

# Models of supply chain management in the efforts to develop the banyumasan batik industry

Marcely Susanti\*, Nurlaili, Rachmat Darmawan

Department of Industrial Engineering, Universitas Islam Jakarta, East Jakarta

\*Corresponding author: [marcellysusanti@gmail.com](mailto:marcellysusanti@gmail.com)

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**Abstract.** *Supply Chain Management is a business process system used to manage planning starting from the process of acquiring basic materials until the finished product is by the consumers. The problem that occurs is how the industrialists in the supply chain can distribute the product related to just in just-in-time concept. Such as the Batik Banyumasan Industry which still faces the problem of applying a supply chain model. All this time is still based on a going custom. This research aim is to produce an appropriate supply chain for the characteristics and conditions of the Batik Banyumasan Industry. The object of the study was 45 Banyumasan Batik entrepreneurs in Sokaraja Regency. In this study, data were collected through questionnaires and interviews with Banyumasan Batik entrepreneurs. Information collection was also carried out by way of Focus Group Discussion (FGD), namely to validate the respondents' answers as a basis for conclusions. The analysis data used is descriptive analysis. The research result is managing basic materials properly has an important role in developing the Batik Banyumasan Industry. The research result shows that the effective and appropriate supply model chain for Batik Banyumasan Industrialist is the basic material supply model and no agent distribution product.*

**Keywords:** *participatory and collaborative learning, converter kit, descriptive statistics*

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## 1. Introduction

The cultural result in the textile field of Indonesian society that was born from the process of cultural acculturation is batik, batik has high artistic value and still exists. The artistic value contained in batik is illustrated through a variety of motifs and techniques in making which go through several processes. Batik is a technique of making ornamental varieties by carving the night using canting or stamping tools. The development of batik has historical value and is an important record for the community that owns it. Historical content is a forming element of a motif and technique in batik cloth that undergoes several stages of development (Mulyono, 2011).

At first, batik was only known in the palace environment in Java such as the Surakarta Palace and Yogyakarta Palace, but with the existence of trade relations, government, customs, culture, and religion, now batik can be found in almost all regions in Indonesia, including the Banyumasan region (Retnawati, et al, 2010). Banyumasan Batik is spread throughout Banyumasan district, including in Sokaraja District and Banyumasan District where most of the people pursue batik business. The development of Banyumasan Batik is not known with certainty, because there is no information both written and oral about the origin of Banyumasan Batik. Banyumasan Batik is synonymous with a group of non-geometric motifs dominated by brownish and black base colors. The motifs depicted in Banyumasan batik are distillations of the flora and fauna that live in the natural environment around Banyumasan. The flora that is used as a motif in Banyumasan batik is some flowers and plants that live in community fields such as taro plants, bamboo, coconut tree flowers, and ginger plants. The depiction of fauna takes animals that have proximity to community life activities such as chickens, birds, and butterflies. Compositions from animals and plants are applied to typical Banyumasan motifs, among others: Gowokan, Lumbon, Pring Sedhapur, Angrem Baboon, Manggar, and Jaheyang (Sudantoko, 2010). The motifs in Banyumasan batik represent the life of the people who make it where geographically Banyumasan is an area that is classified as a mixture of coastal culture and inland culture (Utomo, 2012). Acculturation of inland and coastal cultures is the influence of culture around the Banyumasan area, namely, the Pekalongan area, Yogyakarta, and West Java culture which is directly adjacent to the Banyumasan area. The mixing

of cultures produces several unique characteristics in the depiction of motifs in Banyumasan Batik which can be viewed in terms of adding new supporting motifs and colors used.

The production of Banyumasan Batik cloth has a distinctive characteristic, especially in its coloring, namely red and soga colors which are a blend of Chinese culture and indigenous culture. Banyumasan Batik motifs that are still maintained include gringsing/mountain, ringgit/scales, sekar jagad, latohan/public kitchen, parang menag/parang rusak, sido mukti, abang biru (bang biru), tiga negeri, empat negeri, kawong, pasiran, iced tea, tumpal main, tumpal slope, background slope, background ireng, kricak/watu broke and others (Sartika, 2009). The batik process is all done manually so it is a labor-intensive sector. The batik motif contains philosophical meaning which is an original classic product so that it has more value than other batik (Sujadi, 2008). The efficiency and effectiveness of inventory control and accuracy in supplier selection are related to the upstream approach and the smooth production process carried out. In addition, the 'supplier as a partner' approach largely determines the flow of the product to the next stage. The flow of finished goods from companies to consumers is closely related to the downstream approach. The determination of distribution chain will greatly determine the timeliness of the product reaching the hands of consumers. The concept of this approach is better known as supply chain management (SCM), namely the determination of the right value chain that will make the product arrive in the hands of consumers on time (Soekesi, 2010). Supply chain management is a system in business processes that is used to organize a mature plan starting from raw materials obtained to finished goods produced to the final consumer. The problem that arises is how business actors in a supply chain can distribute products following the concept of just in time.

