



## Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author: lamatinulu 1  
Assignment title: No Repo  
Submission title: Interpretive Structural Modeling of Performance Improve...  
File name: Papers\_IJTPE\_Lamatinulu\_Uji\_Turnitin.docx  
File size: 220.97K  
Page count: 9  
Word count: 6,216  
Character count: 34,035  
Submission date: 23-Mar-2023 06:13AM (UTC-0400)  
Submission ID: 2044338984

### Interpretive Structural Modeling of Performance Improvement Strategies on the Perspective of Customers

Lamatinulu M. Dahlan N. Rauf M. Nusran

Department of Industrial Engineering, Universitas Muslim Indonesia, Makassar, Indonesia  
[lamatinulu@gmail.com](mailto:lamatinulu@gmail.com), [mahammad.dahlan@umi.ac.id](mailto:mahammad.dahlan@umi.ac.id), [nurhacwati.rauf@umi.ac.id](mailto:nurhacwati.rauf@umi.ac.id), [mahammad.nusran@umi.ac.id](mailto:mahammad.nusran@umi.ac.id)

**Abstract:** The small and medium enterprises (SMEs) category of the cocoa processing industry as an organization is required to always improve its performance. One of the aspects that need to get the main attention is improving the performance of the customer perspective. This is especially important because it is related to customer satisfaction which is the main requirement in increasing product competitiveness in market share. In connection with this, it was determined that this study aims to develop the level of strategy needed to improve performance sustainably in the SME-scale cocoa processing industry. The method used in this research is the Interpretive Structural Modeling (ISM) method. The results of this study found that there are 13 strategies to improve the performance of the customer perspective, namely there are 6 dependent strategies, 2 linkage strategies, and 6 independent strategies. The finding independent factor strategy is a strategy that has a strong driving force towards performance improvement strategies which include product quality improvement (S<sub>1</sub>), customer service quality improvement (S<sub>2</sub>), product innovation strategy implementation (S<sub>3</sub>), appropriate promotion and information technology-based (S<sub>4</sub>), product development (S<sub>5</sub>) and diversification of information technology-based marketing media (S<sub>6</sub>).

**Keywords:** Strategy, performance, ISM, cocoa industry, SMEs.

#### 1. INTRODUCTION

In 2019 the province of South Sulawesi was the third largest cocoa bean producer in Indonesia with a production of 118,775 tonnes [1]. Although this area is a producer of cocoa beans, there are still fundamental problems that need attention, namely the low added value of cocoa beans produced by the community because most of them are sold in the form of beans with low quality and price. This fact has encouraged community groups in several cocoa-producing regions to develop small and medium-scale cocoa processing industries (SMEs). The existence of a SMEs scale industry is very important to encourage economic growth because on a global scale, it is estimated that it will contribute to the national economy of a country and 80% of it contributes to world economic growth. The

existence of the cocoa industry on an SME scale is something that needs attention because this business group has been able to survive despite the economic crisis. The SMEs scale industry also plays an important and strategic role in regional and national economic growth [2]. Based on the consideration of the important role of SMEs, efforts are needed to increase their performance and productivity. The existence of a SMEs-scale cocoa processing industry in cocoa-producing centers in South Sulawesi is one of the efforts that can support the increase in the economic value added to cocoa beans. The establishment of the cocoa industry is expected to carry out the processing process to produce processed cocoa products such as cocoa butter, cocoa paste, cocoa powder, and several types of derivative products.

The factors that need to be given main attention in the operational activities of the SME-scale cocoa industry in South Sulawesi are increasing competitiveness and performance to be able to achieve high levels of productivity. One important aspect that needs to be improved is the industry's performance in increasing product sales volume. Efforts to increase sales volume are closely related to the ability of an industry to expand market share through a strategy of increasing the number of customers and customer satisfaction. The customer value aspect is one of the important prerequisites that can determine the success of an industrial company in the future because the customer perspective is one of the factors that can significantly influence the performance of industrial companies. [3]. In this regard, to encourage performance improvement and productivity in the cocoa processing industry, a strategy to improve performance from the customer's perspective is urgently needed. The strategy for increasing the value of performance from the customer perspective is especially important to be studied in a structured manner to justify the elements of the strategy that have a strong driving force in improving performance. In connection with the importance of a performance improvement strategy, the main objective of this study is to formulate and design a structural model of a performance improvement strategy from a customer perspective for the SME-scale cocoa processing industry. In connection with the research objectives, the method approach used in designing the structural model of the

# Interpretive Structural Modeling of Performance Improvement Strategies on the Perspective of Customers

*by lamatinulu 1*

---

**Submission date:** 23-Mar-2023 06:13AM (UTC-0400)

**Submission ID:** 2044338984

**File name:** Papers\_IJTPE\_Lamatinulu\_Uji\_Turnitin.docx (220.97K)

**Word count:** 6216

**Character count:** 34035

# Interpretive Structural Modeling of Performance Improvement Strategies on the Perspective of Customers

Lamatinulu M. Dahlan N. Rauf M. Nusran

Article Error (ETS)

Department of Industrial Engineering, Universitas Muslim Indonesia, Makassar, Indonesia

[lamatinulu@gmail.com](mailto:lamatinulu@gmail.com), [muhammad.dahlan@umi.ac.id](mailto:muhammad.dahlan@umi.ac.id), [nurhayati.rauf@umi.ac.id](mailto:nurhayati.rauf@umi.ac.id), [muhammad.nusran@umi.ac.id](mailto:muhammad.nusran@umi.ac.id)

**Abstract-** The small and medium enterprises (SMEs) category of the cocoa processing industry as an organization is required to always improve its performance. One of the aspects that need to get the main attention is improving the performance of the customer perspective. This is especially important because it is related to customer satisfaction which is the main requirement in increasing product competitiveness in market share. In connection with this, it was determined that this study aims to develop the level of strategy needed to improve performance sustainably in the SME-scale cocoa processing industry. The method used in this research is the Interpretive Structural Modeling (ISM) method. The results of this study found that there are 13 strategies to improve the performance of the customer perspective, namely there are 6 dependent strategies, 2 linkage strategies, and 6 independent strategies. The finding independent factor strategy is a strategy that has a strong driving force towards performance improvement strategies which include product quality improvement ( $S_1$ ), customer service quality improvement ( $S_2$ ), product innovation strategy implementation ( $S_8$ ), appropriate promotion and information technology-based ( $S_9$ ), product development ( $S_{13}$ ) and diversification of information technology-based marketing media ( $S_{14}$ ).

