MANAGEMENT INFORMATION SYSTEM PROCUREMENT OF GOODS IN CV. MAHKOTA SAKTI BANDUNG

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ABSTRACT

CV. Mahkota Sakti *is a company engaged in the procurement of general trading, office equipment, engineering, electricity, electronics, instruments, printing, and services. CV. The Sakti crown is located on the street Uranus Tengah V no. 103 Bandung. This company has been established since the year 1999 based in the city of Bandung and have not had a branch. Based on the results of interviews with Mr. Yayat as Executive Production Division of the company stated that there are problems in the selection of vendors. Vendor Selection in CV. The current Crown of the company choosing a vendor based solely on the lowest cost does not consider other factors such as the quality of the goods, and the delivery time of the goods. Other problems that exist in the CV. Crown Sakti is in checking receipt of goods from vendors who will be sent to customers. Checks made by the company at this time only based on the specification of the goods just do not use criteria checking goods made a company. The SAW (Simple Additive Weighting) method is a method used to perform vendor determination to be performed by the Production Department and the result will be a rating stating which vendor will be selected. Selection of vendor is done according to a criterion of a vendor which has been made by Production Part. In this system, the Production Department will check the goods before they are sent to the customer. The purpose of doing this research is to help the Production Department determine the appropriate vendor selection for product ordering and assist the Production Section in checking the goods before being delivered to the customer.*

Based on the results of black box testing and beta testing can be concluded that this system has helped the Production Department in determining vendors, determine the criteria vendors, and check the goods

Keywords: *Management Information System, Procurement of Goods, Methods (Simple Additive Weighting), Checking Goods..*

1. INTRODUCTION

Currently, the development of the business world more rapidly, resulting in increasingly fierce competition as well. CV. Mahkota Sakti is a company engaged in the procurement of general trading, office equipment, engineering, electricity, electronics, instruments, printing, and services. In conducting its business activities, CV. Mahkota Sakti is working with vendors to fulfill customer orders. The purchase of goods to the vendor is adjusted by the number of ordering goods from the customer, therefore the selection of the vendor is very important because it must be able to meet customer orders in quick time so that it can deliver the goods to the customer on time. The increasingly tight competition from year to year makes the challenge of CV. Mahkota Sakti is currently demanded to be able to provide the needs of customer desires so that customers feel satisfied in the service company so as to increase the number of customers. Based on observations and interviews with Bpk. Yayat as Executive Production Division of the company, states that there are problems in the selection of vendors. Vendor Selection in CV. The current Crown of the company choosing a vendor based solely on the lowest cost does not consider other factors such as the quality of the goods, and the delivery time of the goods. The impact that occurs is the company loses customers due to a procurement of goods provided by less good companies that make customers less satisfied. Other problems that exist in the CV. Crown Sakti is in checking receipt of goods from vendors who will be sent to customers. Checks made by the company at this time only based on the specification of the goods just do not use criteria checking goods made a company. Impacts that occur are goods that have been sent to existing customers are not good quality that makes the company lost customer trust. Based on the above background for the purpose to be achieved in research and development of management information system are:

- Assist the Production Section to determine the appropriate vendor selection for product ordering.
- Assist the Production Section in checking the receipt of goods before being sent to the customer.

2. RESEARCH CONTENTS

2.1 Management Information System (MIS)

Management information system is a set of subsystems that are interconnected, gather together and form a unity, interact and cooperate between the parts with each other in certain ways to perform data processing functions, receive input (input) in the form of data, Then processing it, and generating outputs in the form of information as a basis for making useful decisions and having real value that can be perceived as a result both immediately and in the future, supporting operational, managerial and strategic activities of the organization, utilizing various Resources available and available for the function to achieve the goal.

Management Information Systems (MIS) can also be defined as a computer-based system that provides information to multiple users with similar needs. Such information is available in the form of periodic reports, special reports, and outputs of mathematical simulations.

