

ANALYSIS OF THE LOGISTICS COST STRUCTURE OF MOCHI AHMAD YANI IN THE PREPARATION OF SUPPLY CHAIN STRATEGIES

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DOI:10.15408/aj.v18i2.42802

Abstract

Mochi Sukabumi is a specialty food that has developed into one of the local culinary icons and has been recognized as an Intangible Cultural Heritage (WBTH) by the West Java Provincial Government in 2022. As a glutinous rice-based product with a relatively short shelf life, mochi Sukabumi requires effective and efficient supply chain management to maintain quality and meet consumer demand. This study aims to analyze the supply chain of Mochi Ahmad Yani, one of the pioneers of mochi in Sukabumi, with a focus on the management of raw materials, production, distribution and sales. Data were collected through in-depth interviews with business actors involved in the supply chain, namely suppliers, manufacturers, distributors, and retailers. This study used the Activity-Based Costing (ABC) method to analyze the logistics cost structure. The results show that procurement and material handling activities have the largest proportion of costs in the mochi supply chain, especially at the producer tier. The dominant cost structure in procurement is due to the need for quality raw materials to maintain product standards, while material handling costs are greater in distributors and retailers due to the handling of products directly related to end consumers. With an in-depth understanding of the logistics cost structure, Mochi Ahmad Yani is expected to formulate a more efficient supply chain strategy to improve competitiveness and customer satisfaction.

Keywords: Activity-Based Costing; Local Cuisine; Mochi Sukabumi; Raw Material Management; Supply Chain.

INTRODUCTION

Mochi Sukabumi is often considered a Japanese specialty. However, historian Irman Firmansyah emphasizes that mochi has deep roots in the local region and only spread to Japan in the 9th to 11th centuries. Glutinous rice, the basic ingredient of mochi, has been known since the Sundanese Kingdom as evidenced by the inscription Sanghyang Tapak Cibadak. In 2022, mochi was recognized as an Intangible Cultural Heritage (WBTH) by the West Java Provincial Government. (Alya, 2024). Mochi is an integral part of Sukabumi's cuisine and a cultural heritage that must be preserved.

The development of mochi in West Java, especially in Sukabumi, is a concern in Indonesia's local culinary scene. One of the pioneers of mochi in Sukabumi is Mochi Ahmad Yani, which was founded by a Chinese immigrant. Hendry, the third generation of the founder, explained that Mochi Ahmad Yani initially started his business by selling hawkers since 1970, until finally a shop was established. However, in the 1990s, the store went through a difficult period, especially during the 1998 tragedy that caused the store to be temporarily closed. During the closure, customers who wanted to buy mochi had to press a bell, just like when visiting home. In the 2000s, Mochi Ahmad Yani reopened until today. Mochi Ahmad Yani now has two branches that support Sukabumi MSMEs through product entrustment so that in store outlets there are also products other than Mochi, namely MSME products of almost all traditional foods.

Stable mochi market demand due to customer satisfaction is driven by optimal supply chain management so that it can support the development of mochi products in the midst of increasingly competitive market competition. (Mahesa, 2022). The supply chain is a series of activities from producers to end consumers that include sourcing, procurement, production,

distribution, and distribution of goods or services. The supply chain has an important role in mochi products so that it must be managed efficiently because of the relatively short shelf life, producers are required to maintain production and distribution quickly and precisely to prevent quality decline. Therefore, a good supply chain is the key to the success of mochi products in meeting consumer needs efficiently and with quality.

In the mochi supply chain, there are various challenges that must be faced. The storage of raw material inventory and mochi inventory becomes a risk management during the production and distribution process, if not managed properly, as it results in delays or inventory damage. In addition, rising costs due to external factors are also a major issue, requiring operational adjustments to remain efficient. (Zakrzewska-Bielawska, Lis, & Ujwary-Gil, 2022).

The supply chain at Mochi Ahmad Yani includes several components from upstream to downstream, namely 1) Raw material suppliers, suppliers who provide ingredients such as sticky rice flour, sugar, peanuts, suji leaves, and other ingredients. The quality of raw materials is very important to maintain product quality (Mahesa, 2022). 2) Manufacturers, the manufacturing process starts from mixing raw materials, processing dough, making fillings, forming, and packaging. 3) Distributor, mochi production, and packaging will be distributed to the three Ahmad Yani store outlets. 4) Retailers, parties who sell Mochi products to end consumers 5) Consumers, the final party in the supply chain, where end consumers get Mochi by directly buying in stores or through *e-commerce*.

