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# Value Chain Analysis to Implementation of Indonesian National Standard (SNI) Batik With ISO Methodology Approach

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**Abstract.** In 2017 the value of batik exports increased from US \$ 39 million to US \$ 51.15 million where most of the exporters were SMEs. However, to be able to market their products, required product quality requirements that have been determined, in this case the standard has an important role in helping SMEs to improve product quality and can market their products abroad. At present there are only 8 SMEs from 47,775 SMEs that have implemented SNI batik. One way to improve the implementation of SNI batik in Indonesia is by knowing information about the benefits of the implementation of SNI so that this information is expected to increase the implementation of SNI batik. The ISO Methodology approach is used to find out the benefits of implementing standards based on the company's value chain. The results show that the business functions of procurement and technology development have a more significant relationship with the benefits of standardization for SMEs according to ISO.

## 1. Introduction

The development of international trade currently leads to a form of free trade which aims to reduce or eliminate barriers in trade in goods [1]. In addition, free trade can also affect the value of exports and imports in a country, one of which is Indonesia. This was marked by the export value in November reaching US \$ 15.28 billion, an increase of 0.26% compared to October 2017, while the value of Indonesia's imports in November 2017 reached US \$ 15.15 billion, an increase of 6.42% compared to October 2017 [2]. In increasing the export value, Small and Medium Enterprises (SMEs) are one of the factors that impact the increase in exports, this is indicated by the increase in the export value of SMEs in 2017 reaching IDR 20.27 billion to IDR 24.47 billion, which increased by 20,72% [3]. One area of the SMEs sector that has increased is in the textile sector and its derivatives in particular are batik products, batik is one of Indonesia's cultural heritage products that has been recognized by UNESCO on October 2, 2009. For this recognition, Indonesian batik is able to compete with other countries' products which is similar to batik in the country and abroad. According to [4] the export value of batik SMEs has increased starting from June 2017 which reached US \$ 39 million until October 2017 reaching US \$ 51.5 million.

Based on the increase in export value, it is known that even if implementing SNI or not, batik products currently have a great opportunity in marketing their products, this is reinforced by the level of batik sales that have not implemented SNI in 2015 reaching IDR. 5.6 trillion [5]. But in marketing their products to foreign countries, SMEs are required to meet the specified requirements, one of which is product quality assurance. SNI batik is made by adjusting international standards so that products that have SNI certificates can easily enter international market share and encourage SMEs to expand their



product marketing. Even though standards have been provided for batik products, the number of batik SMEs that have implemented SNI in Indonesia is only eight SMEs from 47,775 SMEs [5]. According to the results of research conducted by [7], they stated that the obstacles faced by SMEs in implementing standards caused of the certification process which is not easy and technically difficult to implement. In addition, the cost of testing or certification which is considered expensive is also an obstacle because it can increase production costs.

To change this perception, it is necessary to do a way to convince SMEs that SNI batik has positive benefits for SMEs. This research was used to increase the number of implementation of SNI batik in Indonesian batik SMEs by analyzing the benefits found by SMEs after implementing SNI batik by looking at the value chain based on the ISO methodology approach. ISO has developed a simple, step-by-step methodology and a robust set of tools to measure the economic benefits of standards. The methodology can be implemented to all companies and industry sectors in order to identify the contribution that standards make to their performance [8]. The objectives of the methodology include providing a set of methods to measure the impact of standards on the creation of organizational values with an emphasis on organizational business, provide clear and well-managed criteria for decision makers to assess things related to standards, provide guidelines for assessing benefits from standards in certain industrial sectors [9].

The ISO Methodology approach has been used by several researchers [10]. By using the ISO Methodology framework is to find out the economic benefits of standard implementation for SMEs in the form of financial values seen from the 9 value chain business functions. In the study, researchers sought the impact of implementing standardization in the form of financial value [11] as well as in large-scale industries to find out the benefits of implementing standards in quantitative form. While in this study using ISO methodology to see the benefits of implementing SNI batik according to the perception of stakeholders in the scope of small and medium enterprises (SMEs). This research was conducted based on the ISO methodology approach to obtain information about the benefits found by batik SMEs by looking at the perspective of nine business functions in the value chain. This information is used as an illustration for SMEs that have not implemented SNI batik regarding the benefits found by SMEs in implementing SNI batik. By knowing this information, it is expected to increase sales of batik products in Indonesia and abroad so do increase the number of batik SMEs that implement SNI batik to improve product quality.

