

Decision Support System Determines The Best Customers for Giving Rewards Using Weighted Product Method

Suwandi*, Lena Magdalena, Ade Rahmat Hidayat, Wiwiek Nurkomala Dewi, Ika Kartika
Catur Insan Cendekia University

Corresponding author*
suwandi@cic.ac.id

Abstract: Giving rewards to the best customers is one strategy that can increase customer loyalty and satisfaction. The problem is that determining which customers are most worthy of receiving rewards is often a challenge because it requires considering various criteria, such as number of purchases, frequency of visits, and length of membership. The object of this research is PT Citra Kreasi Makmur (CKM) Cirebon, which is one of the leading companies in Indonesia which has distribution rights for the best products and brands from all over the world, such as Philips Home Appliances and others. This research aims to develop a decision support system (DSS) that can help companies select the best customers for giving rewards using the Weighted Product (WP) method. The WP method was chosen because of its ability to carry out calculations based on the weight of each predetermined criterion. The selection process begins by collecting customer data and determining the weight for each criterion. After that, calculations are carried out using the WP method to produce the final value for each customer. The customer with the highest score is considered the best customer who is entitled to a reward. The results of this research can help companies make more objective and precise decisions in giving rewards, as well as increase customer loyalty. Apart from that, this system can also be developed further by adding other relevant criteria according to the company's needs.

Keywords: Decision Support System, Best Customer, Rewards, Weighted Product (WP).

Introduction

One of the important assets for business continuity is customers, especially in service and product-oriented industries. Maintaining customer satisfaction and loyalty is one of the main priorities in business strategy. One effective way to maintain customer loyalty is by giving rewards or awards to customers who contribute significantly to the company (Susanti, S. 2019). However, in practice, determining which customers are worthy of receiving rewards can be a challenge because of the many factors that need to be considered (Sugiarto, A. et al 2020). Therefore, we need a system that can help companies determine the best customers objectively and precisely.

PT. Citra Kreasi Makmur (CKM) Cirebon is a company operating in the retail sector, especially in

the distribution of daily necessities products. As the business develops and competition becomes increasingly fierce, this company relies heavily on customer loyalty to maintain market share. PT. CKM Cirebon has implemented various strategies to increase customer satisfaction, one of which is through a reward program given to customers who are considered to have made a major contribution to sales. In practice, companies often face obstacles in determining customers who deserve to receive rewards fairly and appropriately.

Currently, determining the best customers at PT. CKM is still done manually using basic transaction data such as total purchases and frequency of visits. This method tends to be subjective and does not consider various other criteria that can indicate overall customer loyalty. As a result, some customers who may have a

significant contribution to the company are not properly identified, while some customers who are only active during certain periods actually receive rewards. This condition can cause dissatisfaction among customers who feel worthy but do not receive awards, which in the end can have an impact on decreasing customer loyalty.

Seeing this problem, PT. CKM Cirebon needs a system that is able to identify the best customers in a more objective, fair and data-based manner (Safitri, F. L. et al, 2023). The use of technology in the form of a Decision Support System (DSS) can be a solution to help companies make more appropriate decisions regarding giving rewards (Ikhsanuddin, M. N et al, 2024). This SPK allows processing various relevant criteria, such as number of purchases, transaction frequency, and duration of being a customer, so that companies can provide appropriate rewards to customers who are truly deserving.

In this research, the Weighted Product (WP) method is used as an approach for conducting multi-criteria assessments of customers (Farizhi, M. A., & Diana, A. 2020). This method was chosen because of its ability to give different weights to each criterion that plays a role in determining the best customers. With the WP method, companies can assess customers more comprehensively, where every aspect of customer loyalty is taken into account proportionally according to its importance (Saputro, F. A., & Isyriyah, L. 2021). The implementation of SPK based on the WP method is expected to increase the effectiveness of the reward program at PT. CKM Cirebon.

This research not only focuses on system development, but also on testing its effectiveness in a real environment using PT customer data. CKM (Frendinata, K. 2022). With the expected results, companies can optimize reward programs to increase customer loyalty in a sustainable manner, while creating fairness and transparency in the reward giving process.

Materials And Methods

Research Materials

The materials used in this research are sourced from primary data and secondary data. Primary

data was obtained from the research site, namely by conducting interviews, meanwhile, secondary data was obtained from literature, reference books, articles, journals, theses or theses related to Decision Support Systems for Determining the Best Customers for Giving Rewards Using the Weighted Product Method (Mugiarso, R. 2023).

The research variables used to find the best alternative customers to give rewards consist of 4 assessment criteria that will be tested, namely sales data, returns data, payment data and subscription length data.

