CRM Dimensional Analysis and ANP Method for Oil and Gas Industry Sub-contractor in Indonesia in the Context of Reducing Customer Complaints

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Abstract

To enhance competitive advantage in oil and gas industry sub-contractor in Indonesia, the attention to customer satisfaction and customer loyalty should be a priority. This study used the Analytic Network Process (ANP) to determine the strategic dimensions and criteria of Customer Relationship Management (CRM) through interviews and distributed the questionnaires to five experts in the field of CRM oil and gas industry sub-contractor. The results of this research are six main dimensions and twenty-seven criteria for the design of a CRM strategy. It was found that the most important dimension is Customer, Output of CRM, CRM Strategy, CRM Process, Company Workcode Analysis, and Organizational Alignment. The priority of CRM criteria for an effective CRM strategy is Customer Retention.

Keywords

Customer Satisfaction, Customer Loyalty, Analytic Network Process (ANP) method, Customer Relationship Management (CRM).

1. Introduction

Changes in the business paradigm that were previously product-oriented turn to customer loyalty. The highest income from business processes comes from customers; therefore, companies need to identify, satisfy, and retain the most profitable customers (Buttle, 2004). Adding customer loyalty by 5% can increase profits by almost 100% (Gallo, 2014). Customer Relationship Management (CRM) is a multi-perspective business paradigm consisting of people, processes, and technology (Rahimi, 2017).

Several studies have revealed the effect of CRM implementation to the achievement of competitive advantage (Mohammed, Rashid & Tahir, 2014). CRM also has a direct influence on company performance (Dutu & Hălmăjan, 2010). In addition, measurements are not only based on finance but also on non-finance, namely customer satisfaction, employee satisfaction, the number of new customers acquired, or employee fluctuations (Selvam, Gayathri, Vasanth, Lingaraja & Marxiaoli, 2016).

This study examines for dimensions and strategic criteria that influence the preparation and effectiveness of the Customer Relationship Management (CRM) strategy followed by the weighting, which is done by taking into account the interrelationships between dimensions and criteria for Customer Relationship Management (CRM). After that, the mapping of dependent relationships between dimensions and criteria using the Analytic Network Process (ANP) method, afterward the mapping of dimensions and priority of criteria that affect the effectiveness of the Customer Relationship Management (CRM) strategy was conducted.

This research aims to determine the dimensions and strategic criteria for Customer Relationship Management (CRM) as input to reduce the level of customer complaints (Oil and Gas Cooperation Contract Contractors) in the oil and gas industry sub-contractor.

2. Literature Review

2.1 Customer Relationship Management (CRM)

Customer Relationship Management (CRM) is defined as the process concerned with managing customer interactions for the purpose of enhancing the formation and maintaining the long-term profitable relationships (Neely, 1998). CRM enables companies to harness the power of databases, data mining, and interactive technologies to collect and store an unprecedented amount of customer data, build knowledge from that data and spread knowledge generated throughout the organization (Day and Van den Bulte, 2002). The main benefits of Implementing Customer Relationship Management (CRM) is enabling companies to have more effective relationships with business clients and customers (Bose, 2002).

2.2 Analytic Network Process (ANP)

Analytical Network Process (ANP), as a development of the Analytical Hierarchy Process (AHP), can be used in solving problems in selections under conditions of uncertainty (Saaty, 2001). A review of the use of ANP application published in scientific journals shows that the greatest number of uses is to solve the problem of strategic decision making.

ANP explicitly considers the interrelationships between factors through paired comparisons. The strength of the ANP allows decision makers to consider strategic, operational, tangible (quantitative) and intangible (qualitative) measurements in the evaluation process and its ability to assist in measuring and synthesizing a number of factors in a hierarchy or network (Sarkis, 2002).

3. Methods

In this study, the ANP was used to ascertain the importance of weight dimensions and criteria of CRM which will be used as attributes in the design of CRM strategies in oil and gas industry sub-contractor companies. There were three stages in this research:

- Stage 1: Identification of dimensions and criteria for Customer Relationship Management (CRM) based on literature studies and the results of discussions with experts in the oil and gas industry sub-contractor companies. The preparation and distribution of the first stage questionnaire were carried out to eliminate the dimensions and criteria of Customer Relationship Management (CRM).

