information systems of human resource management at PT. Bahana Surya crown. Here are the stages of SIM HR management information system of human resources at PT. Surya Bahana Mahkota :

1. Human Resources planning.

   SIM early stages of HR is doing human resource planning stages. At this stage the HR Manager will plan and criteria to determine the number of employees needed to fill the vacancy. But before determining the number of employees needed, HRD Manager will evaluate the condition of the appropriate basis for the criteria required by the job, and if it determines the appropriate criteria and then determine the number of employees who must be accepted to cover vacancies in the department.
2. Recruitment and selection of employees.

   After Manager HRD determine the number of employees needed and the criteria it will soon be the recruitment and selection of new employees by the Human Resources Administration. Recruitment is done to get a prospective employee allows to choose or select prospective employees in accordance with company requirements.
3. Placement of employees.

   Then, after the process of recruitment and selection is done it will be done appointments were needed.
4. Evaluation of employee performance.

   After the employees working there will be a performance evaluation of employees who will employee performance evaluation results will serve as a basis of reference in determining the decision awarding compensation salary increase, promotion, and termination of employment to employees. If in the process of performance evaluation shows the results for the termination of the employment relationship, the Administration HRD will do the recruitment and selection of new employees back to fill the void that position and vice versa if the results of performance evaluation shows good results, it will be compensated for a raise or promotion as well HRD administration does not need to recruit new employees again.

Then subsequently be re-evaluated on the results of the recruitment process and human resource planning that has been done, that is by evaluating whether the results of HR planning is the form of the recruitment by the Administration HRD are in accordance with the needs of the amount and the criteria employees needed the company and in the placement process will be evaluated whether the placement was appropriate or not, for example, has done a placement, whether the performance of employees placed at certain positions already capable to conduct and responsible work. If the result is not in accordance with the initial planning is based on the performance of employees, action may be taken for improvement through employee performance evaluation results of the performance evaluation will be made back to the terms and conditions in the planning and placement of HR.

2.3.1 Analysis Recruitment and selection using the method of Weighted Product (WP)

Stages of the recruitment and selection of employees for which accounts using the method of Weighted Product can use PDCA cycle.

1. *Plan*

   Stages of the recruitment and selection of employees first is before the recruitment and selection of employees, HR Manager must first determine the weights and criteria, here are weights and criteria contained in Table 1 and Table 2.

Table 1 Weight of numbers Fuzzy

Bilangan Fuzzy	**Bobot nilai**
Sangat kurang	1
Kurang	2
Cukup	3
Baik	4
Sangat baik	5

Table 2 Criteria for recruitment and selection

No.	Kriteria	Inisial
1	Tingkat pendidikan	k1
2	Pengalaman Kerja	k2
3	Keterampilan pekerjaan	k3
4	Nilai hasil test tertulis	k4
5	Nilai hasil test wawancara	k5

For the criterion level of education and work experience have been determined weight as shown in Table 4 and Table 5.

Table 4 Weight value education level criteria

Tingkat pendidikan	**Bobot nilai**
SMU / SMA / SMK	1
D1	2
D3	3
S1	4
S2	5

Table 5 Weight of the value of work experience criteria

Pengalaman kerja	Bobot nilai
< 1 tahun	1
> 1 tahun s/d < 3 tahun	2
>3 tahun s/d < 5 tahun	3
5 tahun <	4

2. *Do*

The next stage in the process of recruitment and selection of employees is the recruitment and selection of employees. HRD Manager has determined the terms - the terms of recruitment and selection criteria, will further determine the weighting of each criterion to be determined based on the needs of employees needed. Sample data service candidates with requisite criteria for each - each and has been carrying out a written test and interview test as shown in Table 6.

Table 6 Data prospective employees

Calon Pegawai	Kriteria				
	Tingkat pendidikan	Pengalaman kerja	Keterampilan pekerjaan	Nilai test tertulis	Nilai test wawancara
Budi Santoso	S1	1 tahun	75	85	70
Joko Priyatno	S1	3 tahun	80	75	75
Rekky Setiawan	S2	1 tahun	80	80	75

Data values are in Table 6, then further improved weighting of criteria for the level of education and work experience. Data prospective employees who have fixed weight value criteria of education and work experience as shown in Table 7.

