

ENHANCING COMPETITIVENESS OF TEXTILE AND CLOTHING SMALL-MEDIUM INDUSTRIES THROUGH PERFORMANCE MEASUREMENT OF MATERIAL PLANNING USING SCOR METHOD

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ABSTRACT

Competition between products that occurred in Indonesia is very strict, beside to competing with domestic products, Indonesia product also have to compete with imported products. This is because Indonesia has signed free trade AFTA (ASEAN Free Trade Area), which has been signed since 2003, ACFTA (ASEAN China Free Trade Area) in 2010, and MEA in 2015.

The objectives of this research are: (1) Mapping the business processes of material planning system; (2) Determine performance attributes of material planning system; (3) Measuring performance attributes of material planning system; and (4) Formulate and provide recommendations on strategy in material planning system in order to achieve SMI's performance.

The value of the achievement of performance material planning system is processing by Analytical Hierarchy Process (AHP), assisted by Expert Choice. Prior to weighting the value, industry expert opinion must be obtained through a questionnaire that given to the expert.

Identified of mapping business processes on material planning are perfect order fulfillment (reliability), order fulfillment cycle time (responsiveness), upside supply chain flexibility (agility), total supply chain management (cost), and cash to cash cycle time (asset management). The gap in material planning performance occur in additional metric source volume (agility) and deliver fixed asset value (asset management). Percentage of material planning performance is 94%. There are two recommendations: (a) for additional source volume on Agility is to predict material economic order quantity base on fiorecasting method, and (b) for deliver fixed asset value on asset management is to do warehouse relayout and optimize base on storage space restriction.

Key words: material planning, performance, small medium industry, textile and clothing industry, supply chain management, SCOR

1. INTRODUCTION

1.1. Research Background

Competition between products that occurred in Indonesia is very high. Besides competing with other domestic products, Indonesian producers also have to compete with imported products. This is because Indonesia in 2003 signed ASEAN Free Trade Area (AFTA) Agreement, in 2010 signed ASEAN-China Free Trade Area (ACFTA) Agreement, and in 2015 signed ASEAN Economic Community (MEA) Agreement.

Agenda MEA (ASEAN Economic Community) requires Indonesia to have high competitiveness as a provider of textile

products. This is because the MEA aims to minimize the constraints in economic activity across the region.

Indonesia had to work hard to exceed the competition and to survive, and compete in both the national and international markets, thus its main products are hosted in their own country (Nurhasanah, 2013).

1.2. Objective

The objectives of this research are: (1) Mapping the business processes of material planning system; (2) Determining performance attributes of material planning system; (3) Measuring performance attributes of material planning system; and (4) Formulating and providing

recommendations on strategy in material planning system in order to achieve SMI's performance goals.

2. THEORETICAL BACKGROUND

2.1. State of The Art

Studies conducted by SMECDA (2006) entitled "Barriers to Small and Medium Enterprises in Export Activities" states that SMEs still have constraint in productive resources accessibility, product specifications, production capacity, export documents and cost of exports.

Base on observation findings show that barriers to SMEs in accessing productive resources contained in the financing and marketing (64,29%), business networks (57,14%) and technology (42,86%). That condition requires accompaniment as an effort to improve SMEs' access to productive resources.

Research conducted based on performance assessment by Georgise et al (2013) entitled "Implementing the SCOR Model Best Practices for Supply Chain Improvement in Developing Countries" states that some companies in developing countries adopt best practices to improve their industrial performance. It is done to increase the productivity in their industrial operations. But what happens is best practice implementation is not in accordance with the environmental conditions the industry is.

Other studies related to the performance assessment by Gulledge (2013) entitled "Aligning the Supply Chain Operations Reference (SCOR) Model with Enterprise Applications: Real-time Value Chain Intelligence" stated the integration of products, processes, and information. Global

business environment is very complex and rapidly changing, thus affecting customer demand.

Technological advances force companies utilize optimally information system. So that coordinated with suppliers, partners and customers. It is very real challenges of effectively using information technology to identify, communicate and continuously improve internal and external

processes of companies. This study uses the Supply Chain Operations Reference (SCOR) model as a methodology for process management.