**Keywords:** Strategy, performance, ISM, cocoa industry, SMEs.

## 1. INTRODUCTION

In 2019, the province of South Sulawesi was the third largest cocoa bean producer in Indonesia with a production of 118,775 tonnes [1]. Although this area is a producer of cocoa beans, there are still fundamental problems that need attention, namely the low added value of cocoa beans produced by the community because most of them are sold in the form of beans with low quality and price. This fact has encouraged community groups in several cocoa-producing regions to develop small and medium-scale cocoa processing industries (SMEs). The existence of a SMEs scale industry is very important to encourage economic growth because on a global scale, it is estimated that it will contribute to the national economy of a country and 80% of it contributes to world economic growth. The

existence of the cocoa industry on an SME scale is something that needs attention because this business group has been able to survive despite the economic crisis. The SMEs scale industry also plays an important and strategic role in regional and national economic growth [2]. Based on the consideration of the important role of SMEs, efforts are needed to increase their performance and productivity. The existence of a SMEs-scale cocoa processing industry in cocoa-producing centers in South Sulawesi is one of the efforts that can support the increase in the economic value added to cocoa beans. The establishment of the cocoa industry is expected to carry out the processing process to produce processed cocoa products such as cocoa butter, cocoa paste, cocoa powder, and several types of derivative products.

The factors that need to be given main attention in the operational activities of the SME-scale cocoa industry in South Sulawesi are increasing competitiveness and performance to be able to achieve high levels of productivity. One important aspect that needs to be improved is the industry's performance in increasing product sales volume. Efforts to increase sales volume are closely related to the ability of an industry to expand market share through a strategy of increasing the number of customers and customer satisfaction. The customer value aspect is one of the important prerequisites that can determine the success of an industrial company in the future because the customer perspective is one of the factors that can significantly influence the performance of industrial companies. [3]. In this regard, to encourage performance improvement and productivity in the cocoa processing industry, a strategy to improve performance from the customer's perspective is urgently needed. The strategy for increasing the value of performance from the customer perspective is especially important to be studied in a structured manner to justify the elements of the strategy that have a strong driving force in improving performance. In connection with the importance of a performance improvement strategy, the main objective of this study is to formulate and design a structural model of a performance improvement strategy from a customer perspective for the SMEs-scale cocoa processing industry. In connection with the research objectives, the method approach used in designing the structural model of the

performance improvement strategy is the Interpretive Structural Modeling method. Considerations for the use of the ISM method are based on several series of previous studies that examine strategies that are oriented towards improving performance in SME-scale industries using the ISM approach [4]. The ISM method approach in research is directed at justifying strategic elements that have a strong driving force and strategic elements that have a weak thrust. What is used in determining the priority scale of the strategy to be implemented to improve performance on an ongoing basis is the result of ISM analysis.

## 2. MATERIAL AND METHOD

The series of research methods used in determining the formulation and model for structuring the performance improvement strategy is as follows:

### 2.1 Determination of research samples

The population in this study are people who have been customers of the SME-scale cocoa processing industry in South Sulawesi. Determination of the sample based on the purposive sampling technique approach by determining predetermined criteria. The main criteria for respondents in this study are people who understand the products of the cocoa processing industry and people who have knowledge related to processed cocoa products and understand the situation and conditions of consumers of processed cocoa products. Especially for the application of the ISM method in the analysis of the level of performance improvement strategy structuring, expert respondents are needed.

### 2.2 Data collection

Data were collected through literature studies, interviews, and questionnaires. There are 2 types of questionnaires used. Questionnaire 1 is used to identify and justify the required strategy formulation using a Likert scale in the assessment of the established strategy formulation. Questionnaire 2 is used to apply the ISM method in structuring the performance improvement strategy.

### 2.3 Stages of data processing

#### 2.3.1 Determination of the formulation of a performance improvement strategy

The stages of data processing to determine the formulation of performance improvement strategies from the customer perspective are using descriptive statistical method approaches. The descriptive approach to the average method is carried out after the data collected has been declared valid and reliable. Descriptive statistical methods based on the weighted average value have been used by previous researchers [5-6].

#### 2.3.2 Stages of structuring the level of performance improvement strategies

The logical steps for implementing the ISM method were developed by referring to the results of previous research [7-8]. The logical steps can be described as follows:

1. Conduct a literature review and survey involving expert respondents to determine the elements of a

customer perspective performance improvement strategy in the SME-scale cocoa processing industry.

2. For ISM modeling, it is carried out in the second stage, namely building contextual relationships between elements.
3. Prepare a single structured interaction matrix (Structural Self-Interaction Matrix / SSIM). SSIM aims to represent the assessment of expert respondents regarding the relationship between elements. The type of relationship between the two elements is assessed using four symbols as described below:
  - V: Represents the relationship between elements  $E_i$  and  $E_j$ , and not vice versa
  - A: Represents the relationship of the elements  $E_j$  with  $E_i$ , and not vice versa
  - X: Is an interrelationship between  $E_i$  and  $E_j$ , and vice versa
  - O: It is a symbol that  $E_i$  and  $E_j$  are not related
4. Prepare the Reachability Matrix (RM). At this stage, the SSIM symbol is changed to a binary matrix. SSIM to RM conversion steps is carried out using the following rules:
  - Elements  $E_{ij}=1$  and  $E_{ji}=0$  if in SSIM there is a relationship between  $E_i$  and  $E_j=V$
  - Elements  $E_{ij}=0$  and  $E_{ji}=1$  if in SSIM there is a relationship between  $E_i$  and  $E_j=A$
  - Elements  $E_{ij}=1$  and  $E_{ji}=1$  if in SSIM there is a relationship between  $E_i$  and  $E_j=X$
5. Determine the classification of elements of the customer perspective performance improvement strategy into 4 parts, namely autonomous strategies, dependent strategies, linkage strategies, and independent strategies.
6. Define the elements of the strategy at different levels in the form of an ISM structural model. At this stage, the two sets of elements  $E_i$  of the system are connected. At this stage Reachability set ( $R_i$ ) is formed.  $R_i$  is the set of elements achieved ( $E_i$ ), and the Antecedent set ( $A_i$ )
7. Provide preparation digraphs through Canonical's preparation matrix phases by grouping elements at the same level in matrix development.
8. Develop a Directional Graph concept, which is a graph that provides an overview of the elements of the strategy that are related to each other, and hierarchical levels.
9. Interpretive Structural Model Development Stage of performance improvement strategy from the perspective of customers in the SME-scale cocoa processing industry.