The objects in this study were SMEs that had and implemented SNI batik in Indonesia, namely 8 SMEs including Mahkota Laweyan Batik in Surakarta, 16 Semarang Batik in Semarang, Mutiara Hasta Batik in Semarang, Zee Batik in Semarang, UD. Sekar Ayu Wilujeng in Tuban, Satrio Batik in Banyuwangi, Batik Lumbung in East Java, and Batik Diasri Summersari in East Java.

## **2. Research Methodology**

This study consists of four stages, namely identification of batik SMEs that have batik SNI, designing questionnaire measuring instruments, identifying standard impacts and testing hypotheses.

The first stage is the identification of batik SMEs that have SNI certification, at this stage a search for data on the number and information about Batik SMEs in Indonesia that has SNI certificates is conducted.

The second stage is designing a questionnaire measuring device, namely by determining the value chain, value driver's analysis, and determining key performance indicators. The questionnaire uses a Likert scale of 1 to 5, 1 stated strongly disagree, 2 stated disagree, 3 stated normal, 4 stated agree and 5 stated strongly agree, Likert scale uses several questions to measure individual behavior by responding to the 5 points of choice in each item, strongly agree, agree, do not decide, disagree, and strongly disagree [12]. The questionnaire was distributed to 40 respondents from 8 batik SMEs in Indonesia who had SNI certificates where each SMEs consisted of 5 respondents. Then the questionnaire validation was carried out to determine the validity of the questionnaire.

The third stage is the identification of standard impacts using the Weight Means Score (WMS) technique, which calculates the average weight of each variable so that it can determine the average trend of each variable by equalizing the score by interpreting the criteria weights [13].

The fourth stage is testing the hypothesis by using the SEM model, which is to determine the relationship between the benefits of batik SNI for SME with the benefits of standardization for SMEs according to ISO. This study uses a PLS (Partial Least Square)-based SEM model. Partial least square is a multivariate statistical technique that can handle many response variables and explanatory variables at once. This analysis is a good alternative for the method of multiple regression analysis and main component regression, because this method is more robust or immune. Robust means that the model parameters do not change much when new samples are taken from the total population [14]. The hypothesis to be raised in this study is in the table 1.

**Table 1.** Hypothesis Testing

No	Hypothesis
1	Inbound logistics affects the benefits of standardization for SMEs
2	Operation has an effect on the benefits of standardization for SMEs
3	Outbound logistics affects the benefits of standardization for SMEs
4	Marketing and sales affect the benefits of standardization for SMEs
5	Service affects the benefits of standardization for SMEs
6	Human Resources Management impacts the benefits of standardization for SMEs
7	Technology Development affects the benefits of standardization for SMEs
8	Procurement affects the benefits of standardization for SMEs
9	Firm Infrastructure influences the benefits of standardization for SMEs

### 3. Discussion

#### 3.1. Identification of batik SMEs that have SNI certificates

Identification of batik SMEs that have SNI certificates is done by looking for data from government institutions, namely the National Standardization Agency which is tasked with developing and fostering standardization activities in Indonesia. From these sources 8 batik SMEs were obtained that had SNI batik including Mahkota Laweyan Batik, Semarang 16 Batik, Mutiara Hasta Batik, Zie Batik, UD. Bloom Ayu Wilujeng, UD. Batik Satrio, Batik Lumbung and UD. Summersari Batik.

#### 3.2. Designing the Questionnaire

At this stage, the design of a questionnaire consisting of the first 3 stages of ISO Methodology there are to determine the value chain, value driver analysis, and key performance indicators. The stage of determining value chain refers to the porter value chain model, which consists of 9 business functions divided into two activities, namely primary activities consisting of inbound logistics, operations, outbound logistics, marketing and sales, service, then supporting activities consisting of human resource development, technology development, procurement, and firm infrastructure. Continue to do value driver's analysis of each business function and finally determine key performance indicators based on the value drivers that have been determined. From this stage, 47 indicators were used as reference questionnaires by measuring each indicator using a Likert scale of 1 to 5, the questionnaire will be distributed to 40 respondents in 8 batik SMEs with each SMEs consisting of 5 respondents, then validation using SPSS software and obtained 32 valid indicators. The design of the questionnaire can be seen in figure 1 while the selected indicator can be seen in table 2.