- Stage 2: Determine the relationships that exist between all dimensions and criteria to describe the structure of the model. The results of this stage had been described as the ANP relationship network.

- Stage 3: Pairwise comparison by experts for weight calculation in the Analytic Network Process (ANP). The results of the second questionnaire were compared to determine the level of importance by using 9-point Saaty's measurement scale. The results had been taken into consideration in the preparation of a Customer Relationship Management (CRM) strategy.

There are also three questionnaires used in this research, here are the explanation for each questionnaire:

- Questionnaire 1: Eliminate and obtain dimensions and criteria for Customer Relationship Management (CRM). Respondents: Business Development Manager (7 years work experience), Senior Sales Manager (8 years and 10 years work experience), and Country Manager (7 years and 14 years work experience).

- Questionnaire 2: Respondents were asked to choose the relationship between the criteria in the inner dependency or outer dependency with 6 (six) dimensions and 27 (twenty seven) criteria for Customer Relationship Management (CRM).

- Questionnaire 3: Pairwise comparisons between dimensions and criteria by experts for weighting calculations in the Analytic Network Process (ANP). Questionnaire 3 was based on the results of the relationship between dimensions and criteria in Questionnaire 2 and arranged in a closed form.

4. Results

4.1 Results of the Stage One Questionnaire

The data was processed using Geometry Mean where the dimensions and criteria whose results were less than 3.5 had been eliminated because they were considered, by experts, do not have significant influence. In the stage one, based on the questionnaire, all dimensions and criteria for Customer Relationship Management (CRM) were considered to have a significant effect. The result is shown in Table 1.

Table 1. Results of the Stage One Questionnaire

CRM Dimension	CRM Criteria	Respondent					Geo Mean
		R1	R2	R3	R4	R5	
CRM Output (CO)	Customer Retention	4	4	4	4	5	4.18
	Customer Acquisition	4	5	4	4	5	4.37
	Share of Wallet	4	5	4	2	5	3.80
Customer (C)	Customer Value	4	4	4	4	5	4.18
	Customer Satisfaction	4	4	3	4	5	3.94
	Customer Loyalty	5	4	3	4	3	3.72
	Customer Response	5	3	4	4	5	4.12
	Customer Trust	5	4	4	4	5	4.37
	Customer Complaints	5	5	4	3	5	4.31
CRM Process (CP)	Customer Targeting	5	4	4	4	5	4.37
	Enquiry Management	4	5	4	3	3	3.72
	Customer Knowledge Generation	4	5	4	3	3	3.72
	Campaign Management	4	4	4	3	3	3.56
	Managing Problems	4	5	4	4	3	3.94
	Product Logistics	4	5	4	4	5	4.37
Organizational Alignment (OA)	Intellectual Alignment	4	5	4	3	5	4.12
	Social Alignment	4	5	4	3	5	4.12
	Technological Alignment	4	5	4	3	5	4.12
Company Workcode Analysis (CWA)	Chargeable	5	5	4	3	5	4.31
	Contract	5	5	4	4	5	4.57
	Engineering Support	5	5	4	4	5	4.57
	Goodwill	5	5	4	4	5	4.57
	Sales Support	5	5	4	4	5	4.57
	Warranty	5	5	4	4	5	4.57
CRM Strategy (CS)	Customer Strategy	4	4	4	4	5	4.18
	Customer Interaction Strategy	4	4	4	4	5	4.18
	Value Creation Strategy	4	4	4	4	5	4.18