## 3. RESULTS AND DISCUSSION

### 3.1 Determining the formulation of a customer perspective performance improvement strategy.

Based on the description of previous research literature studies regarding the determination of Key Performance Indicators Based on the description of previous research literature studies regarding the determination of Key Performance Indicators (KPIs) needed for the customer aspect of the SME-scale cocoa processing industry [9], this

study developed a KPI-based performance improvement strategy. The formulation of a performance improvement strategy from a customer perspective (S) was determined based on the justification from the literature review and the assessment of 75 expert respondents. The assessment of expert respondents regarding the level of importance of the proposed strategy uses 5 scales, namely 1 = not really needed, 2 = not needed, 3 = not needed, 4 = needed, and 5 = really needed. The results of determining the formulation of a customer perspective performance improvement strategy in the SME-scale cocoa processing industry are shown in Table 1.

Table 1. Performance improvement strategy formulation

No.	Strategy formulation	Code
1	Product quality improvement	S <sub>1</sub>
2	Improved customer service quality	S <sub>2</sub>
3	Proper market segmentation	S <sub>3</sub>
4	Appropriate pricing of products	S <sub>4</sub>
5	Application of proper marketing communication	S <sub>5</sub>
6	Customer relationship development	S <sub>6</sub>
7	Differentiation of Processed Cocoa Products	S <sub>7</sub>
8	Product innovation strategy	S <sub>8</sub>
9	Use of information technology in the promotion	S <sub>9</sub>
10	On-time product delivery	S <sub>10</sub>
11	Application of the right product distribution channel	S <sub>11</sub>
12	Information technology-based communication	S <sub>12</sub>
13	Development of processed cocoa products	S <sub>13</sub>
14	Marketing diversification with Information Technology media	S <sub>14</sub>

The results of the assessment have justified that the 14 strategic formulations are needed as a performance improvement strategy. This is shown by the assessment of expert respondents who produce an average weight value of 14 strategic formulations greater than 4.0 as shown in Figure 1. This shows that all 14 strategic formulas from a customer perspective (S) are needed.

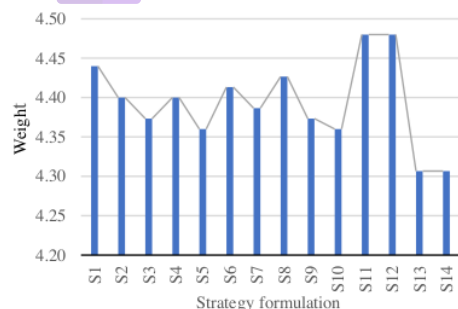


Figure 1. The strategic weight value is required from the customer's perspective.

The results of the assessment of the 14 levels of need for the strategy formulation and the level of accuracy are also strengthened by testing the validity and reliability of the results of the assessment data. This is the basis for ensuring that the data from the respondents' assessments is declared valid, reliable, and accountable. The results of the

data validity test showed that the  $r_{count} > r_{table}$  value was shown in Table 2.

Table 2. Data Validity Test Results

No.	Code	$r_{count}$	$r_{table}$	Results
1	S <sub>1</sub>	0.359	0.226	Valid
2	S <sub>2</sub>	0.416	0.226	Valid
3	S <sub>3</sub>	0.402	0.226	Valid
4	S <sub>4</sub>	0.359	0.226	Valid
5	S <sub>5</sub>	0.400	0.226	Valid
6	S <sub>6</sub>	0.333	0.226	Valid
7	S <sub>7</sub>	0.509	0.226	Valid
8	S <sub>8</sub>	0.468	0.226	Valid
9	S <sub>9</sub>	0.488	0.226	Valid
10	S <sub>10</sub>	0.555	0.226	Valid
11	S <sub>11</sub>	0.444	0.226	Valid
12	S <sub>12</sub>	0.323	0.226	Valid
13	S <sub>13</sub>	0.467	0.226	Valid
14	S <sub>14</sub>	0.364	0.226	Valid

To strengthen the level of trust in the results of data processing for the level of need for performance improvement strategy formulation, a data reliability test was carried out as shown in Table 3. The results of the data reliability test also showed a Cronbach's Alpha value of 0.741. The research instrument is reliable if Cronbach's Alpha value is  $> 0.60$  [10]. This shows that the results of this reliability test are considered reliable because the value of Cronbach's Alpha is greater than 0.60. In this regard, it can be stated that the statements related to the 14 strategic formulations in the research instrument are reliable or consistent and can be trusted.

Table 3. Data Reliability Test Results

Reliability Statistic	
Cronbach's Alpha	N of items
0.741	14

### 3.2 Design a model for structuring the performance improvement strategy customer's perspective.

By paying attention to the formulation of the customer perspective strategy set out in Table 1, a performance improvement strategy structuring model can be compiled using the Interpretative Structural Modeling (ISM) method. In applying the ISM method, the strategy formulation was developed through a literature review and the opinions of expert respondents.

Identification of contextual relationships between elements of the performance improvement strategy formulation from the customer perspective is compiled into SSIM, then a Reachability Matrix is developed. To carry out a strategic analysis that affects improving the performance of the customer perspective in the SME-scale cocoa processing industry, 14 strategic formulations were determined as shown in Table 1. The strategy elements were determined based on literature studies and brainstorming with expert respondents. The stages of developing the ISM model for the elements of performance improvement strategy from the customer perspective can be described as follows:

### 3.2.1 Compilation SSIM

Based on the results of the respondents' assessment through a questionnaire instrument, the SSIM matrix was prepared as the initial stage of the ISM method analysis.

The results of the assessment of contextual relationships between elements of performance improvement strategies from the customer's perspective can be seen in Table 4.

Table 4. Structural Self-Interaction Matrix

Element to-i	Element to-j													
	S <sub>14</sub>	S <sub>13</sub>	S <sub>12</sub>	S <sub>11</sub>	S <sub>10</sub>	S <sub>9</sub>	S <sub>8</sub>	S <sub>7</sub>	S <sub>6</sub>	S <sub>5</sub>	S <sub>4</sub>	S <sub>3</sub>	S <sub>2</sub>	S <sub>1</sub>
S <sub>1</sub>	X	X	V	V	V	V	V	V	V	V	V	V	V	V
S <sub>2</sub>	X	X	V	V	V	V	V	V	V	V	V	V	V	V
S <sub>3</sub>	A	A	A	X	X	A	A	A	X	X	X	X	X	X
S <sub>4</sub>	A	A	X	X	X	V	A	A	X	V	X	V	X	X
S <sub>5</sub>	A	A	X	X	X	V	A	A	X	X	X	X	X	X
S <sub>6</sub>	A	A	X	X	X	A	A	A	X	X	X	X	X	X
S <sub>7</sub>	A	A	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>8</sub>	X	X	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>9</sub>	A	A	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>10</sub>	A	A	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>11</sub>	A	A	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>12</sub>	A	A	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>13</sub>	X	X	V	V	V	X	X	X	X	X	X	X	X	X
S <sub>14</sub>														