Table 7 Data prospective employees who have fixed weights

Calon Pegawai	Kriteria				
	Tingkat pendidikan	Pengalaman kerja	Keterampilan pekerjaan	Nilai test tertulis	Nilai test wawancara
Budi Santoso	4	2	75	85	70
Joko Priyatno	4	3	80	75	75
Rekky Setiawan	5	2	80	80	75

After obtaining the data value of the prospective employee, a step - step of the process of recruitment and selection of new employees by using the method of Weighted Product is as follows :

1. Determine the initial weight of each criteria have been determined, the weight of this initial value can change - change in accordance with the conditions set by the company for the recruitment and selection of new employees. HR Administration determine the initial weight for each - each criteria, ie criteria of education level is 3, the weight of work experience is 4, the weight of job skills is 5, weighting the results of the written test is 3, and the weight of the test results of the interview is 5. The initial weight of each criteria give the following reference weight :

   W = (3, 4, 5, 3, 5). Total = 20

2. Then do the repairs weight by using a formula :

   $W_j = \frac{W}{\sum W}$, so as to obtain $\sum W_j = 1$.

   How the solution is as follows :

$$W_1 = \frac{3}{3+4+5+3+5} = \frac{3}{20} = 0{,}15$$
$$W_2 = \frac{4}{3+4+5+3+5} = \frac{4}{20} = 0{,}20$$
$$W_3 = \frac{5}{3+4+5+3+5} = \frac{5}{20} = 0{,}25$$
$$W_4 = \frac{3}{3+4+5+3+5} = \frac{3}{20} = 0{,}15$$
$$W_5 = \frac{5}{3+4+5+3+5} = \frac{5}{20} = 0{,}25$$

   so that :

$$\sum W = 0{,}15 + 0{,}20 + 0{,}25 + 0{,}15 + 0{,}25 = 1$$

3. Then the next step is to determine the value of vector S, where data - the data will be multiplied, but reappointment previously done with the initial weight. How can the solution using the formula :

$$S_i = \prod_{j=1}^{n} X_{ij}^{\ w_j}$$

   It is simply like :

$$S_i = (k_1^{\ W_1})(k_2^{\ W_2})(k_3^{\ W_3})(k_4^{\ W_4})(k_5^{\ W_5})$$

How the solution is as follows :

$$S_1 = (4^{0,15})\,(2^{0,20})\,(75^{0,25})\,(85^{0,15})\,(70^{0,25})$$
$$= 1,23\ x\ 1,24\ x\ 2.94\ x\ 1,94\ x\ 2,89 = \mathbf{25,42}$$
$$S_2 = (4^{0,15})\,(3^{0,20})\,(80^{0,25})\,(75^{0,15})\,(75^{0,25})$$
$$= 1,23\ x\ 1,31\ x\ 2.99\ x\ 1,91\ x\ 2,94 = \mathbf{27,32}$$
$$S_3 = (5^{0,15})\,(2^{0,20})\,(80^{0,25})\,(80^{0,15})\,(75^{0,25})$$
$$= 1,27\ x\ 1,24\ x\ 2.99\ x\ 1,92\ x\ 2,94 = \mathbf{26,93}$$

From the above calculation, the values obtained for the vector S are as follows :

Table 8 Value vector S

Calon pegawai	Nilai Vektor S
Budi Santoso	**25,42**
Joko Priyatno	**27,32**
Rekky Setiawan	**26,93**

4. Then determines the value of the vector V is used for ranking the alternatives by using the formula :

$$V_i = \frac{\prod_{j=1}^{n} X_{ij}^{\ w_j}}{\prod_{j=1}^{n} \left(X_{ij}^{\ *}\right) w_j}$$

Put simply like this :

$$V_i = \frac{S_i}{S_1 + S_2 + \cdots S_n}$$

How the solution is as follows :

$$V_1 = \frac{25,14}{25,14 + 27,05 + 26,57} = \frac{25,42}{78,76} = \mathbf{0,3190}$$
$$V_2 = \frac{27,05}{25,14 + 27,05 + 26,57} = \frac{27,32}{78,76} = \mathbf{0,3429}$$
$$V_3 = \frac{26,57}{25,14 + 27,05 + 26,57} = \frac{26,93}{78,76} = \mathbf{0,3380}$$

From the above calculation, the obtained value - value for the vector V is as follows :

Table 9 Value Vector V

Calon pegawai	Nilai Vektor V
Budi Santoso	**0,3190**
Joko Priyatno	**0,3429**
Rekky Setiawan	**0.3380**

3. *Check*

This stage is the stage of examination by the Manager of HRD whether the results of the recruitment and selection of employees who carried out are in accordance with what is expected by the company. This check is performed by examining the results of the ranking of each prospective employee. Checking the results of screening of prospective employees whether alternate between V1, V2 and V3 which will be the best option to be selected and accepted by the company. Perangkingan results obtained from the value of each - each prospective employees can be seen in Table 10.