4.2 Results of the Stage Two Questionnaire

The result of stage two was the model of relationships between all dimensions and criteria that had been validated by the experts. The results of this stage had been described as the ANP relationship network which shown in Figure 1.
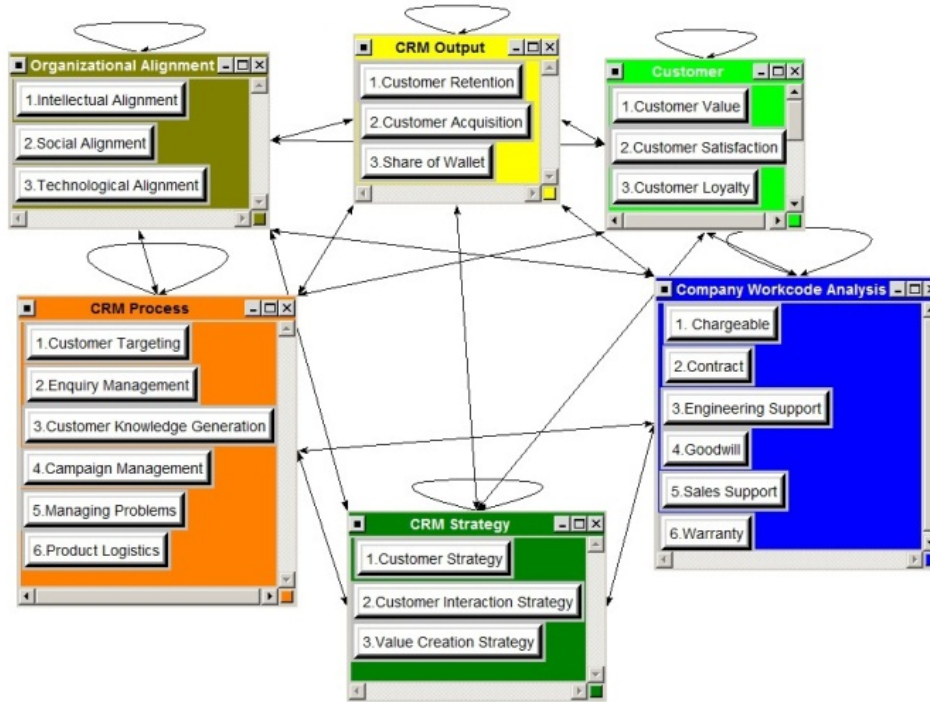
Figure 1. Analytic Network Process (ANP) Model for Customer Relationship Management (CRM) Dimensions and Criteria

4.3 Results of the Stage Three Questionnaire

The results of the third stage questionnaire obtained priority from pairwise comparisons between dimensions and CRM criteria which shown in Table 2.

Table 2. Pairwise Comparison Result

Dimension	Company Workcode Analysis	CRM Output	CRM Process	CRM Strategy	Customer	Organizational Alignment
Company Workcode Analysis	0.035667	0.035667	0.035667	0.035667	0.035667	0.036050
CRM Output	0.092768	0.092768	0.092768	0.092768	0.092768	0.094428
CRM Process	0.116094	0.116093	0.116093	0.116093	0.116094	0.117195
CRM Strategy	0.169636	0.169636	0.169636	0.169636	0.169636	0.167164
Customer	0.537085	0.537086	0.537086	0.537086	0.537085	0.535704
Organizational Alignment	0.048750	0.048750	0.048750	0.048750	0.048750	0.049459

4.4 Determination of Priority and Ranking Criteria

Normalization was used to determine priority and ranking values; therefore, the total score for each group is equal to 1 (one). From the normalization results, it was known that the highest priority value on the Customer Retention criteria is 0.81080 and the smallest priority value on the Chargeable criteria is 0.00776. The results of the ranking criteria can be seen in Table 3:

Table 3. Criteria Ranking of CRM

Dimension	Criteria	Limiting	Normalized	Rank
CRM Output (0.092768)	1.Customer Retention	0.065433	0.81080	1
	2.Customer Acquisition	0.006826	0.08458	18
	3.Share of Wallet	0.008443	0.10462	15
Customer (0.537085)	1.Customer Value	0.014385	0.02512	23
	2.Customer Satisfaction	0.228601	0.39925	7
	3.Customer Loyalty	0.055895	0.09762	17
	4.Customer Response	0.020951	0.03659	22
	5.Customer Trust	0.177410	0.30984	8
	6.Customer Complaint	0.075336	0.13157	13
CRM Process (0.116094)	1.Customer Targeting	0.002709	0.02113	26
	2.Enquiry Management	0.027806	0.21691	10
	3.Customer Knowledge Generation	0.015423	0.12031	14
	4.Campaign Management	0.002964	0.02312	24
	5.Managing Problems	0.070751	0.55192	4
	6.Product Logistics	0.008537	0.06660	21
Organizational Alignment (0.048750)	1.Intellectual Alignment	0.026761	0.61606	2
	2.Social Alignment	0.013457	0.30979	9
	3.Technological Alignment	0.003221	0.07415	20
Company Workcode Analysis (0.035667)	1.Chargeable	0.000271	0.00776	27
	2.Contract	0.003564	0.10202	16
	3.Engineering Support	0.005377	0.15391	11
	4.Goodwill	0.000752	0.02153	25
	5.Sales Support	0.020091	0.57508	3
	6.Warranty	0.004881	0.13971	12
CRM Strategy (0.169636)	1.Customer Strategy	0.010634	0.07587	19
	2.Customer Interaction Strategy	0.057007	0.40674	6
	3.Value Creation Strategy	0.072514	0.51738	5

From the results of pairwise comparisons between dimensions and Customer Relationship Management (CRM) criteria, it was found that the Customer dimension has the highest weight of 0.53709, while the lowest weight is the Company Workcode Analysis dimension accounted 0.03567. The results of the comparison order between dimensions and Customer Relationship Management (CRM) criteria from the highest to the lowest score can be seen in the following Table 4:

Table 4. CRM Dimension Ranking

Dimension	Score	Rank
Customer	0.53709	1
CRM Strategy	0.16964	2
CRM Process	0.11609	3
CRM Output	0.09277	4
Organizational Alignment	0.04875	5
Company Workcode Analysis	0.03567	6

5. Discussion

5.1 Dimensions and Criteria Weighting

This study determined 6 (six) dimensions and 27 (twenty seven) CRM criteria (Table 3). To effectively implement the CRM strategy, the customer dimension must be improved with the support of all the improved performance criteria in the customer dimension.
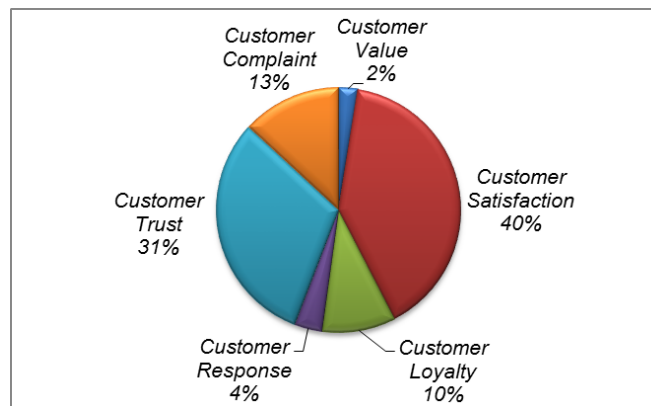

Figure 2. Criteria Weight on the Customer Dimension

Table 5. Ranking CRM Criteria

Criteria	Limiting	Rank
Customer Retention	0.81080	1
Intellectual Alignment	0.61606	2
Sales Support	0.57508	3
Managing Problems	0.55192	4
Value Creation Strategy	0.51738	5
Customer Interaction Strategy	0.40674	6
Customer Satisfaction	0.39925	7
Customer Trust	0.30984	8
Social Alignment	0.30979	9
Enquiry Management	0.21691	10
Engineering Support	0.15391	11
Warranty	0.13971	12
Customer Complaint	0.13157	13
Customer Knowledge Generation	0.12031	14
Share of Wallet	0.10462	15
Contract	0.10202	16
Customer Loyalty	0.09762	17
Customer Acquisition	0.08458	18
Customer Strategy	0.07587	19
Technological Alignment	0.07415	20
Product Logistics	0.06660	21
Customer Response	0.03659	22
Customer Value	0.02512	23
Campaign Management	0.02312	24
Goodwill	0.02153	25
Customer Targeting	0.02113	26
Chargeable	0.00776	27

The increase in customer satisfaction, there will also increase the tendency of customers to re-buy products offered by the company. Customer satisfaction with the company and its products will affect future customer behavior that has a significant impact on business performance. Therefore companies must pay attention to aspects of customer satisfaction and create a CRM system that aims to add and retain loyal customers. The aspects of customer trust will affect the company's revenue when the customer returns to buy the product offered rather than turning to a competitor. Companies can also improve services using complaints given by customers and make it as an evaluation material whose results are applied in the future to achieve better customer satisfaction. The first goal of handling complaints is not only to overcome the root of the problem but also to retain customers. Thus, the steps taken in responding to customers are crucial. The next priority is customer loyalty accounted for 10% weight. Loyalty is the impact of customer satisfaction. Companies also need to consider Customer response and Customer value.