Timely distribution of products to consumers greatly affects the sustainability of these products to survive in the market. The relationship of the concept of on time is inseparable from the flow of the product manufacturing chain from upstream to downstream. The upstream concept refers to the ease, affordability, and sustainability of raw materials and materials obtained by entrepreneurs to start their production activities (Marcelly, 2019). Likewise, the Banyumasan Batik industry in its development also faces problems related to the supply chain. The supply chain models that have been applied to Banyumasan Batik industry are: four supply chain models have been applied by the Banyumasan Batik industry, namely, (1) raw material supply model and product distribution without intermediaries, (2) raw material supply model with intermediaries and product distribution without intermediaries, (3) raw material supply models without intermediaries and product distribution with intermediaries, (4) raw material supply model with intermediaries and product distribution with intermediaries. The application of the supply chain model has not been based on consideration. The application of the model is based only on habits that have been running.

Due to the high demand for Banyumasan batik, the government in Banyumasan regency began to pay attention to the preservation of batik in Banyumasan by providing batik galleries in several villages, such as Papringan Village and its surroundings which functioned as place for making batik and marketing. The management of this gallery is carried out by the local community, the majority of whom are housewives. With the provision of facilities to develop Banyumasan Batik in several villages, it has led to the emergence of new batik producers who also enliven the batik market in Banyumasan, but this does not cause unhealthy competition between batik entrepreneurs. Based on these conditions, in this study testing the four supply chain models will be carried out so that the best model will be obtained in the development of the Banyumasan Batik industry. This study aims to avoid excess and shortage of raw materials by calculating the amount of raw material inventory at PT Semen Bosowa Maros. This study uses the Min-Max Stock method.

## **2. Method**

The object of research is Banyumasan Batik entrepreneurs in Sokaraja Regency as many as 45 people. The reason for choosing this object is because currently, Banyumasan Batik is the flagship product of Sokaraja Regency which always continues to improve the quality and quantity of its products to penetrate the export market.

The collection of research data was carried out by distributing questionnaires to 45 respondents. The outputs in the study include classifying attributes based on the satisfaction of Banyumasan Batik entrepreneurs, attributes that are the top priority to be maintained and improved, the overall

level of satisfaction with services, and proposed improvements to entrepreneurs to penetrate the export market. Research consists of three stages, namely the stages of preparation, data collection, and data processing. In the preparation stage, the author conducts a survey and looks for information related to research. From these results, the author identifies and formulates problems that occur in the field. Then determine the purpose of the research so that the research can focus on problems in the field. Furthermore, determine the service attributes needed by Banyumasan Batik entrepreneurs. The determination of these attributes was through an interview process with resource persons who were Banyumasan Batik entrepreneurs.

In this study, data was collected through questionnaires and interviews with Banyumasan Batik entrepreneurs. Information collection is also carried out utilizing Focus Group Discussion (FGD), which is to validate respondents' answers as a basis for making conclusions. The questionnaire is prepared based on the Saaty scale with weights of values 1 to 9. The weight value 1 describes 'equal importance', this means that the attribute value is the same scale, the weight value is 1, while the weight value 9 describes the case of the attribute being 'absolute importance' compared to everything else (Sudantoko, 2010). A value of 1 means that both criteria (elements) are equally important. A value of 3 means that one criterion (element) is slightly more important than the other (element) criteria. A value of 5 means that one criterion (element) is more important than the other (element) criteria. A value of 7 means that one criterion (element) is more important than another criterion (element). A value of 9 means that one criterion (element) is more important than the other (element) criterion. The values 2, 4, 6, and 8 mean the values between two adjacent criteria (elements) (Probowati, 2011). The thinking framework can be seen in Figure 1.

### 3. Results and Discussion

#### Supply Chain Management Design

The supply chain is a series of relationships between companies or activities in channeling the supply of goods or services from the place of origin to buyers or customers (Indrajit, 2005). Companies in a supply chain have the same goals, namely customer satisfaction, products at low prices, punctuality of delivery, and maintained product quality. The principle of supply chain management prioritizes the flow of information, money, and logistics to optimize material flow through the stages of logistics and operations, both inside and outside the business institution/company (Kusumawati, 2004).