2.2 Procurement of Goods and Services

Procurement of goods and services is a procurement activity in terms of obtaining goods and services. The stages in a procurement of goods and services with pre qualification are:

- Prequalification announcement
- Collection of pre qualification documents
- Entry of pre qualification documents
- Evaluation of pre qualification documents
- Determination of pre qualification result x
- Announcement of pre qualification results
- Prequalification period
- Invitation to participants who pass the pre qualification
- Collection of public tender documents
- Explanation
- Preparation of minutes of the auction document and its amendments
- Offer submission
- Opening offer
- Evaluate the offer
- Determination of the winner
- Winner announcement
- Rebuttal
- The designation of a winner
- Signing of contract

2.3 Method (Simple Additive Weighting) SAW

The SAW method is often also known as the 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. The SAW method requires the process of normalizing the decision matrix (X) to a scale comparable to all existing alternative ratings. Here's the normalization formula in Figure 1.

$$r_{ij} = \begin{cases} \dfrac{x_{ij}}{\max_i x_{ij}} \\ \dfrac{\min_i x_{ij}}{x_{ij}} \end{cases}$$

Figure 1. *Normalization formula of SAW (Simple Additive Weighting) Method*

Explanation:
Benefit: each matrix element is divided by max from the matrix row. If the greatest value is best
Cost: min of the matrix column divided by each matrix element. If the smallest value is best
Rij: performance rating is normalized
Maxij: the maximum value of each row and column
Minij: the minimum value of each row and column
Xij: rows and columns of the matrix
Rij: normalized performance rating from alternative Ai on attribute Cj; I = 1,2, ... m and j = 1,2, ..., n.

Here's the final value formula in Figure 2.

$$V_i = \sum_{j=1}^{n} w_j \, r_{ij}$$

Figure 2 *Final Value Formulas (Vi) SAW (Simple Additive Weighting) Method*

Explanation:
Vi: The final value of the alternative
Wj: The specified weight
Rij: Normalization of the matrix
The largest value of Vi becomes the best / best alternative

2.4 POAC Analysis (Planning, Organizing, Actuating, Controlling)

The POAC analysis involves determining the best vendors and checking the goods. Here is a cycle of POAC (Planning, Organizing, Actuating, Controlling) applied to the procurement management information system on the CV. Crown of Bandung Sakti in Figure 3.

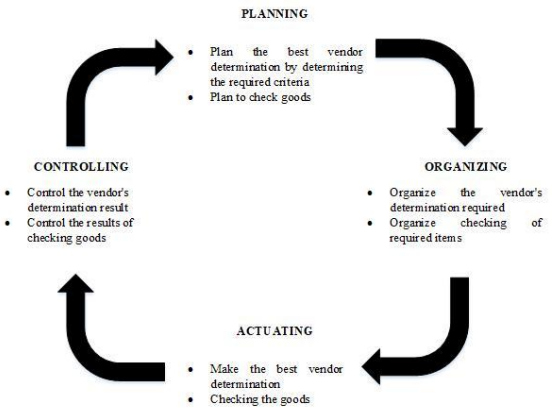


Figure 3 POAC Cycle

2.4.1 POAC Analysis Vendor Determination

1. *Planning*

This stage is the planning stage for vendor determination. The data needed for planning determines the vendor based on transaction data, vendor data, vendor determination criteria data. Here is one of the data criterion of determining vendor like table 1.

Table 1 Vendor Criterion Data

Vendor Criteria Data
1. Product Selling Cost
2. Delivery Time
3. Product Quality

2. *Organizing*

This stage is the stage where the vendor determines the organization. The case example is the demand for goods ordering in January 2017 office furniture. Required data in determining vendor for demand for goods ordering in January 2017 is demand data of ordering goods in January 2017, alternative data of office furniture vendor, and vendor criterion data to determine vendor selection.

3. *Actuating*

This stage is to determine the vendor using the tool that is SAW Method. In a January 2017 transaction, the Company obtained a request for the procurement of office furniture items

a. Criteria Code

Criteria data contains code, name, weight, attribute. The weight of the value determines how important the criteria are. Determination of the weight of the value performed by the Supervisor. Determination of the weight of the value of the company conducted every period or 6 months. Attribute criteria consist of benefit or cost, where the benefit means the greater the value the better, while the smaller the value the better the value. The determination of the vendor criterion value weight is done with a maximum total criterion value of 100. The supervisor will determine which criteria are considered more important. Criteria vendors who are considered more important company will be given the weight of more value as the following table.