### 3.2.2 The preparation steps for the Reachability Matrix

Reachability Matrix (RM) can be formed through SSIM changes by substituting the X symbol, A symbol, X symbol, and O symbol. Substitution for SSIM is either 0 or 1 in RM. The initial RM can be made based on the conditions in the substitution as follows:

1. Enter (i, j) in the form of number 1 and (j, i) number 0 in RM if the sign on SSIM is V
2. Enter (i, j) in the form of number 0 and (j, i) number 1 in RM if the mark on SSIM is A
3. Enter (i, j) in the form of number 1 and (j, i) number 1 in RM if the sign on SSIM is X

4. Enter (i, j) in the form of number 0 and (j, i) number 0 in RM if the sign on SSIM is through the application of the transitivity concept, the initial reachability matrix can be changed to the final reachability matrix. The concept of transitivity can be applied if there is a contextual relationship meaning condition such as A1 is related to B1, B1 is related to C1, then A1 is related to C1. In the process of assessing the contextual relationship in Table 4, no transitivity conditions were found, so it was continued with the preparation of the final reachability matrix as shown in Table 5.

Table 5. Final Reachability Matrix

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>	S <sub>10</sub>	S <sub>11</sub>	S <sub>12</sub>	S <sub>13</sub>	S <sub>14</sub>	DP	R
S <sub>1</sub>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	1
S <sub>2</sub>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	1
S <sub>3</sub>	0	0	1	1	1	1	0	0	0	1	1	0	0	0	6	7
S <sub>4</sub>	0	0	1	1	1	1	1	0	0	1	1	1	0	0	8	5
S <sub>5</sub>	0	0	1	1	1	1	0	0	0	1	1	1	0	0	7	6
S <sub>6</sub>	0	0	1	0	1	1	0	0	0	1	1	1	0	0	6	7
S <sub>7</sub>	0	0	1	1	1	1	1	1	1	1	1	1	0	0	10	4
S <sub>8</sub>	0	0	1	1	1	1	1	1	1	1	1	1	1	1	12	2
S <sub>9</sub>	0	0	1	1	1	1	1	1	1	1	1	1	1	0	11	3
S <sub>10</sub>	0	0	1	0	0	1	0	0	0	1	1	0	0	0	4	8
S <sub>11</sub>	0	0	1	1	1	1	0	0	0	1	1	1	0	0	7	6
S <sub>12</sub>	0	0	1	1	1	1	0	0	0	1	1	1	0	0	7	6
S <sub>13</sub>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	1
S <sub>14</sub>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	1
D	4	4	14	12	13	14	8	7	7	14	14	12	5	4		
H	1	1	7	5	6	7	4	2	3	8	6	6	1	1		

Note: D=Dependence; H=Hierarchy; DP= Driven Power; R = Ranking  
Source: Questionnaire data processing

### 3.2.3 Partition Level

At this stage, each element of the strategy is formed by an intersection set, the reachability set, and the antecedent set. The factor which has the same intersection set and reachability set is level 1 in the ISM hierarchy. After level 1 is identified, this factor is removed, and then it is continued with the next iteration. In the initial iteration process, elements of the strategy for product delivery on time (S<sub>10</sub>) are obtained. In the second iteration, elements of

the right market segmentation strategy are obtained (S<sub>3</sub>). As it was then obtained strategies to improve product quality (S<sub>1</sub>), improve customer service quality (S<sub>2</sub>), product development (S<sub>13</sub>), and diversify information technology-based marketing media (S<sub>14</sub>) is the result of the last iteration with a level 8 position. The number of iteration processes in the analysis is 7, the results are summarized in Table 6.

Table 6. Summary of partition levels for all initial iterations of strategy formulation

Element	Reachability	Antecedent	Intersection	Level
S <sub>10</sub>	S <sub>3</sub> ,S <sub>6</sub> ,S <sub>10</sub> ,S <sub>11</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>3</sub> ,S <sub>4</sub> ,S <sub>5</sub> ,S <sub>6</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>10</sub> ,S <sub>11</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>3</sub> ,S <sub>6</sub> ,S <sub>10</sub> ,S <sub>11</sub>	1
S <sub>3</sub>	S <sub>4</sub> ,S <sub>5</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>4</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>4</sub> ,S <sub>5</sub>	2
S <sub>5</sub>	S <sub>12</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>12</sub>	3
S <sub>6</sub>	S <sub>12</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>12</sub>	3
S <sub>11</sub>	S <sub>12</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>12</sub>	3
S <sub>12</sub>	S <sub>12</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>12</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>12</sub>	3
S <sub>4</sub>	S <sub>7</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>7</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>7</sub>	4
S <sub>7</sub>	S <sub>8</sub> ,S <sub>9</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>8</sub> ,S <sub>9</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>8</sub> ,S <sub>9</sub>	5
S <sub>9</sub>	S <sub>13</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>13</sub> ,S <sub>14</sub>	S <sub>13</sub>	6
S <sub>8</sub>	S <sub>14</sub>	S <sub>1</sub> ,S <sub>2</sub> ,S <sub>14</sub>	S <sub>14</sub>	7
S <sub>1</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	8
S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	8
S <sub>13</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	8
S <sub>14</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	S <sub>1</sub> ,S <sub>2</sub>	8

Based on the level of elements in Table 4, a structural model of a performance improvement strategy can be made from a customer perspective based on a conical matrix. The ISM model is used to demonstrate performance improvement strategies. The strategy elements at level 1 are placed in the top position and the strategy elements at level 8 are placed at the bottom. The ISM model is shown in Figure 2.

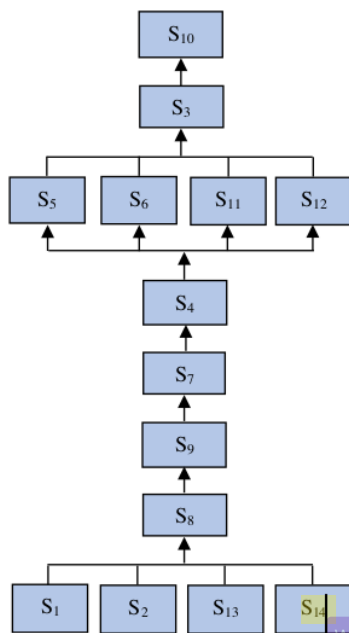


Figure 2. ISM Model Strategy to Deliver Customer Perspective Performance

Based on Figure 2, ISM verification is carried out using the *Matrice d'Impacts Croises-Multiplication Appliquée au Classement* (MICMAC) analysis. The results of the ISM analysis using MICMAC are shown in Figure 3. Based on the results of the MICMAC analysis, elements of performance improvement strategies from the customer perspective for the SME-scale cocoa industry are classified into four categories, namely: autonomous

factors (sector I), dependent barrier (sector II), linkage factors (sector III) and independent factors (sector IV). Sector II consists of strategic elements that have a strong dependence but weak driving power. Strategies in this sector include strategies S<sub>3</sub>, S<sub>5</sub>, S<sub>6</sub>, S<sub>7</sub>, and S<sub>11</sub>. Sector III is a strategic link between the strategies in sector II and sector IV which have a strong dependence on and driving power. Strategic elements in this sector include SP11 and SP12. Sector IV contains a strategy element that has a low level of dependence but has a strong driving power. The strategic elements in this sector include the S<sub>1</sub>, S<sub>2</sub>, S<sub>8</sub>, S<sub>9</sub>, S<sub>13</sub>, and S<sub>14</sub> strategies.