The supply chain is affected by the logistics cost structure in the mochi product value chain due to several interrelated factors. Factors affecting logistics costs, such as warehousing, material handling, transportation, and packaging, play an important role in determining the total logistics cost per unit. (Singhdong, 2020). So the management of supply chain and logistics costs is an important factor in achieving productivity and efficiency. Mochi Ahmad Yani can formulate a supply chain strategy by reviewing several important factors related to quality and speed of distribution. Mochi Ahmad Yani can ensure that mochi products are readily competitive and meet consumer expectations, as well as support the wider food industry.

RESEARCH METHODS

Research Location and Time

The subject of this research is Ahmad Yani Mochi Business. This business is one of the oldest mochi production businesses in Sukabumi, located at Jl. No. 170 A, Sukabumi City, West Java 43165. This research was conducted periodically on September 24, 2024 and October 28, 2024.

Data Source Type

The data in this study were obtained through a quantitative research approach, which involves the collection and analysis of numerical data to test hypotheses, draw conclusions, and examine the relationships between variables (Priyanda et al., 2022; Zakrzewska-Bielawska, Lis, & Ujwary-Gil, 2022). The respondents in this study consisted of four business actors involved in the mochi supply chain, namely raw material suppliers, producers, distributors, and retailers. Data were collected through in-depth interviews following a research design based on the previous study by Wijaksana and Pramulya (2024), which applied a similar supply chain model in a case study of siam oranges.

Sampling was carried out using two techniques: purposive sampling and snowball sampling. The first respondent was selected through purposive sampling, a technique that involves selecting a sample based on specific criteria relevant to the research topic (Asari et

al., 2023). This method is commonly used to ensure the selection of quality, unbiased samples, thereby increasing the reliability and trustworthiness of the findings (Nyimbili & Nyimbili, 2024). Subsequent respondents were identified through snowball sampling, a multi-stage method in which initial participants help the researcher reach additional participants with similar characteristics. This method continues until the planned number of respondents is obtained (Lenaini, 2024; Nyimbili & Nyimbili, 2024).

Data Analysis

According to the numerical data used in this study is the logistics cost structure, which is then processed using cost analysis using the Activity-Based Costing (ABC) Method. Activity-Based Costing is one of the methods in the cost system that focuses on the activities generated to produce goods/services. (Giselawati et al., 2024). According to (Wijaksana & Pramulya, 2024) to conduct a cost analysis, this research uses several formulas, including:

- Total Cost (Rp/Year) = Fixed Cost + Variable Cost ... (1)
- Production Revenue (Rp/kg) = Production Quantity (kg) × Selling Price (Rp/kg) ... (2)
- Profit (Rp) = Total Revenue – (Variable Cost + Fixed Cost) ... (3)

RESULTS AND DISCUSSION

Mochi Supply Chain Analysis

Mochi Sukabumi has unique characteristics that are different from Japanese mochi. This mochi uses a variant of peanuts for the filling. The outside of the mochi is made from a mixture of glutinous rice flour, sugar, and suji leaves as a natural colorant, giving it a chewy and soft texture. Mochi is a perishable product if not consumed immediately, so it requires an efficient supply chain.

Effective supply chain management includes coordination of product flow, information flow, and financial flow among supply chain actors to improve profit maximization. (Hunter, Norrman, & Berg, 2022). Product flow moves from upstream to downstream, financial flow moves from downstream to upstream, and information flow moves from both, namely from upstream to downstream and vice versa from downstream to upstream. (Fachrezi, et al., 2024).. The mochi supply chain process includes the provision of raw materials, production, and fast distribution. Speed in distribution is very important to maintain product freshness, which ultimately has an impact on customer satisfaction. Customer satisfaction is a key element to maintaining business continuity (Rizkilawati, et al., 2015). (Rizkilawati, et al., 2024).. Based on observations and interviews at Mochi Ahmad Yani, the mochi supply chain can be described as shown in **Figure 1**.