Every company has the same business orientation, which is to generate maximum profit or profit by minimizing the costs incurred. This can be realized by choosing the right supplier or suppliers. Suppliers or suppliers are business partners who play an important role in ensuring the availability of supply goods needed by the Company (Widayati, 2012). The performance of suppliers or suppliers will affect the performance or performance of the company. Therefore, companies need to assess suppliers or suppliers carefully and precisely. Supplier selection is a series of strategic activities, especially if the supplier will supply items that are important and will be used in the long term (Wulandari, 2014).

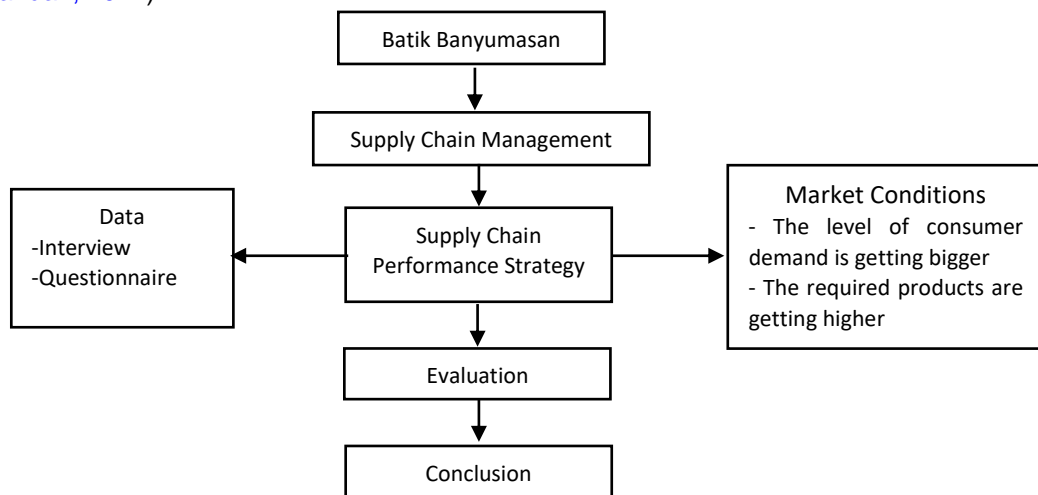


Figure 1 Thinking Framework

In its development, supply chain management not only concerns the flow of goods but also concerns other things needed by customers such as product development, quality assurance of goods, packaging, financial convenience, post-sales services, and information services (Indrajit, 2006). There are four actors in the supply chain, namely suppliers, companies, distributors, and customers. This link relationship is illustrated in Figure 2.



Figure 2 Supply Chain (Soebagiyo, 2008)

Based on Figure 2, supply chain management is the expansion and development of the concept and meaning of logistics management. Supply chain management is essentially the further integration of logistics management between companies.

### Business Partner Evaluation for the Manufacturing Industry

Suppliers are one of the business partners that play an important role in ensuring the availability of supply goods needed by the company. In assessing suppliers, criteria are needed that can describe overall supplier performance (Putri, 2012). Meanwhile, according to Indrajit (2006), supplier evaluation is a process of finding potential suppliers who meet or exceed certain requirements or criteria set by the company or customer. Supplier selection requires a lot of time and resources, especially for key suppliers. It is necessary to conduct initial evaluations, presentations, and surveys. This is intended to avoid losses due to various mistakes. Selected suppliers must also be monitored and assessed for their performance regularly so that their performance is maintained and can even improve.

Supplier evaluation can be carried out qualitatively or quantitatively. Generally, a quantitative approach is better than a qualitative evaluation, because it is more objective and more accountable. The process of selecting new suppliers is different from selecting or evaluating old suppliers. Evaluation of old suppliers, emphasis is placed on the results of their performance so far. For new suppliers, the emphasis of assessment is on administrative or technical completeness and financial capability. In new suppliers, experience can also need to be evaluated but based on references or information above work only (Yusuf, 2009).

### Business Plan Design

The importance of the supply chain model in small and medium enterprises has been examined whose results are the discovery of the configuration pattern of the supply chain system of ATBM woven glove companies and the design of software for supply chain mapping (Weiss et al., 2023). The results of Soekesi's (2010) research related to the supply chain model are a comprehensive supply chain model that illustrates the formation of synergistic cooperation in the supply chain. Another researcher, Rahmasari (2011), managed to find that supply chain practices have a positive and significant effect on company performance and competitive advantage. Departing from the results of this research, a study is needed related to the application of the supply chain model that truly follows the characteristics of entrepreneurs.

