

Supply Chain Modelling in the Ceramic Industry Center in Purwakarta, Indonesia

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ABSTRACT

This research is aimed at demonstrating a supply chain model used by ceramic craftsmen in Purwakarta, Indonesia, through a qualitative method. Data were collected through literature study and field research. Moreover, field studies were conducted through observation and interviews, and the sampling technique used was purposive random sampling. Results showed that ceramic industry companies use three supply chain models, namely, consumer, manufacturer–retail/store–consumers and material processors, production artisans, supplier and exporters. We propose a model that encourages a collaboration among actors in the supply chain.

Keywords: *supply chain, export, manufacture*

1. INTRODUCTION

Purwakarta Regency is a 97,172 ha industrial area, which utilises approximately 30% of the total land area. Small crafts and intermediate industries are considered a rapidly growing industry. The land is located in the Plered and Tegalwaru districts with an area of 1000 ha, of which approximately 650 ha is newly used. Land utilisation is prioritised for developing small craft industries and intermediate commodities, such as decorative ceramics and building materials.

The ceramic industry is a leading industry in Purwakarta Regency, especially in the Plered District. The ceramic form is equally diverse as the tools of everyday necessities, such as jugs, jars, pots and barrels, or decorations, such as jars and flower pots.

The ceramic industry provides business fields with 58.32% and 2.78% of employees, of which 58.3% constitute the regional revenue (Riyadi, 2017).

Distribution is an aspect in ceramic processing activities. This process applies to large and small companies. Notably, the Plered ceramics industry is a component of the household industry, which must be developed optimally given its vast potential to support the regional economy in the future.

The Plered ceramics industry has been established in developing an industry that tends to be static, that is, hardly improving. This industry is related to the distribution and procurement of raw materials. Supply chain management (SCM) refers to

disseminating information, goods and services from producers to consumers. The distribution process must consider determining appropriate distribution channels, related to mileage, travel time and pattern of supply and demand of each consumer (Bogataj, 2005; Xiao et al., 2008; Perdana and Soemardjito, 2015). The lengthy travel time during product distribution will affect the quality of goods and initiate losses for traders because they have to bear the burden of costs of the delayed distribution process.

In addition, the relationship between suppliers, customers and the company must be managed well. Suppliers must be held responsible for the quality of products, excellent and long-term relationships with suppliers and customers and timely product distribution from upstream to downstream and end users. This point requires an efficient management. An error that occurs in distributing goods and services will reduce the quality of the goods and services (Rahmasari, 2011). Business actors in a supply chain must deliver products that suit the requirements of consumer in terms of quality, quantity, price, time and place (Furqon, 2014).

This condition occurs because knowledge in this aspect remains minimal. Thus, the supply chain or distribution can only be performed by large and advanced ceramic companies. Individually, craftsmen remain dependent on the government unit or *Unit Pelaksana Teknis Dinas (UPTD)* that overshadows them. These craftsmen can only craft ceramics. However, the ceramics industry lacks attention.

Thus, craftsmen only produce in accordance with order, regardless of the distribution channel. They only consider the buyer and number of buyers being served, regardless of the length of the job. These craftsmen depend on government agencies, that is, the *UPTD*, which facilitates orders and purchases. If this cycle is incomplete, then the ceramics business will remain undeveloped.

This situation is detrimental to the craftsmen. Therefore, providing a link for the craftsmen is crucial. This research focuses on the supply chain implementation, which is related to existing models.

2. LITERATURE REVIEW

2.1. Supply Chain Concept

Arifianti (2017) stated that supply managers must decide on the frequency of placing an order and the number of items in that order. These supply managers handle the logistics starting from the purchasing, storing raw materials, processing of products and creating the final products.

Supply of raw materials is a determinant in order fulfilment of market demands. Stagnation occurs when the source of this raw material is uncontrolled by the company. This scenario might cause the non-fulfilment of demand orders from the market and customers. Therefore, benefits must be provided and advantages created for companies facing competition in the market to overcome this dilemma in the supply chain (Tampubolon, 2014).

Meanwhile, Pavico (2016) indicated a significant correlation between price and promotion of marketing and SCM practices; this observation is relevant because micro enterprises strive to integrate their functions towards attaining a competitive advantage in terms of cost; however, warehousing and physical distribution of logistics and price in marketing are considered significantly correlated with competitive advantage in terms of differentiation.