The ISM model in Figure 2 shows that there are 8 levels of strategy structuring needed to improve the performance. The strategy group that is included in the sector (quadrant II) includes 6 strategies at level 1, level 2, and level 3 which include strategies S<sub>3</sub>, S<sub>5</sub>, S<sub>6</sub>, S<sub>10</sub>, S<sub>11</sub>, and S<sub>12</sub>. At the strategic level, it illustrates that the right market segmentation strategy is the main driver of the realization of the right product delivery process. To support the realization of the right market segmentation, a marketing communication system (S<sub>5</sub>) driving strategy is needed, good relationship with customers (S<sub>6</sub>), product delivery accuracy (S<sub>10</sub>), distribution channel accuracy (S<sub>11</sub>), and application of information technology in communication (S<sub>12</sub>). The strategy in this sector can be influenced by the driving strategy in sector III and sector IV. Market segmentation needs to be carried out in the SME-scale cocoa industry because market segmentation is important and can be a product marketing service strategy for customer satisfaction [8]. Communication strategies also need to be developed because the effectiveness of marketing communications can increase customer loyalty [9]. Effective marketing communication needs to be developed to increase customer loyalty. Customer relationships need attention to be developed because this is related to customer response, brand development, customer support, response to prices, and brand preferences [10]. The application of information technology (IT) based marketing communications is a strategy for improving the performance of the customer perspective. The application of information technology can increase the company's speed in facing competitors which can improve company performance [11]. This is in line with research findings which state that the use of IT

such as internet services can improve performance from a customer perspective [12]. Distribution channels are a strategy that needs to be considered if the cocoa processing

industry has a clear market share because distribution channels can affect the effectiveness of product sales [13].

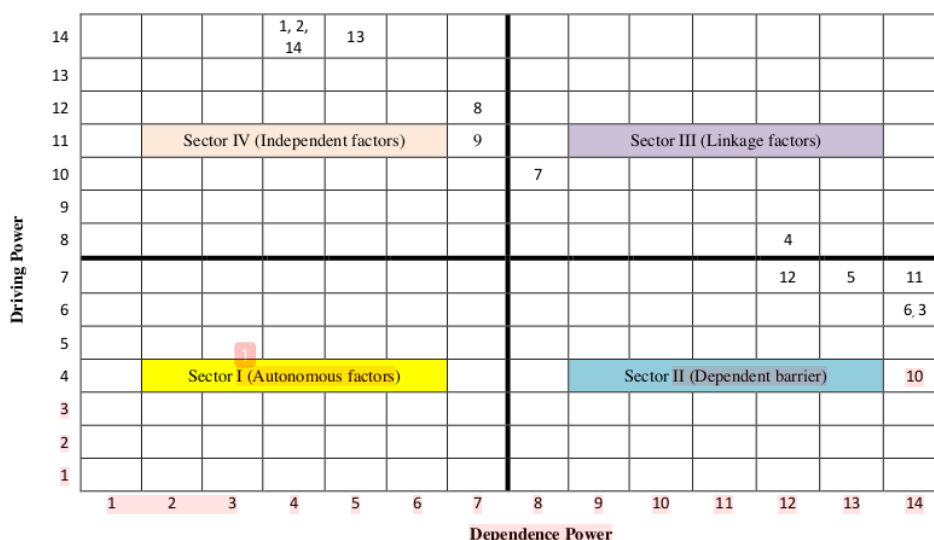


Figure 3. The results of the ISM analysis using MICMAC

Strategies that are in the sector III position include the right product pricing strategy (S<sub>4</sub>) and the cocoa product differentiation strategy (S<sub>7</sub>). These two strategies are at level 4 and level 5 in the ISM model, respectively. Strategies are in the category of hook strategy factors that have a large dependency and driver power so they play an important role in efforts to improve performance. The product price factor of the cocoa industry is also a factor that can influence the purchase motivation of customers, so it needs to be determined appropriately. Pricing needs to consider the aspects of fairness and focus on customers [14] because this can be a strategy to increase product demand from consumers [15]. Product pricing should be determined appropriately as this is one of the key factors in business success. Incorrect pricing has the potential to be one of the causes of the failure of a business venture [16]. Concerning efforts to improve performance in the small cocoa processing industry, it is necessary to determine the penetration price, because this can have an impact on the number of customers, customer loyalty, and quality of customer service [17]. Product differentiation can have an impact on the stability of increasing the number of customers in an industry and can affect marketing performance [18]. Differentiation, based on market and technological innovation, drives the output of brand performance [19] and the slightest product differentiation steps taken in an industrial organization show the fact that it can have an impact on organizational performance [20]. The differentiation strategy is a viable strategy option to be used as a tool to achieve a competitive advantage. The strategy in sector IV is the strategy that has the greatest driving force to realize performance improvements in the SME scale cocoa processing industry.

The strategy in sector IV occupies positions level 7 and level 8 in the design of the ISM model. Strategies that enter sector IV which have the greatest potential include improving product quality (S<sub>1</sub>), improving customer service quality (S<sub>2</sub>), implementing product innovation strategies (S<sub>8</sub>), proper promotion and information technology-based (S<sub>9</sub>), product development (S<sub>13</sub>), and diversification of information technology-based marketing media (S<sub>14</sub>). The implementation of a strategy to improve the quality of processed cocoa products at the scale of SMEs is an especially important factor to improve the performance of customer aspects because this can increase customer satisfaction and customer loyalty [21]. Customer satisfaction and loyalty is a requirement to improve the performance of the customer perspective, so the strategy that aims to achieve this must be implemented. Improving product quality through the application of quality standardization, continuous quality control, and implementation of the Good Manufacturing Process (GMP) is a strategic activity that must be carried out.