Table 10 Ranking of recruitment and selection

Alternatif	Calon pegawai	Nilai	Ranking
V2	Joko Priyatno	0,3429	I
V3	Rekky Setiawan	0.3380	II
V1	Budi Santoso	0,3190	III

4. *Action*

This stage is the stage of decision will be determined by the Human Resources Manager for further recruitment and employee selection results will be used as the basis in the recruitment and placement positions. Based on Table 10 above, the alternative choice of candidates obtained between employees V1, V2 and V3 with the greatest value is V2, so that V2 = "Joko Prayitno" will be selected to be the best alternative to be chosen by the Manager to fill positions that are vacant and received by the company.

2.3.2 Employee Performance Evaluation Analysis using Method 360 Degrees

Evaluation of the performance of the management information system using the 360 degree method, the use of these methods take the votes of parties - parties to be around employees who are valued and party bosses will no longer be a source of one - only to update the performance evaluation for performance evaluation can be done by superiors, peers , subordinates and themselves. The results of evaluation of performance will give a different assessment - depending on the role of the employee in question. Employee performance evaluation stage calculation using the 360 degree method can use the PDCA cycle.

1. *Plan*

Before the performance evaluation, HR manager must first determine the weights and criteria, here are the weight and the evaluation criteria listed in Table 11, Table 12, Table 13 and Table 14.

Table 11 Weight of evaluation criteria

No.	Nama Kriteria	Presentase bobot (%)
1	Karakteristik	40
2	Energi	15
3	Motivasi	15
4	Kedewasaan	30
	Total	100

Table 12 Criteria for assessment

No.	Kriteria	No.	Sub kriteria	Bobot (%)
1	Karakteristik	1	Kemantapan dan kematangan bertugas	5
		2	Ketekunan dalam bekerja	10
		3	Kejujuran	5
		4	Kerajinan	10
		5	Kehadiran	10
2	Energi	1	Antusias	5
		2	Inisiatif	10
3	Motivasi	1	Potensi untuk maju	10
		2	Keinginan belajar	5
4	Kedewasaan	1	Kemandirian	5
		2	Kerjasama	5
		3	Kemampuan berpikir kreatif	5
		4	Komunikasi secara aktif	5
		5	Tanggung jawab dan loyalitas	10

Table 13 Weight Assessor

No.	Penilai	Bobot (%)	Bobot (%)	Bobot (%)	Bobot (%)
1.	Atasan	40	60	70	90
2.	Rekan kerja	30	30	-	-
3.	Bawahan	20	-	20	-
4.	Diri sendiri	10	10	10	10
	Total	100	100	100	100

Table 14 Range of values

Rentang Nilai	Penilaian	Keterangan
< 40	Buruk	***Dapat dipertimbangkan untuk pemutusan hubungan kerja***
40 < s/d 60	Cukup	***Dipertimbangkan untuk mendapatkan pelatihan***
60 < s/d 80	Baik	***Dipertimbangkan untuk mendapatkan kompensasi kenaikan gaji***
80 < s/d 100	Sangat Baik	***Dipertimbangkan untuk mendapatkan promosi jabatan***

2. *Do*

Stages in the process of evaluating employee performance which manager will set the period and time of the assessment, the next step is to conduct the performance evaluation process that will be conducted by the supervisor / manager, peers, subordinates, and themselves according to the assessor different weights - different. All employees of each department will conduct employee performance evaluations then the results will be used as the basis in determining the award of compensation for a raise, promotion, and termination of employment. The period used for the evaluation of this case is the period 2014-2015 by using the 360 degree method for evaluating employee performance.