Supply chain is a system, where an organisation distributes its products and services to its customers. This chain is also a network by itself or that of various interconnected organisations with the same goal. This incentive is possible and useful for organising the procurement or distribution of goods. The term 'distribution' may be inappropriate because the term 'supply' covers the process of changing the goods, for example, from raw materials to finished goods (Indrajit and Djokopranoto, 2006).

According to Heizer and Render (2006) and Siagian (2005), SCM is the act of managing activities to convert raw materials into semi-finished or finished goods and then delivering the products to consumers through a distribution system. These activities cover traditional purchasing and other essential activities, which are related to suppliers and distributors. The following aspects may contribute to the SCM:

1. Transportation;
2. Transfer of credit and cash;
3. Suppliers;
4. Distributors and banks;
5. Debts and receivables;
6. Warehousing;
7. Order fulfilment;
8. Information-sharing on demand forecasts, production and inventory control activities.

SCM is directly related to a complete cycle of raw materials from suppliers to production, warehouses and distribution. The consumer is the last component of the supply chain. Meanwhile, companies increase their competitiveness through products and quality adjustments, cost reduction and market-reaching speed with additional emphasis on the supply chain (Siagian, 2005).

The concept of supply chain is a fairly new one in terms of logistics issues. The old concept considers logistics as an internal problem for each company, in which solutions are internal to the respective companies. In this new concept, the logistics problem is considered a broad problem, which starts from the base material to finished goods used by the final consumer in the supply chain. Therefore, Levi et al. (in Indrajit and Djokopranoto, 2006) defined supply chain management as follows:

Supply chain management is a set of approaches utilised to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, at the right time, in order to minimize system wide costs while satisfying service level requirement.

2.2. Supply Chain Elements

Indrajit and Djokopranoto (2006) stated that the elements (major players) in the supply chain are composed of companies that have the same interests as follows:

1. Supplier

The network begins with the supplier, which is the source of the first materials and where the supply chain also begins. The first material can be in the form of raw and auxiliary materials, ingredients, subassemblies and spare parts. In its pure meaning, supplier includes suppliers or sub-suppliers. Suppliers may be many or few but are frequently numerous. This element is also known as the first link.

Chain 1–2: Supplier ► Manufacturer

The first chain is connected to the second chain of manufacturer, assembler, fabricator or another form, which makes, fabricates, assembles, converts or finishes the goods. For this research, this variety of forms is collectively known as the manufacturer. This relationship with the first chain has the potential to earn savings. For example, inventories of raw, semi-finished and finished materials on suppliers, manufacturers and transit points are targets for these savings. Frequently, savings of over 40%–60% can be obtained through inventory by carrying the cost for the chain. This saving can be obtained through partnerships with suppliers.

Chain 1–2–3: Supplier ► Manufacturer ► Distributorship

The finished goods produced will be distributed to the customers. Distributorship is frequently utilised and pursued by numerous supply chains, although goods are delivered to customers through various means. Goods from factories and warehouses are channelled to wholesalers or wholesaler warehouses in large quantities. Consequently, wholesalers deliver these goods in small quantities to retailers.

Chain 1–2–3–4: Supplier ► Manufacturer ► Distributorship ► Retail Outlet

Large traders own their warehouse facilities or rent from other parties. A warehouse is used to hoard goods before being redistributed to retailers. Here, an opportunity presents to earn savings in inventories and warehouse costs by redesigning the patterns of delivery of goods from the manufacturers and manufacturer warehouse (retail outlets).

Chain 1–2–3–4–5: Supplier ► Manufacturer ► Distributorship ► Retail Outlet ► Customer

From the shelves, retail outlets, such as shops, stalls, department stores, supermarkets, cooperative stores, malls and club stores, offer their goods directly to customers, buyers or users of the goods. The connection from the buyers (who came to the retail outlet) to the real customers or users is the last link because the buyer may not necessarily be the real user. The supply chain ends where the actual user utilises the goods or services of the relevant item.

3. RESEARCH METHOD

In this research, the descriptive–qualitative approach is used. The descriptive research conducted in this research is aimed at systematically, factually and accurately describing or depicting facts.