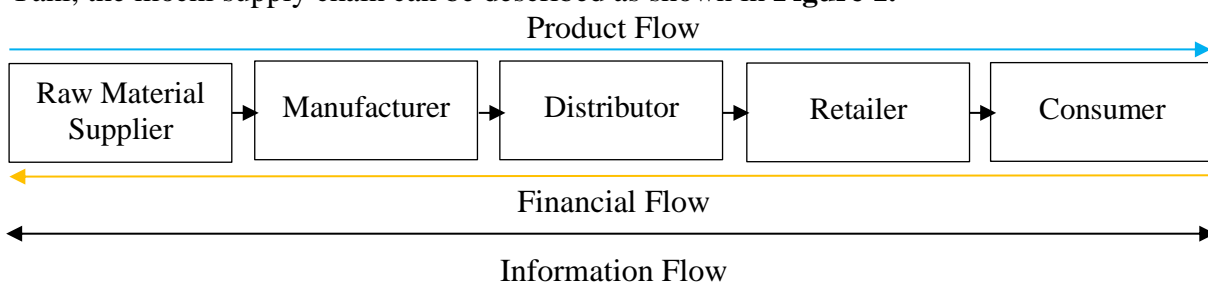


Figure 1. Product, Financial and Information Flow Patterns Based on Primary Data

Raw material suppliers are the first actors who have an important role in providing raw materials for producers to produce final products, so that transparent relationships between producers and raw material suppliers can increase efficiency and reduce production risks (Hecht, 2022).

This is in line with Mochi Ahmad Yani because raw material suppliers act as the first actor in the supply chain, responsible for providing high-quality mochi-making ingredients so that the final product can meet consumer expectations for chewy and delicious traditional mochi. In addition, the quality of raw materials can determine the texture, flavor, and durability of mochi. Factors such as availability of goods, quality of raw materials, and price are criteria in choosing suppliers. Manufacturers have the flexibility to change or find another supplier if the supplier cannot meet the expected standards.

The main actor in the mochi supply chain is the producer. Producers have an important role in processing raw materials into ready-to-consume products that meet quality standards. At the initial stage of production, it starts with mixing the basic ingredients in the right proportion to create a chewy and soft mochi texture. The second stage of mochi dough is filled with variants of nut fillings. The third stage of mochi is formed into a circle or a certain shape before being directly packaged in boxes or baskets. Packaging using baskets aims to maintain air circulation so that the mochi remains fresh, according to consumer preferences. Manufacturers also carry out quality control at every stage of production to ensure that the mochi produced is of high quality and meets taste standards. The producer provides training for its workforce to ensure they have the skills in each stage of production, such as mixing, filling, and shaping, so that the products produced are always consistent.

Distributors are the third actor who plays an important role in ensuring that products reach outlets in a timely manner and in good condition. Mochi that has been produced and packaged by the manufacturer is distributed regularly to the three Mochi Ahmad Yani outlets. Distributors ensure that mochi stock is always available at each outlet, anticipating fluctuations in consumer demand, especially on days with high demand.

Retailers are the fourth actor in the supply chain and are directly responsible for selling products to end consumers. Retailers at the three Mochi Ahmad Yani stores function as intermediaries for sellers to end consumers and provide education to consumers about the uniqueness of mochi products. Retailers have the responsibility to store mochi properly and arrange them attractively on *display* shelves to maintain optimal product appeal. Retailers face storage risks in the deterioration of mochi quality due to prolonged storage. Retailers seek to minimize risks in the supply chain so that *stock* requests are adjusted to the general amount of consumer demand so that mochi products remain of high quality and are always available to consumers.

Consumers are the last actor in the mochi supply chain, and they have the freedom to choose products according to their needs and preferences. Three types of mochi products are available in different sizes and packaging to provide flexibility of choice for consumers. There are basket packaging options that contain 10 mochi, small boxes that contain 20 mochi, and large boxes that contain 40 mochi. Prices range from Rp13,000 to Rp50,000 depending on the size and number of mochi in each package. Consumers can enjoy the distinctive original taste of traditional mochi, with a peanut filling. This variant maintains the authentic taste of Sukabumi's famous mochi.