<b>QUESTIONNAIRE</b>							
<b>The Identity Of The Respondent</b>							
Name : _____							
Position : _____							
Name Of Company : _____							
Email / Telephone : _____							
Business Function	Value Drivers	Indicator	Scale Option				
			1	2	3	4	5
<i>Inbound Logistics</i>	Control and inventory of raw materials	By applying SNI, the control process and raw material inventory run effectively					
	Warehousing or storage of raw materials	By applying SNI, the system or warehousing layout or storage of raw materials runs efficiently					
<i>Operation</i>	Productivity of equipment use compared to competitors	By implementing SNI, the productivity of facility use increases compared to competitors.					
	Factory layout and goods flow design	Factory layout or placement of production processes and design of goods flow when the production process runs efficiently					

**Figure 1.** Questionnaire**Table 2.** Validation Questionnaire

Business Function	Code	Explanation
<i>Inbound Logistics</i>	V1a	Control and inventory of raw materials
	V2a	Warehousing or storage of raw materials
<i>Operation</i>	V3b	Production control system to improve quality and costs
	V4b	Factory layout
<i>Outbound Logistics</i>	V1c	Flow of finished goods to customers
	V2c	Finished goods warehousing activities
<i>Marketing and Sales</i>	V1d	Market research on customer needs and segmentation
	V2d	innovation in promotions and advertisements
	V3d	Evaluate alternative distribution channels
	V5d	Development of the image quality of goods
<i>Service</i>	V6d	Development of brand loyalty from customers
	V1e	how to accommodate customer input to improve the quality of goods
	V2e	Ability to respond to customer complaints
	V1f	Procedure for recruitment, training, career development for all employees
<i>Human Resource Management</i>	V2f	Feasibility of remuneration, rewards and sanctions systems to motivate employees
	V3f	Maintenance of a work environment that minimizes employee absenteeism and turnover
	V5f	The activeness of managers and technicians in their participation in professional organizations
	V6f	level of job satisfaction and motivation of employees

Business Function	Code	Explanation
<i>Technology Development</i>	V1g	The success of research and development activities in product and process innovation
	V2g	Quality of work relations between employees in the R & D and other parts
	V3g	Quality of work relations between employees in the R & D and other parts
	V4g	Laboratory quality and other facilities
	V5g	Qualifications and experience of laboratory technicians and scientists
	V6g	The ability of the work environment to encourage innovation and creativity
<i>Procurement</i>	V1h	Alternative development of sources of procurement of raw materials to reduce dependence
	V2h	Effectiveness and efficiency of procurement of raw materials, auxiliary materials, materials for production processes and so on in terms of quality, time and price
	V3h	Effectiveness and efficiency of procurement procedures
	V4h	Relations with key suppliers
<i>Firm Infrastructure</i>	V1i	The ability to recognize new opportunities in the market or potential environmental threats
	V2i	Quality of a strategic planning system to achieve company goals
	V6i	Relationship with public decision makers and related groups
	V7i	Public impression of the company

### 3.3. Identification of Impact Standards

At this stage the technique is Weight Means Score (WMS), a technique used to obtain the average of each research variable. The following is an example of a calculation using the Weight Means Score (WMS) technique. Examples of calculations performed on respondents responses 40 respondents to the effectiveness of control and inventory of raw materials (V1a), shown in table 3.

**Table 3.** Recapitulation of Weighted Means Square (WMS) Techniques

No	Alternativee	F	x	f(x)	$M = \frac{\sum f(x)/n}{M = \frac{169}{40}}$
1	Strongly Disagree	0	1	0	
2	Disagree	0	2	0	
3	Neutral	5	3	15	
4	Agree	21	4	84	
5	Strongly Agree	14	5	70	
Total		40		169	4,23