The strategy to improve the quality of customer service is an important factor for improving performance from a customer perspective because this strategy has a positive impact on customer satisfaction and loyalty [22]. This strategy can be applied through sales service activities to meet demand, adopting ways to overcome customer complaints, and building communication with customers. Product innovation strategy is applied to design new products that have differences from previous products or are the result of product improvements. Consumers in choosing products based on the criteria of added value or advantages compared to other similar products. This is the basis for the main considerations that an innovation



strategy needs to be applied to the cocoa processing industry because product innovation is the right strategy to increase competitiveness. An innovation strategy based on customer expectations can increase customer interest in an innovative product so that it can contribute to company performance [23]. Innovation strategy is especially important to improve the performance of the cocoa processing industry. This is relevant to the research findings which state that product innovation can affect the improvement of product innovation performance and the performance of SME-scale industries [24-25]. The innovation strategy also needs to consider aspects of value engineering because this is a powerful tool for maintaining quality and producing the best products at the lowest cost [26]. An information technology-based promotion strategy is an important thing to introduce processed cocoa products to consumers. Promotion through the application of information technology is effective in expanding and accelerating the reach of promotion because promotion through information technology has the potential to reach more customers and introduce products faster [27].

#### 4. CONCLUSIONS

Based on the results of data processing and discussion analysis, it can be concluded that it was found that there were 14 strategy formulations needed to improve performance. The formulation of the defined strategy was developed into 8 levels of structuring performance improvement strategies for the SME scale cocoa processing industry. The strategy groups are classified into three categories of strategies needed to improve performance, namely the barrier-dependent strategy element group, the environmental strategy element group, and the independent strategy element group. The dependent barrier strategy consists of strategies related to the feasibility of implementing market segmentation, the right application of marketing communication systems based on the application of information technology, building good relationships with customers, and implementing the right product delivery system. The linkage strategy is a linking strategy between the dependent strategy and the independent strategy of its application through the implementation of product differentiation and price adjustments for processed cocoa products. An independent strategy is a strategy that has the strongest driving power in driving increased performance. This strategy includes the implementation of strategic elements that include strategies to improve product quality, improve customer service quality, process development, and product innovation, implement appropriate promotional methods, and diversify marketing based on information technology.

#### Declaration of competing interest

Related to the writing of this article, all the authors state that there is no problem of competition between financial and non-financial interests in the material discussed in this paper if any of the authors have any financial and non-financial competing interests they must be declared in this section.

#### Acknowledgments

The authors would like to thank the Directorate of Research and Community Service, Directorate General of Higher Education, Ministry of Education and Culture of the Republic of Indonesia

#### REFERENCES

- [1] Central Bureau of Statistics, "Indonesian Cocoa Statistics", BPS- Statistics Indonesian Publishing, Jakarta, 2019.
- [2] Lamatinulu, Ramlawati, M. Dahlan, "Small and Medium Industry Performance Measurement Model"; Nas Media Pustaka, Makassar, Indonesia, 2019.
- [3] R. Neupane, "Relationship Between Customer Satisfaction and Business Performance in Lloyds Bank UK: a case study", International Journal of Social Sciences and Management, Vol. 1, No. 2, pp. 74-85, 2014.
- [4] Lamatinulu, Pratikto, P.B. Santoso, Sugiono, "Design of Strategy to Increase the Added Value and Competitiveness of Products Mini Cocoa Processing Industry Based OVOP with using Interpretive Structural Modeling (ISM)", Journal of Engineering Science and Technology Review, Vol. 10, No.5, pp. 98-103, 2017.
- [5] I.N. Memon, S. Noonari, M. Asif, S.T. Shah, M.B. Peerzado, G.M. Panhwar, A.A. Sethar, G.Y Kalwar, M.A. Bhatti, A.S. Jamro, "Economic analysis of poultry egg production in Quetta District Balochistan", Journal of Fisheries & Livestock Production, Vol. 3, No.137, 1-7.
- [6] Lamatinulu, Mardin, M. Dahlan, "Product Diversification to Increase the Competitiveness of the SMEs-Scale Cocoa Industry in South Sulawesi", ARPN Journal of Engineering and Applied Sciences, Vol. 17, No.14, pp. 1441-1447, July 2022.
- [7] P.S. Poduval, V. R. Pramod, V. P. Jagathy Raj, "Interpretive Structural Modeling (ISM) and Its Application in Analyzing Factors Inhibiting Implementation of Total Productive Maintenance (TPM)", International Journal of Quality & Reliability Management, Vol. 32 Iss. 3, pp. 308 – 331, 2015.
- [8] R.Attri, N. Dev, V.Sharma, "Interpretive Structural Modeling (ISM): An Overview", Research Journal of Management Sciences, Vol. 2, No. 2, pp. 3-8, 2013.
- [9] Lamatinulu, M. Dahlan, Ramlawati, "Identification and determination of the priority of key performance indicators perspective of customers on cocoa processing industry of SMEs scale in South Sulawesi", International Journal of Engineering Sciences & Research Technology, Vol.7, No.7, pp. 41-47, 2018.
- [10] Pallant, J. (2001), "SPSS Survival Manual - A Step By Step Guide to Data Analysis Using SPSS For Windows (Version 10)", Buckingham Open University Press.
- [11] V. Prifti, K. Dhoska, "Information Systems in Project Management and Theirrole in Decision Making", International Journal on Technical and Physical Problems of Engineering (IJTPE)", Issue 53, Vol.14, No.4, pp. 189-194, 2022.
- [12] A. Ghazian, H.M. Hossaini, H. Farsijani, "The effect of customer relationship management and its significant relationship by customers reactions in LG Company",

Procedia Economics and Finance, Vol. 36, pp. 42-50, 2016.

[13] N.R. Obajie, "The Effects of Channels of Distribution on Nigerian Product Sales," International Business & Economics Research Journal, Vol. 10, No.2, pp. 85-91.

[14] M. Hanif, S. Hafeez, A. Riaz, "Factors affecting customer satisfaction", International Research Journal of Finance and Economics, Vol. 60, No. 60, pp. 44-52, 2010.

[15] O.D. Faith, M.A. Edwin, "A review of the effect of pricing strategies on the purchase of consumer goods. International Journal of Research in Management, Science & Technology, Vol.2, No.3, pp. 88-102, 2014.

[16] I.I. Adeyemi, O.H. Gazal L.O. Okpara, "Effects of product pricing on business failure", American International Journal of Contemporary Research, Vol. 3, No. 2, pp. 95-103, 2013.

[17] A. Sije, M. Oloko, "Penetration pricing strategy and performance of Small and Medium Enterprises in Kenya", European Journal of Business and Social Sciences European, Vol. 2, No.9, pp.114-123, 2013.