The techniques used for data collection are as follows:

a. Library research

The completion of primary data required secondary data through library research. Secondary data collection was conducted by studying textbooks and other works, such as research journals, that are considered supplementary to the current discussion and analysis of research results on data from ceramics craftsmen in Plered, Purwakarta, West Java.

b. Observation

Observation of the manufacturing process from raw materials to finished goods in the form of ceramics was directly performed in the ceramics production unit.

c. Interview

We conducted interviews with ceramics artisans to probe further on certain topics, such as *UPTD* in Plered, Purwakarta, and the history and process of ceramics manufacture up to the marketing of ceramic products.

4. RESULT AND DISCUSSION

The supply chain is a system of delivering goods and services to customers. The goal is to organise the procurement or distribution of the goods. The term ‘procurement’ or ‘distribution of goods’ is synonymous across small and large companies. The sustainability of the organisations involved is crucial to implementing this process. This system also applies to small businesses, such as the ceramics artisans in Plered, Purwakarta. Furthermore, distribution activities can be explained as follows: In the delivery to the consumer using a certain supply chain, supply chain types are regarded as follows:

4.1. Manufacturer–Consumer

Manufacturer

The manufacturer, assembler or fabricator makes, fabricates, assembles, converts or finishes the goods (finishing). Manufacturing, in this research, is related to the makers of ceramics, specifically the craftsmen.

Consumer

Buyers visit the craftsmen for the finished products. These consumers may be domestic or foreign tourists who visit and learn to make ceramics given the low cost and quality of the product.

4.2. Manufacturer–Seller–Consumer

1. Manufacturer

The manufacturer, assembler or fabricator produces the goods to be sold, that is, the Plered ceramics maker. The makers manufacture two types of products, namely, ready-made goods and decorative items.

2. Retailer/Store

From the shelves, such as those in shops and cooperative stores, or other outlets, where the end buyers make a purchase, these retailers offer their goods directly to the customers, buyers or users of the goods.

Retailers transfer the goods directly from artisans using trucks. However, the price they offer is expensive. They buy from the manufacturer (artisans) every day or once a week depending on the inventory of existing goods.

The average retail store is frequently located along the highway. Behind this shop may be another unit, which houses the craftsmen who make ornamental ceramics. Workshops for ready-made ceramics are located nearby the retailer’s store.

3. Consumer

Consumers are similar to buyers, who are related to people who engage in transactions, such as buying and selling. These consumers typically buy ceramics from shops that sell ceramics.

4.3. Supplier, Manufacturer, Supplier/Distributor and Consumer

Craftsmen are involved in the following supply chain types:

1. Supplier

This activity starts from the craftsmen or a particular team by processing clay materials. Clay is typically supplied by certain parties.

2. Manufacturer

Manufacturing is related to production. Clay materials, which have been purchased from another supplier, is processed. The treatment begins by forming the ceramics to be made, storing ceramics that have been formed, and drying, burning and finishing the end-product by painting. This process constitutes the production of ornamental ceramics. However, crafting household ceramics is different. Pickling is performed before combustion for the safety of the users.

3. Supplier/Distributor

Suppliers, in this context, are related to the store that sells ceramics in accordance with the type of ceramics (ornamental or household), finishing (painting) and distribution. Distribution of ceramics can be carried out through *UPTD*, which is the service that handles the ceramics business. *UPTD* conducts exhibits of ceramics products; thus, consumers can buy the goods in these exhibits. In the absence of *UPTD*, this distribution channel will not proceed smoothly. In particular, the ceramic industry will fail without *UPTD*.

4. Consumer

The consumer is also known as the buyer. Export power is an important term in crafts. This term refers to overseas and domestic consumers. For example, Mr. Richard is an exporter from Korea. Typically, consumers will buy bulk orders of approximately 1 container per month from Mr. Richard.

5. CONCLUSIONS AND SUGGESTIONS

5.1. Conclusion

The results showed that the company uses three supply chain models, namely, manufacturing and buyer, retail/store and consumer and supplier, manufacturer and consumer.

5.2. Recommendation

We recommend that these modelling types should be developed with the cooperation among actors in the supply chain.

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