The flow of money in the mochi supply chain from consumers to raw material suppliers includes several stages of payment transactions between each actor. First, consumers make payments to retailers or store outlets when purchasing mochi products. This payment is received directly by the retailer in the form of cash or non-cash, according to the price of the product based on the size and type of packaging chosen. The funds received by the retailer are used to cover the operational costs of the outlet. Furthermore, the retailer makes direct payments to the manufacturer for the delivery of the mochi products received. Since the distributors are still part of the manufacturer's employees, this distribution process does not

involve external payments, but is managed directly by the manufacturer as part of its internal operations. The manufacturer then uses this revenue from retailers to pay raw materials to suppliers as well as cover production costs, including labor and maintenance of production equipment.

Logistics Cost Structure Analysis

In this study, there are five logistics activities that are interrelated with the mochi supply chain system, namely *procurement*, *material handling*, *inventory*, *transportation*, and *information*. According to (Wijaksana & Pramulya, 2024) each logistics activity has different cost components at each level in the supply chain. The details of the logistics cost components at each tier of the mochi supply chain based on the results of interviews with respondents can be seen in **Table 1**.

After collecting data from each supply chain actor, the logistics cost components were itemized. The detailed costs and percentages of each logistics activity can be seen in **Table 2**. And the proportion of each logistics activity to the overall cost can be seen in **Figure 2**.

The results show that *procurement* activities have the largest proportion of costs, which amounted to 56.62% of total logistics costs. The dominant cost component of *procurement* activities is raw material costs with a cost proportion of 47.85% of total logistics costs. This is due to the quality factor that needs to be highlighted in the food industry. The quality of raw materials makes a positive contribution that can determine quality, meaning that the better the quality of raw materials, the better the quality of the product. (Hilary, 2021).

The next logistics activities are *inventory*, *transportation*, and *information*. *Inventory* refers to storage costs, which in this case only includes electricity costs incurred by each *tier*. Meanwhile, *transportation* and *information* activities are only incurred by distributors and retailers. This is because these two actors are responsible for delivering and marketing products directly to end consumers. The percentage of logistics activities for each *tier* can be seen in **Table 3**.

Table 1. Breakdown of logistics costs at each mochi tier

Activity Logistics	Cost Component Details	Raw Material Supplier	Manufacturer	Distributor	Retailer
<i>Procurement</i>	- Mochi raw materials (glutinous rice flour, sugar and peanuts) (a) - Packaging material (b) - Transportation (c)	√ (a, c)	√ (a, b, c)	√ (c)	√ (c)
<i>Material Handling</i>	- Production operating costs (d) - Packaging cost (e) - Labor wage (f)		√ (d, e, f)	√ (f)	√ (f)
<i>Inventory</i>	- Electricity (g)		√	√	√
<i>Transportation</i>	- Shipping cost (h) - Vehicle depreciation (i)			√ (i)	√ (h)
<i>Information</i>	- Communication cost with customers (j)			√	√

Table 2. Breakdown of logistics cost components at each mochi *tier*

<i>Activity Logistics</i>	<i>Cost Component Details</i>	Total Logistics Cost (IDR/Package)	Logistics Cost Percentage (%)
<i>Procurement</i>	Raw material cost	8.300	56,62
	Packaging costs	1.250	
	Transportation costs	270	
	Total	9.820	
<i>Material Handling</i>	Operating costs	6.500	37,47
	Total	6.500	
<i>Inventory</i>	Storage Cost	725	4,18
	Total	725	
<i>Transportation</i>	Vehicle depreciation	223	1,34
	Total	233	
<i>Information</i>	Cost of communication with customers	67	0,39
	Total	67	
TOTAL		17.345	100