[18] K.Harapah J.S. Raharja, S.O. Abdoellah, A.Muftiadi, "Effect of product differentiation implementation on marketing performance on apparel industry in Bandung city", IOSR Journal of Business and Management. Vol. 19, No. 5, pp. 41-50, 2017.

[19] N.S. Davcik, P. Sharma, "Impact of product differentiation, marketing investments and brand equity on pricing strategies: A brand level investigation", European Journal of Marketing, Vol. 49, No. 5, p.760-781, 2015.

[20] I.J. Dirisu, O. Iyiola, S.O. Ibiduni, "A tool of competitive advantage, and optimal organizational performance (A study of Unilever Nigeria PLC)", European Scientific Journal, Vol.9, No. 34, p. 258-281, 2013.

[21] S.M. Nuridin, "Effect of service quality and quality of products to customer loyalty with customer satisfaction as intervening variable in PT. Nano Coating Indonesia", International Journal of Business and Applied Social Science, 2018, Vol. 4, No.1, pp.19-31, 2018.

[22] D. Darmawan, R. Mardikaningsih, S. Hadi, "The Effect of Service Quality, Customer Satisfaction, and Corporate Image on Customer Loyalty in the banking sector in Indonesia", IOSR Journal of Business and Management (IOSR-JBM)", Vol. 19, No. 11, pp. 46-51, 2017.

[23] Nuryakin, "Competitive Advantage and Product Innovation: Key Success of Batik Smes Marketing Performance in Indonesia", Academy of Strategic Management Journal, Vol. 17, Iss. 2, pp. 1-17, 2018.

[24] M.M. Rosli, S. Sidek, "The impact of innovation on the performance of small and medium manufacturing enterprises: evidence from Malaysia", Journal of Innovation Management in Small & Medium Enterprise, Vol. 2013, pp.1-16, 2013.

[25] K.T. Beyene, C.S. Shi, W.W. Wu, "The Impact Of Innovation Strategy On Organizational Learning And Innovation Performance: Do Firm Size and Ownership Type Make A Difference ? ", South African Journal of Industrial Engineering, Vol. 27, No.1, pp 125-136 125, May 2016.

[26] M. Abdulkareem S. Naimi, "Development of Products And Construction In Value Engineering, International Journal on Technical and Physical Problems of Engineering (IJTPE)", Issue 53, Vol.14, No.4, pp 247-252, 2022.

[27] B.A. Shaqiri, "Impact of information technology and internet in businesses", Academic Journal of Business, Administration, Law and Social Sciences, Vol. 1, No. 1, pp. 73-79, 2015.

## BIOGRAPHIES



Name: Lamatinulu

Middle Name: -

Surname: Lamatinulu

Birthday: June 08, 1969

Birthplace: Palopo, Indonesia

Bachelor: Industrial Engineering and Management, Industrial Engineering,

Faculty of Industrial Technology, Universitas Muslim Indonesia, Makassar, Indonesia, graduated in 1994.

Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia, graduated in 2002. Doctorate: Manufacturing Industrial Engineering, Mechanical Engineering Department,

Faculty of Engineering, Brawijaya University, Malang, Indonesia, graduated in 2018. The Last Scientific Position:

Assoc. Prof. Bachelor Student, Department of Engineering Faculty of Industrial Technology, Universitas Muslim

Indonesia Makassar, Indonesia, Since 2007. Research Interests: Operation Research, Performance Measurement,

Product Development, Production Planning and Control. Scientific Publications: Has produced 30 articles in

journals and proceedings, 3 books, 7 copyrights, and 5 research projects funded by the government of the

Republic of Indonesia. Scientific Memberships: Indonesian Engineers Association, Indonesian Lecturer

Association



Name: Muhammad

Middle Name: -

Surname: Dahlan

Birthday: November 06, 1966

Birthplace: Jeneponto, Indonesia

Bachelor: Industrial Engineering and Management, Industrial Engineering,

Faculty of Industrial Technology, Universitas Muslim Indonesia, Makassar, Indonesia, graduated in 1993.

Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia, graduated in 1999. The Last Scientific Position: Assoc. Prof. Bachelor Student, Department of Engineering

Faculty of Industrial Technology, Universitas Muslim Indonesia Makassar, Indonesia, Since 2006. Research

Interests: Operation Research, Performance Measurement, Product Development, Production Planning, and Control.

Scientific Publications: Has produced 15 articles in journals, 2 books, 6 copyrights, and 4 research projects funded by the government of the Republic of Indonesia.

Scientific Memberships: Indonesian Lecturer Association, Indonesian Engineers Association.



Name: Nurhayati  
Middle Name: -  
Surname: Rauf  
Birthday: August 21, 1968  
Birthplace: Malakaji, Indonesia  
Bachelor: Industrial Engineering and Management, Industrial Engineering, Faculty of Industrial Technology, Universitas Muslim Indonesia, Makassar, Indonesia, graduated in 1993.  
Master: Industrial Management, Department of Industrial Engineering, Faculty of Industrial Technology, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia, graduated in 2002. Doctorate: Operational Management, Management Science, Economics, Universitas Muslim Indonesia, Makassar, Indonesia, graduated in 2018. The Last Scientific Position: Assoc. Prof. Bachelor Student, Department of Engineering Faculty of Industrial Technology, Universitas Muslim Indonesia Makassar, Indonesia, Since 2008. Research Interests: Quality Control, Product Development, Ergonomics. Scientific Publications: produced 10 articles in journals, 3 books, 3 research projects funded by the Universitas Muslim Indonesia, Scientific Membership: Indonesian Lecturer Association, Indonesian Engineers Association.



Name: Muhammad  
Middle Name: -  
Surname: Nusran  
Birthday: February 12, 1964  
Birthplace: Ujung Pandang, Indonesia  
Bachelor: Agricultural Engineering, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia, Graduated in 1988.  
Master: Management, Institute of Economic Science IPWIJA, Jakarta, Indonesia, graduated in 1997.  
Doctorate: Business Administration / Management, Asia e University (AeU), Kuala Lumpur, Malaysia, graduated 2015. The Last Scientific Position: Assoc. Prof. Bachelor Student, Department of Engineering, Faculty of Industrial Technology, Universitas Muslim Indonesia, Makassar, Indonesia, Since 2007. Research Interests: Industrial Management, Marketing Management, and Halal Management. Scientific Publications: Has produced 43 articles in journals, 12 books, 4 copyrights, and 3 research projects funded by the government of the Republic of Indonesia. Scientific Memberships: Indonesian Lecturer Association, Indonesian Engineers Association.