Research Procedures

1. Data collection methods

a. Observation

In this research the author made direct observations by visiting and observing the situation that occurred at PT. Citra Kreasi Makmur Cirebon regarding giving rewards (Indriyani, N et al, 2024).

b. Interview

The interview stages were carried out with the Administration Department PT. Citra Kreasi Makmur Cirebon is in charge of creating customer data reports for which rewards will be given.

c. Literature Study

The literature studies in this research were obtained from various sources, namely journals, books, documentation, the internet and libraries.

2. Software Development Methods

The software development method in this research uses the wartefall method (Afdina Tri Dinanti Dewi, A. (2023). The choice of using the waterfall method is because the waterfall method uses a linear and systematic approach, where each phase has a clear beginning and end (Pratama, W, et al, 2024). Each stage, such as requirements analysis, design, implementation, testing, and maintenance, is completed sequentially. This approach makes the development process easier to follow and manage.

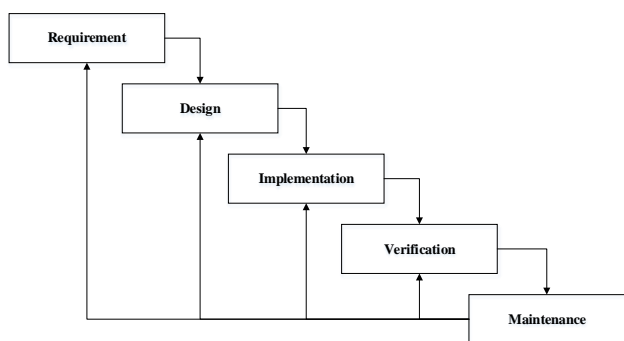


Figure 1 Software Development Method – Waterfall

3. Conceptual Framework

The following is the research framework created by the author:

INPUT	There are 4 customer assessment indicators at PT. Citra Kreasi Makmur, namely: 1. Sales Data 2. Return Data 3. Payment Data 4. Old subscription data
PROCESS	(a) Processing customer data through a decision support system. (b) Application of the Weighted Product (WP) method to calculate the preference value of each customer. (c) Weighting of each criterion based on level of importance. (d) Calculation of the final value of each customer using the WP formula. (e) Evaluate results to determine the best customers.
OUTPUT	(a) List of customers with the highest preference value. (b) The best customers are selected for rewards. (c) Analysis results report showing the criteria and weights used as well as customer ratings.

Figure 2 Conceptual Framework

Results and Discussion

The following is an example of manual calculation of the Weighted Product (WP) method that will be used in the system. The criteria that will be used as assessment indicators consist of 4 criteria, namely purchases, returns, payments and subscription length which have been determined by PT. Citra Kreasi Makmur Cirebon.

Table 1 Assessment Criteria.

Code	Criteria Name
C1	Purchase
C2	Return
C3	Payment
C4	Long time customer

Meanwhile, determining suitability ratings uses a 1-5 scale for weighting, where the 1-5 scale is a policy determined by the company. The following table-2 explains the value of each suitability rating:

Table 2 Suitability Rating.

Weight	Suitability rating
1	Not important
2	Less important
3	Quite important
4	Important
5	Very important

Based on the Product Weight Method, after determining the value of each criterion for the suitability rating, then the preference weight (W) is determined and the weights are corrected and the type of criteria is determined, where W has a negative rank for the cost attribute and a positive rank for the profit attribute. The weight of each criterion is a provision of PT. Citra Kreasi Makmur Cirebon.

Table 3 Improvement of Criteria Weights.

Code	Criteria	Weight	Weight improvement	Attribute type
C1	Purchase	5	0,36	Profit
C2	Return	4	-0,29	Cost
C3	Payment	3	0,21	Profit
C4	Longtime customer	2	0,14	Profit

Here's how to calculate weight improvements using the equation:

$W_{C1} = 5/14 = 0,36$, positive value because of the type of profit attribute

$W_{C2} = 4/14 = -0,29$, negative value because of the type of cost attribute

$W_{C3} = 3/14 = 0,21$, positive value because of the type of profit attribute

$W_{C4} = 2/14 = 0,14$, positive value because of the type of profit attribute

The next step is to determine the suitability rating, as shown in table-4 below:

Table 4 Suitability Rating.

ID	Customer Code	Criteria			
		C1	C2	C3	C4
F1	CTR0800317	100.000.000	3.000.000	5	3
F2	CTR0800090	300.000.000	6.000.000	2	5
F3	CTR0800117	350.000.000	9.000.000	2	4
F4	CTR0800016	450.000.000	12.000.000	3	2
F5	CTR0800018	550.000.000	15.000.000	4	2

After determining the suitability rating, the next stage is to determine the amount of reward that will be received by selected customers.