From Table 5, it is known that the top five ranking criteria are consist of criteria originating from different dimensions. With the results of customer retention (0.81080), intellectual alignment (0.61606), sales support (0.57508), managing problems (0.55192) and value creation strategy (0.51738). This shows that criteria from other dimensions have a relationship of dependence and influence on each other.

5.2 Interrelationships between Dimensions and Criteria

Based on the results of the third questionnaire, obtained the relationship between the dimensions and CRM criteria, each dimension and the CRM criteria influence one another. The CRM Output dimension does not influence the Customer dimension but the customer satisfaction criteria affect the customer acquisition criteria. The Customer dimension affects each other with the CRM Process dimension; when the customer is satisfied but the CRM Process is unsatisfactory, it will affect the Customer dimension as a whole. The Organizational Alignment dimension influences the CRM Strategy dimension because the CRM strategy will run effectively if there is support from top management and is in line with the company's mission and vision.

5.3 Designing a Customer Relationship Management (CRM) Strategy based on Dimensions and Criteria

Based on the results of the study, the most important priority dimension is the customer dimension, so the attention or focus of the company to streamline the CRM strategy must be supported by the performance criteria contained therein. If the CRM strategy can work then the criteria in the customer dimension must be improved.

On the other hand, to streamline the CRM strategy, it is necessary to improve the performance of the other criteria as a whole. The criteria that need to be improved are the criteria that have the greatest weight (regardless of the overall dimension of CRM).

5.4 Application of selected dimensions and criteria in bussines of oil and gas industry sub-contractor.

- Customer Retention
  Customer retention in the oil and gas industry sub-contractor is very important as one of the factors in which to support this the company must innovate by increasing the company's value proposition and also offering a better sales program from competitors

- Intellectual alignment
  The industry must be able to balance IT with business strategies, with this combination can streamline resources and also be able to balance finance with company outcomes. Aligning these two things can help companies serve customers in the oil and gas industry sub-contractor better.

- Sales support
  Sales support is one of the criteria for reducing customer complaints. Some of these are strategies that can be applied, namely developing and growing long-term relationships with customers, translating customer

needs, then outlining their desires, looking for clients that allow benefiting the company, developing and growing long-term relationships length with the customer, translating customer needs then describe customer desires.

- Managing Problem
  The problems that exist in the oil and gas industry are how to reduce production costs, the optimum performance of the assets used by companies and how to improve the improvement of the former production environment. If the problems mentioned above can be managed properly, customer complaints will decrease in line with improvements made.

- Value Creation Strategy
  Value creation strategy is one of the criteria that must be done to reduce customer complaints in the oil and gas industry sub-contractor including the cost efficiency of exploration, production, refining, marketing, and overhead costs

6. Conclusions

This research determined six main dimensions and twenty-seven CRM criteria as guidelines for designing a CRM strategy in the oil and gas supporting industry. In order of priority, the following are Customer, CRM Strategy, CRM Output, Organizational Alignment, and Company Workcode Analysis.

The customer dimension is prioritized in the preparation of CRM strategies in the order of criteria (performance indicators) that are in accordance with their influence on the achievement of CRM strategies as follows: Customer Satisfaction, Customer Trust, Customer Complaint, Customer Loyalty, Customer Response and Customer Value.

The priority of criteria that affects the effectiveness of CRM strategies is Customer Retention, Intellectual Alignment, Sales Support, Managing Problems, Value Creation Strategy, Customer Interaction Strategy, Customer Satisfaction, Customer Trust, Social Alignment, and Inquiry Management.

Acknowledgment

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