Supplier evaluation can be carried out qualitatively or quantitatively. Generally, a quantitative approach is better than a qualitative evaluation because it is more objective and more accountable. The process of selecting new suppliers is different from selecting or evaluating old suppliers. Evaluation of old suppliers, emphasis is placed on the results of their performance so far. For new suppliers, the emphasis of assessment is on administrative or technical completeness and financial capability. In new suppliers, experience may also need to be evaluated but based on references or information above work only.

### Data Analysis

Data analysis techniques in this study are descriptive statistics used to analyze data by describing or describing the data that has been collected. Statistical descriptions are carried out by compiling an assessment matrix from each respondent for the criteria and supply chain model of the Banyumasan batik industry. Alternative criteria for Banyumasan batik industry supply chain players are:

- a. Timely management of raw material inventory (K-1).
- b. Smooth production process (K-2).
- c. Timeliness of products into the hands of consumers (K-3).
- d. Cost efficiency (K-4).
- e. There is a value added (K-5).

The four models in question are the supply chain model that has been applied by batik entrepreneurs writing laser, namely: (1) raw material supply model and product distribution without intermediaries, (2) raw material supply model with intermediaries and product distribution without intermediaries, (3) raw material supply model without intermediaries and product distribution with intermediaries, (4) raw material supply models with intermediaries and product distribution with intermediaries (Saaty, 2000).

#### Criteria Value Matrix Results from Each Respondent

Based on the answers from respondents to each criterion, an assessment of the level of importance (weight) for each criterion was carried out. The results of the criteria value matrix (weight) are summarized for the highest assessment of the 5 (five) existing criteria from each respondent. A summary of the results of respondents' assessment of the highest level of importance (weight) for supply chain criteria and alternatives is in Table 1.

**Table 1** Summary of Highest Importance (Weight) Criteria

No	Criterion	Sum of Respondents
1	Timely management of raw material inventory (K-1)	22
2	Smooth production process (K-2)	10
3	Timeliness of products into the hands of consumers (K-3)	2
4	Cost efficiency (K-4)	0
5	Value added (K-5)	0
6	Choosing K-1 and K-2	10
7	Assessment is the same for the five criteria	1
<b>Sum</b>		<b>45</b>

Based on Table 1, the 22 respondents give the highest weight to the criteria for timely management of raw material inventory. This shows that according to Banyumasan Batik industry players, timely management of raw material inventory plays a very important role in the development of the Banyumasan Batik industry. Meanwhile, none of the respondents gave an assessment of the importance of the criteria for cost efficiency and added value. This means that according to Banyumasan Batik industry players, these two criteria are considered less important in the development of the Banyumasan Batik industry. If you can manage raw material inventory well, it will automatically have an impact on creating cost efficiency which will ultimately provide added value. So according to Banyumasan Batik industry players, the high level of importance is how the industry can manage raw materials well in terms of procurement and inventory.

#### Model Score Matrix Results from Each Respondent

Based on respondents' answers, a matrix is arranged to determine the score of each model. The model that obtained the highest score was the model selected individually by each respondent. The summary of the model selected by each respondent is presented in Table 2.

**Table 2** Supply Chain Models Were Individually Selected by Respondents

No	Type	Respondents
1	Model of raw material supply and product distribution without intermediaries (Model-1)	18
2	Model of raw material supply with intermediaries and distribution of products without intermediaries (Model-2)	10
3	Model of raw material supply without intermediaries and distribution of products with intermediaries (Model-3)	7
4	Model of raw material supply with intermediaries and distribution of products with intermediaries (Model-4)	10
<b>Sum</b>		<b>45</b>



Based on [Table 2](#), 18 individual respondents chose the first model, namely the raw material supply model and product distribution without intermediaries. This shows that according to Banyumasan Batik industry players, the model of raw material supply and product distribution without intermediaries is very important to develop its business compared to other models.

### **Results of Supply Chain Development Aspects**

Determining the right supply chain process will greatly determine the effectiveness and efficiency of the overall production process activities including determining selling prices. Establishing the right model will ensure timely inventory management including the timeliness of products reaching consumers. The supply chain process starts from the raw material supply chain. The model chosen as a model in efforts to develop the Banyumasan Batik industry is a model of raw material supply and product distribution without 1 intermediary.