The process of evaluating the performance of employees who have direct supervisor / manager and coworkers can be assumed as follows :

a) The performance evaluation by supervisor / manager

Name Appraisal: Theo Pareira
Position: Manager HRD
Weights Rater: 60%
Name assessed: Yusvita D CHR Miha Balo
Position: HR Admin
Process: Evaluation of the performance of an employee by the employer

Tabel 15 Evaluasi kinerja oleh atasan

No.	Kriteria	Bobot(%)	Nilai
Karakteristik			
1	Kemantapan dan kematangan bertugas	5	75
2	Ketekunan dalam bekerja	10	75
3	Kejujuran	5	75
4	Kerajinan	10	75
5	Kehadiran	10	75
Energi			
6	Antusias	5	75
7	Inisiatif	10	75
Motivasi			
8	Potensi untuk maju	10	75
9	Keinginan belajar	5	75
Kedewasaan			
10	Kemandirian	5	75
11	Kerjasama	5	75
12	Kemampuan berpikir kreatif	5	75
13	Komunikasi secara aktif	5	75
14	Tanggung jawab dan loyalitas	10	75
	Jumlah Nilai :		75
	Subtotal = Jumlah nilai x Bobot Penilai → Subtotal = 75 x 0.6		45

After all employees of start supervisor / manager, co-workers and myself have been doing performance evaluations such as table - the table above, then be calculated to obtain the final results of the evaluation, the final results of the evaluation of employee performance is shown in Table 16.

Table 16 Calculation of employee performance evaluation results

Pegawai yang dinilai	Pegawai penilai	Jabatan	Bobot penilai	Subtotal nilai
Yusvita D CHR Miha Balo (Admin HRD)	Theo Pareira	Manager HRD	60%	45
	Jozua Pierre E.S Pello	Training	30%	7
	Daniel Koroh	Training		8
	Claudio Godefrido C	Reqruitment		8
	Yusvita D CHR Miha Balo	Admin HRD	10%	8
			Nilai akhir	**76**

3. *Check*

This stage is the stage of examination of whether the results of the performance evaluation conducted was in accordance with what is expected by the company. This check is performed by examining the results of the performance evaluation of each employee.

Tabel 17 Hasil evaluasi kinerja pegawai

No.	NIP	Nama	Jabatan	Nilai akhir	Hasil evaluasi
1	120.01.05	Theo Pareira	Manager HRD	79,5	Kenaikan gaji
2	121.02.05	Yusvita D CHR Miha Balo	Admin HRD	76	Kenaikan gaji
3	122.03.05	Jozua Pierre E.S Pello	Training	82	Promosi
4	123.03.05	Daniel Koroh	Training	33,5	PHK
5	124.04.05	Claudio Godefrido C	Reqruitment	85,5	Promosi

After getting the results of the evaluation of each - each employee will be performed examinations final value to be used as a reference for decision awarding compensation to get a raise, promotion and termination of employment based on the decisions contained in the range of values.

4. *Action*

This stage is the stage of evaluating the performance of employees to further results of this evaluation will be used as the basis for planning and subsequent placement and determine the compensation increase in salaries, promotion and termination of employment.

After calculating the Capital Yusvita DCR Miha Balo get the final value is 76, based on the range of values which have been determined by the company with a value of 76 is obtained, then the mother Yusvita will get consideration the compensation of the company's salary increase. After consideration perusaahan approved by the General Manager, and Ms. Yusvita deserve a raise given by the company, as well as other employees would get a decision based on the final value obtained.

2.4 Analysis Database

Data analysis aims to analyze the data that is to be applied in the system and explain the data necessary for the system to run properly in accordance with the needs of the user. Entity Relationship Diagram illustrates how the relationships between entities that are interconnected to one another. The diagram is illustrated in Figure 3.

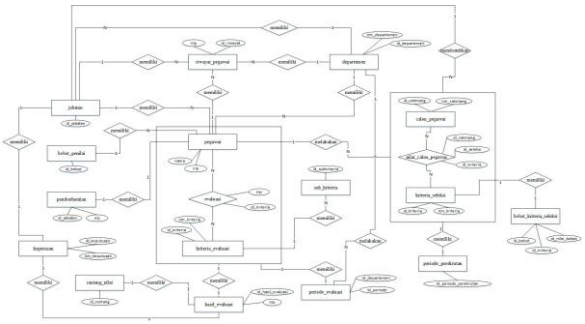


Figure 3. *Entity relationship diagram*

2.5 Diagram Context

Context diagram is used to describe the first system in outline. Diagram context is also a data flow diagram (DFD Data Flow Diagram or) to the top level (top level). Diagram context on the system can be seen in Figure 4.