Table 2 Weight of Vendor Criteria Values

No	*Code*	*Name Criteria*	*Weight Value*	*Attribute*
1	*C1*	*Product Selling Cost*	*40*	*Cost*
2	*C2*	*Delivery Time Item*	*30*	*Benefit*
3	*C3*	*Product Quality*	*30*	*Benefit*

b. Alternate Vendor Code

Alternate vendor data provided with an alternative code. Alternate vendor data is partly determinant to determine vendor determination.

c. Calculation of SAW Method

- Analytical Stage

This stage provides values on vendor alternatives based on the company provided. Determination of value weighting criteria is done by the production section of each transaction. Here is an average determination of the value of each vendor with a minimum of 10 to a maximum of 100 as the following table 3.

Table 3 Average Table Weight Value of Each Vendor

Code	*Name Criteria*	*Weight Value*	*Attribute*	*Description*
C1	*Product Selling Cost*	*10 – 30*	*Cost*	*Very Cheap Costs*
		≥ 30 – ≤ 50		*Cheap*
		≥ 50 – ≤ 70		*Expensive*
		≥ 70 –100		*Very Expensive*
C2	*Delivery Time Item*	*≥ 70 –100*	*Benefit*	*Very Good*
		≥ 50 – ≤ 70		*Good*
		≥ 30 – ≤ 50		*Late*
		10 – 30		*Very Late*
C3	*Product Quality*	*≥ 70 –100*	*Benefit*	*Excellent*
		≥ 50 – ≤ 70		*Good*
		≥ 30 – ≤ 50		*Bad*
		10 – 30		*Very Bad*

The following is the weighting criteria of the value that has been made part production with a minimum value of 10 to a maximum of 100 as the following table 4.

***Tabel 4** Analysis Vendor Table*

Alternate Vendor Code	C1	C2	C3
A1	10	70	60
A2	40	60	80
A3	20	80	70
A4	30	90	90

- *Normalization stage*

For criterion C1, because the cost then the search min (10, 40, 20, 30) = 10, so to:A1 = 10 / 10 = 1
A2 = 10 / 40 = 0,25
A3 = 10 / 20 = 0,5
A4 = 10 / 30 = 0,33

For criterion C2, because the benefit is then sought max (70, 60, 80, 90) = 90, so to:
A1 = 70 / 90 = 0,78
A2 = 60 / 90 = 0,67
A3 = 80 / 90 = 0,89
A4 = 90 / 90 = 1

For criterion C3, because the benefit then the sought max (60, 80. 70. 90) = 90, so to:
A1 = 60 / 90 = 0,67
A2 = 80 / 90 = 0,89
A3 = 70 / 90 = 0,78
A4 = 90 / 90 = 1

Calculation results Normalization as the following table 5.

***Table 5** Normalization Result Table*

Alternate Vendor Code	C1	C2	C3
A1	1	0,78	0,67
A2	0,25	0,67	0,89
A3	0,5	0,89	0,78
A4	0,33	1	1

- *Ranking Stage*

In the ranking stage it will multiply the criterion weight by each row of the normalized value matrix as follows.
*A1 = (1 * 40) + (0,78 * 30) + (0,67 * 30) = 83,5*
*A2 = (0,25 * 40) + (0,67 * 30) + (0,89 * 30) = 56,8*
*A3 = (0,5 * 40) + (0,89 * 30) + (0,78 * 30) = 70,1*
*A4 = (0,33 * 40) + (1 * 30) + (1 * 30) = 73,2*

The results obtained from the ranking calculation as the following table 6.

***Table 6.** Results Ranking Table*

Alternate Vendor Code	C1	C2	C3	Total	Rank
	40	30	30		
A1	1	0,78	0,67	83,5	1
A2	0,25	0,67	0,89	56,8	4
A3	0,5	0,89	0,78	70,1	3
A4	0,33	1	1	73,2	2

- ***Conclusion Phase***

Based on the above table then obtained among the alternative vendors that have the largest total value is A1, then Vendor A1 will be selected to be the best choice vendor choice.