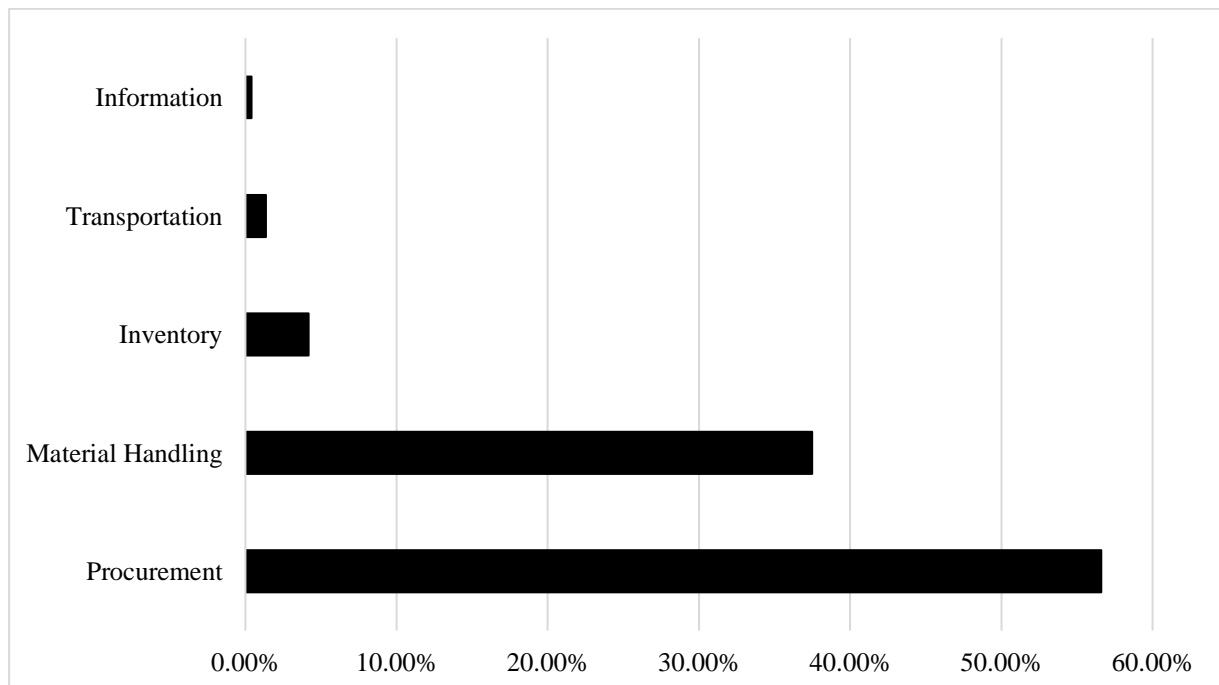


Figure 2. Proportion of mochi supply chain costs at each tier

Table 3. Percentage of logistics activities in each *tier of mochi* (% Logistic Cost)

Tier	Procurement (%)	Material Handling (%)	Inventory (%)	Transportation (%)	Information (%)	Total (%)
Raw Material Supplier	100	0	0	0	0	100
Manufacturer	53,46	41,84	4,7	0	0	100
Distributor	3,46	83,38	9,3	2,86	1	100
Retailer	3,46	83,38	9,3	2,86	1	100

Based on the table above, the percentage of material handling and procurement costs dominates the logistics cost structure in the mochi supply chain. This results in high total logistics costs and has the potential to affect the price of the products offered. So that each *tier* needs to optimize its expenses to maintain product competitiveness and ensure smooth logistics flow. This is in line with the main objectives of this supply chain management is the delivery or delivery of products on time for consumer satisfaction, reduce time, reduce costs, improve all results from the supply chain, centralize planning and distribution activities (Yusuf & Soediantono, 2022).

CONCLUSION AND SUGGESTION

Based on the analysis of the mochi supply chain, it was found that the largest logistics costs are found in the procurement and material handling activities. Raw material procurement accounts for 56.62% of the total logistics cost, as the quality of raw materials plays an important role in maintaining the texture and flavor of mochi. Meanwhile, material handling costs, including production operations, labor wages, and packaging, accounted for 37.47%. Thus, each tier in the supply chain needs to optimize, such as by reducing procurement and material handling costs through operational efficiency. This optimization is in line with the goal of supply chain management, which is to ensure the timely delivery of products for consumer satisfaction and reduce costs to improve efficiency. In addition, risk management in the distribution sector must also be considered so that products can be delivered quickly and on time, so that their freshness is maintained until they reach consumers. This distribution efficiency can help improve customer satisfaction.

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