Based on the above calculations, it is known that of the 40 respondents who answered neutral or normal as many as 5 respondents, who answered agreed as many as 21 respondents then those who answered strongly agreed as many as 14 respondents and no respondent chose the answer did not agree. So the results of the interpretation numbers generated from table 4.6 are 4.23 which are included in the criteria strongly agree. Based on the results of the questionnaire calculation recapitulation, it is known that the average score of 32 variables is between 1.81 - 2.60 with disagreement information, in the range of 2.61 - 3.40 with a neutral statement, 3.41 - 4.20 with a statement agreeing and 4,21 - 5,00 with information strongly agreeing. Where there are 24 variables that have a tendency to agree on average

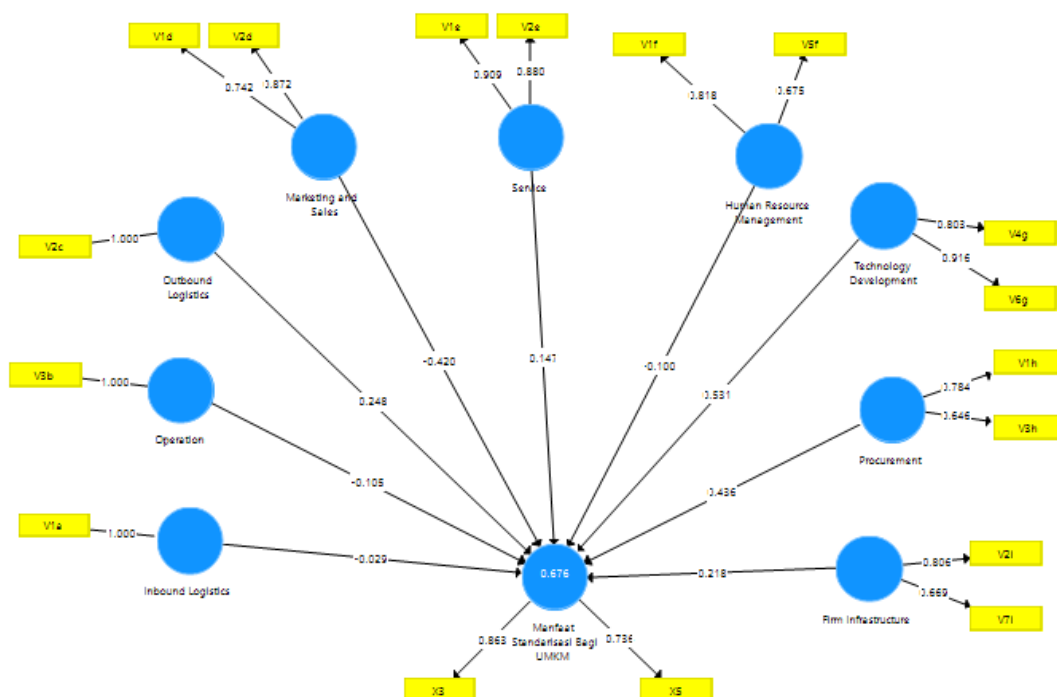
and strongly agree, 5 variables have a tendency to average neutral and 3 variables have a tendency to average disagree.

### 3.4. Hypothesis testing

At this stage the hypothesis is tested using Structural Equation Model (SEM) - Partial Least Square (PLS) to carry out tests related to the relationship between the benefits found by batik SMEs after the implementation of standards with ISO theory regarding the benefits of implementing standards for SMEs. At this stage to find out which business functions have more significant value with the ISO theory regarding the benefits of implementing standards for SMEs. Structural Equation Model (SEM) - Partial Least Square (PLS) is divided into two stages, namely outer model and inner model.

#### 3.4.1. Evaluation outer model.

Evaluation of the outer model is done by measuring convergent validity as well as discriminant validity. Convergent validity is assessed based on the correlation between item scores. The individual reflexive measure is said to be high if it correlates more than 0.70 with the measured variable. However, for the initial research, new items are removed if there are loading factors that are worth under 0.50. The standard of loading factors is greater than 0.50, this is done so that a specific model is obtained. Discriminant validity is measured by square root of average variance extracted (AVE), if the value of construct AVE is greater than the correlation with all other constructs, it is said to have good discriminant validity. In this regard, the measurement value of AVE must be greater than 0.50. The results of the outer model are shown in figure 2 and table 4



**Figure 2.** Results Outer model

Based on the results of the evaluation results outer model in the picture above, it is shown that the model is valid or reliable which is characterized by the value of the loading factor above that is 0.5. To see a clearer recapitulation of the number of loading factors, it can be seen in table 4 and table 5.