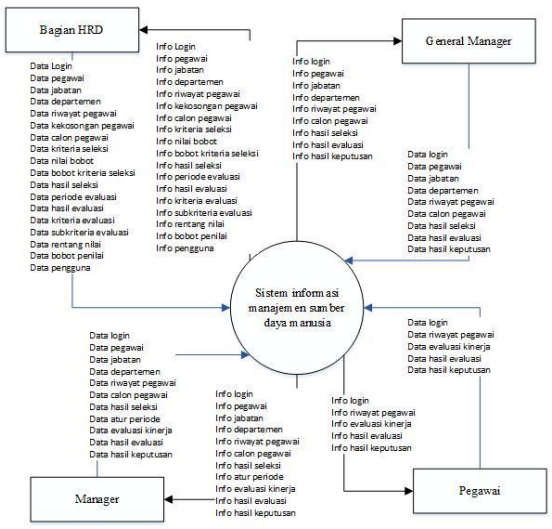


Figure 4. Diagram context

2.6 Data Flow Diagram (DFD)

Data Flow Diagram is a graphical representation that illustrates the flow of information and information transformation that is applied as the data that flows from the input (input) and output (output).

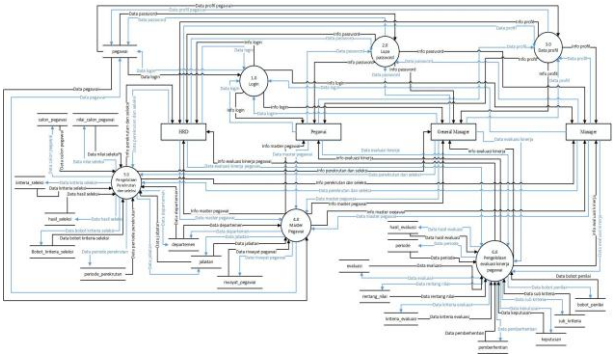


Figure 5. DFD Level 1

2.7 Table Relation

In data modeling, entity presented with a table of existing entities in diagam E-R written with the framework of the table containing attributes called Table Relationships. Making the entity tables are always guided by the provisions on how to prepare the table. Table relationships are described in Figure 6.

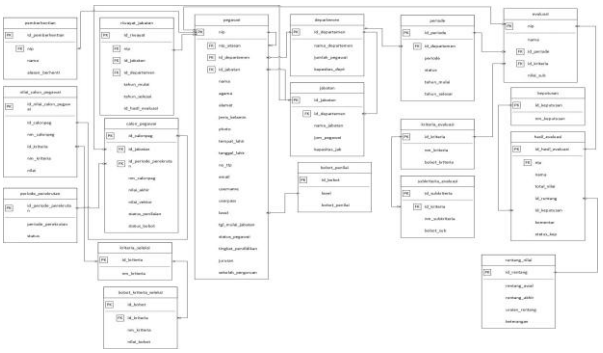


Figure 6. Table relations

2.8 Design Interfaces

The design of the interface is a plan that explains all circumstances related to the system interface. Here is a sample login interface design that can be seen in Figure 7.

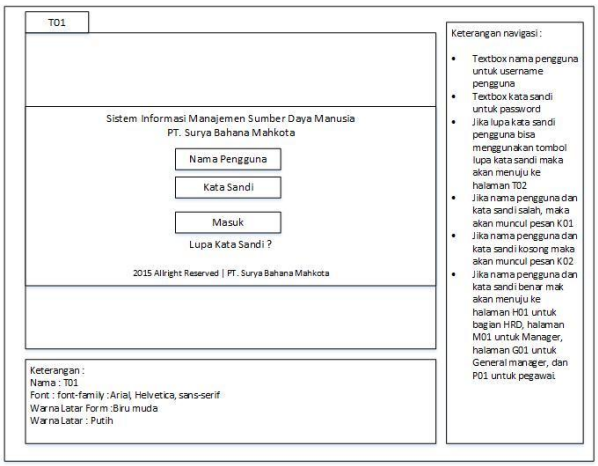


Figure 7. Interface Design T01 Login

2.9 Network Design Semantics

Semantic network design section is a description of the semantic network in the human resources department of this system, the following is a semantic network of human resources department can be seen in Figure 8.