2.2. Previous Research

Conducted research titled "Improvement of Competitiveness of Small and Medium Industries Commodities Textile and Textile Product Derivatives in West Java through Development Information System Web-Based for Production Planning and Control Integrated" managed to identify problems that some textile SMI yet have a standard method in planning order materials to the supplier, the impact industry is not able to meet an increasing demand from consumers, and often there is excess materials resulting accumulate working capital in warehouse inventory. (Nurhasanah, 2014)

Other publications relating to the optimization of material planning (Nurhasanah, 2014) titled "Optimizing Planning and Inventory Control Raw Material Products in PT.XYZ" states the importance of considering lead time of raw materials. Fuzzy sets theory by triangular fuzzy number used to optimize this case.

Preliminary research has been done with the title "Model of Business Plan Development Policy Small and Medium Industries Textile Commodities Textile in the county and the city of Bogor" stated that SMI's problem is the continuity of the industry existence.

The first previous research (Nurhasanah, 2010) concluded that the constraints experienced by SMI Textile and Clothing Industry is the capital, marketing and understanding the concept of development of new products. The second previous research (Nurhasanah, 2012) developed SMI Textile and Clothing Industry scenarios with dynamic system simulation approach by using software Powersim 2000.

3. RESEARCH METHOD

This research was preceded by a previous research conducted from literature study. First step of this research is mapping

business process IKM TPT for raw materials planning system by using SCOR metrics first level.

Furthermore, determination of performance attributes by using SCOR metrics second level, and performance measurement by using SCOR metrics third level. The third level is identifying gap

between plan and actual movement in industry.

The final step of this research is formulate and provide recommendations on strategy in system material planning in order to achieve SMI's performance by using root cause analysis. Research method is presented on Figure 1.

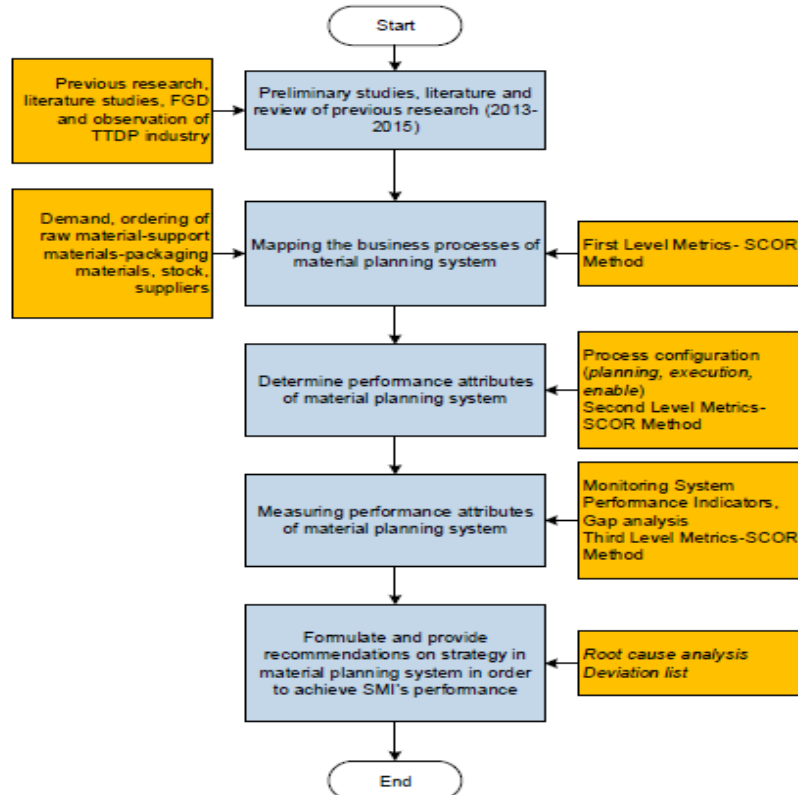


Figure 1. Research Method

4. RESULT AND DISCUSSION

4.1. SCOR Metrics First Level

Mapping the business process of material planning system by using SCOR metrics first level is shown by Table 1.