**Table 4.** Result of Convergent Validity

<b>Business Function</b>	<b>Code</b>	<b>Loading Factor</b>
<i>Inbound Logistics</i>	V1a	1.000
<i>Operation</i>	V3b	1.000
<i>Outbound Logistics</i>	V2c	1.000
<i>Marketing and Sales</i>	V1d	0.742
	V2d	0.872
<i>Service</i>	V1e	0.909
	V2e	0.880
<i>Human Resource Management</i>	V1f	0.818
	V5f	0.675
<i>Technology Development</i>	V4g	0.803
	V6g	0.916
<i>Procurement</i>	V1h	0.784
	V3h	0.646
<i>Firm Infrastructure</i>	V2i	0.806
	V7i	0.669
Standard benefits for SMEs	X3	0.863
	X5	0.763

**Table 5.** Results of Evaluation of AVE Value

<b>Business Function</b>	<b>AVE</b>
Inbound Logistics	1.000
Operation	1.000
Outbound Logistics	1.000
Marketing and Sales	0.656
Service	0.801
Human Resource Management	0.562
Technology Development	0.742
Procurement	0.516
Firm Infrastructure	0.549
Standard benefits for SMEs	0.644

#### 3.4.2. Evaluation Inner Model.

Evaluation of the inner model is used to test the significant parameters formulated in the hypothesis, and is done to ensure that the structural models are robust and accurate so that hypothesis testing can be done. Evaluation of the inner model can be done by looking at the size of the R-Square. The greater the R-Square, the greater the impact of certain exogenous latent variables on endogenous variables. In this study, the R-Square value was 0.688 for constructs of Standardization Benefits for SMEs. This can be interpreted that 9 business functions have an impact of 6.88% on the benefits of standardization for SMEs so that they can be said to have a fairly strong impact. The model is also robust and the next phase of the hypothesis can be tested.

Hypothesis testing is done using bootstrapping with the test statistic tested is the t test. This test is carried out using SmartPLS software. If p-value  $\leq 0.05$  (alpha 5%) is obtained, with a t value greater



than or equal to t table that is 1.98, it can be concluded that there is an impact between variables or it can be said to be significant. From the results of testing the inner model hypothesis, the results of 2 business functions are obtained which have a significant impact on the benefits of standardization for SMEs, namely Procurement, and Technology Development. The results of testing the outer model hypothesis can be seen in table 6.

**Table 6.** Results of Hypothesis Testing

Hypothesis	p-Values
Inbound logistics -> Benefits of standardization for SMEs	0,811
Operation -> Benefits of standardization for SMEs	0,506
Outbound logistics -> Benefits of standardization for SMEs	0,139
Marketing and sales -> Benefits of standardization for SMEs	0,102
Service -> Benefits of standardization for SMEs	0,492
Human resource management -> Benefits of standardization for SMEs	0,716
Technology development -> Benefits of standardization for SMEs	0,014
Procurement -> Benefits of standardization for SMEs	0,025
Firm infrastructure -> Benefits of standardization for SMEs	0,298

#### 4. Conclusion

To increase the number of implementation of batik SNI in SMEs, information is needed on the benefits of implementing SNI batik to convince SMEs that SNI batik has benefits for it. To obtain this information, this study uses the ISO methodology approach, namely by looking at the benefits of implementing SNI based on the company's value chain. The first stage that was carried out was the identification of batik SMEs that had SNI batik and obtained data of 8 SMEs that had SNI. The second stage was done by designing the questionnaire to using the initial three stages of ISO methodology. From that stage 47 indicators were used as reference questionnaires distributed to 40 respondents, then questionnaire validation was carried out to determine the validity of the questionnaire that had been made as well as for 32 data processing was obtained as valid indicator. Furthermore, the third stage identifies standard impacts using the Weight Means Score (WMS) technique and the results were 24 variables which have a tendency to agree on average and strongly agree, 5 variables have a tendency to average disagree. Next was testing the hypothesis by using the SEM model and obtaining more significant business function results with the benefits of standardization for SMEs according to ISO, namely technology development and procurement.

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