In the selected model for obtaining raw materials, entrepreneurs come directly to suppliers to increase the efficiency of obtaining quality raw materials. By coming directly to the supplier, batik tulis entrepreneurs will get cheaper raw material prices than through intermediaries. The pattern of direct supply of raw materials has also become a habit for generations so a strong relationship is formed between Banyumasan Batik entrepreneurs and raw material suppliers. This condition encourages the formation of partnership patterns so that batik entrepreneurs get convenience both from the payment system and the number of orders. The most basic thing from the supply chain that is formed is the ability of suppliers to meet the needs of batik entrepreneurs. So far, the supply of shoulder material has never been choked, thus smoothing the flow of production. In addition, the speed of suppliers in serving batik entrepreneurs further increases the confidence of batik entrepreneurs to continue using the supply chain without intermediaries

As for the product distribution channel in the raw material supply model product distribution without intermediaries is short distribution. In the distribution of such products, entrepreneurs do not use the services of intermediaries. This is done so that entrepreneurs can reduce selling prices because there are no additional costs for transportation or intermediaries. Sales made by batik entrepreneurs are directly through showrooms that are integrated with the production site. Batik entrepreneurs also make sales when conducting exhibitions both in their area and outside the Sokaraja Regency. Thus, there will be direct interaction with consumers. The existence of this interaction will build bonds with consumers because entrepreneurs can serve as well as possible. In addition, with good communication with consumers, entrepreneurs will get input and suggestions related to their products. Another important thing is that with this direct product distribution, entrepreneurs can account for the quality of their products directly which will increase consumer confidence in the products sold.

### **Results of Product Development Aspects**

Banyumasan Batik every year experiences development both from the number of existing batik entrepreneurs and the variety of motifs produced. Batik motifs in Banyumasan are local motifs and can be used by all groups regardless of status or position. Unlike the batik in other regions such as Solo, Yogyakarta, and surrounding areas, some traditional ceremonies or socio-cultural activities will wear some batik motifs as an identity or social status marker for those who wear them. Banyumasan people use Banyumasan batik on various occasions regardless of what and how the motive is worn. Until now Banyumasan batik is still growing and developing amid society along with the emergence of several new motifs that do not leave the distinctiveness of the people in Banyumasan.

Banyumasan Batik Center located in Papringan village functions as a batik workshop room and work display room. The management and employees who manage the Batik Center are mostly the surrounding village community. Many batik works are carried out in their respective home environments because the majority of workers in this batik center are housewives, by doing batik in their respective homes, they can still control their households while making batik. The batik products produced in the workshop room of the Banyumasan batik center in Papringan village are typical Banyumasan batik motifs either packaged or developed. The Banyumasan batik product can be seen in [Figure 3](#).



**Figure 3** Banyumasan Batik Products  
Source: [Marcelly Susanti \(2019\)](#)

Banyumasan Batik can develop well because batik activities in the Banyumasan area are still being carried out by several craftsmen and batik companies. Banyumasan craftsmen and batik are present as conservationists in the existence and existence of Banyumasan Batik as a result of the culture that reflects its society. The development of some of Banyumasan's original motifs into several new motifs does not leave elements of old motifs is one of the things done by Banyumasan batik craftsmen and companies. The role of artists in Banyumas is no less important in the development of batik in Banyumas and its surroundings, some artists who are engaged in the arts, such as longer, beg, or kentongan often wear Banyumas batik as a support for the presentation of both in the form of costumes and stage decorations.

Currently, many large companies prefer to produce Banyumasan batik with more modern techniques such as stamping and printing, but there are still some companies that apply the cablaka technique. The loss of traditional values and philosophical meaning from the development of batik in the Banyumasan area is a form of changing times in the current era. The philosophical meanings contained in each Banyumasan batik motif that has existed since ancient times have shifted over time and changes in society in Banyumasan in particular. Another change that appears in Banyumasan batik is in the products produced by batik craftsmen in Banyumasan Regency.

#### **4. Conclusions and Suggestions**

Proper management of raw material inventory plays a very important role in the development of the Banyumasan Batik industry. The supply chain model that is effective and follows the characteristics of Banyumasan Batik entrepreneurs is a model of raw material supply and product distribution without intermediaries. With this process, for business development, coordination with other entrepreneurs is needed to build business independence to further improve the efficiency and effectiveness of the existing supply chain model. Through this learning, there is a need for an approach with local governments for the development and development of the Banyumasan Batik industry towards export-oriented medium entrepreneurs.

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