4. Controlling

This stage is the stage of controlling the results of vendor determination. The production section will control the vendor's determination result whether the selected vendor is appropriate or not. Controlling the production section is to compare the cost of the type of office furniture items ordered with other vendors

If after controlling the cost of the results obtained by vendor A1 is not appropriate or the cost of goods in vendor A1 is more expensive than other vendors, then the production section will do the evaluation by replacing the vendor alternative to the vendor chooses to the 2nd. Production will change the weight of the vendor's criteria value accordingly With the cost ratio. Production Section will report to the Supervisor for knowledge of superiors.

2.4.2 POAC Analysis Checking Goods

1. Planning

This planning stage is the stage where the Production Division will perform the goods checking plan. To check the goods, required data that must be prepared ie goods data from vendors and data criteria checking goods. Here one of the data planning criteria checking goods such as the following table 7.

Table 7. *Table of goods check criteria*

Standard Data Check Criteria CV. Mahkota Sakti		
No	***Item Type***	***Criteria***
1	*Medical Health*	*Procurement Document*
	Electricity	*Document Specification Goods*
	Electronic	*Packaging Goods*
		Goods Warranty
		Quantity of Goods
		Quality Goods
		Trial of Goods
2	*Office Furniture*	*Procurement Document*
		Document Specification Goods
		Quality Goods
		Quantity of Goods
3	*Clothing*	*Procurement Document*
		Document Specification Goods
		Quantity of Goods
		Quality Goods
		Packaging Goods

2. Organizing

This stage is the organizing stage of goods checking. The case example is the demand for goods ordering in January 2017. To check the goods on demand for goods order in January 2017 required goods data from vendor in January 2017,

After preparing the goods data from the vendor, then next to the data planning criteria checking goods according to the type of goods ordered. The type of goods ordered on demand ordering goods in January 2017 is the office furniture, then done the data planning criteria checking of office furniture items like the following table 8.

Table 8. *Table of criteria for checking of office furniture items*

Standard Data Check Criteria CV. Mahkota Sakti	
No	***Office Furniture***
	Criteria
1	*Procurement Document*
2	*Document Specification Goods*
3	*Quality Goods*
4	*Quantity of Goods*

3. Actuating

This stage is the stage where the production section will check the goods before being sent to the customer. Checking of goods is done in accordance with the standard data of office furniture inspection

4. Controlling

If any goods are not in compliance with the checking standards, the production department reports to the Supervisor and the production department will return items not meeting those criteria by making a return letter. Vendors must procure goods back with a maximum of procurement time 2 days before the deadline of customer order request. If it has been more than 2 days and the vendor has not made a procurement then the vendor will be penalized. Whereas if the goods have been in accordance with the standards of goods checking, then the production department will report to the supervisor and make the receipt of goods and goods will be ready to be sent to the customer.

2.5 Data Analysis

Data analysis aims to analyze the data to be applied in the system and explain the data required for the system to run properly in accordance with the needs of its use. The following describes how relationships between entities are interconnected with each other

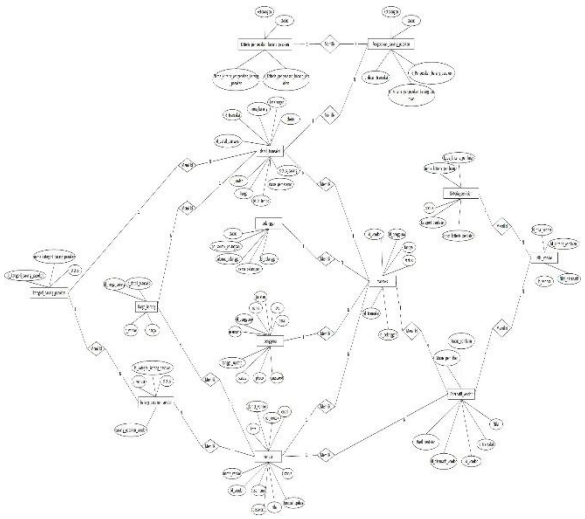


Figure 4 Entity Relationship Diagram

2.6 Non-Functional Needs Analysis

The analysis of non-functional requirements is the analysis needed to determine the system specification requirements. This specification also covers what will be built until the system is implemented. This needs analysis also determines the input specifications required by the system, the output will be generated system and

process needed to process the input so as to produce the desired output.