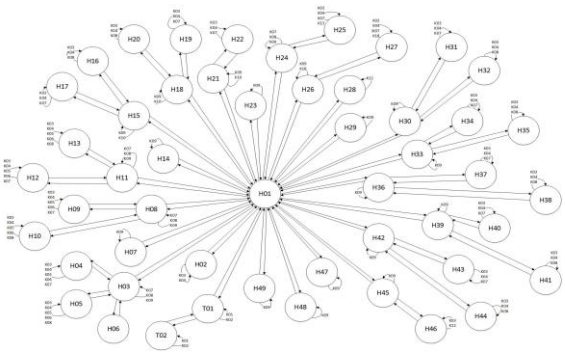


Figure 8. Designing Network Semantics HRD

2.9 Testing Systems

Testing of the system is the cornerstone that aims to find errors - errors and deficiencies - deficiencies in the software being tested. The test aims to determine whether the system has been created to meet the needs in accordance with the system design objectives.

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

1. Pengujian *Black Box*

Black box testing focuses on functional requirements of software built.

The management information system testing using test data based on the data contained at PT. Surya Bahana Mahkota.

Based on test results to the test case example above can be concluded that at every process in the system built still allows for syntax errors, but functional system can issue the expected results.

2. Beta Testing

Beta testing is done in order to determine the extent to which the quality of software that is built, is already in line with expectations or not. For it is in beta testing research by providing questions to potential users of the software. The research methods used were interviews. To determine the achievement of the desired objectives in the development of information systems, interviews submitted to the HRD Manager at PT. Surya Bahana Mahkota.

Based on beta testing, it can be concluded that :

1. This system is enough to help the Human Resources Department because the system is already able to meet the needs in managing employee data so as to provide information about the needs of employees in the planning of human resources needs.
2. 2. This system is already assisting the Human Resources Department in organizing the recruitment and selection of new employees with good and fast because of the value of each - each test performed, is calculated by calculating the precise and accurate so as to accelerate the process of selecting candidates for new employees.
3. 3. This system provides precise results and ease of selection in the decision to select candidates where the best and the right to be accepted by the company.
4. 4. This system has features that make it easy for rank ordering of the value of the selection results each - each prospective employee.
5. 5. This system has been able to help the Human Resources Department in carrying out an objective evaluation of the performance.
6. 6. The results of the evaluations performed on these systems is enough to serve as a basic reference for decision awarding compensation salary increase, promotion and termination of employment.
7. The system is fairly easy to use, but should be considered again in the use of language to update the message presented.
8. This system is sufficient to provide convenience to view the performance rating - each employee.
9. This system has a positive impact on employees to improve morale and avoid social jealousy on the assessment of the performance evaluation is done.
10. This system has been helpful in providing clear and accurate information regarding the final value of the decision to employees.
11. Display system is attractive, but there are some parts that need to be improved zoom.

3. CLOSING

In this section, describes the conclusions which contains the results obtained after the analysis, design, and implementation of software design that was built and has been developed as well as suggestions that will provide important records and possible improvements that need to be done for software development previous.

3.1 Conclusion

Based on the description of the discussion of the analysis and testing that has been done, it can be a conclusion to the Management Information System Human Resources at PT. Surya Bahana Mahkota These are as follows :

1. Management Information System Human Resources at PT. Bahana Surya This crown is enough to help Manager Human Resources Department (HRD) in determining HR planning is effective and appropriate in the process of hiring new employees and quite easy to determine the most appropriate employee decisions required by the company.
2. Management Information System Human Resources at PT. Bahana Surya This crown is enough to help Manager Human Resources Department (HRD) to conduct employee performance evaluation process more objective and facilitate decision-making in the provision of compensation for a raise, promotion and termination of employment to employees.

3.2 Suggestion

Based on the conclusions that have been described above, it is expected in the future is for the Management Information System Human Resources at PT. Bahana Surya This crown can be developed more broadly in order to further improve the performance of employees in order to provide benefits to the company and can certainly assist the company in managing the company's data.

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