Table 1. SCOR Metrics First Level

Index	First Level	%
RL.1.1	Perfect Order Fulfillment	100
RS.1.1	Order Fulfillment Cycle Time	100
AG.1.1	Upside Supply Chain Flexibility	75
CO.1.1	Total Supply Chain Management	100
AM.1.1	Cash to Cash Cycle Time	75

4.2. SCOR Metrics Second Level

Determining performance attributes of material planning system by using SCOR metrics second level is shown by Table 2.

Table 2. SCOR Metrics Second Level

Index	Second Level	%
RL.2.1	% of Orders Delivered in Full	100
RL.2.4	Perfect Condition	100
RS.2.1	Source Cycle Time	100
RS.2.3	Delivery Cycle Time	100
AG.2.1	Upside Source Flexibility	50
AG.2.4	Upside Source Return Flexibility	100
CO.2.2	Cost to Plan	100
CO.2.3	Cost to Make	100
AM.2.2	Inventory days of Supply	100
AM.2.3	Pays of Payable Outstanding	50

4.3. SCOR Metrics Third Level

Measuring performance attributes of material planning system by using SCOR metrics second level is shown by Table 3.

Table 3. SCOR Metrics Third Level

Index	Third Level	%
RL.3.7	% Item Location Accuracy	100
RL.3.35	Delivery Quantity Accuracy	100
RL.3.19	% Orders Received Defect	100
RL.3.55	Warranty and Return	100
RS. 3.8	Authorized Supplier	100
	Payment Cycle Time	
RS.3.102	Received Product Cycle Time	100
RS.3.47	in Stock %	100
RS.3.49	Issue Material Cycle Time	100
AG.3.8	Additional Source Volume	0
AG.3.43	Current Supplier Constrains	100
AG.3.7	Additional Source Return Volume	100
AG.3.44	Current Supplier Return of Cycle Time	100
CO.3.104	Cost to Plan Deliver	100
CO.3.106	Cost to Plan Return	100
CO.3.141	Direct Material Cost	100
CO.3.155	In Direct Cost Received Production	100
AM.3.1	% of Hazardous Material in Inventory	100
AM.3.5	% of Production Materials re-used	100
AM.3.11	Deliver Fixed Asset Value	0
AM.3.19	Packaging as % Total Material	100

4.4. Material Planning Performance

To determine value of the achievement of performance material planning system must know the weights of five items first on SCOR metrics.

The scores of the achievement of Performance Material Planning System are calculated by Analytical Hierarchy Process (AHP) method, using Expert Choice software. Input data for the AHP were collected from questionnaires distributed to the experts. Expert is the owner of Textile and Clothing SMI. Table 4 shown the result.

Table 4. Metrics Weight by AHP

Metrics	Weight
Reliability	0,278
Responsiveness	0,220
Agility	0,103
Cost	0,241
Asset Management	0,160
TOTAL	1,000

Thus, material planning system on Textile and Clothing SMI performance is 94%.

This value is derived from the sum of the five metrics which has calculate from first, second and third level. Table 5 presents the overall metric values.

Table 5. Metrics Value

Metrics	Value (%)
Reliability	28
Responsiveness	22
Agility	8
Cost	24
Asset Management	12
TOTAL	94

5. CONCLUSION

- (1) The types of measurement for business processes maps on material planning are perfect order fulfillment (reliability), order fulfillment cycle time (responsiveness), upside supply chain flexibility (agility), total supply chain management (cost), and cash to cash cycle time (asset management). The gap in material planning performance occurred in additional metric source volume (agility) and delivered fixed asset value (asset management).
- (2) Identification of performance attributes are: (a) the percentage of orders delivered in full and perfect condition (reliability), (b) source and delivery cycle time (responsiveness), (c) upside source and resource flexibility (agility), the cost to plan and make (cost), and (d) inventory days of supply and pays of payables outstanding (asset management).
- (3) The gap in material planning performance occur: (a) in additional metric source volume (agility), and (b)

deliver fixed asset value (asset management)

- (4) The study showed the score for material planning performance is excellent at 94%. Two recommendations are given: (a) for additional source volume on agility: predict material economic order quantity based on forecasting method, (b) for delivery fixed asset value on asset management: conduct warehouse re-layout and optimization based on storage space restriction.

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