2.6.1 Hardware Analysis

The hardware used to run a web site-based management information system. The minimum hardware requirements required to run this system are as follows:

- Processor with a minimum speed of 1.8 GHz
- RAM used at least 512MB
- Harddisk used at least 10 GB
- Video Card that can work on 1024 x 768 Pixel
- Network for internet access.

2.7 System Design

System design begins after the analysis phase of the system is done. System design can be defined as the depiction, planning and sketching or arrangement of several separate elements into one unified whole.

2.7.1 Relationship Diagram

In data modeling, entities are presented with entity tables that exist on E-R charts written with a framework of tables containing their attributes called relations schemes. Entity table creation is always guided by the provisions on the way tables are compiled. So that will be obtained arrangement entity table which is a table free from an existence of data. Here is a relation diagram in Figure 5

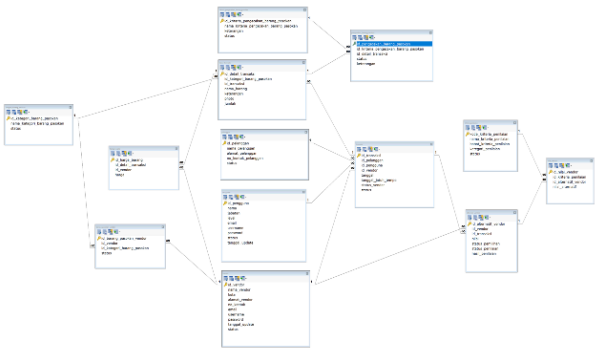


Figure 5. *Relation Diagram*

3. *CLOSING*

3.1 Conclusions

Based on the description of the analysis and testing that has been done, it can be taken a conclusion on Procurement Management Information System In CV. Mahkota Sakti Bandung is as follows:

- *Procurement Management Information System At CV. Mahkota Sakti Bandung is enough to assist the Production Division in planning, organizing and controlling in determining the best vendor determination.*
- *Procurement Management Information System At CV. Mahkota Sakti Bandung is enough to assist the Production Department in doing the planning, organizing, and control in checking the goods sent vendors before sent to customers*

3.2 Suggestions

Based on the conclusions that have been described above, what is expected in the future is for Procurement Management Information System In CV. Mahkota Sakti Bandung can be fixed again the shortcomings, especially in the goods checking. Checking goods at this time only to check the goods alone without any other stage. It is expected that other can be developed more broadly to become Procurement Management Information System that facilitates the user.

BIBLIOGRAPHY

[1] A. Kristanto, "Sistem Informasi," dalam *Perancangan Sistem Informasi Dan Aplikasinya*, Yogyakarta, Gaya Media, 2008, p. 1.

[2] M. Manullang, dalam *Dasar-dasar Manajemen*, Ghalia Indonesia Jakarta, 1983, pp. 15-16.

[3] G. B. Davis, "Sistem Informasi Manajemen," dalam *"Kerangka dasar SIM"*, Jakarta, PT. Pustaka BInaan Pressindo, 1985, p. 23.

[4] 5. Keppres, Pengadaan Barang dan jasa, Jakarta: Keppres, 2010.

[5] G. R. Terry, Principles of Management, New York : Alexander Hamilton, 1953.

[6] B. Perry, "Elsevier Science & Technology Books," dalam *CIMA Learning System 2007 Organisational Management and Information Systems.*, New York , The McGraw-Hill Companies, 2006, p. 70.

[7] H. W. Kusumadewi, "Fuzzy Multi-Attribute Decision Making (Fuzzy MADM), Yogyakarta: Graha Ilmu, 2006.

[8] A. M. Rudianto, Pemrograman Web Dinamis Menggunakan PHP dan MySQL, Yogyakarta: Andi , 2011.

[9] A. M. Rudyanto, Pemrograman Web Dinamis Menggunakan PHP & Mysql., Yogyakarta: C.V Andi Offset, 2011.