Table 5 Determination of Reward Amount.

Ranking	Reward
1	5%
2	4%
3	3%
4	2%
5	1%

Data on Rewards at PT. Citra Kreasi Makmur

Berikut ini adalah contoh data pemberian reward dan data ketentuan reward yang saat ini berjalan di PT. Citra Kreasi Makmur Cirebon selama bulan Januari s/d Juni 2023:

Table 6 Data on PT Rewards. CKM Cirebon.

No	Customer Code	Customer Name	Total Purchases	Reward (%)	Reward (Value)
1	CTR0300271	CV. Gandrung	550.000.000	5%	27.500.000
2	CTR0300465	Family Jaya	470.000.000	4%	18.800.000
3	CTR0300027	Mulya Elektronik	300.000.000	3%	9.000.000
4	CTR0300340	Sinar CV	290.000.000	2%	5.800.000
5	CTR0300272	Alam Elektronik	120.000.000	1%	1.200.000

Use Case Diagram

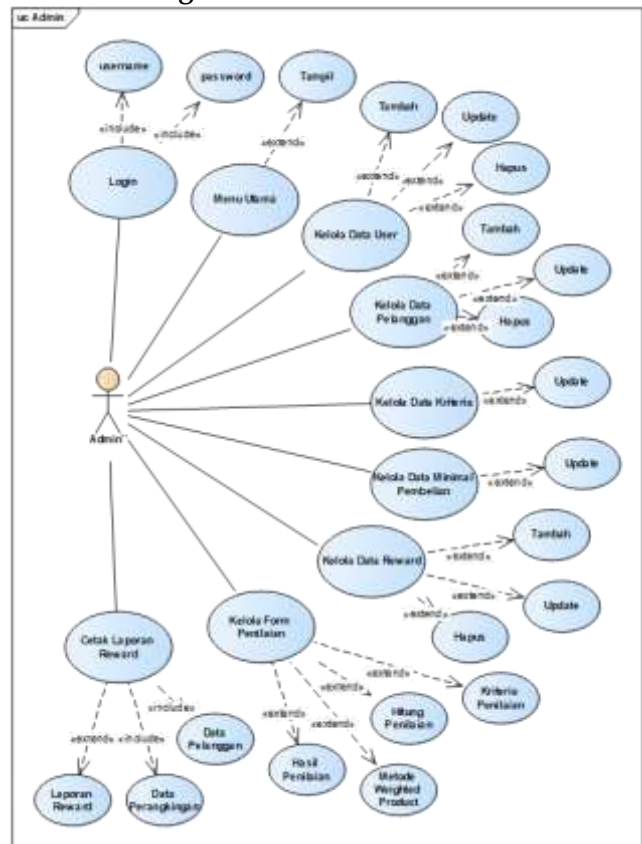


Figure 3 Admin Use Case Diagram.

Program Display

1. Login Form Display

The login form page is a page that can be accessed by the admin section, manager section, and the accounting section can be used to enter and access data in the application. The data required to be able to enter the application is the username and password which have previously been registered in the Decision Support System database for Determining the Best Customers for Giving Rewards Using the Weighted Product Method at PT. Citra Kreasi Makmur Cirebon.



Figure 4 Login Form Display.

2. Admin User Display

2.a. Dashboard View

The dashboard display is the first display the user sees after logging in. This page is used for quick shortcuts to several available menus, the admin section of the dashboard can be seen in Figure 5 below:



Figure 5 Admin Dashboard Display.

2.b. Customer Data Display

The customer data page is a page that displays customer data in the Decision Support System database for Determining the Best Customers for Giving Rewards Using the Weighted Product Method at PT. Citra Kreasi Makmur Cirebon, the customer data display in the admin section can be seen in Figure-6 below:



Figure-6 Customer Data Display.

2.c. Criteria Data Display

The criteria data page is a page that displays the criteria data in the database, there are 4 criteria, namely purchases, returns, payments and length of subscription. The admin section criteria data display can be seen in Figure 7 below:



Figure 7 Criteria Data Display.

2.d. Display of Assessment Results

The assessment results page is the page that will appear after the admin carries out the assessment input process and presses the calculate button. The results of this assessment are the results of calculations for each customer which are input and calculated using the weighted product method in the Decision Support System for Determining the Best Customers for Giving Rewards Using the Weighted Product Method at PT. Citra Kreasi Makmur Cirebon. On this page, ranking and determining rewards are also carried out based on pre-planned conditions. The assessment results can be seen in Figure-8 below:



Figure 8 Display of Assessment Results.