# Interpretive Structural Modeling of Performance Improvement Strategies on the Perspective of Customers

## ORIGINALITY REPORT

12%

SIMILARITY INDEX

11%

INTERNET SOURCES

7%

PUBLICATIONS

4%

STUDENT PAPERS

## PRIMARY SOURCES

1	<a href="https://repository.umi.ac.id">repository.umi.ac.id</a> Internet Source	2%
2	<a href="https://www.ijisrt.com">ijisrt.com</a> Internet Source	1%
3	Sri Hartuti Husin, Yaswinda Yaswinda. "Analisis Pembelajaran Sains Anak Usia Dini di Masa PANDEMI Covid-19", Jurnal Basicedu, 2021 Publication	1%
4	<a href="https://res.mdpi.com">res.mdpi.com</a> Internet Source	1%
5	<a href="https://www.e3s-conferences.org">www.e3s-conferences.org</a> Internet Source	1%
6	Submitted to Universitas Diponegoro Student Paper	1%
7	Sharafat Ali, Haiyan Xu, Waqas Ahmed, Najid Ahmad, Yasir Ahmed Solangi. "Metro design and heritage sustainability: conflict analysis using attitude based on options in the graph	1%

# model", Environment, Development and Sustainability, 2019

Publication

---

8	<a href="http://www.freepatentsonline.com">www.freepatentsonline.com</a> Internet Source	1 %
9	Devika Kannan. "Role of multiple stakeholders and the critical success factor theory for the sustainable supplier selection process", International Journal of Production Economics, 2018 Publication	1 %
10	<a href="http://id.123dok.com">id.123dok.com</a> Internet Source	1 %
11	<a href="http://www.gssrr.org">www.gssrr.org</a> Internet Source	1 %
12	<a href="http://oa.las.ac.cn">oa.las.ac.cn</a> Internet Source	1 %
13	Raut, Rakesh D., Balkrishna Narkhede, and Bhaskar B. Gardas. "To identify the critical success factors of sustainable supply chain management practices in the context of oil and gas industries: ISM approach", Renewable and Sustainable Energy Reviews, 2017. Publication	1 %
14	<a href="http://aemtconf.org">aemtconf.org</a> Internet Source	1 %

---

---

Exclude quotes      On

Exclude matches      < 1%









Exclude bibliography      On

# Interpretive Structural Modeling of Performance Improvement Strategies on the Perspective of Customers

---








PAGE 1

---

-  **Article Error** You may need to use an article before this word. Consider using the article **the**.
-  **Article Error** You may need to remove this article.
-  **Confused** You have a spelling mistake near the word **an** that makes **an** appear to be a confused-word error.
-  **Article Error** You may need to remove this article.
-  **Article Error** You may need to remove this article.
-  **Missing ","** You may need to place a comma after this word.
-  **Missing ","** You may need to place a comma after this word.
-  **Wrong Article** You may have used the wrong article or pronoun. Proofread the sentence to make sure that the article or pronoun agrees with the word it describes.

PAGE 2

---

-  **Wrong Article** You may have used the wrong article or pronoun. Proofread the sentence to make sure that the article or pronoun agrees with the word it describes.
-  **Confused** You have used **A** in this sentence. You may need to use **an** instead.
-  **S/V** This subject and verb may not agree. Proofread the sentence to make sure the subject agrees with the verb.
-  **Article Error** You may need to remove this article.
-  **Proper Noun** If this word is a proper noun, you need to capitalize it.
-  **Proper Noun** If this word is a proper noun, you need to capitalize it.
-  **P/V** You have used the passive voice in this sentence. Depending upon what you wish to emphasize in the sentence, you may want to revise it using the active voice.



**P/V** You have used the passive voice in this sentence. Depending upon what you wish to emphasize in the sentence, you may want to revise it using the active voice.

PAGE 3

---



**Frag.** This sentence may be a fragment or may have incorrect punctuation. Proofread the sentence to be sure that it has correct punctuation and that it has an independent clause with a complete subject and predicate.



**Article Error** You may need to remove this article.



**Article Error** You may need to remove this article.



**P/V** You have used the passive voice in this sentence. Depending upon what you wish to emphasize in the sentence, you may want to revise it using the active voice.



**P/V** You have used the passive voice in this sentence. Depending upon what you wish to emphasize in the sentence, you may want to revise it using the active voice.

PAGE 4

---



**Missing ","** You may need to place a comma after this word.



**Missing ","** You may need to place a comma after this word.



**Missing ","** You may need to place a comma after this word.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Article Error** You may need to remove this article.



**Missing ","** You may need to place a comma after this word.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.





**Article Error** You may need to remove this article.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Article Error** You may need to remove this article.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Missing ","** You may need to place a comma after this word.



**Missing ","** You may need to place a comma after this word.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Confused** You have used **A** in this sentence. You may need to use **an** instead.



**Missing ","** You may need to place a comma after this word.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Garbled** Grammatical or spelling errors make the meaning of this sentence unclear. Proofread the sentence to correct the mistakes.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**Proper Noun** If this word is a proper noun, you need to capitalize it.



**P/V** You have used the passive voice in this sentence. Depending upon what you wish to emphasize in the sentence, you may want to revise it using the active voice.



**Article Error** You may need to use an article before this word. Consider using the article **the**.

PAGE 5

---



**Dup.** You have typed two **identical words** in a row. You may need to delete one of them.



**Article Error** You may need to use an article before this word.



**Article Error** You may need to remove this article.



**Article Error** You may need to use an article before this word.



**Wrong Article** You may have used the wrong article or pronoun. Proofread the sentence to make sure that the article or pronoun agrees with the word it describes.



**Confused** You have a spelling mistake near the word **an** that makes **an** appear to be a confused-word error.



**Article Error** You may need to remove this article.



**Article Error** You may need to remove this article.



**Article Error** You may need to remove this article.



**Prep.** You may be using the wrong preposition.

PAGE 6

---



**Missing ", "** You may need to place a comma after this word.



**Proofread** This part of the sentence contains a grammatical error or misspelled word that makes your meaning unclear.



**S/V** This subject and verb may not agree. Proofread the sentence to make sure the subject agrees with the verb.



**Article Error** You may need to remove this article.



**Article Error** You may need to remove this article.



**Article Error** You may need to use an article before this word. Consider using the article **the**.



**Missing ","** You may need to place a comma after this word.

PAGE 7

---



**Article Error** You may need to use an article before this word. Consider using the article **the**.



**Article Error** You may need to use an article before this word. Consider using the article **the**.



**Missing ","** You may need to place a comma after this word.



**Article Error** You may need to use an article before this word.



**Possessive** You may need to use an apostrophe to show possession.



**Missing ","** You may need to place a comma after this word.

PAGE 8

---

PAGE 9

---