2.d. Reward Report Display

The reward report detail page is a page that displays all data on one report document number sorted based on ranking results and also displays other details including reward results. Admin can also print the selected reward report by pressing the print button at the top of the detailed data of the selected reward report. The detailed display of the admin section reward report can be seen in Figure-9 below:

No	No Bukti	Bulan	Tahun	Status	Berkas
1	000001	Jan	2024	Selesai	[Download]
2	000002	Jan	2024	Selesai	[Download]
3	000003	Jan	2024	Selesai	[Download]
4	000004	Jan	2024	Selesai	[Download]
5	000005	Jan	2024	Selesai	[Download]

Figure 9 Detailed View of the Reward Report.

Conclusion

This research succeeded in designing and implementing a Decision Support System (DSS) to determine the best customers at PT. Citra Kreasi Makmur Cirebon uses the Weighted Product (WP) method. This system is able to process various customer criteria with appropriate weights, resulting in more objective and accurate decisions in the reward giving process. With the implementation of this SPK, PT. Citra Kreasi Makmur is expected to increase customer loyalty through a fairer and more transparent reward system. In the future, this system can be further developed by adding other criteria or expanding implementation to other relevant sectors.

References

- Afdina Tri Dinanti Dewi, A. (2023). Sistem Pendukung Keputusan Dalam Pemberian Reward Bagi Dokter Terbaik Dengan Menggunakan Metode Weighted Product (Doctoral dissertation, Universitas Dehasen Bengkulu).
- Farizhi, M. A., & Diana, A. (2020). Sistem Pendukung Keputusan Pemilihan Karyawan Terbaik Untuk Promosi Jabatan Dengan Metode WP (Weight Product). *Pros. Semin. Nas. Teknoka*, 5(2502), 9-18.
- Frendinata, K. (2022). Sistem Pendukung Keputusan Penentuan Bonus Karyawan Pada PT Mulia Asri Utama Menggunakan Metode Weighted Product Dengan Bahasa Pemrograman Php Dan Database MYSQL (Doctoral dissertation, Universitas Putra Indonesia YPTK).
- Ikhsanuddin, M. N., Srirahayu, A., & Muhammad, N. F. (2024). Implementasi Sistem Pendukung Keputusan Pemilihan Tenaga Kesehatan Terbaik Menggunakan Metode Weighted Product. *Jurnal JTIC (Jurnal Teknologi Informasi dan Komunikasi)*, 8(4), 1152-1159.
- Indriyani, N., Fauzi, A., & Yanto, A. B. H. Y. (2024). Pemodelan Prediksi Penerima Beasiswa Kip-Kuliah Menggunakan Metode Weight Product. *IMTechno: Journal of Industrial Management and Technology*, 5(1).
- Mugiarso, R. (2023). Penentuan Peringkat Pelanggan Terbaik Menggunakan Metode Rank Order Centroid Dan Weighted Product (Studi Kasus Onesnet). *Aisyah Journal Of Informatics and Electrical Engineering (AJIEE)*, 5(2), 135-140.
- Pratama, W., Arifin, M., & Fithri, D. L. (2024). Penerapan Metode Weighted Product Pada Seleksi Penerimaan Karyawan Baru Berbasis Web. *Jurnal SITECH: Sistem Informasi dan Teknologi*, 7(2), 1-10.
- Safitri, F. L., Tullah, R., & Mariana, A. R. (2023). Pemanfaatan Sistem Pendukung Keputusan Customer Terbaik Menggunakan Analytical Hierarchy Process dan Weighted Product. *JURNAL TREN BISNIS GLOBAL*, 3(2), 78-84.
- Saputro, F. A., & Isyriyah, L. (2021). Sistem Pendukung Keputusan Pemberian Reward Bulanan Teknisi Pasang Baru Indihome Menggunakan Metode Weighted Product Studi Kasus PT Telkom Akses Kepanjen. *J-INTECH (Journal of Information and Technology)*, 9(01), 6-10.
- Sugiarto, A., Rizky, R., Susilowati, S., Yunita, A. M., & Hakim, Z. (2020). Metode Weighted Product Pada Sistem Pendukung Keputusan Pemberian Bonus Pegawai Pada CV Bejo Perkasa. *Bianglala Informatika*, 8(2), 100-104.
- Susanti, S. (2019). Sistem Pendukung Keputusan Untuk Penyeleksian Konsumen Terbaik dengan Menggunakan Metode Weighted Product (WP). *Jurnal Teknologi Informasi dan Komunikasi*, 9(1).